

For the Progress of Man: The TVA, Electric Power, and the Environment, 1939-1969

By

Matthew D. Owen

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Approved:

Gary Gerstle, Ph.D.
Sarah E. Igo, Ph.D.
Michael Bess, Ph.D.
Ole Molvig, Ph.D.
Dana D. Nelson, Ph.D.

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Introduction

Speaking at the University of Chicago in 1954, Gordon R. Clapp, the chairman of the Tennessee Valley Authority's board of directors, remarked, "Electricity, unlike butter, has no substitute."¹ In one sentence, Clapp captured the importance of electric power as a tool of social change for an entire generation of reformers and policymakers. The public power movement of the 1920s first linked the increased consumption of electricity with the rise of a healthy, industrialized economy, the modern, appliance-filled home, and a clean environment. Beginning in the 1930s, the TVA's emphasis on using an abundant supply of inexpensive kilowatts to facilitate economic growth and improve the quality of life in its service area formed the foundation of an energy regime that made access to electric power an indispensable part of the social citizenship package coming out of the New Deal.² In the post-World War II period, the consumption of electricity by businesses and individuals served as both a marker of progress and a means of achieving a modern, American standard of living through a more efficient use of natural resources.

Three core arguments drive this dissertation. First, public power represented a profoundly idealistic and influential approach to resource development that defined energy policy in the United States after the New Deal. The advocates of public power focused on democratizing access to electricity by expanding service and reducing rates in an effort to better

¹ Gordon R. Clapp, "National Power Policy" (lecture 6 of 6 presented at the University of Chicago for the Charles R. Walgreen Foundation, Chicago, Illinois, February 26, 1954), 4, University of Tennessee at Knoxville, John C. Hodges Library, Special Collections [hereafter: UTK: Hodges], TVA Pamphlet Collection 1934-1960 [hereafter: TVA PC], Box 1, Folder 1.

² I will explain the term "energy regime," its use in this dissertation, and its importance as a tool of critical analysis below; also see Gabrielle Hecht, *The Radiance of France: Nuclear Power and National Identity after World War II* (Cambridge: MIT Press, 1998), 14-7. On the concept of social citizenship and its relationship to the New Deal state, see discussion below and Suzanne Mettler, *Dividing Citizens: Gender and Federalism in New Deal Policy* (Ithaca: Cornell University Press, 1998); and Meg Jacobs, *Pocketbook Politics: Economic Citizenship in Twentieth Century America* (Princeton: Princeton University Press, 2007).

the lives of all Americans. Cheap energy became a key component of the liberal state and its goal of achieving social welfare through economic growth and mass consumption. It was also an important bulwark for national security during the Cold War. Together, the state and the public power movement created an energy infrastructure and culture premised on low cost and high use that functioned as a critical support both for the era of material abundance and the military industrial complex.

Second, The Tennessee Valley Authority's power program was the boldest experiment in public power in the nation's history and the apotheosis of federal efforts to promote the widespread adoption of an energy-intensive lifestyle. The agency's emphasis on maintaining an abundant supply of inexpensive kilowatts formed the foundation of a consumption-centric energy regime that shaped the TVA's generating system, encouraged residential use, and transformed the economy of its service area. The Authority relied on the cooperation of local boosters, including businessmen and politicians who embraced cheap electricity as a pathway to progress, and on the municipal utilities and rural coops that distributed TVA power. Particularly in the 1950s and 1960s, the Authority's consumption-centric regime revolutionized patterns of energy use and resource development in the Tennessee Valley Region—an 80,000 square mile expanse that included parts of nine states.³ [Fig. 1.1]

Third, the successes and failures of the TVA's regime highlight the strengths and weaknesses of the liberal state after World War II. They underscore both the state's ability to project its influence by promoting widespread energy use and the limitations of consumption as a

³ The label "Tennessee Valley Region" refers to the communities included in the TVA's service area as well as those directly involved in the production of electricity for the Authority. Admittedly the term has greater meaning when used to describe the immediate postwar period when one could argue that it referred to a roughly contiguous area. The TVA now receives much of its coal from mines in the western United States, including the Powder River Basin in Wyoming. It is also something of an artificial descriptor in the sense that the TVA's system has always been connected to adjacent networks in the southeast and now is part of the national power grid receiving and sending electricity as needed.

social, economic, and environmental policy. Although the Authority succeeded in making inexpensive electric power ubiquitous in its service area, the agency's policies reinforced a political economy that favored an emerging commercial elite and upper- and middle-class white consumers to the detriment of minorities and the poor. The focus on improving the purchasing power of all Americans to raise standards of living did little to reduce social and economic inequality, falling short of the rhetoric of public power's early proponents. Furthermore, the process of generating large volumes of cheap kilowatts had serious consequences for the environment. The TVA's coal-buying policies encouraged the adoption of strip mining practices that destroyed the land and ruined streams in the region's coalfields, and the agency's coal-fired power plants released harmful pollutants that rendered neighboring communities uninhabitable. Despite the destruction that its power program caused, the Authority continued to tout electricity as clean energy for homes and businesses. The TVA's claim rested on the physical separation of energy consumers from the sites of energy production. To Nashville residents, electricity did in fact seem remarkably clean. Gone were the smog and soot that engulfed the city and other urban areas in the 1920s and 1930s. But the pollution problems of coal-fired power had not been solved. Rather, they had been moved to places "invisible" to most electrical customers. Not surprisingly, the environmental costs of the Authority's energy regime fell most heavily on the rural poor.

In 1930s, the public power and regional planning movements shaped the early history of the TVA. The movements formed two parallel branches of conservationist thought, and both supported multipurpose resource development. The advocates of public power believed that government ownership of utilities was necessary to ensure that all consumers had access to electricity, which they argued was a vital resource of modern life. In contrast, the devotees of

regional planning favored cooperation with private electric companies whenever possible. The TVA's first board of directors was split between David Lilienthal, a supporter of public power, and Arthur E. Morgan, a regionalist. Lilienthal pushed for the expansion of the Authority's power program and the expulsion of private providers from the Tennessee Valley Region. Morgan opposed this approach, preferring to rely on private utilities rather than increase the scope of the TVA's power operations. The two men clashed repeatedly until Lilienthal ousted Morgan in 1938. As a result, the tenets of public power became the guiding principles of the Authority's energy regime.

The history of the TVA's power program in the 1950s and 1960s demonstrates the centrality of the public power movement and inexpensive electricity to the making of the modern United States. It is a story of the state's role in promoting a vision of social welfare predicated on the consumption of cheap energy, a vision that favored economic development over the preservation of natural resources and increasing the purchasing power of ordinary Americans over the direct redistribution of wealth. The widespread availability of affordable electric power underpinned much of the United States' prosperity after World War II, facilitating suburbanization and encouraging economic growth. Electricity was also a critical resource for the Army during the Cold War, providing the energy needed to produce the nation's stockpile of nuclear weapons.

The Authority became the biggest producer and wholesale distributor of electricity in the United States in the middle decades of the twentieth century. In the 1950s alone, the agency oversaw a 320 percent increase in its sales of electric power and more than quadrupled its overall generating capacity.⁴ By the 1960s, residents in the Tennessee Valley Region used more

⁴ See TVA, *Annual Report, 1949* (Washington, D.C.: Government Printing Office, 1949), 50; and TVA, *Annual Report, 1959* (Washington, D.C.: Government Printing Office, 1959), 2. In the fiscal year ending in the summer of

electricity per household than any other part of the country, and homes in Nashville consumed electric power at twice the national average.⁵ The Authority's energy regime made the agency's service area attractive to manufacturers and federal defense projects. Electrochemical and metallurgical companies opened new factories in communities like Decatur, Alabama and Calvert City, Kentucky. The Atomic Energy Commission operated laboratories and production centers at Oak Ridge, Tennessee and Paducah, Kentucky, and the Army moved its rocket and guided missile research program to Huntsville, Alabama. Together, these industries and installations fundamentally altered the economy of the region while relying on TVA electricity to meet their energy needs.⁶

Although the Authority made electric power more accessible and affordable for in-home and commercial use, its energy regime bolstered the interests of affluent white residents and did little to redistribute political or economic power to minorities and the poor. The TVA's policies abetted mass movement to economically stratified, racially segregated suburban communities by expanding service on the metropolitan fringe. The manufacturers, research laboratories, and defense projects that used the Authority's cheap kilowatts to transform the region provided few high-paying jobs for African Americans and empowered a new class of business progressives and white collar workers who dominated the region's politics in the post-World War II period.⁷

1950 the TVA reported a generating capacity of approximately 2.74 million kilowatts. Ten years later the figure had risen to nearly 11.5 million kilowatts. See TVA, "TVA Power, 1959-1960," informational pamphlet, January, 1960, 2, UTK: Hodges, TVA PC, Box 4, Folder 8; and TVA, "TVA Power, 1949," undated informational pamphlet, 3, National Archives and Records Administration Southeast Branch, Morrow, GA [hereafter: NARA-SE], Record Group 142 [hereafter: RG 142], Power Manager's File [hereafter: PMF], Box 17.

⁵ For statistics on electricity use in the Tennessee Valley Region and Nashville, see Chapter Three.

⁶ For a discussion of industrial growth and the rise of a postindustrial sector of research and development firms, see Chapter Four.

⁷ The term business progressives refers to the new commercial elite that finally overtook the older planter class in southern politics in the twentieth century and especially after World War II. The term's application in the South can be attributed to George B. Tindall; see George B. Tindall, *The Emergence of the New South, 1913-1945* (Baton Rouge: Louisiana State University Press, 1967); also see, Bruce J. Schulman, *From Cotton Belt to Sunbelt: Federal Policy, Economic Development, and the Transformation of the South, 1938-1980* (Oxford: Oxford University Press, 1991), ix and 8-15.

The agency cultivated the support of these groups, and they became integral to the success of the TVA's energy regime. While the Authority touted inexpensive electricity as a democratizing force in the Tennessee Valley, the energy-intensive lifestyle that the TVA promoted served as an important bulwark for a political economy of white middle- and upper-class privilege.⁸

The Authority also became one of the worst polluters in the United States. The agency's commitment to increasing the capacity of its system ahead of demand resulted in its transition from hydroelectric to coal-fired power following World War II. Rather than install expensive pollution controls at its massive facilities, the TVA chose to locate them in remote areas in an effort to separate the vast majority of consumers from the byproducts of generating electricity from coal. In the process, the agency sacrificed environmental quality in the small, rural communities that hosted its plants. Additionally, the Authority's insistence on reducing the cost of procuring coal incentivized the expansion of strip mining in the Tennessee Valley Region. Stripping operations denuded the landscape, ravaged the soil, and poisoned streams in the coalfields that fed the agency's steam plants. The consequences of the TVA's approach to power production raised internal questions about the agency's responsibilities as a public utility and fostered external criticism from individuals who believed the Authority ought to do more to mitigate the damage that its power program caused.⁹

Historiographical and Conceptual Frames

This dissertation's conceptual focus on technopolitical regimes integrates four different historiographies: the history of energy, American political development and political economy, environmental history, and the history of the TVA. Few scholars have analyzed the relationship

⁸ See Chapter Three and Chapter Four.

⁹ See Chapter Five and Chapter Six.

between the public power movement, postwar social and economic policy, and the environment. Furthermore, the literature on the Tennessee Valley Authority remains narrowly focused on the institution and its internal politics. Connecting these historiographies by framing the TVA's power program as a technopolitical regime demonstrates how the ideals of public power shaped both the political economy and environmental history of the United States in the decades after World War II.

Energy, Electricity, and Technopolitical Regimes

This dissertation makes its greatest contribution to the field of energy history, specifically the history of electricity. It builds on the work of Thomas Parke Hughes and Gabrielle Hecht by framing the TVA's power program as a technopolitical regime that embodied the ideals and contradictions of public power and defined energy policy in the United States after World War II. In *Networks of Power*, a foundational text on the development of electricity, Hughes argues that technological systems are integrated within political, social, and economic contexts, creating a seamless web. His analysis avoids the methodological deficiencies inherent in older approaches to studying the history of technology. Rather than technological determinism, Hughes claims that the interactions between nominally internal and external factors both influence and are influenced by the creation of new technologies.¹⁰

Gabrielle Hecht uses the concept of technopolitical regimes to adapt Hughes' "seamless web" to the study of nuclear energy in France. Hecht defines a technopolitical regime as the

¹⁰ Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983). Also see Thomas P. Hughes, "The Seamless Web: Technology, Science, Etcetera, Etcetera," *Social Studies of Science* 16 (1986): 281-92; Thomas P. Hughes, "The Evolution of Large Technological Systems," in *Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, eds. Wiebe E. Bijker, Thomas P. Hughes, and Trevor J. Pinch (Cambridge: MIT Press, 2012[1987]), 45-76 (in the same volume, also see "Common Themes in Sociological and Historical Studies of Technology: Introduction," and the accompanying essays by Michel Callon and Trevor Pinch and Wiebe Bijker); and Hecht, *The Radiance of France*, 15.

institutions, individuals, engineering practices, and policies that “act together to govern technological development and pursue technopolitics,” a term she uses to refer to “the strategic practice of designing or using technology to constitute, embody, or enact political goals.”¹¹ Hecht demonstrates how French national identity became intertwined with the construction of nuclear power plants in the postwar period. The decision to pursue nuclear power, the design of the reactors, and the public reception that the new facilities received reflected the complex, “mutually constitutive” relationship between technology, politics, and culture.¹² Although scholars like Timothy Mitchell suggest that Hecht’s focus on technopolitical regimes reproduces assumptions about agency that privilege human over nonhuman actors, I find her work highly applicable to the TVA.¹³ The regime metaphor captures the way in which individuals, institutions, ideologies, and environments both shaped and were shaped by the formation and implementation of the Authority’s energy policies.¹⁴

¹¹ Hecht, *The Radiance of France*, 14-7 (for quotes see 15 for latter and 16 for former).

¹² In part, Hecht grounds her framework in the scholarly argument over technological determinism that animated the field of science and technology studies in the 1980s and 1990s. Hecht stakes out a middle ground in the debates. Although she explicitly rejects technological determinism, she also acknowledges that politics and culture are constructed concepts and that real limits of engineering affect the development of energy systems. Hecht, *The Radiance of France*, 8-14 (mutually constitutive is Hecht’s verbiage, see page 9).

¹³ Timothy Mitchell’s understanding of agency is similar to that of Bruno Latour in his work *Reassembling the Social*. As suggested in the previous note, Hecht does well to chart a middle course that acknowledges that human agency is not absolute, i.e. that there were real constraints of engineering that affected the development of nuclear technology in France, without reverting to technological determinism or contorting her framework to develop an entirely new conception of agency. It is not my goal in this dissertation to enter into this battle in great depth. I find that Hecht’s framework produces a commonsensical approach to balancing human agency with technological and environmental constraint. To the extent that my use of technopolitics reifies a false separation between the human and the nonhuman I hope that it does not detract from my larger argument regarding energy, political economy, and the environment in the United States. In fact, the assumption that human actors could separate themselves from environmental constraints was a central tenet of the public power movement. For Mitchell, see Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002); for Latour, see Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005); for a recent critique of Latour’s and Mitchell’s articulation of agency, see Christopher Pearson, *Scarred Landscapes: War and Nature in Vichy France* (London: Palgrave MacMillan, 2008), 6-9.

¹⁴ Hecht’s investigation of the link between national identity and electric power makes her work particularly relevant for a study of the TVA and the liberal state’s role in promoting the use of electricity after the New Deal. For more on the relationship between the development of generating systems, national identity, and politics, also see James Jasper, *Nuclear Politics: Energy and the State in the United States, Sweden, and France* (Princeton: Princeton University Press, 1990) 3-20; and Brian Balogh, *Chain Reaction: Expert Debate and Public Participation in American Commercial Nuclear Power, 1945-1975* (Cambridge: Cambridge University Press, 1991).

In the tradition of Hughes and Hecht, this dissertation examines the connections between the Tennessee Valley Authority's power program and the politics of social, economic, and environmental change. It treats the ideals of the public power movement as the driving force behind a consumption-centric energy regime that included TVA leaders and staff, civic boosters, power distributors, development agencies, and politicians at the national, state, and local levels.¹⁵ These individuals and groups collaborated to ensure the successful operation of the Authority's power program in the post-World War II period. Increasing residential and commercial electricity use in an effort to raise standards of living served as the primary vision for the public power movement and the ultimate policy objective of the TVA and its supporters. The agency's preference for building massive, rurally located coal-fired steam plants while eschewing the installation of costly devices for controlling emissions reflected its emphasis on maintaining an abundant supply of cheap electric power. During this period, municipal utilities and rural cooperatives also improved the capacity and coverage of the power grids in their communities. Framing the TVA's power program as a technopolitical regime highlights the way in which the agency cooperated with outside groups to make the presumed benefits of an energy-intensive lifestyle available throughout the Tennessee Valley Region. Additionally, the regime metaphor facilitates my discussion of the internal and external opposition to the Authority's policies because it acknowledges the "contested nature" of energy systems and their development.¹⁶

This dissertation also heeds David Nye's call for historians to analyze the social meanings of energy. In *Consuming Power*, Nye laments the extent to which scholars of electricity have concentrated their research on the construction of networks and specific

¹⁵ By way of clarification, I am referring to this technopolitical regime throughout the dissertation when I discuss the TVA's consumption-centric energy regime, its consumption-centric regime, its energy regime, or, simply, its regime.

¹⁶ Hecht, *The Radiance of France*, 17.

technologies. He argues that this narrow focus detracts from the important role that energy plays in shaping social life.¹⁷ Recent work on energy and electricity in the United States addresses Nye's concern without abandoning the discussion of systems. In his dissertation on energy use in the Mid-Atlantic region, Christopher Jones demonstrates how the development of new transmission technology altered local landscapes and improved access to electric power in the early twentieth century. By analyzing the intersection of technological innovation, economic development, and the environment, Jones illustrates the important effect that the expansion of service had on the history of the urban fringe.¹⁸ Similarly, Andrew Todd Needham investigates the cooperation of utilities and civic boosters in Phoenix, Arizona, during the 1960s in his book, *Power Lines*. He shows how a combination of private enterprise and public purpose transformed the American southwest after World War II. Increasing regional generating capacity and extending the electric grid were both integral to Phoenix's evolution into a sprawling, modern metropolis, though the former had severe consequences for the environment.¹⁹ Neither Jones nor Needham, however, addresses the influence of the public power movement or the liberal state in the postwar period.²⁰ This dissertation highlights the connections between the Authority's energy regime and the political economy of the 1950s and 1960s. Cheap electricity wove itself into the social fabric of the nation. In the Tennessee Valley Region, the TVA's power policies

¹⁷ David E. Nye, *Consuming Power: A Social History of American Energies* (Cambridge: MIT Press, 1998), 8-10.

¹⁸ Christopher F. Jones, "Energy Landscapes: Coal Canals, Oil Pipelines, Electricity Transmission Wires in the Mid-Atlantic, 1820-1930" (PhD diss., University of Pennsylvania, 2009), 1-31 and 325-65.

¹⁹ Todd Andrew Needham, *Power Lines: Phoenix and the Making of the Modern Southwest* (Princeton: Princeton University Press, forthcoming 2014).

²⁰ Needham, in particular, appears to ignore the resemblance between the consumption-centric promotional campaigns and the construction of mine-mouth power plants in the southwest during the 1960s and 1970s and the campaigns and construction projects that the advocates of public power and the TVA championed only a decade earlier. Jones mentions Gifford Pinchot and Giant Power but does not follow their influence beyond the 1920s. In general, scholarship that discusses public power focuses on the movement prior to World War II; see Ronald C. Tobey, *Technology as Freedom: The New Deal and the Electrical Modernization of the American Home* (Berkeley: University of California Press, 1996), 40-61; Sarah T. Phillips, *This Land, This Nation: Conservation, Rural America, and the New Deal* (Cambridge: Cambridge University Press, 2007), 21-36; and Jay Brigham, *Empowering the West: Electrical Politics Before FDR* (Lawrence: University of Kansas Press, 1998).

helped promote suburbanization, consumerism, and economic growth. Emphasizing consumption and the state underscores the link between the public power movement and American political development in the twentieth century.

Political Economy, Social Citizenship, and the State

The growing literature on the state in American politics helps frame my analysis of the TVA and its technopolitical regime. Contrary to scholars like Philip Funigiello and Craufurd Goodwin, who claim that the United States lacked any discernible energy policy in the post-World War II period, this dissertation argues that the federal government endeavored to create a culture and infrastructure that encouraged the widespread adoption of an energy-intensive lifestyle. The Authority's regime represented one iteration of this larger effort. While Funigiello and Goodwin focus on the federal government's failure to establish a nationwide regulatory apparatus and its inability to nationalize the utility industry, they rely on a conceptualization of state action that is too narrow.²¹

In the last three decades, scholars of history and the social sciences have begun treating the state as an important actor and a vital unit for academic discourse rather than a passive entity, derivative of the conflicts and desires of individual policy makers and social groups.²² Stephen Skowronek and Theda Skocpol have both greatly influenced the field of American political

²¹ For scholarship that claims the United States did not develop an energy policy, see Philip J. Funigiello, *Toward a National Power Policy: The New Deal and the Electric Utility Industry, 1933-1941* (Pittsburgh: University of Pittsburgh Press, 1973), xi-xvi; and Craufurd D. Goodwin, "The Lessons of History," in *Energy Policy in Perspective: Today's Problems, Yesterday's Solutions*, ed. Craufurd D. Goodwin (Washington, D.C.: The Brookings Institution, 1981), 665-84.

²² Theda Skocpol, "Bringing the State Back in: Strategies of Analysis in Current Research," in *Bringing the State Back In*, eds. Peter B. Evans, Dietrich Rueschemeyer, and Theda Skocpol (Cambridge: Cambridge University Press, 1985), 3-44.

development.²³ In his examination of the federal bureaucracy's expansion after the Civil War, Skowronek argues that the American state experienced a period of reform and reorganization in response to the challenges of industrialization. This led to the creation of a modern administrative apparatus that the nation had previously lacked.²⁴ His work supports the traditional narrative in United States history that emphasizes the growing power of the federal government in the twentieth century—especially after the New Deal.²⁵ Skocpol criticizes this teleological approach to American political development. In her study of the origins of federal welfare programs, she suggests that the state played a significant role in the creation of social policy well before the 1930s.²⁶

Increasingly, other scholars, including William Novak and Brian Balogh, have also rejected the myth of the weak American state. Balogh, in particular, relies on an associational conceptualization of state power that dismisses the traditional Weberian focus on size and visibility. Instead, he builds on the work of Ellis Hawley, emphasizing the importance of public-private cooperation in American political development. In this way, Balogh assesses the ability of government institutions to influence the creation and implementation of policy through

²³ In the last two decades numerous scholars have followed their lead, bringing the state back in to academic discourse on American politics, culture, and society. See Stephen Skowronek, *Building a New American State: The Expansion of National Administrative Capacities, 1877-1920* (Cambridge: Cambridge University Press, 1982); Theda Skocpol, *Protecting Soldiers and Mothers: The Political Origins of Social Policy in the United States* (Cambridge: The Belknap Press of Harvard University Press, 1992); Richard Bense, *Yankee Leviathan: The Origins of Central State Authority in America, 1859-1877* (Cambridge: Cambridge University Press, 1990); and Karen Orren and Stephen Skowronek, *The Search for American Political Development* (Cambridge: Cambridge University Press, 2004).

²⁴ Skowronek, *Building a New American State*, vii-ix and 3-18.

²⁵ For examples of the traditional growth thesis, see Roy Lubove, *The Struggle for Social Security, 1900-1935* (Cambridge: Harvard University Press, 1968); James T. Patterson, *America's Struggle Against Poverty, 1900-1980* (Cambridge: Harvard University Press, 1981); Michael B. Katz, *In the Shadow of the Poorhouse: A Social History of Welfare in America* (New York: Basic Books, 1986); Daniel Levine, *Poverty and Society: The Growth of the American Welfare State in International Comparison* (New Brunswick: Rutgers University Press, 1988); Bense, *Yankee Leviathan*; Mettler, *Dividing Citizens*; Ira Katznelson, *When Affirmative Action was White: An Untold Story of Racial Inequality in Twentieth Century America* (New York: W. W. Norton & Company, 2005); Gareth Davies, *See Government Grow: Education Politics from Johnson to Reagan* (Lawrence: Kansas University Press, 2007); and Jacobs, *Pocketbook Politics*.

²⁶ Skocpol, *Protecting Soldiers and Mothers*, 1-62.

partnerships with private actors to highlight the relative strength of the American state during the nineteenth century.²⁷

This dissertation uses the associational model of state power to analyze the Authority and its energy regime. Although the TVA was a product of the New Deal and although it displaced existing private utilities, traditional models of state power do not fully capture the extent to which Authority, as a regional agency, relied on the support of local actors to implement its consumption-centric policies. The TVA mandated rate reductions and required its distributors to pay down their debts and invest in infrastructure. Much of the Authority's success, however, resulted from collaboration with civic leaders who embraced the vision of the broader public power movement. Municipal utilities and rural cooperatives engaged in promotional campaigns to encourage domestic consumption, and local development organizations worked to attract private investment by electrochemical and metallurgical companies. The strength of the TVA's regime stemmed less from the agency's ability to centralize authority than from its relationship with powerbrokers in the region, demonstrating one of the important ways in which the liberal state projected its influence both during and after the New Deal.

²⁷ Brian Balogh, *A Government Out of Sight* (Cambridge: Cambridge University Press, 2009). While Balogh discusses the nineteenth century, his work has applications for the post-New Deal period as well. As noted above, I believe that the study of technopolitical regimes provides an avenue for understanding and analyzing how the New Deal state projected power in the post-World War II era. Also see Ellis W. Hawley, *The Great War and the Search for a Modern Order: A History of the American People and their Institutions, 1917-1933*, second edition (New York: St. Martin's Press, 1992). For a sample of other scholarship that utilizes the associational framework to analyze the American state, see Michael Fein, *Paving the Way: New York Road Building and the American State, 1880-1956* (Lawrence: Kansas University Press, 2008); and for an analysis of the development of modern bureaucracies in the late nineteenth and early twentieth century, Olivier Zunz, *Making America Corporate, 1870-1920* (Chicago: University of Chicago Press, 1990). William Novak focuses more on the history of regulation at the local level and the importance of police powers to understanding the strength of the nineteenth century state; see William Novak, "The Myth of the 'Weak' American State," *American Historical Review* 113 (June 2008): 752-72; and William Novak, *The People's Welfare: Law & Regulation in Nineteenth-Century America* (Chapel Hill: University of North Carolina Press, 1996). For Weber, see Max Weber, "The Three Types of Legitimate Domination," in *Essays in Economic Sociology*, ed. Richard Swedberg (Princeton: Princeton University Press, 1999), 99-108; Max Weber, "The Bureaucratization of Politics and the Economy," in *Essays in Economic Sociology*, ed. Richard Swedberg (Princeton: Princeton University Press, 1999), 109-15; and Max Weber, "The Rational State and Its Legal System," in *Essays in Economic Sociology*, ed. Richard Swedberg (Princeton: Princeton University Press, 1999), 116-9. For another critique of the Weberian definition of the state and state power, see John Brewer, *The Sinews of Power: War, Money and the English State, 1688-1783* (New York: Alfred A. Knopf, 1989).

Framing the Tennessee Valley Authority in this way also underscores the extent to which consumption became a central component of social policy in the United States. Liz Cohen, Suzanne Mettler, and Meg Jacobs all show how the New Deal's Keynesian turn linked access to goods and services with national identity.²⁸ Cohen analyzes the growth of consumer culture after World War II in her book, *Consumer's Republic*. She argues that the United States built "an economy, culture, and politics...around the promises of mass consumption, both in terms of material life and the more idealistic goals of greater freedom, democracy, and equality" in the 1950s and 1960s.²⁹ Similarly, Mettler and Jacobs use the concept of social citizenship, which they define as an individual's "entitlement...to the basic necessities of economic security and social well-being," to examine the state's role in facilitating the rise of Cohen's consumer's republic.³⁰ In *Dividing Citizens*, Mettler focuses on welfare programs such as unemployment insurance and old age insurance that provided supplemental income to those who were either out of work or had retired. She claims that the ability to take part in these programs became a marker of civic membership following the New Deal, and she describes how the federal government excluded many African Americans and women from participating in them.³¹ In

²⁸ Elizabeth Cohen, *A Consumer's Republic: The Politics of Mass Consumption in Postwar America* (New York: Alfred A. Knopf, 2003); Mettler, *Dividing Citizens*; and Jacobs, *Pocketbook Politics*. The literature on consumption and consumerism and their relationship to political and social history in the United States is long and detailed; some examples of scholarship that address the topic either from a contemporary or historical lens include Thorstein Veblen, *The Theory of the Leisure Class: An Economic Study of Institutions* (New York: Macmillan, 1899); Daniel Horowitz, "Consumption and Its Discontents: Simon N. Patten, Thorstein Veblen, and George Gunton," *Journal of American History* 67(September 1980): 301-17; David M. Potter, *People of Plenty: Economic Abundance and the American Character* (Chicago: University of Chicago Press, 1954); E. Franklin Frazier, *Black Bourgeoisie* (Glencoe, IL: Free Press, 1957); John Kenneth Galbraith, *The Affluent Society* (Boston: Houghton Mifflin, 1958); Lynn Dumenil, *Modern Temper: American Culture and Society in the 1920s* (New York: Hill and Wang, 1995); and Alan Brinkley, *The End of Reform: New Deal Liberalism in Recession and War* (New York: Alfred A. Knopf, 1995).

²⁹ Cohen, *A Consumer's Republic*, 9.

³⁰ Mettler, *Dividing Citizens*, 9. Jacobs uses the term "economic citizenship" to describe the ability to participate in the "mass consumer economy"; see Jacobs, *Pocketbook Politics*, 2. Both scholars link civic membership with consumption.

³¹ Mettler, *Dividing Citizens*. For more on the extent to which the liberal state's social policies benefited heterosexual, white, men, see Katznelson, *When Affirmative Action was White*; and Kathleen J. Frydl, *The GI Bill* (Cambridge: Cambridge University Press, 2009).

Pocketbook Politics, Jacobs suggests that the ability to consume has functioned as the “foundation of American identity” and that the liberal state adopted the high-wage, low-price economy as a mechanism for improving the purchasing power of individuals during the 1930s.³² This dissertation draws on the work of these three scholars to frame the TVA’s energy regime within the context of federal efforts to foster a political economy predicated on mass-consumption that treated access to goods and services like electricity as one of the basic rights of American citizenship.

Furthermore, the Authority’s regime helped transform the economy of the agency’s service area by creating the infrastructure necessary to support energy-intensive manufacturing and research. The literature on economic development in the American South after World War II emphasizes the importance of the military industrial complex and a new commercial elite in breaking agriculture’s hold on the region. It does not discuss cheap electricity in great detail. Bruce Schulman, for example, acknowledges the TVA’s power program in his book, *From Cotton Belt to Sunbelt*, but he does not count the agency among the major factors that attracted defense spending and private capital to the South.³³ This dissertation integrates the Authority’s energy regime more fully into a history of the South’s rise after 1945. The TVA’s inexpensive kilowatts did influence the Army’s decision to locate certain projects in the Tennessee Valley and made possible the rapid expansion of electrochemical and metallurgical industries in the

³² Jacobs, *Pocketbook Politics*, 2.

³³ Schulman’s work is most relevant for Chapter Four on the Huntsville-Decatur corridor in Alabama. Schulman’s study is substantially broader geographically than mine, and he does not focus exclusively on the importance of the TVA because of this. As a result, Schulman deemphasizes the importance of cheap energy to development in the South. It is true that energy, and specifically electricity, represented only one factor that affected economic growth in the region; nevertheless, it has received little attention from scholars. See Schulman, *From Cotton Belt to Sunbelt*. For a sample of other works that discuss the changing politics and economy of the New South, see V. O. Key, *Southern Politics In State and Nation* (New York: Knopf, 1949); C. Vann Woodward, *Origins of the New South, 1877-1913* (Baton Rouge: Louisiana State University Press, 1951); Tindall, *Emergence of the New South*; Dwight B. Billings, Jr., *Planters and the Making of the “New South”* (Chapel Hill: University of North Carolina Press, 1979); and James C. Cobb, *Industrialization and Southern Society, 1877-1984* (Lexington: University of Kentucky Press, 1984).

region. The growth of cities like Huntsville, which became a center for aeronautical research in the 1950s and 1960s, would not have occurred if not for the Authority. Affordable electricity in large volumes was critical to the emergence of the new Sunbelt economy.

Environmental History

This dissertation also adds to recent scholarship on the relationship between the New Deal and the environment. Sarah Phillips and Neil Maher both demonstrate how conservationist thought influenced the environmental policies of the Roosevelt administration in the 1930s. Phillips, in particular, connects the TVA's early history with the conservation movement and public power, though she does not explore the agency's power program in the period after World War II.³⁴ This dissertation expands her analysis of the Authority by investigating the long-term environmental consequences that resulted from the liberal state's embrace of public power and conservation. The TVA's decision to construct its power plants in sparsely populated areas protected the majority of its customers from the noxious byproducts of generating energy from coal. As William Cronon argues in his study of late nineteenth century commodity flows, the separation of consumption from the site of production is a defining feature of modernity that insulates most Americans from the side effects of development.³⁵ It also concentrates pollution in communities inhabited by minorities and the poor.³⁶ In the Tennessee Valley Region, the

³⁴ Phillips and Maher represent a new thrust in environmental scholarship on the New Deal. Earlier works tend to focus on the dust bowl or technical aspects of programs like the Civilian Conservation Corps. Phillips and Maher advance this literature by framing the New Deal's environmental programs within conservationist thought. See Phillips, *This Land, This Nation*; and Neil M. Maher, *Nature's New Deal: The Civilian Conservation Corps and the Roots of the American Environmental Movement* (Oxford: Oxford University Press, 2008). Earlier works include, Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (Oxford: Oxford University Press, 1982); and John Salmond, *The Civilian Conservation Corps, 1933-1942: A New Deal Case Study* (Durham, Duke University Press, 1967).

³⁵ William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton & Co., 1991).

³⁶ Several scholars have commented on the tendency of the poor and minorities to bear the brunt of industrialization's environmental consequences in the United States; see Robert D. Bullard, *Dumping in Dixie:*

TVA's coal-fired power plants inundated small rural towns with ash and gaseous emissions, and the agency's coal buying policies promoted strip mining that destroyed local landscapes and streams throughout the Kentucky and Tennessee coalfields. The "use of the earth for the good of man" privileged upper- and middle-class urban and suburban consumers to the detriment of the rural poor.³⁷ In this way, the Authority's energy regime underscores the weaknesses inherent in the New Deal's approach to resource management.

Contextualizing the TVA

By contextualizing the Tennessee Valley Authority within the politics of public power and the post-World War II period, this dissertation also contributes to the historiography of the TVA. Erwin C. Hargrove's exhaustive study, *Prisoners of Myth*, remains the definitive work on the Authority's power program. Hargrove notes the role of the agency's leadership in both creating and perpetuating founding narratives that have shaped the culture of the TVA and affected its approach to designing and maintaining its generating system. Nevertheless, *Prisoners of Myth* focuses almost exclusively on the Authority's inner-workings.³⁸ Much of the scholarship on the TVA maintains a similarly narrow focus. Early works on the Authority provide a narrative of the agency's success. Often written by former TVA staffers and board members, these accounts offer laudatory assessments of the Authority that lack critical

Race, Class, and Environmental Quality (Boulder: Westview Press, 1990); Andrew Hurley, *Environmental Inequalities: Race, Class, and Industrial Pollution in Gary, Indiana, 1945-1980* (Chapel Hill: University of North Carolina Press, 1995); and Steve Lerner, *Diamond: A Struggle for Environmental Justice in Louisiana's Chemical Corridor* (Cambridge: MIT Press, 2005).

³⁷ The phrase "use of the earth for the good of man" is in reference to a Gifford Pinchot who often used it to describe the philosophy of the conservation movement and public power. The TVA quoted it in its annual reports, see TVA, *Annual Report, 1953* (Washington, D.C.: Government Printing Office, 1953), 52; also see Erwin C. Hargrove, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990* (Knoxville: University of Tennessee Press, 1994), 181.

³⁸ Hargrove, *Prisoners of Myth*.

analysis.³⁹ Other historians and political scientists have probed the TVA's shortcomings, emphasizing its paternalistic approach to development and the extent to which the agency's policies reinforced existing social hierarchies in its service area.⁴⁰ Few of the authors in either of these groups have made an attempt to locate the Authority within the broader forces of United States history.

This dissertation connects Hargrove's detailed institutional history to the work of another set of scholars who link the TVA with the rise of conservationist thought in the early twentieth century. As noted above, Sarah Phillips analyzes how the principles of conservation and public power shaped the development of the Authority's agricultural programs and its power policies.⁴¹ While Phillips focuses on the 1930s, this dissertation demonstrates that the principles of public

³⁹ For example, in *Democracy on the March*, David Lilienthal, one of the TVA's original board members, describes the Authority as a federal agency that encouraged grassroots participation in the management of resources, empowering local communities rather than becoming an insulated bureaucracy. He emphasizes the Authority's protracted battle with private utility companies as a conflict in which the TVA ultimately proved victorious. Having vanquished its competitors by 1940, the TVA stands alone at the conclusion of *Democracy on the March* as a triumphant yet benevolent institution. David Lilienthal, *TVA: Democracy on the March* (New York: Harper & Row, 1944); for other examples of work written by former administrators and employees see Gordon Clapp, *The TVA: An Approach to the Development of a Region* (Chicago: Chicago University Press, 1955); Wilmon Henry Droze, *High Dams and Slack Waters: TVA Rebuilds a River* (Baton Rouge: Louisiana State University Press, 1965); Arthur Morgan, *The Making of the TVA* (Buffalo: Prometheus Books, 1974); and Marguerite Owen, *The Tennessee Valley Authority* (New York: Praeger, 1973); and for a slightly more even handed treatment see, Thomas K. McCraw, *TVA and the Power Fight, 1933-1939* (Philadelphia: J.B. Lippincott Company, 1971).

⁴⁰ For examples, see Philip Selznick, *TVA and the Grass Roots: A Study in the Sociology of Formal Organization*, second edition (New York: Harper & Row, Publishers, 1966), ix-xvi and 3-16; Victor C. Hobday, *Sparks at the Grassroots: Municipal Distribution of TVA Electricity in Tennessee* (Knoxville: University of Tennessee Press, 1969); Michael J. McDonald and John Muldowny, *TVA and the Dispossessed: The Resettlement of Population in the Norris Dam Area* (Knoxville: University of Tennessee Press, 1982); William U. Chandler, *The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-1983* (Cambridge: Ballinger Publishing Company, 1984); 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 Nancy L. Grant, *TVA and Black Americans: Planning for the Status Quo* (Philadelphia: Temple University Press, 1990). Also see Walter L. Creese, *TVA's Public Planning: The Vision, the Reality* (Knoxville: The University of Tennessee Press, 1990). Creese acknowledges that the Authority has attained some level of success in the area of farming.

⁴¹ Phillips, *This Land, This Nation*, 1-148. For two earlier accounts that discuss the connections between the TVA, conservation, and public power in the pre-World War II era, see Judson King, *The Conservation Fight: From Theodore Roosevelt to the Tennessee Valley Authority* (Washington, DC: Public Affairs Press, 1959); and Preston J. Hubbard, *Origins of the TVA: The Muscle Shoals Controversy, 1920-1932* (Nashville: Vanderbilt University Press, 1961). King, in particular, traces the role of politicians like George Norris in fighting for the creation of a government agency that would manage the resources of the Tennessee Valley in the 1920s and in guiding the TVA Act through Congress in the 1930s.

power and a definition of conservation that privileged development over preservation continued to drive the TVA's energy regime after World War II. In doing so, it locates the Authority within the political economy of the postwar era.

Tennessee Valley Region

Regional history presents certain challenges. In particular, one must define the area under study and demonstrate that it represents a useful unit for analysis. A variety of methods exist for identifying and demarcating regions, including political borders, cultural and ethnic divisions, and river systems.⁴² The multiplicity of frameworks causes disagreements among scholars. Historians and social scientists who study the United States, for example, often quarrel over the relative importance of politics, culture, economics, and geography when discussing the boundaries of the American South.⁴³ None of these approaches, however, best describes the Tennessee Valley Region.

⁴² Christopher Jones makes this observation in his recent dissertation on energy systems in the Mid-Atlantic; see Jones, "Energy Landscapes," 22-4 and 22n.36. Environmental historians, in particular, have focused on rivers and watersheds to frame regional studies; for an example, see Richard White, *The Organic Machine* (New York: Hill and Wang, 1995).

⁴³ A voluminous literature exists on the South. For debate over the region's boundaries, see Schulman, *From Cotton Belt to Sunbelt*, x and 232n.7; Cobb, *Industrialization and Southern Society*; Michael O'Brien, *The Idea of the American South, 1920-1941* (Baltimore: Johns Hopkins University Press, 1979); Timothy G. O'Rourke, "The Demographic and Economic Setting of Southern Politics," in *Contemporary Southern Politics*, ed. James F. Lea (Baton Rouge: Louisiana State University Press, 1988); and Carl Abbott, "The American Sunbelt: Idea and Reality," *Journal of the West* 18 (July 1979): 5-18. More generally, Howard W. Odum's work, *Southern Regions of the United States*, stands out as the first piece of social science that had an effect on social policy at the federal level. It was quickly followed by a report from the National Emergency Council in which Franklin Roosevelt labeled the South as the greatest economic problem in the United States; see Howard W. Odum, *Southern Regions of the United States* (Chapel Hill: University of North Carolina Press, 1936) and United States National Emergency Council, *Report on Economic Conditions of the South* (Washington, D.C.: Government Printing Office, 1938). For a sampling of the vast historiography on the New South, see Woodward, *Origins of the New South*; C. Vann Woodward, *The Strange Career of Jim Crow* (Oxford: Oxford University Press, 1955); Billings, Jr., *Planters and the Making of the "New South"*; and Tindall, *Emergence of the New South*. For an example of work on the New South that focuses more on cultural and social history than economic history, see Glenda E. Gilmore, *Gender & Jim Crow: Women and the Politics of White Supremacy in North Carolina, 1896-1920* (Chapel Hill: University of North Carolina Press, 1996).

This dissertation adopts William Cronon's focus on commodity flows from *Nature's Metropolis*, in which Cronon argues that the movement of grain and livestock connected Chicago with a vast hinterland of producers and consumers in the late nineteenth century.⁴⁴ Recently, Christopher Jones and Todd Andrew Needham have utilized frameworks similar to Cronon's to examine the development of energy systems in the Mid-Atlantic and the Southwest. Both Jones and Needham show how the production, distribution, and consumption of electricity linked far flung communities. Although individuals are not always conscious of the relationship between their use of electric power and the consequences of surface mining or coal-fired emissions, the very act of turning on a light renders them part of a larger system.⁴⁵

This dissertation treats the TVA's consumption-centric energy regime as the sinew that makes the Tennessee Valley Region a useful unit for analysis. Rather than the Tennessee River Valley proper, I use the term Tennessee Valley Region to refer to the communities included in the Authority's service area and those directly involved in the production of electricity for the agency.⁴⁶ [Fig. 1.1] The TVA distributed electric power to municipal utilities, rural cooperatives, large industries, and federal defense installations in Tennessee, northern Alabama, northern and eastern Mississippi, western Kentucky, western North Carolina, southwestern Virginia, and northern Georgia. Outside of its service area, the Authority purchased coal from mines in Alabama, eastern and western Kentucky, Virginia, Illinois, and Indiana in the 1950s and

⁴⁴ Cronon focuses on Chicago and the development of its hinterland during the late nineteenth century. Although my project does not focus on a single node, it does treat the production and consumption of electricity as a commodity flow that connects different communities to create a region. See Cronon, *Nature's Metropolis*.

⁴⁵ Jones, "Energy Landscapes"; and Needham, *Power Lines*.

⁴⁶ As I discuss in a footnote above, the term Tennessee Valley Region is probably most accurate when used to describe the three decades following World War II. During this period my regional schema refers to a roughly contiguous area. The TVA now purchases coal from mines in Wyoming and other western states. The label is also artificial to the extent that the Authority has always shared connections with surrounding networks and now is part of a national power grid that shares electricity across the nation.

1960s, and it operated a steam plant in Muhlenberg County, Kentucky.⁴⁷ The TVA's energy regime had its greatest effect on this region.

A regional approach is particularly useful to the study of the Tennessee Valley Authority. The TVA is neither a national nor a local agency. It cannot expand its service area without Congressional approval, and it does not sell electricity directly to residential customers or any but the largest manufacturers. Instead, it provides wholesale power to municipal distributors and rural cooperatives. Within its service area, the TVA has operated with a large degree of autonomy throughout its history. It plans and carries out its own projects, and it sets its own rates. The Authority has always been enmeshed in national and local politics, but the agency itself resides somewhere between the two. This "betweenness" is critical to understanding the TVA. A regional study provides a more nuanced picture of the Authority's regime and its importance for social, economic, and environmental policy than either a broad survey of energy issues in the United States or a detailed analysis of a single city.

Chapters

This dissertation unfolds across six chapters. Chapter One shows that the ideals of the public power movement of the 1920s formed the foundation of the TVA's power program. The chapter discusses the importance of the conservation movement to the Authority's origins, and it demonstrates how two competing visions of conservation, one rooted in regional planning and the other public power, vied for control of the fledgling agency in the personal battles between two of its directors, Arthur E. Morgan and David Lilienthal. The chapter shows how Lilienthal

⁴⁷ The TVA also purchased large volumes of coal from inside its service area in Tennessee, western Kentucky, southwestern Virginia, and northern Alabama. It operated numerous coal-fired steam plants inside its service area as well. In fact, the Paradise Steam Plant in Muhlenberg County, Kentucky was the only facility that the agency built in a community to which it did not also provide power.

ultimately wrested the TVA from A. E. Morgan with Franklin Delano Roosevelt's support and incorporated the ideals of the public power movement into the Authority's power program, committing the agency to cheap electricity.

Chapter Two illustrates the extent to which the public power ideal became ingrained in the TVA and its power program, manifesting itself especially in the agency's embrace of coal-fired steam generating facilities in the 1950s. The Authority's emphasis on maintaining an abundant supply of inexpensive electricity as well as its focus on using new technology as a symbol of the agency's positive role in developing the region resulted in the construction of the largest coal-fired power plants in the world. These generating stations became integral features of the TVA's energy regime, and they reinforced both the New Deal-Cold War state's political economy of consumption and its burgeoning military industrial complex. Although the TVA's leadership continued to connect the production and consumption of electric power with sound resource management, the new facilities and the agency's coal buying policies devastated the environment in outlying communities and led critics to claim that the Authority's focus on cheap kilowatts had caused the agency to abandon its role as a protector of the environment.

Chapters Three and Four utilize two case studies to investigate how the TVA's power program and the public power ideal shaped the ways in which consumers used and experienced electricity in the 1950s and 1960s. Chapter Three focuses on the Nashville metropolitan area to demonstrate the role of the TVA and its distributors in promoting cheap electric power to residential consumers to illustrate how electricity shaped the city by facilitating suburbanization and reducing the number of coal-fired furnaces. Chapter Four examines the role of electricity in promoting industrial growth and scientific research in a corridor running between Huntsville and Decatur, Alabama. In particular, it emphasizes the importance of inexpensive energy in luring

defense laboratories and electrochemical and metallurgical companies to the area. Together, Chapter Three and Chapter Four demonstrate that local leaders and the TVA's customers embraced electric power as a key component of an American standard of living in the decades after World War II.

This dissertation also explores how the environmental consequences of the public power movement's consumption-centric approach to producing electricity created a threat to the stability of the TVA's regime. The last two chapters contend that the TVA's energy policies, in particular its embrace of coal-fired power, imposed undue environmental burdens on the communities that were involved in power generation. Chapter Five reveals that scientists and engineers within the Authority's Division of Health and Safety expressed concerns about the agency's steam plants as early as the late 1940s and won important concessions on pollution control from the board of directors and the Office of Power. Nevertheless, the TVA's institutional commitment to the principles of public power prevented its leadership and staff from developing meaningful solutions to the environmental problems that its coal-fired facilities created, though the agency did conduct groundbreaking scientific research on airborne pollutants.

Chapter Six investigates the effect of the Authority's power plants and strip mining on Muhlenberg County, Kentucky. In the 1960s, the Authority constructed a massive coal-fired power plant near the village of Paradise in Muhlenberg County, providing much-needed electricity for consumers in Nashville and stabilizing the local coal industry. In fact, development organizations and politicians had long worked to make rivers of the western Kentucky coal basin capable of supporting a modern generating facility in the hope of luring the TVA to the area. The plant's emissions, however, overwhelmed the neighboring town of

Paradise, fouling the community's air, sickening its residents, and rendering it uninhabitable. Furthermore, the Authority's coal-buying policies promoted strip mining that damaged the environment in the region's coalfields. The degradation that resulted both from surface mining and the burning of coal undermined the TVA's standing within its service area and contributed to the agency's decision to begin building nuclear power plants in the late 1960s and 1970s.

For the Progress of Man

The paradoxes of public power define the postwar period. Abundant, cheap electricity served as a bulwark for the era of mass-consumption that followed World War II. Inexpensive kilowatts helped make the single-family suburban home replete with numerous appliances affordable for a wide swath of the American public. They also attracted private capital and defense spending, transforming the economy of the Tennessee Valley Region. Despite the rhetoric of the agency's leaders, however, the TVA's regime did not reduce social and economic inequality. In particular, the environmental consequences of the agency's emphasis on low-cost power weighed most heavily on communities in the region's coalfields and the towns that hosted the Authority's steam plants. The state's effort to achieve social uplift by promoting both an energy-intensive way of life and a political economy predicated on improving the purchasing power of all Americans sacrificed environmental quality in areas "invisible" to the average consumer.

Chapter 1

Protecting a Public Good: Conservation and the Origins of the TVA's Power Program

A history of electric power and, more specifically, public power in the Tennessee Valley Region necessitates a discussion of the Tennessee Valley Authority, its origins, and the development of its distinct, institutional culture within the context of the conservation movement and the New Deal. The Authority defined the scope of its service area broadly and by 1959 had expanded it to include almost all of Tennessee and parts of Mississippi, northern Alabama, northwest Georgia, western North Carolina, southwest Virginia, and southern Kentucky. [Fig. 1.1] As the sole provider of electric power for this 80,000 square mile region that included approximately five million residents, the TVA exerted a large influence over the development of electricity as an energy source for the communities and businesses that it served.¹

By the 1950s, the Authority promoted electric power both as an integral tool for the modern home that could provide important creature comforts and as a vital component of industrial growth in a region that relied disproportionately on agriculture as compared to the rest of the nation. Concomitantly, the TVA became increasingly beholden to the very electric ideal that it was promoting, causing one prominent scholar of the Authority to conclude that the

¹ The city of Memphis which initially joined the TVA's service area in the 1930s opted to establish its own municipal generating system in 1959 as part of the conclusion to the Dixon-Yates controversy. Memphis reentered the TVA's power network in 1965. For more information on Memphis and Dixon-Yates, see Aaron Wildavsky, *Dixon-Yates: A Study in Power Politics* (New Haven: Yale University Press, 1962); TVA, *Annual Report, 1959* (Washington, D.C.: Government Printing Office, 1959) 2 and 33; TVA, *Annual Report, 1964* (Washington, D.C.: Government Printing Office, 1964), 32; and TVA, *Annual Report, 1965* (Washington, D.C.: Government Printing Office, 1965), xii and 36. For information on the size and population of the agency's service area, see TVA, "TVA Power, '58-'59," informational pamphlet, March 1959, 16, National Archives and Records Administration Southeast Branch, Morrow, GA [hereafter: NARA-SE], Record Group 142 [hereafter: RG 142], Power Manager's File [hereafter: PMF], Box 17.

agency's leadership had become prisoners of their own myth.² The belief that widespread access to an abundant supply of cheap electricity was an undeniable social good became so dominant within the hierarchy and culture of the TVA that it subjugated all other aspects of the agency's mission. The Authority, however, did not become committed to the goal of providing an ever expanding quantity of inexpensive electricity before 1938. A discussion of the TVA's beginnings and early institutional battles, then, provides a necessary starting point for understanding why the agency's power program became so important in the period following World War II.



Figure 1.1: The TVA's Service Area – The 80,000 square mile expanse changed little after 1959. Source: TVA, "TVA Power, 1966," informational pamphlet, July 1966, 5, NARA-SE, RG 142, PMF, Box 17.

Judson King and Sarah Phillips have both made compelling arguments that link the Authority's history to the conservation movement. While King traced the TVA's legislative

² Erwin C. Hargrove, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990* (Knoxville: University of Tennessee Press, 1994), 3-8.

roots back to early twentieth century debates about whether private corporations or public agencies should develop the nation's resources, more recently, Phillips has demonstrated that the Authority's programs were part of a larger federal commitment to a new philosophy of conservation that emphasized the improvement of both human and natural resources. This change in conservationist thought began during the 1920s and resulted from the parallel growth of the concepts of public power and regional planning, both of which took a special interest in achieving social uplift in communities throughout the United States and especially in rural areas.³

At the same time, important differences existed between public power and regionalism, while each branch of conservation carried its own internal contradictions. The devotees of public power focused narrowly on shifting control of electric utilities to the government in an effort to expand access to cheap kilowatts for businesses and residential consumers. They believed that electricity was an indispensable social and economic input that raised standards of

³ Judson King, *The Conservation Fight: From Theodore Roosevelt to the Tennessee Valley Authority* (Washington, DC: Public Affairs Press, 1959); and Sarah T. Phillips, *This Land, This Nation: Conservation, Rural America, and the New Deal* (Cambridge: Cambridge University Press, 2007), 1-148. For a history of the TVA's origins that makes similar if implicit connections to the conservation movement, see Preston J. Hubbard, *Origins of the TVA: The Muscle Shoals Controversy, 1920-1932* (Nashville: Vanderbilt University Press, 1961). As noted in the introduction, most of the scholarship on the Tennessee Valley Authority has focused narrowly on whether or not the TVA succeeded in its mission while evaluating the extent to which the agency has been a positive or negative force in the Tennessee Valley Region. Although these works have developed important narratives about the Authority as an institution and the effect that specific projects have had on local communities, the majority have not delved into the broader historical context of the TVA. Examples of scholarship that portray the TVA favorably include: David E. Lilienthal, *TVA: Democracy on the March* (New York: Harper & Row, 1944); Gordon Clapp, *The TVA: An Approach to the Development of a Region* (Chicago: Chicago University Press, 1955); Wilmon Henry Droze, *High Dams and Slack Waters: TVA Rebuilds a River* (Baton Rouge: Louisiana State University Press, 1965); and for a slightly more even handed treatment, see Thomas K. McCraw, *TVA and the Power Fight, 1933-1939* (Philadelphia: J.B. Lippincott Company, 1971). Examples that treat the TVA critically include: Philip Selznick, *TVA and the Grass Roots: A Study in the Sociology of Formal Organization*, second edition (New York: Harper & Row, Publishers, 1966); Victor C. Hobday, *Sparks at the Grassroots: Municipal Distribution of TVA Electricity in Tennessee* (Knoxville: University of Tennessee Press, 1969); 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 Nancy L. Grant, *TVA and Black Americans: Planning for the Status Quo* (Philadelphia: Temple University Press, 1990). Finally, Thomas P. Hughes has discussed the growth of the Authority's power network within the context of the expansion of technology during the middle decades of the twentieth century, see Thomas P. Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970* (Chicago: University of Chicago Press, 2004).

living and that private providers would never serve the needs of all Americans. Despite their antipathy for electric companies, public power's advocates did not call for the government to take over other industries; electricity represented a special case because of its importance for modern life. According to its proponents, public power could coexist with private enterprise.

In contrast, the supporters of regionalism embraced a broader commitment to centralized social planning that emphasized designed communities and environmental management. Like the backers of public power, they believed that electricity was a necessary component of progress; however, they focused more on ensuring that resource development benefited local residents.⁴ For regionalists, it was possible to work with private utilities to achieve their goal of environmental and economic balance.

Although both groups influenced the Authority's early years, the public power ideal became more important to the agency's long term growth. Erwin Hargrove has explained the increasing importance of the production and distribution of electricity for the TVA through a focus on the Authority's different chairmen and their leadership styles in his definitive work on the agency's institutional history, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990*. Hargrove argued that the TVA's leadership became beholden to two myths: first, that the Authority's programs were democratic; and second, that ample access to cheap electric power would lead to social and economic progress.⁵ Hargrove's work was the first to analyze the institutional culture of the TVA while making a cogent argument about the way in which electricity changed the agency as a whole.

⁴ Phillips, *This Land, This Nation*, 30-3.

⁵ Hargrove, *Prisoners of Myth*, 3-8. Hargrove argues that these myths represented powerful institutional narratives that built internal support for the agency's policies and its mission in the region. Like Philip Selznick, however, Hargrove suggests that the TVA's conception of democracy rarely extended to decision-making and that the agency's grassroots approach often relied on local elites rather than a true amalgamation of the general public; also see Selznick, *TVA and the Grass Roots*. Hargrove does note that the second myth contained a larger kernel of truth: cheap power did facilitate increases in residential consumption and economic growth.

The development of the Authority's power program in the agency's first decade needs to be more firmly situated in the context of public power and regional planning.⁶ The intellectual origins of the TVA's power program are to be found in these movements. This chapter draws on Hargrove's analysis of the TVA's early leaders, most notably David Lilienthal and Arthur E. Morgan, and adds to it a discussion of the evolution of public power and regional planning in the 1920s and 1930s. It reconstructs the early history of the Authority and explains why Lilienthal and the public power ideal triumphed over Morgan and regional planning, in 1938. As a result, the TVA's leadership became committed to a power policy that focused on providing individuals and businesses with access to copious amounts of cheap electricity in an effort to increase energy consumption rather than a policy that emphasized detailed social and economic planning.

Muscle Shoals, the Conservation Movement, and Hydroelectricity before 1920

In 1897 a group of businessmen from northern Alabama formed the Muscle Shoals Power Company and lobbied Congress to pass legislation that would have granted them the authority to construct a hydroelectric facility on the Tennessee River at Muscle Shoals, Alabama. The Shoals split the Tennessee in half as the river dropped 134 feet over the course of 40 miles, creating a formidable obstacle to shipping in the nineteenth and early twentieth centuries but also the second most valuable hydropower site in North America east of the Mississippi River.⁷ [Fig.

⁶ For the most part, scholars who have worked on the TVA's power program have focused narrowly on its fight to obtain constitutional legitimacy during the 1930s, or they have emphasized the consequences of coal-fired power for environmental quality after World War II. For the former, see McCraw, *TVA and the Power Fight*; and for the latter, see William U. Chandler, *The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-1983* (Cambridge: Ballinger Publishing Company, 1984).

⁷ Donald Davidson calculated the drop as more than 3.5 feet per mile for almost 40 miles between the mouth of the Elk River and Florence, Alabama; see Donald Davidson, *The Tennessee Volume I: The Old River, Frontier to Secession* (New York: Rinehart & Co., Inc., 1946), 12-13; Judson King argues that the drop was 134 feet over 37 miles, see King, *The Conservation Fight*, 1-3; King notes that steamboat service operated on either side of the Shoals but not over it. The speed of the river at Muscle Shoals when combined with the dangers posed by exposed rocks made this section of the Tennessee impassable even when the water levels were normal. As a result, growing

1.2] This initial foray into developing the hydroelectric potential of the Tennessee sparked a political contest over the region's supply of electricity and whether it should be controlled by private corporations or public agencies that would continue until 1959.⁸

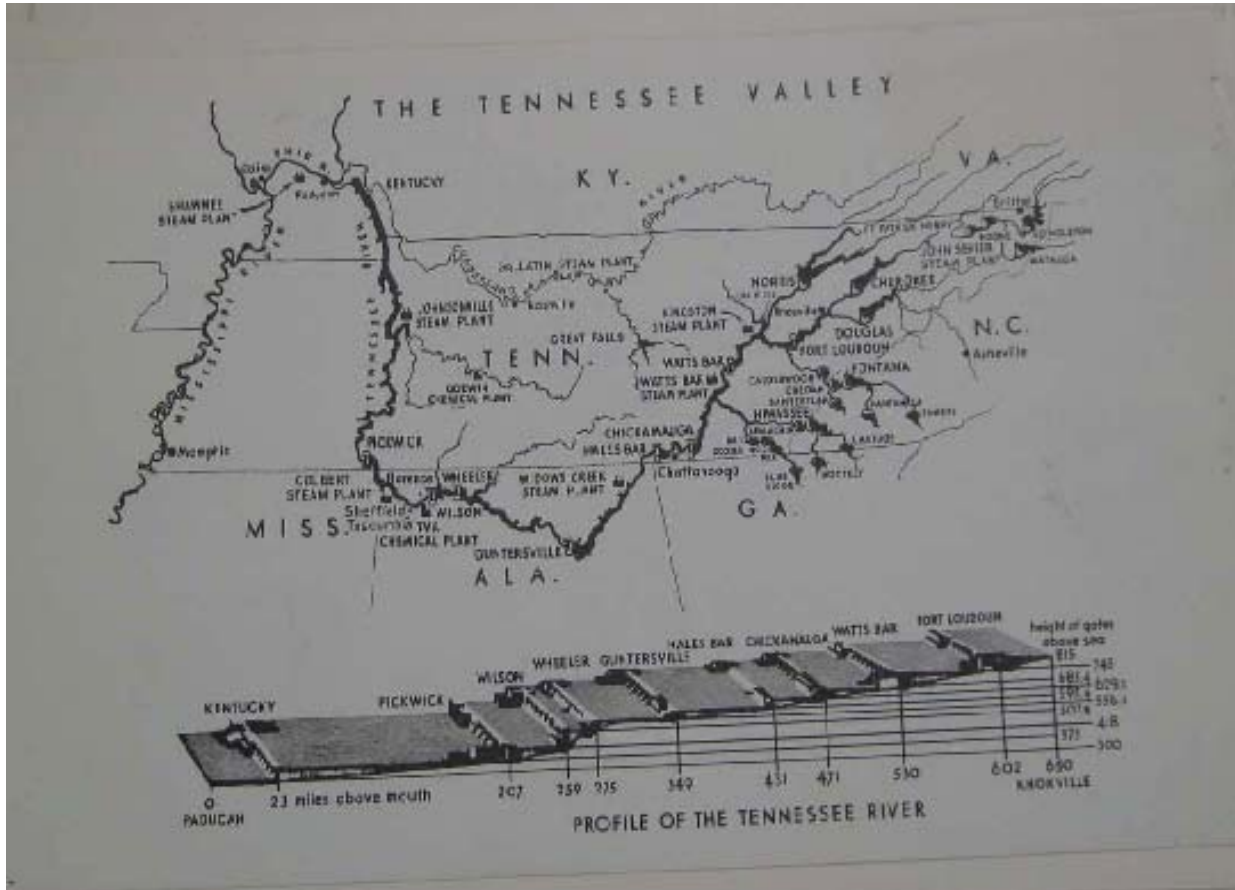


Figure 1.2: Map of the Tennessee River Valley – The Tennessee River and its major tributaries, including a profile of TVA dams. Source: TVA, “TVA Power, 1952,” informational pamphlet, December 1952, 20, NARA-SE, RG 142, PMF, Box 17.

cities on the upper reaches of the Tennessee, such as Chattanooga and Knoxville, remained cutoff from the trade networks of the Mississippi for most of the year. While steamboats could run the Shoals during periods of high-water in the spring, it remained a treacherous part of the river. Niagara Falls is the only site on the North American continent with a greater hydroelectric capacity east of the Mississippi River.

⁸ King, *The Conservation Fight*, 1 and 10-33; Paul K. Conkin, “Intellectual and Political Roots,” in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 6-7; and Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920* (Cambridge: Harvard University Press, 1959). Conkin suggests that electricity overshadowed navigation and flood control throughout the early twentieth century in the debates over Muscle Shoals and the Tennessee River, while King and Hays note that government control of hydroelectric projects became a national issue during the same time period.

The rise of the conservation movement and Gifford Pinchot history provide an important context for understanding the fight over Muscle Shoals, the eventual passage of the TVA Act, and the early years of the Authority. Born in Connecticut in 1865, Pinchot became the public face of conservation as well as one of the movement's most consistent advocates in national level politics, serving as the Chief of the Department of Agriculture's Division of Forestry—later the United States Forest Service—from 1898 to 1910. In his time as chief forester, he commissioned a survey that suggested that the nation's timber resources would be exhausted within two or three generations if the current harvesting practices continued unabated, and he waged a successful seven year campaign that ended with the transfer of the national forests from the Department of the Interior to the Department of Agriculture in 1905. Under Pinchot's control, the forests became a giant demonstration program that he used to convince many Americans of the virtues of sustained yield forestry.⁹

While conservationists did not always display unity of purpose, most steered a middle course between unabashed resource exploitation and outright preservation.¹⁰ Unlike John Muir and his supporters in the Sierra Club who decried the despoliation of the land, advocates of conservation believed in managed development. Pinchot loathed the practices of the private timber industry, but he never advocated for the complete cessation of logging. As he put it, “the first principle of conservation is...the use of the natural resources existing on this continent for

⁹ Hays, *Gospel of Efficiency*, 28-9 and 35-48; and King, *The Conservation Fight*, 11-2. Pinchot remade the discipline of forestry in the United States in his time as chief forester. He also took a direct interest in regulating access to potential hydroelectric sites within the national forests.

¹⁰ Samuel Hays argues that conservationists like Pinchot began to break from preservationists like John Muir in the late nineteenth and early twentieth centuries. Hays pinpoints the Hetch Hetchy controversy that raged between 1905 and 1914 in which Muir and the Sierra Club led a campaign to prevent San Francisco from building a dam in the Hetch Hetchy Valley to supply the city with water and electric power as emblematic of the differences between conservationists and preservationists. The dam's advocates argued that it represented the appropriate development of natural resources for public purposes, while its opponents decried the effect that the project would have on the wildlife and grandeur of the Hetch Hetchy Valley. Ultimately, the conservationists won, and Congress approved the dam in 1914. Hays, *Gospel of Efficiency*, 192-95; also see, William Cronon, “The Trouble with Wilderness; or, Getting Back to the Wrong Nature,” in *Uncommon Ground: Rethinking the Human Place in Nature*, ed. William Cronon (New York: W. W. Norton & Company, 1996), 72.

the benefit of the people who live here now.”¹¹ The implementation of scientific methods and new technologies for achieving balanced growth connected the movement with larger societal impulses towards modernization and efficiency.¹²

Much like scientific forestry, the management of hydroelectric power became an increasingly important issue for the conservation movement during the early twentieth century.¹³ In 1907, Theodore Roosevelt convened the Interstate Waterways Commission, and he tasked the group with making a report of the nation’s water resources and creating a comprehensive plan that “should consider and include all the uses to which streams may be put and co-ordinate the points of views of all uses of water.”¹⁴ The Commission’s final report specifically highlighted hydroelectric power as an important asset derived from the nation’s rivers and streams on par with navigation and flood control and concluded that such an important source of energy could not be left unregulated.¹⁵ Roosevelt’s emphasis on coordination also reflected the growing popularity of multipurpose resource development among conservationists during the Progressive Era that tapped into the ethos of efficiency that pervaded the movement. Indeed, multipurpose development became one of the central tenets of conservationists.¹⁶

¹¹ Gifford Pinchot, *The Fight for Conservation* (Seattle: University of Washington Press, 1910), 43. Also quoted in Phillips, *This Land, This Nation*, 12.

¹² Hays, *Gospel of Efficiency*, 123-46.

¹³ Hays, *Gospel of Efficiency*, 73-82; and Conkin, “Intellectual and Political Roots,” 8-9.

¹⁴ Quoted in King, *The Conservation Fight*, 13. Roosevelt had forged a strong personal and professional relationship with Pinchot dating back to Roosevelt’s time as governor of New York, and he had become a willing convert to the tenets of the conservation movement; see Timothy Egan, *The Big Burn: Teddy Roosevelt and the Fire that Saved America* (Boston: Houghton Mifflin Harcourt, 2009), 17-38.

¹⁵ The Commission concluded, “In the light of recent progress in electrical application, it is clear that over wide areas the appropriation of water power offers an unequalled opportunity for monopolistic control of industries. Wherever water is now or will hereafter become the chief source of power, the monopolization of electricity produced from running streams involves monopoly of powers for the transportation of freight and passengers, for manufacturing, and for supplying light, heat, and other domestic, agricultural and municipal necessities, to such an extent that unless regulated it will entail monopolistic control of the daily life of our people to an unprecedented degree. There is here presented an urgent need for prompt and vigorous action by State and Federal governments.” Quoted in King, *The Conservation Fight*, 14.

¹⁶ Gifford Pinchot was already grappling with what he perceived to be the interconnectedness of the nation’s natural resources. In questioning the links between his work as a forester and the management of soil and mineral reserves as well as issues of water control, including navigation, flood prevention, and hydroelectricity, Pinchot concluded,

Widespread acceptance of multipurpose projects, however, was not immediately forthcoming. Congress debated but did not pass a water power bill every single year between 1913 and 1920.¹⁷ The fight over the nation's hydroelectric resources was less about whether they would or should be developed and more about who would control the process, private corporations or public agencies. Conservationists like Gifford Pinchot, who believed in the importance of public control over water resources, fought diligently to establish government ownership of hydroelectric projects at the municipal, state, and federal levels.

The debate over Muscle Shoals followed a similar trajectory. The advocates of conservation repeatedly blocked legislation that would have permitted private companies to improve the site. Although the Wilson administration began building two munitions plants at the Shoals during World War I, the facilities remained in various stages of development throughout the 1920s. Partisan opposition in Congress prevented Wilson and subsequent presidents from either completing or disposing of the facilities.¹⁸

“Suddenly the idea flashed through my head that there was a unity in this complication—that the relation of one resource to another was not the end of the story. Here were no longer a lot of different, independent, and often antagonistic questions, each on its own separate little island, as we had been in the habit of thinking. In place of them, here was one single question with many parts. Seen in this new light, all these separate questions fitted into and made up the one great central problem of the use of the earth for the good of man.” Quoted in TVA, *Annual Report, 1953* (Washington, D.C.: Government Printing Office, 1953), 52, also see 51. Particularly in the case of water resources, managing rivers as an integrated unit helped to maximize the benefits that could accrue from flood control, navigation, and the generation of hydroelectricity. Separately these functions might compete with one another, but a coordinated approach to development helped to mitigate conflicts. Furthermore, multipurpose projects promised to be more cost effective than piecemeal improvements. The generation and sale of hydroelectricity could help defray the infrastructural costs associated with damming rivers to aid in flood control and navigation. As Theodore Roosevelt noted, “Wherever the Government constructs a dam and lock for the purpose of navigation there is a waterfall of great value.” Quoted in TVA, *Annual Report, 1953*, 62.

¹⁷ King, *The Conservation Fight*, 19-23 and 45-58; Conkin, “Intellectual and Political Roots,” 8-10; and Hays, *Gospel of Efficiency*, 175-98 and 239-40.

¹⁸ Conkin, “Intellectual and Political Roots,” 10-4. Given Muscle Shoals' standing as the second most advantageous hydroelectric site in the eastern United States, few were surprised when Wilson selected the Shoals as the location for a plant that would produce nitrates from synthetic ammonia in 1917, or when, three months later, he authorized the construction of a second facility that utilized the energy intensive Cyanamid process.

Fits and Starts: the Ford Plan and George Norris

In 1921, Henry Ford caused a stir by submitting an offer to develop the area along the Tennessee River around Muscle Shoals into an industrial corridor on par with Detroit. Ford saw great promise in the hydroelectric potential of the Tennessee, and he asked the federal government to complete and then lease two dams at the Shoals to a new company that he would control. He touted his plan as one that could achieve economic growth in the region by reducing the dependence of local communities on agriculture while putting one million men to work in the new factories that he would locate along the river. Ford's proposal initially proved to be quite popular, and the prospect of a new manufacturing sector centered on Muscle Shoals caused a brief real estate boom in northern Alabama while eliciting several additional offers from likeminded entrepreneurs who also wanted to tap the hydroelectric potential of the Tennessee.¹⁹

Ford's plan, however, faced a determined opposition in George W. Norris, the chairman of the Senate's Agriculture and Forestry Committee. A progressive Republican in the mold of Theodore Roosevelt, Norris championed public power and resource conservation throughout his tenure in Congress and led the resistance to proposals for private development of Muscle Shoals.²⁰ In particular, he lamented the fact that Ford would control access to an energy source in the Tennessee River that seemed to have an increasingly vast potential while paying the government what Norris considered a paltry sum in compensation.²¹ Several prominent conservationists, including Pinchot (who by that time was governor of Pennsylvania) and the

¹⁹ King, *The Conservation Fight*, 98-122; Conkin, "Intellectual and Political Roots," 14-5; and Hubbard, *Origins*, 122. Of the options for private development and operation of the Shoals, Ford's plan seemed the likeliest to obtain congressional approval. Southern agricultural interests supported it, and it offered Congress with a solution to the Muscle Shoals problem that prevented the government's investment in the project from completely going to waste.

²⁰ King, *The Conservation Fight*, 42-4 and 107-9. Born in 1861, Norris became active in Nebraska politics in the early 1900s, and he was elected to the House of Representatives five times beginning in 1902 before moving on to the Senate in 1913. Norris had voted in favor of the provisions within the National Defense Act of 1916 that prevented private capital from developing Muscle Shoals without Congress' approval.

²¹ Conkin, "Intellectual and Political Roots," 15-6; and Hubbard, *Origins*, 119-20.

former Secretary of War, Newton Baker, joined Norris in testifying against Ford's proposal in the 1924 Senate debates.²² The men claimed that permitting a private corporation to dominate the power resources of the Tennessee River would deprive communities of the benefits of equitably-distributed, inexpensive electricity and retard industrial growth. The Senate Agriculture and Forestry Committee rejected the Ford bill on May 27, 1924.

Norris also submitted his own proposals for Muscle Shoals that emphasized multipurpose development and public control of the river's hydroelectric potential.²³ For conservationists like Norris, multipurpose development of watersheds like the Tennessee River Valley entailed the construction of dams to control seasonal flooding, increase navigability, and produce electricity. The generation of hydropower was particularly important because its sale helped to defray the costs of riverine improvement.²⁴ Furthermore, Norris and his allies stressed the social and economic gains that could be made by the communities surrounding Muscle Shoals if they were given greater access to electric energy. The battle over the Shoals had evolved into a larger struggle over who was to benefit from the exploitation of the United States' resources, private corporations or, as Norris and his fellow conservationists preferred, the general public and especially the rural poor.

The TVA Act and the Balance between Public Power and Regional Planning

The public power and regional planning movements shaped the debates about Muscle Shoals and the creation of the TVA. Both shared a vision of managed development that fit within the larger umbrella of conservationist thought, and both attained national prominence in

²² Hubbard, *Origins*, 120-40.

²³ Norris' proposal evolved over time; for an overview and a sense of his rhetoric, see Conkin, "Intellectual and Political Roots," 16-7. For more examples of rhetoric from Norris, Baker, and Pinchot, see Hubbard, *Origins*, 120-40.

²⁴ TVA, *Annual Report, 1939* (Washington, D.C.: Government Printing Office, 1940), 47-8.

the United States during the 1920s. Nevertheless, devotees of public power often limited their crusade to the utility industry while many regionalists were willing to compromise and work with existing private electric companies. The important differences that separated each movement created conflicts that divided the Authority's first board of directors and influenced the agency's early history.

The advocates of public power denied that private corporations could manage electric resources in the interest of the people and called for the creation of government owned and operated utilities. Regional holding companies had absorbed many local providers in the 1910s and 1920s, hindering state regulation of the electric industry and bolstering public perception that private utilities ignored the needs of residential consumers and were instead subservient to moneyed interests.²⁵ Displays at international exhibitions in Buffalo, St. Louis, Paris, and Chicago all highlighted the benefits of electric power in the home as well as in the factory. Like other reformers in the Progressive Era, public power's supporters had also become alarmed at what they deemed to be the deteriorating quality of life in industrialized urban settings. They believed that the electrification of the countryside could serve a dual purpose, raising living standards and promoting economic growth outside city limits thereby encouraging the relocation of the population from crowded, dirty, morally-bereft metropolitan centers.²⁶ Within the context of the backlash against large corporations that began during the late nineteenth century,

²⁵ Ronald C. Tobey, *Technology as Freedom: The New Deal and the Electrical Modernization of the American Home* (Berkeley: University of California Press, 1996), 41-50; and Howard Hampton, *Public Power: The Fight for Publicly Owned Electricity* (Toronto: Insomniac Press, 2003), 87-96.

²⁶ For a discussion of electrical presentations at World's Fairs, see David E. Nye, *Electrifying America: Social Meanings of a New Technology, 1880-1940* (Cambridge: The MIT Press, 1990), 29-84. For a discussion of public power, conservationists, the social threats of urbanization, and the depopulation of the countryside, see Phillips, *This Land, This Nation*, 21-36; and Morris Llewellyn Cooke, "General Report of Director to Board," in *Report of the Giant Power Survey Board to the General Assembly of the Commonwealth of Pennsylvania*, eds. Morris Llewellyn Cooke and Judson C. Dickson (Harrisburg: The Telegraph Printing Co., 1925), 40; for a discussion of how the New Deal appropriated the ideal of decentralization see below and Daniel Schaffer, "Benchmark Report on Environmental Quality: A Historical Perspective," TVA Cultural Resources Program (February, 1983), 25-9, University of Tennessee at Knoxville, John C. Hodges Library, Special Collections [hereafter: UTK: Hodges], Energy, Environment, and Resource Center Records [hereafter: EERC], Box 3, Folder 4.

widespread popular anger with power companies focused on the rates charged for in-home electric service and the unwillingness of private providers to expand their networks to include rural areas.²⁷ The public power movement, however, never extended beyond the production and distribution of electricity.

Early experiments in public power focused narrowly on individual municipal systems. By 1913, cities and towns throughout the nation had established 1,833 public electric utilities, and municipal ownership peaked ten years later at 3,083 systems.²⁸ In the 1920s, the reformers like Gifford Pinchot and Morris Cooke began developing more ambitious plans in response to the Ontario Hydro-Electric Commission's (Ontario Hydro) foray into regional public power. Having begun operations in 1907, Ontario Hydro's experience confirmed the theory that residential consumers in both urban and rural communities would readily use large quantities of electric power if it were provided at low enough rates and that the subsequent increase in volume would allow a utility to cover the cost of its infrastructural investments.²⁹

²⁷ Throughout the early part of the twentieth century, power companies often charged significantly higher rates to residential consumers compared to large industries, claiming that the increased prices reflected the relative cost of providing electricity to small volume users. Using a similar line of reasoning, few private utilities made an effort to extend service to rural areas prior to the 1930s, arguing that rural customers would not use enough power to justify the investment associated with building transmission lines over large swaths of sparsely populated countryside. Nye, *Electrifying America*, 260-77 and 292-304. Nye suggests that utilities did not seriously consider widespread residential electrification before 1918; Tobey, *Technology as Freedom*, 10-21 and 41-50; Gifford Pinchot, "Governor Pinchot's Message of Transmittal," in *Report of the Giant Power Survey Board to the General Assembly of the Commonwealth of Pennsylvania*, eds. Morris Llewellyn Cooke and Judson C. Dickson (Harrisburg: The Telegraph Printing Co., 1925), xi-xii; Cooke, "General Report of Director to Board," 37-46; and Hampton, *Public Power*, 87-96. Ironically, Samuel Insull, the chairman of one of the nation's largest holding companies had demonstrated the feasibility of providing service to rural communities in 1913; see Philip J. Funigiello, *Toward a National Power Policy: The New Deal and the Electric Utility Industry, 1933-1941* (Pittsburgh: University of Pittsburgh Press, 1973), 123; and Harold L. Platt, *The Electric City: Energy and the Growth of the Chicago Area, 1880-1930* (Chicago: University of Chicago Press, 1991), 59-197.

²⁸ Tobey, *Technology as Freedom*, 41-50; and Hampton, *Public Power*, 87-96.

²⁹ For example, in a 1924 issue of *Survey Graphic*, Pinchot touted Ontario Hydro's accomplishments. Cooke had done the same in a 1922 issue of *New Republic*; see Phillips, *This Land, This Nation*, 30. Ontario Hydro tapped the potential of Niagara Falls and the St. Lawrence River to provide affordable electricity in large quantities to businesses and residents throughout southeastern Canada. Residential rates in cities in Ontario Hydro's service area were minimal when compared with average rates in the United States. For example, the average rate paid by residential customers in Ontario's cities fell between seven and twelve cents per kilowatt-hour to 1.9 cents between 1907 and 1921. Average use exploded, increasing by 452 percent. Meanwhile, urban residents in Massachusetts

Pinchot's and Cooke's Giant Power proposal for the state of Pennsylvania best exemplified the expanded vision of public power's supporters in the United States. By the time he was elected governor, Pinchot viewed electric energy as a public good, believing that access to an abundant supply of electricity had become both a necessary prerequisite for robust industrial growth and an integral resource for improving the quality of life in the domestic sphere.³⁰ Pinchot conceptualized energy as the basis of social progress, modernity, and American prosperity, arguing that advances in energy technology had led directly to advances in human civilization.³¹ If the steam engine had formed the infrastructural foundation for industrial society, the age of electricity promised to be equally epochal with electric power helping to erase the social and environmental blight of the industrial revolution.³² Cooke, who served as the

and Wisconsin paid 9.32 cents and 7.11 cents per kilowatt-hour in 1921. Customers in Ontario used approximately 872 kilowatt-hours of electricity per year while those in Massachusetts and Wisconsin used 430 and 501 kilowatt-hours respectively; see, Benjamin H. Williams, "Appendix C: A Study of the Amount of Electric Current Consumed with Special Reference to the Price Charged," in *Report of the Giant Power Survey Board to the General Assembly of the Commonwealth of Pennsylvania*, eds. Morris Llewellyn Cooke and Judson C. Dickson (Harrisburg: The Telegraph Printing Co., 1925), 319-21.

³⁰ Pinchot's letter transmitting the Giant Power proposal to the Pennsylvania legislature articulated a vision that emphasized the importance of energy sources and energy abundance to human advancement, stating that "[m]echanical energy is the heart of modern civilization," before pronouncing that "[w]e owe the present American standard of living mainly to our use of greater quantities of power per inhabitant than any other people on earth." Furthermore, Giant Power was "a plan by which most of the drudgery of human life can be taken from the shoulders of men and women who toil, and replaced by the power of electricity." In Pinchot's vision, electric power had labor saving applications at home and on the farm as electricity reduced the work required of women, making cooking and cleaning less time consuming, while helping farmers milk cows and cut wood among other daily tasks. Electric lights made the home brighter, cleaner, and safer. In industrial settings, electricity alleviated the nuisance caused by smoke and ash from coal-fired furnaces. It also theoretically led to better pay and shorter hours for workers via increased production. For quotes, see Pinchot, "Governor Pinchot's Message of Transmittal," iii and v. In fact, much of Pinchot's vision for electricity never materialized. Studies have demonstrated that electricity did not reduce the amount of time that women spent on work inside the home. Furthermore, it is doubtful that electricity shortened work hours for laborers. If anything electric power enabled factories to remain open longer as it improved visibility on the shop floor. Nye, *Electrifying America*, 185-237 (for workers and the factory), 238-86 (for women and the home), and 243 (for the safety and cleanliness of electric lighting). On women and the home, also see Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave* (New York: Basic Books, 1984), 100. Ronald Tobey points out that public power's advocates aligned themselves with the rational housekeeping movement; see Tobey, *Technology as Freedom*, 45-55.

³¹ Pinchot, "Governor Pinchot's Message of Transmittal," iv.

³² As Pinchot put it, "Steam makes slums. Electricity can replace them with garden cities." See Pinchot, "Governor Pinchot's Message of Transmittal," xiii; for a discussion of the consequences of steam see, iv and xii-xiii. For discussion of Progressive Era discontent with the effects of industrialization and urban life on workers see, Phillips, *This Land, This Nation*, 21-36.

consulting engineer and project director, made similar claims about electricity's importance for modern society and the necessity of public power.³³ Their Giant Power proposal called for the development of several massive coal-fired power plants located in close proximity to Pennsylvania's largest mines.³⁴ The facilities' size would take advantage of engineering efficiencies while the use of relatively few, centralized, mine-mouth plants would save on the cost of transporting coal and eliminate the need for individual furnaces in homes and factories that inundated cities like Pittsburgh with smoke and ash. Pinchot and Cooke planned to use new high voltage power lines that could carry electricity to all corners of the state in large volumes and with minimal losses.³⁵ More importantly, they both believed that private corporations could not manage such an important resource.³⁶ As Pinchot noted, private utilities developed plans that

³³ Cooke, "General Report of Director to Board." Cooke went on to a distinguished career in public power, consulting with Franklin D. Roosevelt on a public power system for the state of New York during the latter's years as governor before being appointed as the first head of the Rural Electrification Administration in the New Deal.

³⁴ Unlike the Tennessee River Valley, Pennsylvania was not blessed with an abundance of hydroelectric power sources; the state did, however, possess a lot of coal. Pennsylvania's nascent electric utilities primarily served urban centers like Philadelphia and Pittsburgh, but they often lacked the generating capacity to provide electric power in large enough blocks to sustain the needs of manufacturers. As a result, many industrial plants and even some large mechanized farms utilized their own coal-fired generators to produce electricity. In terms of their engineering, the smaller, individual generating stations were woefully inefficient compared to larger, centralized power plants, requiring more coal to produce the same amount of electricity. Since many factories operated their own generators, the time consuming and expensive process of upgrading old or building new equipment whenever a business wanted to expand stifled economic development. Finally, the surfeit of many small utilities and companies that operated their own lines and power networks made it difficult to share power across systems, thereby limiting one major way that utilities could meet demand at peak hours. Cooke, "General Report of Director to Board," 18-31; for secondary source accounts see, Christopher F. Jones, "Energy Landscapes: Coal Canals, Oil Pipelines, Electricity Transmission Wires in the Mid-Atlantic, 1820-1930" (PhD diss., University of Pennsylvania, 2009), 261-365; Phillips, *This Land, This Nation*, 25-9; Funigiello, *Toward a National Power Policy*, 126-8; and Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983), 297-313.

³⁵ Cooke, "General Report of Director to Board," 15-6, 23-5, 29-30, and 40-6; and Gifford Pinchot, "Governor Pinchot's Message of Transmittal," v-vi. Thomas Hughes argues that Cooke promoted the use of mine-mouth facilities as a result of his experience dealing with railroads and the transportation of coal in World War I; see, Hughes, *Networks of Power*, 299.

³⁶ Pinchot, "Governor Pinchot's Message of Transmittal," viii-ix; also see, Hughes, *Networks of Power*, 297-305. Pinchot and Cooke recognized that private utilities possessed the technological capability and engineering expertise to design and operate the massive integrated system that they proposed. Jones, "Energy Landscapes," 313-7. Only a few years earlier, William Murray, a railroad consultant, had floated a plan that he called Super Power that would have created a large, interconnected system along the eastern seaboard, stretching from New England to Washington, D.C. while providing service to communities up to 150 miles inland. Cooke had supported Murray's proposal for a short period of time until he became concerned with Murray's denigration of public utilities.

brought “greater profit to the companies.”³⁷ In contrast, “The main object of the Giant Power idea is greater advantage to the people.”³⁸ For the advocates of public power, the development of public utilities had become the only way to ensure that the construction of a statewide, integrated power system benefited consumers.³⁹ Pennsylvania, however, never implemented Giant Power. The state legislature remained wary of a plan that appeared to threaten private utilities.⁴⁰

Pinchot’s and Cooke’s proposal was also noteworthy for its silence regarding public ownership of other industries. Although they vehemently opposed private utilities, the public power movement’s devotees narrowly focused on the production and distribution of electric energy. They did not call for the government to intervene in other sectors of the economy or society. In fact, they portrayed public power as a means for attracting private investment to individual communities. The movement was in this respect relatively conservative, and its advocates tried to position public power as an important bulwark for a robust system of free enterprise rather than a threat.

A second branch of conservationists coalesced in the regional planning movement. While vague as to its specifics, regional planning represented a potential solution to the perceived failure of markets in the early twentieth century and especially during the Great Depression. Like public power, the movement began at the municipal level before expanding in geographic scope. Unlike public power, regional planning entailed a broad array of reforms. Furthermore, its supporters did not believe that government ownership of utilities was always

³⁷ Pinchot, “Governor Pinchot’s Message of Transmittal,” viii.

³⁸ Pinchot’s proposal promised “vastly better service and vastly cheaper rates” for Pennsylvania residents. For both quotes, see Pinchot, “Governor Pinchot’s Message of Transmittal,” viii.

³⁹ In Pinchot’s and Cooke’s opinion, Pennsylvanians needed Giant Power to protect themselves from the “most dangerous monopolies ever known.” Despite its hyperbole, the designation captured Pinchot’s belief in the importance of electric power for modern life and his distrust of large corporations, two beliefs that suffused the public power movement. For quote, see Pinchot, “Governor Pinchot’s Message of Transmittal,” viii.

⁴⁰ Hughes, *Networks of Power*, 297-313; and Jones, “Energy Landscapes,” 313-21.

necessary, though they supported improved access to electricity for residential customers and rural communities.⁴¹

The concept of regional planning grew out of the garden city movement in England and the work of French theorists who viewed geography and culture as forces that bound communities together. In the United States, planning took several forms, including the structuring of community land use through zoning, efforts to attract manufacturing, the building of multipurpose dams, and improvements in education, forestry, and agriculture. The movement gained supporters from a variety of backgrounds and was comprised of economists and other social scientists, architects, foresters, philosophers, and city planners who had become interested in expanding their discipline's reach beyond municipal borders.⁴² Regionalism's allure as an approach to solving social problems lay in its emphasis on the resources and other factors that connected individuals, towns, and cities together. Those who embraced it criticized industrialization, believing that the centralization of jobs and workers in urban areas had robbed rural towns of wealth and inhabitants and metropolitan centers of the social structure necessary for healthy and moral living.⁴³ Benton MacKaye, a leader of the regional planning movement, praised some of the successes of the early conservationists and the advocates of public power but argued that they had not gone far enough. Lewis Mumford elaborated on MacKaye's analysis, suggesting that effective reform required more equitable methods of managing the nation's natural and human resources. As Mumford defined it, "Regional planning is the New

⁴¹ Paul K. Conkin, *Tomorrow A New World: The New Deal Community Program* (Ithaca: Cornell University Press, 1959)59-72; Phillips, *This Land, This Nation*, 30-3; Conkin, "Intellectual and Political Roots," 24-5; and Roy Lubove, *Community Planning in the 1920's: The Contribution of the Regional Planning Association of America* (Pittsburgh: University of Pittsburgh Press, 1963).

⁴² Conkin, *Tomorrow A New World*, 1-89; Phillips, *This Land, This Nation*, 30-3; Conkin, "Intellectual and Political Roots," 24-5; and Lubove, *Community Planning in the 1920's*.

⁴³ Conkin, "Intellectual and Political Roots," 24-5; Conkin, *Tomorrow a New World*, 59-72; and Phillips, *This Land, This Nation*, 30-3. In 1923, Lewis Mumford, a philosopher, Benton MacKaye, a forester, and Stuart Chase, and economist, helped to found the Regional Planning Association of America. Other founding members, including Clarence S. Stein and Frederick L. Ackerman, both city planners, had spent time in England studying garden cities.

Conservation—the conservation of human values hand in hand with natural resources.”⁴⁴

Mumford and the regional planners, however, did not envision a return to a utopian agricultural past; rather they argued that environmental balance was the key to the future prosperity of the United States. Scholars like Howard Odum and Rupert Vance at the University of North Carolina, whose analyses of economic stagnation in the South suggested that regions represented useful units for social science research and the creation of public policy, also bolstered the regional planning movement, helping it gain momentum.⁴⁵

Because of their diversity, many regionalists disagreed about the government’s exact role in planning especially as it related to the economy. Although some argued that federal, state, and local intervention in private markets was necessary, others believed that business leaders would voluntarily cooperate with planners to maximize the benefits of resource development for the communities in which their industries operated.⁴⁶ This tension within the movement meant that experiments in regional planning were often highly individualized. While they embraced a more holistic approach to conservation, the more moderate stance that many planners adopted toward electric utilities created friction with the advocates of public power.

Despite their differences, the policy goals of regionalism and public power had become intertwined by the early 1930s. As noted above, leading public power advocates, such as Gifford Pinchot and Morris Cooke, shared regionalist’s negative opinion of industrial centralization and urban decay. The regionalists, for their part, looked favorably upon Pinchot’s and Cooke’s Giant Power proposal as well as George Norris’ crusades against private utilities in the Senate even if they did not always believe that public ownership of electric companies was necessary.

⁴⁴ Quoted in Phillips, *This Land, This Nation*, 32. Mumford argued that a predatory relationship existed between urban and rural areas.

⁴⁵ Phillips, *This Land, This Nation*, 31-4; and Conkin, “Intellectual and Political Roots,” 24-6.

⁴⁶ Conkin, *Tomorrow a New World*, 73-89. The emphasis on voluntarism of some regional planners as it related to the economy demonstrates the broad political spectrum of regionalists.

Furthermore, the concept of regionalism and its attendant focus on river valleys as planning units reinforced the larger conservation movement's emphasis on multipurpose resource development.⁴⁷

The Great Depression and Franklin Delano Roosevelt's election as President of the United States in 1932 served as key turning points for public power and regional planning in the Tennessee Valley. George Norris had managed to guide a Muscle Shoals bill through Congress in 1928 and 1931, but his insistence on maintaining federal control over the hydroelectric facilities at the Shoals drew vetoes from Calvin Coolidge and Herbert Hoover.⁴⁸ The failure of local institutions and private markets during the Depression fostered support for the creation of federal relief programs and an increased role for government in promoting social welfare, laying the foundation for Roosevelt's election and the New Deal.⁴⁹ Although Roosevelt remained characteristically distant from the TVA Act throughout its legislative journey in Congress, he did influence the scope of the final bill. Roosevelt's presence in the White House and his affection for public power and regional planning signaled that if Norris successfully guided his proposal through Congress for a third time, it would not be vetoed.⁵⁰

⁴⁷ Phillips makes the case that regionalists and conservationists shared similar goals by the 1930s; see Phillips, *This Land, This Nation*, 31-4; Conkin is more circumspect about the influence of regionalism on conservationist thought seeing the two movements as parallel rather than connected; see Conkin, "Intellectual and Political Roots," 24-7.

⁴⁸ Conkin, "Intellectual and Political Roots," 17-9; and Hubbard, *Origins*, 233-6 and 290-3; Phillips, *This Land, This Nation*, 46-59. While Coolidge never made a definitive statement explaining his decision, the president's critics argued that he wanted to prevent a public utility from operating Muscle Shoals as such a development would reveal the extent to which private providers had artificially inflated their rates. Press coverage at the time cited Coolidge's opposition to public utilities and the direct sale of electricity to public distributors as the major reason for his veto. Similarly, Hoover favored plans that relied on private capital to improve the nation's resources and manage them in the public interest. While Hoover wanted to increase the availability of electric power to American consumers, his reliance on voluntarism put him at odds with public power advocates. Hoover's reliance on voluntarism during the Great Depression is well documented as is his disdain for direct government intervention in private enterprise; see David M. Kennedy, *Freedom From Fear: The American People in Depression and War, 1929-1945* (Oxford: Oxford University Press, 1999), 1-130.

⁴⁹ On the failure of local institutions during the Great Depression, see Lizabeth Cohen, *Making a New Deal: Industrial Workers in Chicago, 1919-1939* (Cambridge: Cambridge University Press, 2008 [1990]).

⁵⁰ Neil M. Maher, *Nature's New Deal: The Civilian Conservation Corps and the Roots of the American Environmental Movement* (Oxford: Oxford University Press, 2008), 20-6. Roosevelt had already embraced the principles of conservation prior to his tenure as governor of New York, relying on scientific forestry to rehabilitate

As governor of New York from 1929 to 1932, Roosevelt had supported the public power movement, and he had worked to expand access to electricity, especially among the state's rural population. Roosevelt set the tone for his policies during his gubernatorial inauguration. As he described the problem, "In the brief time I have been speaking to you there has run to waste on their paths to the sea enough power from our rivers to have turned the wheels of a thousand factories, to have lit a million farmers' homes."⁵¹ Roosevelt's commitment to the power issue stemmed in part from his desire to enhance the quality of life in New York's rural communities but also from his dissatisfaction with the private utility industry. Like many in the public power tradition, he believed that private utilities had continually discriminated against residential consumers and small industries by charging higher than necessary rates. Roosevelt's studies of Ontario Hydro only confirmed his suspicion that it was possible to provide electric power in far flung communities at prices that not only permitted but also encouraged use. Roosevelt even expressed his opinions in nationally circulated publications such as *Forum*, arguing that public operation of hydropower sites at Muscle Shoals, Boulder Dam (now Hoover Dam), and on the St. Lawrence River could become a "yardstick" for measuring the true costs associated with producing and distributing electricity. His inclusion of sites outside of his jurisdiction as governor of New York illustrated his evolving commitment to making energy sources available to homes and businesses throughout the United States.⁵²

his family's estate. Following the advice of foresters at Syracuse University, Roosevelt planted over 500,000 trees on his property between 1912 and his death in 1945.

⁵¹ Franklin D. Roosevelt, "The First Inaugural Address as Governor. January 1, 1929," in *The Public Papers and Addresses of Franklin D. Roosevelt: Vol. 1, The Genesis of the New Deal, 1928-1932*, ed. Samuel I. Rosenman (New York: Random House, 1938), 77-8; Also quoted in Phillips, *This Land, This Nation*, 61.

⁵² Phillips, *This Land, This Nation*, 61-3. In order to carry out his vision for electric power, Governor Roosevelt convinced the state legislature to establish the New York Power Authority (NYPA) in 1931, appointing several leading advocates for public power, among them Morris Cooke, to the agency. In the fall of 1931, Cooke recommended that the state of New York build its own transmission network and that municipalities and rural cooperatives be granted the ability to develop their own distribution systems, but the legislature refused to support

Roosevelt remained committed to idea of public power as he began his campaign in 1932. In fact, when looking back on his meetings with Roosevelt, Raymond Moley, a trusted advisor, recalled that the candidate seemed most interested in developing programs that would ensure widespread access to electricity.⁵³ Roosevelt connected the power issue with two others that he saw plaguing the nation during the Great Depression, weak consumer demand and rural poverty.⁵⁴ Still, he did not draw attention to any concrete plans during the campaign. Muscle Shoals did not factor prominently in the 1932 presidential race, and Roosevelt only gave one campaign speech on public power in Portland, Oregon, on September 21, 1932.⁵⁵ While he did not outline specific programs, Roosevelt's personal predilection for public power predisposed him to support Norris and his legislation for Muscle Shoals.⁵⁶

By the time he became president, Roosevelt was also enamored with regional planning. His uncle, Frederic A. Delano, a noted city planner, had first exposed him to the concept of urban planning in 1909.⁵⁷ Roosevelt later recalled that these conversations had piqued his interest not just in "the mere planning of a single city" but in regional planning, which he viewed

either proposal. Furthermore, the Hoover administration stymied all of Roosevelt's efforts to develop public power along the St. Lawrence River.

⁵³ Raymond Moley, *After Seven Years* (New York: Harper & Brothers, 1939), 12-13; also noted in Phillips, *This Land, This Nation*, 64.

⁵⁴ Phillips, *This Land, This Nation*, 59-74. As he noted, "We are backward in the use of electricity in our homes and on our farms. ... Low prices to the domestic consumer will result in his using far more electrical appliances than he does today." Quote from Franklin D. Roosevelt, *Looking Forward* (New York: The John Day Company, 1933), 147 and 148; perhaps unsurprisingly, Roosevelt's chapter, "The Power Issue," touches on the same themes and uses similar arguments as Pinchot and Cooke in their Giant Power proposal; see pages 139-54. The quote can also be found in Phillips, *This Land, This Nation*, 63.

⁵⁵ Conkin, "Intellectual and Political Roots," 21-2. In the Portland speech, Roosevelt argued that the federal government should retain control over hydroelectric sites that it already owned, including Muscle Shoals. He once again referred to the "yardstick" ideal, and he called for the federal government to produce and distribute electric power at affordable rates.

⁵⁶ It has been a somewhat common refrain among scholars of the New Deal that Roosevelt did not discuss the details of his preferred policies during the 1932 campaign and that he rarely worried himself with the specifics of legislation until it was assured of Congressional approval.

⁵⁷ In 1922, Delano had helped develop a regional plan for the entire New York City metropolitan area at the behest of the Russell Sage Foundation.

as the extension of urban planning to the countryside.⁵⁸ He was active in the new movement and attended the Country Life Conference in 1931 where he delivered a speech on the benefits of planning in rural areas.⁵⁹ As governor of New York, he also praised the work of the New York City Regional Planning Committee, and he looked forward to the day “not far distant when planning will become a part of the national policy of this country.”⁶⁰ In addition to his interest in public power, Roosevelt’s interest in regional planning shaped his vision for the TVA.

Roosevelt became more attentive to the Tennessee Valley after his election. He visited Wilson Dam at the Shoals on January 21, 1933. Later that night in a speech in Montgomery, Alabama, the president urged Congress to pass a sweeping proposal that would encompass the entire Tennessee River watershed and that would engage a plethora of policies including regional planning and the public production and distribution of electric power.⁶¹ Once again, George Norris, who was travelling in the president’s entourage at the time, played the most important role in crafting the legislation.⁶²

The Tennessee Valley Authority Act of 1933 combined Roosevelt’s grand vision with Norris’ support for multipurpose resource development. It created the TVA and tasked the agency with building dams to improve flood control and navigation on the Tennessee River while also generating hydroelectricity. The Act called for the new institution to engage in a program of reforestation and to address soil erosion, nutrient depletion and other agricultural issues plaguing the Valley. Additionally, the Authority was to promote economic growth

⁵⁸ Quote from Conkin, *Tomorrow a New World*, 71. Also see Conkin, “Intellectual and Political Roots,” 24-7.

⁵⁹ Conkin, “Intellectual and Political Roots,” 24-7.

⁶⁰ Quoted in Conkin, *Tomorrow a New World*, 71.

⁶¹ Conkin, “Intellectual and Political Roots,” 22-3.

⁶² It is difficult to tie the TVA Act directly to any of the leading regionalists. George Norris played the most important role in crafting the legislation. Norris was an ardent supporter of the conservation movement and public power, but there is little evidence that he met with MacKaye or Mumford when formulating sections of the TVA Act. Even southern regionalists like Howard Odum appear to have had very little direct influence over the writing of the bill. Conkin, “Intellectual and Political Roots,” 26-7.

opportunities for employment in non-farm labor through the expansion of manufacturing. The two sections of the TVA Act that dealt with planning were relatively vague, sanctioning a survey of the region but saying little about how the Authority was to formulate plans for future development, what those plans would entail, or the extent to which the TVA was to cooperate with local agencies.⁶³ The 73rd Congress and Roosevelt left the task of defining the relationship between planning, agricultural reform, industrialization, navigation, flood control, and the production and distribution of electricity to the Authority's first board of directors. The definition of these relationships had great consequences for the agency.⁶⁴ In particular, friction between the advocates of public power and regional planning shaped the TVA's early history. Under the guidance of three men, Arthur E. Morgan, Harcourt A. Morgan (no relation), and David E. Lilienthal, the Authority and its various functions evolved in tandem.

The Uneasy Triumvirate: A. E. Morgan, H. A. Morgan, and David Lilienthal

The TVA Act established a three person board with each member serving staggered, nine-year terms. Although the president designated Arthur Morgan as chairman, the title did not

⁶³ Conkin, "Intellectual and Political Roots," 26-7. Conkin has argued that part of the problem was that neither the regional planning movement nor Franklin Roosevelt ever crafted a coherent definition of what they meant by the term "planning."

⁶⁴ The TVA Act did provide some guidance for the Authority's leaders in carrying out the Act's power provisions. Section 9(a) of the TVA Act permitted the Authority to produce hydroelectricity at its dams so long as it did not interfere with the maintenance of a navigation channel on the Tennessee River and the prevention of floods. The Act allowed the TVA to sell electricity directly to federal installations in the Tennessee Valley as well as to individual industries. The Act also permitted the Authority to enter into wholesale contracts to provide electricity to distribution companies giving a preference to public municipal utilities as well as rural cooperatives, and it gave the TVA the ability to set its wholesale rate while allowing the Authority to negotiate maximum retail rates with distributors. Victor Hobday and Erwin Hargrove have noted that in practice this gave the TVA the ability to set the retail rates charged to consumers. Nevertheless, the TVA Act left many operational questions unanswered. For example, the original Act did not delimit the boundaries of the area in which the TVA could provide electric power, and it did not prevent the TVA from acquiring customers in communities already served by private utilities. It also failed to specify how the TVA would determine the rates it charged to distributors. Finally, beyond section 9(a), the Act said little about how the agency's leadership should coordinate the power program with the Authority's other functions. See "Tennessee Valley Authority Act of 1933," in *The Statutes at Large of the United States of America from March 1933 to June 1934: Part I, Public Laws*, vol. 48 (Washington: GPO, 1934), 58-72; Hobday, *Sparks at the Grassroots*, 32-109; and Hargrove, *Prisoners of Myth*, 54-6.

technically bestow any added benefits upon its recipient. Each board member possessed a single vote on matters related to the operation of the TVA.⁶⁵ All three men had different areas of expertise and divergent views on the Authority's role in the Tennessee Valley.

Arthur E. Morgan was born to a pious mother and a father who preferred science (and alcohol) to religion and who held a job as a surveyor in Wisconsin. A utopian in the tradition of Edward Bellamy, Morgan worked throughout his life to fuse his father's commitment to science and technological advancement with his mother's sense of morality and social reform. Morgan's greatest professional achievement, the one that most qualified him for the TVA, was his role in helping to control the Ohio River in 1913. In developing the Ohio Conservancy Project (also known as the Miami Conservancy Project), Morgan designed a series of dams that reduced the impact of flooding along the river. In addition, he helped pass legislation that created a regional authority with powers of eminent domain to coordinate operation of the dams and promote integrated flood control along the breadth of the project. For the region's inhabitants, Morgan instituted educational programs and an "enlightened" labor policy designed to achieve social uplift in the river valley. Through his work as an engineer and his commitment to social reform, Morgan embraced the idea of treating a river, its watershed, and the population that lived there as a single unit. He was a regionalist in fact, if not in name.⁶⁶

⁶⁵ Hargrove suggests that over time the chairman has become the *de facto* leader of the board with the other members usually following his decisions; see Hargrove, *Prisoners of Myth*.

⁶⁶ Arthur E. Morgan did not have formal connections to the conservation movement prior to his appointment as TVA chairman, although his predilection for community planning and centralized resource management meant that he had much in common with regionalists like Lewis Mumford and Benton MacKaye. In a move that set a precedent for the Tennessee Valley Authority, Morgan also built housing for the Ohio Conservancy's construction workers. In addition to his work on the Ohio Conservancy Project, he became president of Antioch College, a small school in Ohio, in 1921. There, Morgan worked to instill his ethos that combined practical scientific knowledge, a commitment to social reform, and a strong sense of personal morality in the college's students; see Thomas K. McCraw, *Morgan vs. Lilienthal: The Feud within the TVA* (Chicago: Loyola University Press, 1970), 6-11; and Hargrove, *Prisoners of Myth*, 24-6. On Edward Bellamy's influence on Morgan's own philosophy, see Timothy Miller, *The Quest for Utopia in Twentieth Century America: Volume I: 1900-1960* (Syracuse: Syracuse University Press, 1998), 163.

Arthur Morgan envisioned the TVA as a grand experiment in regional planning. He felt that the Authority was “established in an effort to bring about orderly wholesome development of economic and social life” in the Tennessee Valley.⁶⁷ This meant designing new communities with specific patterns of land use in mind, incorporating space for industries and greenbelts, building dams to regulate rivers, and introducing more sustainable practices for forestry and agriculture for the benefit of local residents. In this way, Morgan hoped that the TVA would become a model for the rest of the nation, demonstrating the best methods for managing the natural and human resources of a region to provide for maximum gains in social welfare.⁶⁸

The second member of the board, Harcourt A. Morgan, had most recently served as the president of the University of Tennessee at Knoxville. A Canadian by birth, Harcourt Morgan had spent most of his adult life living in the American south, initially teaching agricultural science courses at Louisiana State University while overseeing the institution’s agricultural experiment station. In 1905, he assumed the same positions at the University of Tennessee, becoming a dean of the college of agriculture in 1913 before being named university president in 1919. Through his years studying farm practices and working in state experiment stations, Morgan developed both a detailed understanding of the problems that beset southern agriculture and an intimate relationship with the region’s farmers.⁶⁹

⁶⁷ Quoted in Hargrove, *Prisoners of Myth*, 31.

⁶⁸ Hargrove, *Prisoners of Myth*, 30-3.

⁶⁹ H. A. Morgan’s research on pests like the boll weevil and his work with the extension service trying to educate farmers on the benefits of progressive techniques instilled in him a pessimistic view of man’s relationship with natural resources in the rural south. As he put it, “We have sinned against the soil, the crop, and the animal.” Over time, however, he developed his own philosophy, known as “the common mooring,” that he believed would solve the crisis plaguing southern agriculture. H. A. Morgan’s philosophy emphasized the use of sustainable farming practices and the idea that humans existed within nature rather than outside of it; thus, it was necessary to adopt agricultural practices that did not exploit natural resources. As a result, “the common mooring” encouraged farmers to rotate their crops and to sow plants that naturally replenished the soil, adding nutrients that cash crops like cotton and corn stripped away. Interestingly, H. A. Morgan’s vision went beyond agriculture as he advocated for the importance of decentralized industries in creating economic balance in rural areas. Nevertheless, H. A. Morgan strove to bring man into harmony with nature; see McCraw, *Morgan vs. Lilienthal*, 11-6 (quote from page 14); and Hargrove, *Prisoners of Myth*, 26-8.

Harcourt Morgan did not share Arthur Morgan's belief in regional planning. H. A. Morgan's experience with southern farmers caused him to be skeptical of an approach to resource development that did not rely on the initiative of local residents. He knew that the Valley's farmers, particularly the elite landowners, would resist the appearance of an outside agency dictating agricultural practices to them. For this reason, Harcourt Morgan preferred to work with the state extension services, and he ensured that the TVA administered its farm demonstration programs through local institutions. Although his approach shared similarities with Arthur Morgan's vision of the environment, in particular the belief that the natural resources of a region, including human resources, should be treated as a single integrated unit, Harcourt Morgan doubted A. E. Morgan's centralized approach to planning.⁷⁰

David E. Lilienthal, the third board member, was by far the youngest of the directors at only thirty-three years old. Lilienthal's first passion was labor relations, and, after graduating from Harvard Law School in 1923, where he had been a protégé of Felix Frankfurter, he took a position at Donald Richberg's firm in Chicago, drafting legislation that became the Railway Labor Act of 1926. Over time, Lilienthal became interested in public utilities law, and he left Richberg's firm to start his own practice. Lilienthal quickly mastered the complexities of regulating the utility industry, serving as the special attorney for the city of Chicago, during which time he won a \$20 million judgment for the city and its residents against a local telephone company. By 1931, Lilienthal's efforts attracted the attention of Wisconsin governor, Philip LaFollette, for whom he had briefly worked in 1924 on a failed presidential campaign.

⁷⁰ H. A. Morgan's predilection for utilizing preexisting agricultural agencies, like the extension service, facilitated local acceptance of the Authority's farm program. As other scholars have noted, one consequence of the TVA's reliance on local agencies was that wealthy farmers who owned large tracts of land tended to benefit significantly more from the Authority's programs than those who were less well-off, particularly African American sharecroppers; see McCraw, *Morgan vs. Lilienthal*, 11-6; Hargrove, *Prisoners of Myth*, 26-8; and Selznick, *TVA and the Grass Roots*.

LaFollette appointed Lilienthal to the Wisconsin Public Service Commission where he became a thorn in the side of the state's private utilities. While Lilienthal focused much of his attention on the Wisconsin Telephone Company, he also developed an interest in expanding access to electricity among the state's farmers and rural population. Largely because of his passion for public service and his critical view of private utilities, Roosevelt appointed Lilienthal to the TVA Board in 1933.⁷¹

Lilienthal brought with him a different vision of the Authority's relationship with the Valley's private utilities. Arthur Morgan believed that the TVA should work with private electric companies whenever possible and that the utilities should be given the opportunity to demonstrate that they could provide electricity at rates that were affordable to local residents. In contrast, Lilienthal, like Pinchot and many conservationists in the public power tradition, had no faith in private utilities and wanted the government to generate and distribute electricity to consumers and businesses.⁷² Lilienthal often attacked private electric companies in his speeches to great effect, decrying their corruption and mismanagement, while arguing that their corporate interests were "diametrically opposed" to those of their customers.⁷³ Initially, then, Lilienthal saw little benefit to cooperating with the Valley's existing power companies.⁷⁴

⁷¹ McCraw, *Morgan vs. Lilienthal*, 18-23; and Hargrove, *Prisoners of Myth*, 28-30. By 1931, the utilities issue began to consume most of Lilienthal's attention; see David E. Lilienthal, "December 2, 1931," in *The Journals of David E. Lilienthal, Volume I: The TVA Years, 1939-1945, Including a Selection of Journal Entries from the 1917-1939 Period* (New York: Harper & Row, 1964), 20-2.

⁷² Hargrove, *Prisoners of Myth*, 38-41. To Lilienthal, relying on the beneficence of utilities constituted an act of negligence; the very idea was based on "a premise contrary to all past experience." As Lilienthal expressed in a memo to A. E. Morgan on the subject of cooperation, "The authority would violate its public duty if it based its whole program upon the desire of the utilities to cooperate in a program which is directly contrary to their economic interests." Both quotes from Hargrove, *Prisoners of Myth*, 40.

⁷³ Quoted in Hargrove, *Prisoners of Myth*, 46; as Lilienthal put it, "Either TVA has to be for you or it has to be for this other crowd." For another example of a Lilienthal speech that criticized private utilities, see David E. Lilienthal and TVA, "Address of David E. Lilienthal, Director and General Counsel of the Tennessee Valley Authority, Before the League of Women Voters, Boston, Massachusetts, Evening of April 24, 1934," UTK: Hodges, TVA Pamphlet Collection 1934-1960 [hereafter: TVA PC], Box 4, Folder 8. Also see Lilienthal, "November 9, 1931," in *The Journals of David E. Lilienthal, Volume I*, 19-20; Lilienthal, "December 13, 1931," in *The Journals of David E.*

Furthermore, Lilienthal openly detested Arthur Morgan's commitment to regional planning, charging his colleague with paternalism.⁷⁵ Instead, Lilienthal believed "deeply in giving people freedom to make their own choice."⁷⁶ Rather than centralized planning, he felt that the TVA should ensure that the people of the Tennessee Valley had access to the tools necessary to better their own lives. Electricity was one of these tools.⁷⁷ Reflecting the differences between public power and regional planning, the feud between Lilienthal and Arthur Morgan shaped the TVA in the 1930s.⁷⁸

Lilienthal, Volume I, 22-3; and Lilienthal, "January 24, 1932," in The Journals of David E. Lilienthal, Volume I, 24-7.

⁷⁴ McCraw, *Morgan vs. Lilienthal*, 24-40; and Hargrove, *Prisoners of Myth*, 28-30 and 35-6. Lilienthal joined the TVA knowing that Wendell Willkie and the Commonwealth & Southern Corporation would be his main adversaries, Lilienthal, "June 3, 1933," in *The Journals of David E. Lilienthal, Volume I, 32-6.*

⁷⁵ In a 1936 speech to TVA employees, Lilienthal made his disdain for Morgan's vision explicit: "I suppose it is clear that I have no confidence in progress that comes from plans concocted by supermen and imposed upon the rest of the community for its own good." Quoted in McCraw, *Morgan vs. Lilienthal*, 63-4; and Hargrove, *Prisoners of Myth*, 36. Hargrove quotes a second criticism of planning by Lilienthal, "So far as I know there is no instance in the experience of town and regional planners in which the economic and social policy of the region could be directly influenced [by a plan]..." see Hargrove, *Prisoners of Myth*, 39. In part, Lilienthal likely settled on a charge of paternalism for political reasons. Given the history of animosity among white southerners to outsiders dictating economic and political change in the era of Reconstruction, painting Arthur Morgan as a carpetbagger probably seemed like an effective strategy for undercutting support for his fellow board member. It certainly helped that Morgan was known for his moralizing personality. The irony, of course, is that the power program that Lilienthal helped create was no more open to democratic participation than Morgan's vision of planning. Perhaps the biggest difference, as Chapter Three discusses, was the fact that local elites and civic boosters adopted Lilienthal's vision of an all-electric valley.

⁷⁶ Quoted in McCraw, *Morgan vs. Lilienthal*, 63-4; and Hargrove, *Prisoners of Myth*, 36.

⁷⁷ Hargrove, *Prisoners of Myth*, 35-6; Hargrove notes an Alabama newspaperman told him that Lilienthal referred to electricity as being among the "tools of opportunity."

⁷⁸ It seemed at times to Lilienthal and Harcourt Morgan that Arthur Morgan believed he alone controlled the TVA. The first disagreement between the board members came to a head in July 1933. Harcourt Morgan proposed that the three directors divide their responsibilities based on their own areas of expertise. Although the division of power within the board of directors solved the immediate crisis, both Lilienthal and H. A. Morgan understood that it did not address the long term problem facing the TVA, namely the fact that A. E. Morgan viewed the TVA as an experiment in centralized social planning while Lilienthal and H. A. Morgan focused more on the benefits that access to technology and advances in agricultural science could provide for the communities in the Valley. Splitting the Authority's functions among the three board members repeatedly brought their competing visions for the agency into conflict with one another over the next four years. McCraw, *Morgan vs. Lilienthal*, 31-2; and Hargrove, *Prisoners of Myth*, 36-41.

Echoes of Giant Power: Lilienthal's Vision for the TVA and its Power Program

By the time he started working at the TVA, Lilienthal had embraced the public power movement's understanding of electricity as an integral component of modern life. In particular, Lilienthal believed that electric power differed from other commodities and that its production and distribution were suffused with a public purpose. Lilienthal's conceptualization of electricity as a public good formed the foundation of his vision for the TVA's power program. As he noted in a speech before the Boston, Massachusetts chapter of the League of Women Voters in 1934:

The starting point in any discussion of this [the TVA's] power policy and program must be this: that the distribution of electricity is not like the ordinary private business. By its very nature, the generation and distribution of power, whether by private or public agencies, is a public business, for in our present-day community life we are all utterly dependent on that service.⁷⁹

Lilienthal's belief that electric power had become a "necessity of community life" reflected a shift in the narrative of electricity that had taken place in the 1920s when public power advocates began to discuss it not as a curiosity but as an integral source of energy that could help raise the standard of living for individuals, households, communities, and even entire regions.⁸⁰ Similarly, Lilienthal framed his discussion of electric power's status as a public good around its usefulness in the home and its value to industries.

Regarding the domestic sphere, Lilienthal emphasized the connection between cheap kilowatts and the benefits of appliances, specifically efficiency and cleanliness. As other advocates of public power argued, vacuum cleaners, electric irons, washing machines, electric ranges, and refrigerators were all thought to lighten the workload that many housewives faced. For those living in rural areas, the electric water pump removed the burden associated with both

⁷⁹ Lilienthal, "Address Before League of Women Voters," 1, UTK: Hodges, TVA PC, Box 4, Folder 8.

⁸⁰ Lilienthal, "Address Before League of Women Voters," 3, UTK: Hodges, TVA PC, Box 4, Folder 8.

drawing and carrying water from wells by hand. Electric lighting was both safer and cleaner than candles, gas, or kerosene, reducing the likelihood of fire while eliminating the need to wash soot from walls and curtains.⁸¹ Furthermore, inexpensive electricity made owning appliances more affordable to the average household.⁸² To the extent that devices like electric irons came to symbolize the elimination of in-home labor and the reduction of certain health hazards, mass-access to affordable electricity represented a path to increased standards of living.

Lilienthal also embraced inexpensive electric power as a driver of industrial growth. In a speech at the University of Chattanooga (now the University of Tennessee at Chattanooga), Lilienthal boasted that access to cheap kilowatts alone would draw factories to the Valley, claiming that “[i]t is inevitable that industry will turn to this region as the Tennessee River yields to this program for the development of low-cost power.”⁸³ In the same speech, Lilienthal listed the “almost unlimited quantities” of affordable electricity as the first factor influencing the expansion of manufacturing in the TVA’s service area.⁸⁴ Finally, he argued that robust consumer demand for items like refrigerators and ranges had led to an increase in the number of

⁸¹ For an example of public power narrative, see Gifford Pinchot, “Governor Pinchot’s Message of Transmittal,” in *Report of the Giant Power Survey Board to the General Assembly of the Commonwealth of Pennsylvania*, eds. Morris Llewellyn Cooke and Judson C. Dickson (Harrisburg: The Telegraph Printing Co., 1925), v. Despite the fact that it made certain tasks significantly easier and reduced soot and smoke in the home, scholars have found that electricity did not reduce the burden of housework. Nye, *Electrifying America*, 238-86; and Cowan, *More Work for Mother*, 100.

⁸² Lilienthal, “Address Before League of Women Voters,” 4-5, UTK: Hodges, TVA PC, Box 4, Folder 8. Lilienthal argued that cheap electricity also influenced appliance manufacturers and retailers to lower their prices by convincing them that a healthy market existed for their products. According to Lilienthal, appliance manufacturers resisted mass production in the 1920s, believing that the cost of electricity made their products prohibitively expensive for in-home use. The proliferation of cheap power, however, promised to broaden the consumer base for items like refrigerators, vacuums, and electric irons. As a result manufacturers began to mass produce appliances, further reducing the cost of ownership to individual households.

⁸³ David E. Lilienthal and TVA, “Address of David E. Lilienthal Before the Tennessee Valley Institute of the University of Chattanooga, Tennessee, 8:00 P.M., April 21, 1934,” 5, UTK: Hodges, TVA PC, Box 3, Folder 5.

⁸⁴ Lilienthal, “Address Before the Tennessee Valley Institute,” 1, UTK: Hodges, TVA PC, Box 3, Folder 5; another quote that demonstrates the point can be found on page 2: “I turn first to the reason which I have suggested as insuring a period of great industrial expansion for the South—the availability of cheap electric power.”

businesses producing and selling appliances in the Valley.⁸⁵ Much like the advocates of Giant Power before him, Lilienthal regarded electricity as a tool for stimulating the region's economy.

Lilienthal envisioned electric power as the cornerstone of an industrial renaissance for the Tennessee Valley that would help the Authority's service area take full advantage of its natural resources. He recognized that the electro-chemical and light metal industries required access to an abundant supply of inexpensive power to operate profitably, and he understood that these same industries could utilize the rich mineral reserves of the Tennessee Valley Region.

According to Lilienthal, the growth of industries that were "especially adapted to the resources of the Valley" served the public good by encouraging the development of lucrative mineral deposits that the region held in abundance.⁸⁶ Scholars who had studied the South's lagging, agriculturally-based economy hoped that industrialization would be the panacea that helped the region catch up to the rest of the nation. These critics argued that the South's continued reliance on agriculture had hampered its growth and led to ecological ruin.⁸⁷ In 1929, the average yearly income in the Tennessee Valley Region was only forty-four percent of the national average.

Meanwhile, the area had begun to hemorrhage young adults in the years preceding the Depression as many men fled the eroding hillsides and worn out land in search of work in cities like Chicago and Detroit.⁸⁸ [Fig. 1.3] Inexpensive power was part and parcel of a larger vision

⁸⁵ David E. Lilienthal and TVA, "The Widening of Economic Opportunity Through TVA" (pamphlet adapted from Lilienthal's speech at Columbia University in January, 1940), 11-12, UTK: Hodges, TVA PC, Box 1, Folder 1.

⁸⁶ Lilienthal, "Address Before the Tennessee Valley Institute," 4-7, UTK: Hodges, TVA PC, Box 3, Folder 5.

⁸⁷ Scholars who voiced the most consistent critiques included Howard Odum and Rupert Vance. Meanwhile the Tennessee Valley was seventy-eight percent rural compared to a national average of forty-four percent, and its per capita income at the beginning of the 1930s was lower than any single state other than South Carolina. It is worth noting that Odum and Vance were opposed by a group known as the Agrarians headed by Donald Davidson and Robert Penn Warren at Vanderbilt University. Odum and Vance were dismissive of the Agrarians, whom they considered to be escapists; see Phillips, *This Land, This Nation*, 84-8. Davidson's two volume history of the Tennessee River reflects his wariness of industrialization and its presumed effect on the Valley; see Davidson, *The Tennessee Volume I*; and Donald Davidson, *The Tennessee Volume II: The New River, Civil War to TVA* (New York: Rinehart & Co., Inc., 1948).

⁸⁸ TVA Budget Staff, "Progress in the Tennessee Valley, 1933-1952," May, 1952, 1, UTK: Hodges, TVA Reports, 1933-1973, Box 4, Folder NA; Daniel Schaffer, "Benchmark Report on Environmental Quality: A Historical

for industrial expansion, one that promised to boost the Valley's overall economy and raise local standards of living while improving the Tennessee Valley's natural resources both by taking advantage of underutilized mineral deposits and by reducing the damage caused by agricultural practices.⁸⁹

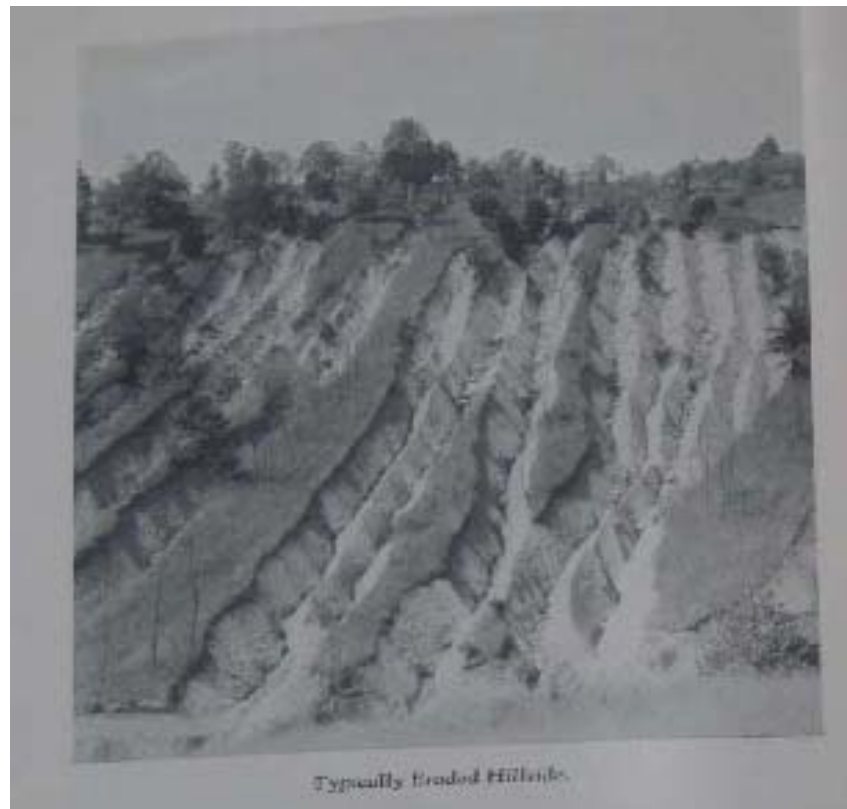


Figure 1.3: Eroded Hillside – A photograph of erosion caused by excessive cultivation in the Tennessee Valley prior to the arrival of the TVA. Source: TVA, “The Development of the Tennessee Valley,” pamphlet, 1936, 6, UTK: Hodges, TVA PC, Box 1, Folder 1.

Perspective,” TVA Cultural Resources Program (February, 1983), 19-21, UTK: Hodges, EERC, Box 3, Folder 4; and Clapp, *An Approach to the Development of a Region*, 53. In his journal, Lilienthal also wrote of his hope that the TVA could achieve “economic rehabilitation in the South;” see Lilienthal, “April 5, 1939,” in *The Journals of David E. Lilienthal, Volume I*, 104.

⁸⁹ The TVA's annual reports during the late 1930s highlighted the economic advantages that electrification provided to farmers. Electricity allowed farmers to freeze their produce, especially strawberries, opening new markets to southern agriculture. Furthermore, electricity allowed dairy farms to chill their milk more easily while powering new equipment that eliminated the need to milk by hand. These advances made dairying more profitable. Together, the changes encouraged a shift away from row cropping, something that agricultural scientists hoped would reduce erosion and prevent the further leaching of nutrients from already tiring soils; see TVA, *Annual Report, 1939*, 82-3; and TVA, *Annual Report, 1937* (Washington, D.C.: Government Printing Office, 1937), 18 and 44.

With his rhetoric, then, Lilienthal located his vision for the Authority and its electric program within the public-private power fights of the 1920s.⁹⁰ In particular, his emphasis on the public nature of the electric power business as well as the centrality of electricity to daily life and its role in raising standards of living in the United States captured the public power movement's insistence on the importance of government involvement in the utility industry. In his references to electricity as the "country's greatest resource," and in his assessment of the Authority's power program as "an integral part of a larger policy for the economic development of the United States," Lilienthal further demonstrated the parallels between his understanding of electricity's role in American society and that of other conservationists in the public power tradition.⁹¹

In Lilienthal's opinion, there remained two obstacles to the widespread dissemination of electric power and its treatment as a public good in the early 1930s. First, unnecessarily high rates made the use of electricity uneconomical, especially for residential customers. Second, many residential customers who did have access to the power grid could not afford many, if any, of the appliances that used electricity for their homes. What was needed was a public agency that could demonstrate the fallacy of the private utilities' position on rates while simultaneously educating consumers about the benefits of electric power.⁹²

⁹⁰ Lilienthal's dual emphasis on residential use and industrial growth underscored his conviction that electricity was a public good, a belief that he shared with Gifford Pinchot, Morris Cooke, and a host of conservationists in the public power tradition. By the 1930s, many intellectuals considered electrification to be a moral crusade, with one claiming that "electricity can give us universally high standards of living, new amusing kinds of jobs, leisure, freedom, and end to drudgery, congestion, noise, smoke and filth." Lilienthal himself once said that, "Electricity happens to coincide more than almost any other service with a change in the standard of living." First quote taken from Schaffer, "Benchmark Report on Environmental Quality," 27, UTK: Hodges, EERC, Box 3, Folder 4. A reference to electricity's equivalence to a moral crusade can be found in S. David Freeman, "The Nine Lives of TVA," *Environment* 27, vol. 3 (April, 1985), 9, a copy of which can be found in UTK Hodges, EERC, Box 6, Folder 23. Second quote taken from Richard A. Couto, "New Seeds at the Grass Roots: The Politics of the TVA Power Program Since World War II" (paper presented at the Conference on the Tennessee Valley Authority: An Experiment in American Government, Vanderbilt Institute for Public Policy Studies, December 3-5, 1981), 15, found in UTK: Hodges, EERC, Box 5, Folder 22.

⁹¹ Lilienthal, "Address Before League of Women Voters," 1, UTK: Hodges, TVA PC, Box 4, Folder 8.

⁹² As Lilienthal put it, "The first duty of the Tennessee Valley Authority in its power program is to set up what the President has called a 'yardstick' by which to measure the fairness of electric rates." Quoted in Lilienthal, "Address

The Authority's early operations in Tupelo, Mississippi, epitomized Lilienthal's vision for the power program. After agreeing to a contract, the TVA began supplying electricity to the city on February 7, 1934. For the citizens and businesses of Tupelo, the arrival of the Authority meant a drastic reduction in the cost of power. Residential rates fell from more than seven cents per kilowatt-hour on average to approximately two cents per kilowatt-hour. Individual industries obtained similar benefits. For example, Reed Brothers, Inc., a clothing manufacturer, saw its rate decrease to 1.4 cents per kilowatt-hour from 3.2 cents per kilowatt-hour. Almost immediately, the TVA noted a corresponding increase in the amount of electricity consumed by the community's residents and businesses. Prior to 1934, the average home in Tupelo used 49 kilowatt-hours of electricity per month, but by 1935, residents used 112 kilowatt-hours per month. Local industries increased their consumption of electricity as well. In fact, the Authority's rate reductions were so steep that its customers in Tupelo saw their overall power bills drop despite the fact that they used more electricity.⁹³

Lilienthal also worked to eliminate the other barriers that existed to residential consumption, specifically the price of appliances and public knowledge about the benefits of electricity, persuading President Roosevelt to establish a sister agency, the Electric Home and Farm Authority (EHFA), to help homeowners finance the purchase of appliances both by

Before League of Women Voters," 3, also see 4-5, UTK: Hodges, TVA PC, Box 4, Folder 8. The "yardstick" concept caught on with TVA employees. President Roosevelt also embraced it, and claimed to have invented it. Also see Phillips, *This Land, This Nation*, 61-2; McCraw, *Morgan vs. Lilienthal*, 3 and 42; and Lilienthal, *Democracy on the March*, 24-5.

⁹³ Average residential rate calculated using data from TVA, *Annual Report, 1935* (Washington, D.C.: Government Printing Office, 1936), 33; the average home in Tupelo used forty-nine kilowatt-hours of electricity per month at a cost of \$3.60. Less than two years after the TVA took over, however, residents used 112 kilowatt-hours per month but paid only \$2.30 for the service. Industrial use is discussed in Lilienthal, "Address Before the Tennessee Valley Institute," 3-5, UTK: Hodges, TVA PC, Box 3, Folder 5; Reed Brothers consumed 10,210 kilowatt-hours per in March, 1934 as compared with 6,580 kilowatt-hours in January, 1934, prior to receiving service from the Authority, an increase of fifty-five percent, while its bill dropped from \$210.25 to \$145.38. Lilienthal also pointed to textile manufacturers like the Tupelo Cotton Mill, a local firm that consumed twenty-six percent more electricity than it had in the month prior to the TVA beginning service in Tupelo while enjoying a forty percent reduction in its power bill during the same period.

offering credit at reasonable rates and by convincing manufacturers to lower their prices.⁹⁴

Finally, Lilienthal embraced the need to educate potential consumers on the benefits of electricity. Working with the EHFA and state and local home economics boards, he supported demonstration programs in rural communities and cities in the TVA's service area.⁹⁵

In conjunction with his emphasis on low rates, Lilienthal made expansion of electrical supply a hallmark of his power policy. Lilienthal connected the Authority's power program to a national policy rooted in the public power movement's commitment to mass consumption. As he put it, "The power program of Congress and the President has as its major objective a constantly wider use of electricity. The fundamental problem of the Tennessee Valley Authority...is to devise economic ways and means to make electricity generally available, of promoting the widest possible use of electricity in the home, on the farm and in the factory."⁹⁶ In part, expansion meant stimulating increased consumption among those who already had access to electric power by reducing rates. Expansion also involved building new transmission networks and a commitment to providing electricity to rural communities for the first time. Much like the city of Tupelo, the Alcorn County (MS) Electric Cooperative symbolized Lilienthal's power policy. The county included the town of Corinth, but it was predominantly rural. After five years of TVA service, rates in Alcorn County had fallen from 5.37 cents per kilowatt-hour to 1.73 cents while consumption had increased by 200 percent per household.

⁹⁴ The EHFA also regulated the design of appliances, insuring that they met certain standards. Lilienthal, "Address Before League of Women Voters," 4-5, UTK: Hodges, TVA PC, Box 4, Folder 8; Arthur E. Morgan, Harcourt A. Morgan, and David E. Lilienthal, "Text of Address Delivered by Directors of the Tennessee Valley Authority over NBC Stations on May 21, 1934," 10-1, UTK: Hodges, TVA PC, Box 1, Folder 1; Lilienthal, "The Widening of Economic Opportunity," 10-4, UTK: Hodges, TVA PC, Box 1, Folder 1; and McCraw, *Morgan vs. Lilienthal*, 44. Lilienthal also discussed his role in creating the EHFA as a source of easy credit for appliances in David E. Lilienthal, "February 25, 1939," in *The Journals of David E. Lilienthal, Volume I*, 88.

⁹⁵ Lilienthal, "Address Before League of Women Voters," 4-5, UTK: Hodges, TVA PC, Box 4, Folder 8; and A. E. Morgan, H. A. Morgan, and Lilienthal, "Address Delivered by Directors over NBC," 10-1, UTK: Hodges, TVA PC, Box 1, Folder 1.

⁹⁶ Lilienthal, "Address Before League of Women Voters," 4, UTK: Hodges, TVA PC, Box 4, Folder 8.

More importantly, the number of customers had nearly doubled. As a result, Alcorn County became a model for successful rural electrification in the 1930s and beyond.⁹⁷

Lilienthal wanted the public municipal distributors and rural cooperatives to sell TVA electricity to every corner of the Tennessee Valley and to force out private suppliers.⁹⁸ Already in 1933, this stance brought him into conflict with Arthur Morgan, who did not wish to antagonize private utilities with whom he hoped to cooperate on future rate reductions. After a meeting with President Roosevelt, Morgan and Lilienthal reached a tentative compromise whereby the TVA agreed to develop “definite regions” surrounding Muscle Shoals and Norris Dam (TN) as well as the areas that lay along a proposed transmission line between the Shoals and Norris.⁹⁹ Nevertheless, the territorial issue remained divisive. In October, 1935, the board rescinded its initial power policy, and on August 4, 1936, Lilienthal and H. A. Morgan approved a resolution by a two to one margin over A. E. Morgan, rejecting any future restrictions on the TVA’s service area.¹⁰⁰ Geographic expansion remained an important feature of Lilienthal’s plan for the Authority’s power program, reflecting his desire to undermine private utilities in the Tennessee Valley Region.¹⁰¹

⁹⁷ Statistics on the Alcorn County Electric Cooperative can be found in TVA, *Annual Report, 1939*, 73-6; overall, the number of customers increased by eighty-one percent between 1934 and 1939 from 1,180 to 2,133. The ACEC paid off its entire debt in only five years further demonstrating the viability of providing cheap electricity in rural areas. Also see Lilienthal, *Democracy on the March*, 20; Lilienthal, “November 17, 1934,” in *The Journals of David E. Lilienthal, Volume I*, 43 (and note); and Lilienthal, “May 24, 1939,” in *The Journals of David E. Lilienthal, Volume I*, 108-9.

⁹⁸ Lilienthal viewed every attempt by the Commonwealth & Southern Corporation and its president, Wendell Willkie, to demarcate the future boundaries of the TVA’s service area as a threat to the ideal of public power. Lilienthal, “March 15, 1939,” in *The Journals of David E. Lilienthal, Volume I*, 97; by 1939 President Roosevelt supported Lilienthal’s position. Also see McCraw, *TVA and the Power Fight*, 56-9. Willkie’s battles against the TVA made him something of a hero for anti-New Deal conservatives, and he was the Republican nominee for president in 1940.

⁹⁹ For a discussion and quoted sections from the power policy, see McCraw, *TVA and the Power Fight*, 56-9.

¹⁰⁰ No Author, “2nd Draft: Power Policy of the TVA,” 90a-90e, NARA-SE, RG 142, PMF, Box 136. Ultimately, the board rescinded the August 4 resolution as well, unanimously settling on a weak statement claiming that the TVA could not agree to a territorial limitation given the present circumstances.

¹⁰¹ For example, see Lilienthal, “March 15, 1939,” in *The Journals of David E. Lilienthal, Volume I*, 97.

Public power represented a way for consumers to take back control over the production and distribution of electricity.¹⁰² Lilienthal's commitment to reducing rates, promoting consumption, and extending transmission lines into rural areas underscored his conviction that the availability and use of electric power contributed to the general welfare. He connected human resource development with natural resource development, contending that the latter improved the relationship between individuals and the environment. Lilienthal's emphasis on expanding the TVA's power program and the narrative that he created about electricity reflected his belief that widespread access to affordable electric power had become a necessity in the twentieth century. Tellingly, Lilienthal neglected the subject of regional planning and the potential connection between it and electric power. While he believed that the government should produce and distribute electricity, he was equally adamant that individual consumers and local communities determine its use.

A Countervailing Vision: Arthur Morgan and Planning

Arthur Morgan had quite different opinions about the power program and its role within the Authority. In Morgan's vision, electricity was to be one component in a much larger policy focused on centralized community planning. Rather than expand the geographic scope of the agency's power program indefinitely, he preferred a more limited approach that focused on

¹⁰² The image of the TVA's power program as a decentralized operation controlled at the grassroots by communities became an important trope in Lilienthal's narrative. For examples, see David E. Lilienthal, "The TVA: A Step Toward Decentralization, an Address Before the University of California, Berkeley, Calif., November 29, 1940," UTK: Hodges, TVA PC, Box 1, Folder 2; David E. Lilienthal, "The TVA: An Experiment in the 'Grass Roots' Administration of Federal Functions, an Address Before the Southern Political Science Association, November 10, 1939, at Knoxville, Tennessee," UTK: Hodges, TVA PC, Box 1, Folder 2; Hargrove, *Prisoners of Myth*, 7 and 42-64; and Lilienthal, *Democracy on the March*. Critics have demonstrated that the Authority retained the lion's share of control over the generation and distribution of electricity and that Lilienthal defined the grassroots narrowly as local elites, namely successful businessmen and large landowners; nevertheless, the decentralized-grassroots ideal became a central component of the TVA narrative; see Selznick, *TVA and the Grass Roots*; Hobday, *Sparks at the Grassroots*; Chandler, *The Myth of TVA*; and Hargrove, *Prisoners of Myth*, 52-3, Hargrove suggests that Harcourt Morgan also defined the "grassroots" as local elites. For a detailed analysis of the operation of the TVA's power program at the local level, see Chapter Three, Chapter Four, and Chapter Six.

demonstrating the benefits of cheap kilowatts in individual planned towns. Nowhere were Morgan's ideas more evident than in the town of Norris, Tennessee.

In October, 1933, the Authority began building Norris Dam on the Clinch River approximately twenty-five miles northwest of Knoxville, Tennessee. In what became a common practice, the TVA also built housing for its workers near the construction site. Arthur Morgan intended the town of Norris to serve as a model for future communities, an example of the benefits that could accrue from detailed town planning. At his direction, the TVA developed a blueprint for Norris that followed the English garden city model. It included a greenbelt that protected the town from encroachment and provided ample open space for outdoor recreation, while the Norris' streets wound in and out of the trees following the local topography. The proposal initially called for the construction of 250 individual residential units with a possibility for future growth. The Authority also built and staffed a school that offered courses for workers at the dam site, and it designed a town center replete with a shops, a community building that housed a post office, a gymnasium, an auditorium, a library, space for small industries, and a farmers market.¹⁰³

Electric power played a significant role in the design of Norris. All of the homes that were to be built in the town were wired for electricity, and many of them exclusively used electric power to meet their energy needs. Electric ranges, refrigerators and water heaters became standard amenities. The TVA's planners viewed the decision to build all-electric houses

¹⁰³ Michael J. McDonald and John Muldowny, *TVA and the Dispossessed: The Resettlement of Population in the Norris Dam Area* (Knoxville: University of Tennessee Press, 1982), 217-35; and Walter L. Creese, *TVA's Public Planning: The Vision, the Reality* (Knoxville: The University of Tennessee Press, 1990), 240-63. Unfortunately, the planners' vision of Norris as a haven for industry and agriculture never materialized.

as a way to publicize the benefits of electricity as an energy source. In fact, Norris received praise for its all-electric houses in the 1930s, becoming known as the first all-electric town.¹⁰⁴

Norris exemplified Arthur Morgan's vision for the TVA and the Tennessee Valley. He believed that the planned village could serve as a model for future development and that it could improve the lives of its residents both by encouraging the growth of local industries to balance the agricultural economy and by fostering a sense of community. Access to electricity was an important part of A. E.'s vision, but his commitment to holistic planning set him apart from his colleagues on the TVA board. Morgan's planning-centric approach with its emphasis on establishing individual communities as models for the region and the nation had little need of a robust power program because A. E. continued to believe that private utilities would cooperate with the Authority to reduce rates throughout the Valley. In Morgan's vision, the success of towns like Norris would convince private power companies to adopt the TVA's rate structure; there was no need to expand the Authority's power program beyond a few select locations.

The Triumph of Lilienthal and Public Power

The conflict between Lilienthal and Arthur Morgan climaxed between 1935 and 1938. President Roosevelt had appointed the three directors to staggered nine-year terms as stipulated in the original TVA Act, and in 1936, Lilienthal's tenure was set to expire. In the fall of 1935, Arthur Morgan met privately with Roosevelt and asked the president to replace Lilienthal the following spring. Over the following months, Morgan also tried to build support for Lilienthal's ouster among the president's confidants, eventually declaring that he would resign if Lilienthal

¹⁰⁴ McDonald and Muldowny, *TVA and the Dispossessed*, 223-4; and Creese, *TVA's Public Planning*, 240-63. Also see TVA, *Annual Report, 1958* (Washington, D.C.: Government Printing Office, 1958), 57-8; in the late 1950s, the TVA cited Norris as a community in which electric space heating had proven to be a cost-effective substitute for coal furnaces and wood stoves.

received a second term. Nevertheless, with an approaching election and an impending battle with the Commonwealth & Southern Corporation looming, Roosevelt preferred to retain both men rather than make a decision that might signal weakness within the TVA, reappointing Lilienthal to a second term.¹⁰⁵

The Authority's increasingly fractious relationship with the region's utilities brought the conflict between Arthur Morgan and Lilienthal to a head. The TVA's original territorial agreement with the Commonwealth & Southern Corporation was set to expire with the completion of Norris Dam in the late fall of 1936, leaving open to the Authority the possibility of expanding its service area. Both Lilienthal and Harcourt Morgan opposed any future restrictions on the geographic scope of the TVA's power program. Meanwhile, Arthur Morgan demurred at making an attack on private utilities as he still preferred a cooperative approach to developing the electrical potential of the region.¹⁰⁶

The fact that Wendell Willkie and the existing electric companies in the Tennessee Valley continued to press litigation against the TVA only exacerbated the rift between the directors.¹⁰⁷ In May, 1936, nineteen private power companies filed a lawsuit claiming that the entire TVA power program was unconstitutional. The case, which became known as *Tennessee*

¹⁰⁵ McCraw, *Morgan vs. Lilienthal*, 52-7; on page 56, McCraw quotes Roosevelt in a meeting with Lilienthal as saying, "We just can't have either thing happen. If either thing happens, it will be disrupting to the future of these Authorities. If I don't reappoint you, it will be heralded all over the country as a power company victory... [but if A. E. Morgan should quit] it will be very bad for the project and for the whole idea of planning." As the preceding quote demonstrates, Roosevelt himself had difficulty choosing one vision for the TVA over the other. The quote can also be found in Lilienthal, "May 12, 1936," in *The Journals of David E. Lilienthal, Volume I*, 61-2. Lilienthal also claimed in his journal that A. E. Morgan tried to undermine Lilienthal's power program, see Lilienthal, "September 12, 1936," in *The Journals of David E. Lilienthal, Volume I*, 63-5.

¹⁰⁶ McCraw, *Morgan vs. Lilienthal*, 63-80; President Roosevelt merely wanted the issue solved in light of the approaching election. The original contract signed in 1934 had permitted the TVA to sell power at locations around Muscle Shoals and allowed the agency to purchase several of the Commonwealth & Southern's systems.

¹⁰⁷ Private utilities brought two major cases against the Authority during the 1930s. The first case, known as *Ashwander vs. TVA*, arose after Lilienthal signed the initial power contract with Commonwealth & Southern in 1934. In the *Ashwander* case, the shareholders of the Alabama Power Company objected to the fact that the contract permitted the TVA to distribute surplus electricity from Wilson Dam. Although the Supreme Court sided with the Authority in February 1936, a second group of utilities filed another lawsuit that became the TEPCO case in May.

Electric Power Company (TEPCO) vs. TVA, solidified the opposition among Lilienthal's supporters to cooperating with private utilities. They now believed that Willkie and his associates wanted to crush the TVA and public power rather than negotiate a new contract in good faith. On December 14, 1936, John J. Gore, a federal judge for the United States District Court of Eastern Tennessee, issued an injunction as part of the TEPCO case halting all future construction of power lines, preventing the TVA from expanding its service area indefinitely. In effect, Gore's ruling threatened to end Lilienthal's vision for the Authority's power program, and it destroyed any remaining possibility of compromise between Lilienthal, his allies, and the private utilities. The decision also began the final chapter in Arthur Morgan's tenure at the TVA. When A. E. continued to push for a negotiated settlement, it appeared to the advocates of public power as though he wished to undermine the agency's power program by siding with Wendell Willkie and the electric companies. At the same time, Roosevelt began to distance himself from Arthur Morgan, meeting less and less with the TVA chairman while drawing closer to Lilienthal.¹⁰⁸

Throughout 1937, Arthur Morgan criticized his colleagues on the TVA board in the press. The final straw came when he publicly accused Lilienthal and Harcourt Morgan of being complicit in a plot to defraud the government.¹⁰⁹ H. A. Morgan and Lilienthal immediately released a statement contradicting A. E.'s accusations, and on January 18, 1938, they sent a list

¹⁰⁸ McCraw, *Morgan vs. Lilienthal*, 80-9; and Hargrove, *Prisoners of Myth*, 44-9. In his Journal Lilienthal quotes Roosevelt, "You know, he[A. E. Morgan] doesn't know *anything* about power." [emphasis in original] see Lilienthal, "January 15, 1937," in *The Journals of David E. Lilienthal, Volume I*, 66. For a more detailed overview of the fight with Commonwealth & Southern and its subsidiaries, see McCraw, *TVA and the Power Fight*, 67-121.

¹⁰⁹ Many of Arthur Morgan's articles challenged Lilienthal and his goals for the Authority. Morgan titled one of his submissions to the *Saturday Evening Post*, "Yardstick—and what else?" a comment on the centrality of the power program to Lilienthal's vision. In other articles, A. E. referred to the "improprieties" of Lilienthal's power policies. Morgan's antics led to condemnation from his fellow board members, and from public power advocates like Morris Cooke, who personally called for A. E. to resign his post; see McCraw, *Morgan vs. Lilienthal*, 90-104.

of grievances to President Roosevelt regarding the chairman's behavior. On March 23, 1938, Roosevelt removed Arthur Morgan from his position on the Authority's board of directors.¹¹⁰

While Harcourt Morgan supplanted A. E. as chairman of the Authority, he continued to devote most of his attention to the TVA's agricultural programs, giving Lilienthal free rein on the power issue. When Lilienthal succeeded Harcourt in 1941, his vision for the power program had become the dominant one within the Authority.¹¹¹ Meanwhile, a three judge panel sitting on the United States District Court for Eastern Tennessee decided the TEPCO case in the TVA's favor in early 1938. The justices' ruling upheld the constitutionality of the Authority's power program, permitting the TVA to sell electricity to municipal distributors and rural cooperatives. The TEPCO decision also legalized the Authority's continued expansion of its service area. Although the private utilities appealed the case, the Supreme Court held that the electric companies lacked legal standing on January 30, 1939. When combined with the ouster of Arthur Morgan, the resolution of the TEPCO case legitimized Lilienthal's vision for the TVA, providing legal sanction for the future growth of the power program.¹¹²

Lilienthal's triumph occurred within the context of the New Deal's Keynesian turn. Apart from Arthur Morgan's personal failings, his influence at the Authority and with the president began to wane as the Roosevelt administration started to distance itself from Morgan's more robust concept of planning and embraced John Maynard Keynes' indirect approach to managing the economy. According to Keynes, creating a robust demand for goods and services represented the best way to ensure long-term economic growth. He argued that the

¹¹⁰ Hargrove, *Prisoners of Myth*, 47-9; McCraw, *Morgan vs. Lilienthal*, 90-104.

¹¹¹ Hargrove, *Prisoners of Myth*, 47-9.

¹¹² Hargrove, *Prisoners of Myth*, 46; Richard Lowitt, "The TVA, 1933-45," in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 42-3; and McCraw, *TVA and the Power Fight*, 108-21. For a more detailed look at the *Ashwander* and *TEPCO* cases, see George Haimbaugh, Jr., "The TVA Cases: A Quarter Century Later" *Indiana Law Journal* v. 41, n. 2 (1996), 197-227.

government's primary role was to manipulate monetary and fiscal policy to facilitate consumption.¹¹³ Lilienthal's preference for expanding the TVA's power program by enlarging the agency's service area, improving access to electricity in rural communities, and promoting the widespread use of power in homes and businesses by reducing rates suited the emerging Keynesian consensus.

Conclusion

In the first three decades of the twentieth century, the conservation movement did more than any other to frame the national debate about energy policy and the production and distribution of electricity. Conservationists favored natural resource development and the improvement of the nation's energy infrastructure via multipurpose projects that took full advantage of the potential provided by rivers and streams. The parallel rise of the public power ideal and the concept of regional planning buttressed the movement's newfound interest in improving standards of living throughout the United States. As an embodiment of the federal government's foray into conservation during the New Deal, then, the TVA Act packaged public

¹¹³ Scholarship on the New Deal emphasizes a shift between the policies of Roosevelt's first 100 days in office and the programs implemented later in his presidency. Alan Brinkley has referred to the early New Deal as having an "associational vision" that relied on voluntary cooperation (National Industrial Recovery Act). Legislation in the later New Deal deemphasized direct government involvement in industrial decision making. Policymakers focused on creating a regulatory state that could combat the negative effects of monopolies and better manage labor relations (National Labor Relations Act) and on achieving economic growth through policies that focused on increasing consumption (Social Security and the Fair Labor Standards Act). For a discussion of shifts within the New Deal, see Alan Brinkley, "The New Deal and the Idea of the State," in *The Rise and Fall of the New Deal Order, 1930-1980*, eds. Steve Fraser and Gary Gerstle (Princeton: Princeton University Press, 1989), 85-121; and Alan Brinkley, *The End of Reform: New Deal Liberalism in Recession and War* (New York: Knopf, 1995). National power policy underwent a similar shift during the 1930s, moving from associational policies that emphasized cooperation with private utilities to robust regulation through the Public Utilities Holding Company Act (1935). Although Philip Funigiello argues that the period ended without a national policy, he focuses narrowly on the fact that the federal government never adopted a centralized rate making function. Instead, his book demonstrates that in the years immediately preceding World War II the federal government committed itself to a philosophy of energy abundance, favoring widespread use and promotional rates. I would argue that this constitutes a consumption-centric approach to energy policy; see Funigiello, *Toward a National Power Policy*.

power with flood control, navigation, reforestation, agricultural reform, the decentralization of industry, and a vague mandate for regional planning.

In the fledgling agency, however, the fissures within the conservation movement surrounding the divergence between the principles of public power and regionalism became manifest. Arthur Morgan's commitment to centralized planning and his faith in the benevolence of the Commonwealth & Southern Corporation clashed with David Lilienthal's emphasis on public power and direct competition with private utilities. Had Morgan prevailed and Roosevelt declined to nominate Lilienthal for a second term on the Authority's board of directors, the agency's power program would have looked very different. Morgan envisioned a power policy for the TVA that was geographically limited in scope. The Authority would not have expanded its service area to include communities like Nashville that lay outside the Tennessee Valley proper. It likely would have curtailed expansion to towns and cities in the valley that already received electricity from private providers and may never have built the massive coal-fired power plants that came to define the agency after World War II. Although he believed in the importance inexpensive electricity, Morgan's willingness to cooperate with private providers would have meant higher costs for consumers. Throughout the 1930s, the region's remaining electric companies consistently lagged behind the TVA in rate reduction.¹¹⁴

Under Lilienthal's guidance, in contrast, the Authority's power program became an archetype for public power. Lilienthal's vision emphasized government control of the production and distribution of electricity for the purpose of promoting residential and industrial use. The public power movement had long equated increases in energy consumption with a rise in standards of living. In particular, advocates argued that electric power was an integral resource for modern life to which all Americans should have access. When compared to steam,

¹¹⁴ See Chapter Three of this dissertation.

electricity's flexibility made it adaptable to many household tasks while it could also be transmitted over great distances, eliminating a techno-geographic barrier that prevented communities located far from rivers or mines from taking advantage of the benefits of mechanical energy. The TVA's adoption of low rates, its promise of abundant supply, and its effort to ensure the availability of easy credit for electrical appliances created incentives for the use of large volumes of electric power while attracting electrochemical and electrometallurgical companies to the Tennessee Valley Region.

Improving the environment of its service area formed another central component of the Authority's new energy regime. The public power movement connected electricity with humanity's ability to exert its "control over the elements."¹¹⁵ Similarly, David Lilienthal envisioned inexpensive kilowatts as the means by which the people of the Tennessee Valley would finally be able to profit from their rich mineral reserves.¹¹⁶ The public power movement and its disciples linked energy consumption with environmental quality, equating the latter with improvements in resource development and the modern, electrified home while shaping the way that the TVA and its customers viewed electricity in the decades that followed World War II.

In this way, Lilienthal's victory resulted in the creation of an agency that was more conservative but that also had a greater influence over a much larger area. Although Morgan's version of planning represented a more radical intrusion into social and economic life, he never envisioned extending the TVA's role beyond individual communities like Norris. Conversely, Lilienthal and his disciples within the Authority presided over the creation of an expansive power program that touched every home and business in an 80,000 square mile region but did not otherwise intervene directly in private markets. The TVA provided the tools of progress; it

¹¹⁵ Pinchot, "Governor Pinchot's Message of Transmittal," iii.

¹¹⁶ Lilienthal, "Address Before the Tennessee Valley Institute," 4-7, UTK: Hodges, TVA PC, Box 3, Folder 5.

did not determine how local residents used those tools nor did it attempt to undermine local elites. Instead, the Authority's power program reinforced existing social hierarchies even as it made the advantages of electric living more attainable for all. Its attempts to produce ever larger quantities of inexpensive kilowatts also damaged the environment and tarnished the TVA's image as an agency committed to resource conservation. By the 1970s, critics derided the Authority as just another power company. The public power movement and its many contradictions defined the TVA's power program after 1938 and shaped the creation of the agency's consumption-centric energy regime. As Chapter Two demonstrates, the tenets of the Authority's regime became a critical support for the era of energy abundance that began after World War II.

Chapter 2

Building the Tools of Progress: The Technopolitics of Coal-Fired Expansion in the TVA's Dynamic Decade

*In this last half of the 20th century, America's responsibility as a leader in the quest for world peace and better living requires a new and bolder approach to the problem of energy supply. An ample power supply is so vital to national welfare and security that it is in the public interest that utilities, privately as well as publicly owned, should receive governmental assistance in meeting capital requirements. Applications of the best modern technology in power supply development will be accelerated by such a course. The result will be greater efficiency and economy in the use of natural resources for power production and higher productivity per unit of human labor.*¹

– Gordon R. Clapp, 1954

In February 1954, Gordon Clapp, who was then the chairman of the Tennessee Valley Authority, gave a six part lecture series on the TVA at the University of Chicago. Clapp was a career employee of the Authority, having started at the agency in 1933 in the personnel department before rising through the ranks to replace David Lilienthal as chairman of the board of directors in 1945. Clapp's lectures reflected the experiences of a man who had spent two decades working in the Tennessee Valley, and they variously covered the agency's role in regional development, the management of the Tennessee River, the TVA's agricultural program, and the agency's relationship with state and local governments. Clapp reserved the last two lectures for a discussion of electricity and the Authority's power program.²

¹ Gordon R. Clapp, "Too Little Electricity," (lecture 5 of 6 presented at the University of Chicago for the Charles R. Walgreen Foundation, Chicago, Illinois, February 24, 1954) 3-4, University of Tennessee at Knoxville, John C. Hodges Library, Special Collections, TVA Pamphlet Collection 1934-1960, Box 1, Folder 1.

² For Clapp's last two lectures see, Gordon R. Clapp, "Too Little Electricity," (lecture 5 of 6 presented at the University of Chicago for the Charles R. Walgreen Foundation, Chicago, Illinois, February 24, 1954) University of Tennessee at Knoxville, John C. Hodges Library, Special Collections [hereafter: UTK: Hodges], TVA Pamphlet Collection 1934-1960 [hereafter: TVA PC], Box 1, Folder 1; and Gordon R. Clapp, "National Power Policy," (lecture 6 of 6 presented at the University of Chicago for the Charles R. Walgreen Foundation, Chicago, Illinois, February 26, 1954) UTK: Hodges, TVA PC, Box 1, Folder 1.

According to Clapp, the prospect of an energy shortage, specifically a shortage of electricity, was one of the most important issues facing the United States in the 1950s. As he put it, “An ample supply of electrical energy at the lowest attainable cost is a basic force that stimulates the expansion of economic activity in a competitive enterprise society.”³ Additionally, he argued that “our very national security” required “a margin of power supply that can accommodate quickly the adjustments a modern and versatile national defense plan embodies.”⁴ Inadequate resources were not the problem; rather, Clapp contended that the United States suffered from a reluctance to grow its power capacity ahead of demand. Laying the blame squarely at the feet of the utility industry, Clapp accused private companies of holding on to “[a] traditional attitude of waiting for demand to precede new supply,” snidely remarking that they had “regularly interpreted too little power as quite enough and ‘too late’ as in good time.”⁵

The TVA, on the other hand, represented the way forward. Clapp noted that the Authority’s leadership had continually advocated for the development of the nation’s electrical resources. Furthermore, he claimed that the agency’s policy of lowering rates and increasing its generating capacity had caused a boom in the residential consumption of electricity as well as a rapid expansion of the Tennessee Valley Region’s economy.⁶ At a time when the Eisenhower administration and Republicans in Congress questioned whether the TVA had outlived its usefulness to the nation, Clapp mounted a vigorous defense of the Authority and its role as a

³ Clapp, “Too Little Electricity,” 3, UTK: Hodges, TVA PC, Box 1, Folder 1.

⁴ Clapp, “Too Little Electricity,” 3, UTK: Hodges, TVA PC, Box 1, Folder 1.

⁵ Clapp, “Too Little Electricity,” 3, UTK: Hodges, TVA PC, Box 1, Folder 1. On page 8, Clapp names C. W. Kellogg, the president of the Edison Electric Institute (a national trade group for private utilities), as an individual who consistently underestimated the nation’s electricity needs. On page 7, he notes that the president of the National Electric Light Association admitted that private utilities were not doing all that they could to meet the demand for electricity.

⁶ Clapp, “Too Little Electricity,” 5, 7, and 14-5, UTK: Hodges, TVA PC, Box 1, Folder 1; and Clapp, “National Power Policy,” 3, 10, and 14-9, UTK: Hodges, TVA PC, Box 1, Folder 1.

provider of electric power, linking access to cheap energy and public power with national security, economic development, and raised standards of living.⁷

Clapp's conceptualization of electric power reflected his commitment to the tenets of the public power movement. Much like his predecessor, David Lilienthal, Clapp described electricity as "a basic necessity of community and national life" that was "not just another 'commercial product' to be placed on the commodity market at the highest price it will bring."⁸ As "the lifeblood of a modern economy," electric power was "especially suited to motivate mass production."⁹ Aside from its impact on the manufacturing sector, Clapp argued that access to inexpensive electricity "brought conveniences and higher standards of material well-being" into the home, listing a bevy appliances that had improved the quality of life in American households and suggesting that electric power had "taken its place with the church and school as an institution which people fight for—to establish, nourish, and expand."¹⁰ In Clapp's opinion, electricity had "become the prime mover in our dynamic economy," and it had "shaped and constantly improved the material circumstances of our lives."¹¹

At the same time, Clapp's discussion of electric power emphasized the important relationship that had developed between the Department of Defense and the TVA's power program during the 1940s and 1950s. He tied national security to the availability of electricity, noting that "many critical defense items are heavily dependent upon large quantities of low-cost

⁷ Erwin C. Hargrove, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1980*, second edition (Knoxville: University of Tennessee Press, 2001), 140-7; Clapp, "Too Little Electricity," UTK: Hodges, TVA PC, Box 1, Folder 1; and Clapp, "National Power Policy," UTK: Hodges, TVA PC, Box 1, Folder 1.

⁸ Both quotes from Clapp, "National Power Policy," 3, UTK: Hodges, TVA PC, Box 1, Folder 1.

⁹ The first quote, "the lifeblood..." is from Clapp, "National Power Policy," 18, UTK: Hodges, TVA PC, Box 1, Folder 1. The second, "especially suited..." is from Clapp, "Too Little Electricity," 5, UTK: Hodges, TVA PC, Box 1, Folder 1.

¹⁰ Clapp, "Too Little Electricity," 5-6 ("conveniences" on 5, "church and school" on 6), UTK: Hodges, TVA PC, Box 1, Folder 1.

¹¹ Both quotes from Clapp, "Too Little Electricity," 5, UTK: Hodges, TVA PC, Box 1, Folder 1.

power.”¹² In doing so, Clapp attempted to legitimize the TVA’s power program in the face of conservatives’ claims that the agency represented a socialist threat to free-enterprise that funneled federal tax dollars to a single region.¹³ Referring to vast quantities of inexpensive electricity as “imperative to ensure our national security,” Clapp argued that the Authority provided a service to the entire United States rather than the Tennessee Valley alone.¹⁴

Clapp’s call for more power occurred at a time of transition for the TVA. The Authority had steadily increased its generating capacity following World War II. Instead of building more dams, however, the agency’s leadership had turned to coal-fired steam plants to meet the power program’s energy needs. In fact, the fiscal year ending in the summer of 1954 was the first year in which the Authority produced most of its electricity from coal. Although the TVA explained

¹² In particular, Clapp mentioned that the projected demand for the Atomic Energy Commission in 1956 was fully one third as much as the entire United States economy had consumed per year prior to World War II while the aluminum industry, a critical supplier for the production of airplanes, currently devoured close to one fifth of the electricity that the entire nation had used two decades earlier. Clapp, “Too Little Electricity,” 6, UTK: Hodges, TVA PC, Box 1, Folder 1. On the same page Clapp also suggests that “[m]odern warfare requires unprecedented levels of output from virtually all sectors of the economy” and that “[i]n war electric power is a strategic key to larger output per unit of raw materials and human energy.” It became common for the TVA to tout its importance to the AEC, especially during the 1950s; see discussion below. Also see, O. S. Wessel, “What TVA Is,” (speech before the Independent Oxygen Manufacturers’ Association, Lookout Mountain Hotel, Chattanooga, Tennessee, June 22, 1953) 6, UTK: Hodges, TVA PC, Box 1, Folder 1; and Gordon R. Clapp, “Some Questions for the Critics of TVA,” (address before the Kiwanis Club, Memphis, Tennessee, September 30, 1953) 6-8, UTK: Hodges, TVA PC, Box 1, Folder 2. In fact, defense industries in the TVA’s service area steadily increased their demand during the 1950s, with the federal installations alone going from approximately 2.8 billion kilowatt-hours in fiscal year 1951 to a high of 31.7 billion kilowatt-hours in fiscal year 1957. The federal government purchased approximately half of the power that the Authority sold between the 1954 and 1959 fiscal years, and in fiscal year 1956, the federal government accounted for approximately 57 percent of all electricity purchased from the TVA. For year-by-year statistics see, TVA, *Annual Report, 1951* (Washington, D.C.: Government Printing Office, 1951), 11; TVA, *Annual Report, 1952* (Washington, D.C.: Government Printing Office, 1952), 24; TVA, *Annual Report, 1953* (Washington, D.C.: Government Printing Office, 1953), 3-4; TVA, *Annual Report, 1954* (Washington, D.C.: Government Printing Office, 1954), 3; TVA, *Annual Report, 1955* (Washington, D.C.: Government Printing Office, 1955), 2; TVA, *Annual Report, 1956* (Washington, D.C.: Government Printing Office, 1956), 3 and 26-7; TVA, *Annual Report, 1957* (Washington, D.C.: Government Printing Office, 1957), 1; TVA, *Annual Report, 1958* (Washington, D.C.: Government Printing Office, 1958), 3; and TVA, *Annual Report, 1959* (Washington, D.C.: Government Printing Office, 1959), 2 and 34.

¹³ John F. Callahan, “Utilities Fearful on Fight with TVA,” *New York Times*, June 6, 1948, F1-F2; Clayton Kirkpatrick, “TVA: A Nation’s 1st Big Venture into Socialism,” *Chicago Daily Tribune*, May 3, 1948, 4; John F. Callahan, “Utilities to Fight New TVA Project,” *New York Times*, March 28, 1948, F1-F2; and Robert C. Albright, “Steam Generators Cause Row: Private Power Firms Win First Round in TVA Battle,” *Washington Post*, April 24, 1948, 1-2.

¹⁴ Clapp, “Too Little Electricity,” 6, UTK: Hodges, TVA PC, Box 1, Folder 1.

its choice to pursue coal-fired power as a dispassionate engineering decision made out of necessity, the Authority's official narrative obscured the role of politics in the decision making process that resulted in the construction of ten massive power plants between 1949 and 1973.¹⁵

This chapter explains the TVA's decision to meet its energy needs by building the largest coal-fired steam-generating facilities in the world rather than purchasing additional electricity from surrounding private utilities, constructing more dams, or designing more modestly sized plants as a form of technopolitics that included the agency's commitment to the principles of the public power movement and its development of a kilowatts-for-defense narrative.¹⁶

Additionally, the Authority used the latest advances in generating technology to promote its image as an institution of progress. The technopolitical choices that the TVA's leadership made in the 1940s and 1950s shaped the agency's relationship with the natural resources of the Tennessee Valley Region and formed the foundation of a consumption-centric energy regime that defined the Authority's approach to producing and distributing electricity in the post-World War II period. Along with the military industrial complex's appetite for inexpensive kilowatts during the Cold War and the agency's institutional focus on utilizing technology to symbolize its positive role in development, the TVA's preferred policy of raising the standard of living in its

¹⁵ According to the Authority, growing demand in its service area required that the agency increase its generating capacity in the 1940s and 1950s. In addition, the TVA claimed that it had already developed the economically viable hydroelectric sites in the Tennessee River watershed. For examples of the TVA discussing its need to expand via steam rather than hydro see, TVA, *Annual Report 1951*, 5-6; and TVA, *The Kingston Steam Plant: A Report on the Planning, Design, Construction, Costs, and First Power Operations*, Technical Report No. 34 (Knoxville: TVA, 1965), 5. Also discussed in Hargrove, *Prisoners of Myth*, 123-8; and Wilmon H. Droze, "The TVA, 1945-80: The Power Company," in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 69-70.

¹⁶ My definition of technopolitics is taken from Gabrielle Hecht who uses the term to refer to "the strategic practice of designing or using technology to constitute, embody, or enact political goals." Gabrielle Hecht, *The Radiance of France: Nuclear Power and National Identity after World War II* (Cambridge: The MIT Press, 1998), 15; see pages 14-17 for more detail on the way in which Hecht defines and uses the term "technopolitics" in her book. For an extended discussion of the importance of Hecht's concept of technopolitics and technopolitical regimes for my dissertation, see the Introduction. Also, Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley, University of California Press, 2002).

service area by maintaining an abundant supply of cheap electricity favored the construction of a system of large, rurally-located, coal-fired power plants.¹⁷

The Power Program Goes to War

The Authority's decision to start building coal-fired steam generating facilities in the late 1940s continued the growth of the power program that had begun earlier in the same decade. TVA electricity had played an integral role in the nation's war effort. The Authority's facility at Muscle Shoals had produced phosphorus for incendiaries, ammonium nitrate for explosives, and calcium carbide for synthetic rubber.¹⁸ More importantly, the power program aided in the manufacture of aluminum, a necessary material for the construction of airplanes and a major factor in the fight for aerial supremacy in World War II that required huge amounts of energy to refine.¹⁹ Since the late nineteenth century, the production of aluminum has involved the use of a smelting process that passes an electric current through a solution of aluminum oxides that must first be extracted from ores such as bauxite.²⁰ Approximately ten kilowatt-hours of electricity

¹⁷ A discussion of the TVA's institutional culture as it related to coal-fired power and the power program can be found in Hargrove, *Prisoners of Myth*, 117-94; this section also discusses the importance of national security to the growth of the power program. For similar discussions see, Droze, "TVA, 1945-80," 66-82; and Marc J. Roberts and Jeremy S. Bluhm, *The Choices of Power: Utilities Face the Environmental Challenge* (Cambridge: Harvard University Press, 1981), 63-78. For a discussion of technology and the TVA see, Walter L. Creese, *TVA's Public Planning: The Vision, the Reality* (Knoxville: University of Tennessee Press, 1990). My chapter advances these four works by discussing the TVA's decisions as a form of technopolitics. I put the TVA's engineering decisions and institutional culture in a broader historical and political context.

¹⁸ TVA, *Annual Report, 1940* (Washington, D.C.: Government Printing Office, 1940), 28; and TVA and Gordon R. Clapp, "Power Supply in the Development of the Region: Address by Gordon R. Clapp, Chairman of the Board, Tennessee Valley Authority, to the Kiwanis Club, Knoxville, Tennessee, December 4, 1952," 2, UTK: Hodges, TVA PC, Box 4, Folder 8.

¹⁹ TVA employees suggested that it required 10 kilowatt-hours of electricity to produce one pound of aluminum; see, Mark Winter, "Oral History Interview with G. O. Wessenauer," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, June 29, 1983, 33-4, NARA-SE, RG 142, Oral History Records [hereafter: OHR], Box 9; and Mark Winter, "Oral History Interview with Edward Falck," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, August 26, 1983, 5, NARA-SE, RG 142, OHR, Box 3.

²⁰ Information about the smelting process can be found at U.S. Energy Information Administration, "Energy Needed to Produce Aluminum," August 16, 2012, accessed March 6, 2013, <http://www.eia.gov/todayinenergy/detail.cfm?id=7570>.

were needed to make one pound of aluminum.²¹ In contrast, a standard incandescent light-bulb draws less than one tenth of one kilowatt-hour for sixty minutes of use. In total, half of all of the aluminum that the United States utilized to build aircraft during the war was manufactured with TVA electricity.²² The Aluminum Company of America (ALCOA) became the Authority's largest customer in the 1941 fiscal year, and together with the other major aluminum manufacturer in the region, the Reynolds Metal Company, ALCOA tied up almost one quarter of the TVA's generating capacity in the 1940s.²³

The Authority's power program also played an important role in the Manhattan Project's development of the atomic bomb. Although much of the final testing and fabrication of the atomic bomb took place in the deserts of New Mexico, the production of the uranium fuel needed to arm the device occurred at the Oak Ridge National Laboratory west of Knoxville, Tennessee. The bomb that the Manhattan Project built required large amounts of a specific uranium isotope, Uranium-235, that was highly volatile. Uranium ore, however, contained only a fraction of the desired U-235; instead, the ore was predominantly made up of U-238, a relatively stable isotope that was not conducive for detonating an atomic weapon. It was necessary, therefore, for the government to produce its own fissile material by separating the two uranium isotopes using either a gaseous diffusion or an electromagnetic process, both of which required enormous amounts of electric power. The Manhattan Project chose the Tennessee

²¹ Winter, "Oral History Interview with G. O. Wessenauer," 33-4, NARA-SE, RG 142, OHR, Box 9; and Winter, "Oral History Interview with Edward Falck," 5, NARA-SE, RG 142, OHR, Box 3.

²² No Author, "The Johnsonville Steam Plant," no date, 2, National Archives and Records Administration Southeast Branch, Morrow, GA [hereafter: NARA-SE], Record Group 142 [hereafter: RG 142], Office of Engineering Design and Construction, Project Histories and Reports [hereafter: OEDC], Box 578.

²³ See, TVA, *Annual Report, 1941* (Washington, D.C.: Government Printing Office, 1941), 2-3; and TVA, *Annual Report, 1942* (Washington, D.C.: Government Printing Office, 1946), 3-8.

Valley Region for its Oak Ridge complex in part because of the availability of an ample supply of cheap TVA electricity.²⁴

During World War II, defense contractors, including ALCOA and Reynolds, and federal installations like Oak Ridge used prodigious amounts of electricity, taking advantage of the fact that the Authority's rates for large manufacturers were roughly two-thirds of the national average.²⁵ The approximately 7.5 billion kilowatt-hours that the valley's defense industries used in fiscal year 1945 was over four times the amount of electricity that the TVA generated for all of its customers in the 1939 fiscal year.²⁶ Throughout the war, those same industries used upwards of 75 percent of all of the power that the Authority sold.²⁷

In response to the demands of the war effort, the TVA engaged in one of the most successful large scale construction programs in American history. As part of its emergency build-up, the Authority completed eleven new dams while adding extra generating units to several existing sites, finishing Douglas Dam in less than fourteen months and keeping many of

²⁴ Richard Lowitt, "TVA, 1933-45," in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 54; and Droze, "TVA, 1945-80," 68. In finding a site for the new facility, the Manhattan Project searched for a relatively isolated, rural area in the middle of the country that would be hidden from potential enemy attack. Given the volatile nature of the compounds being produced, the government preferred locations near topographical features that could help contain the release of harmful radiation. The area that became Oak Ridge National Laboratory comprised a sparsely populated set of valleys tucked between the high ridges located west of Knoxville. Not surprisingly, the TVA's annual reports claim that the war department chose the Tennessee Valley for the Manhattan Project facility because of the Authority's power program. For example, "But with the dropping of atomic bombs on Hiroshima and Nagasaki, the War Department revealed that the ability of TVA to supply abundant electric power was the major factor in locating one of the largest atomic energy projects at Oak Ridge, Tenn." TVA, *Annual Report, 1945* (Washington, D.C.: Government Printing Office, 1945), 1; similar sentiments are expressed in TVA, *Annual Report, 1946* (Washington, D.C.: Government Printing Office, 1946), 1. Later TVA documents reported that the AEC released a statement in 1949 claiming that "The electromagnetic process (for separating uranium atoms) used an enormous amount of electric power and this was a compelling reason for its location in the Tennessee Valley."[emphasis in original] See, TVA, "TVA, AEC, and EEInc," informational report, August 19, 1953, 3, UTK: Hodges, TVA PC, Box 4, Folder 8.

²⁵ Immediately after the end of the war in fiscal year 1946 the TVA's rate for large industries averaged 0.64 cents per kilowatt-hour while the national average was 0.93 cents per kilowatt-hour; see TVA, *Annual Report, 1946*, 73-4.

²⁶ The TVA produced 1.7 billion kilowatt-hours of electricity in fiscal year 1939, see TVA, *Annual Report, 1940* (Washington, D.C.: Government Printing Office, 1940), ix. In fiscal year 1945 defense related industries and the federal government purchased 75 percent of the 10.3 billion kilowatt-hours that the TVA sold, or slightly more than 7.5 billion kilowatt-hours of electricity see TVA, *Annual Report, 1945*, 2 and 61.

²⁷ For example, in fiscal year 1942, defense industries and the federal government purchased 70 percent of the total electricity sold by TVA, see. In fiscal year 1943 and fiscal year 1945 the total was 75 percent; see TVA, *Annual Report, 1943* (Washington, D.C.: Government Printing Office, 1943), 1 and 17; and TVA, *Annual Report, 1945*, 2.

the projects under budget.²⁸ Altogether, these dams doubled the agency's generating capacity, increasing the size of the system to a total of more than 2.5 million kilowatts by the end of the war.²⁹ At the close of the 1945 fiscal year, the TVA operated 26 dams, having built 16 of them while acquiring the rest from private utilities and ALCOA.³⁰

The Authority's massive network produced one tenth of all the electricity used by defense industries during the war, and in the 1945 fiscal year it generated more power than any other integrated system in the United States.³¹ Only one in four farms in the agency's service area, however, had electricity at the end of the war, and although residential customers did increase their consumption between 1939 and 1945, the shortage of home appliances had retarded domestic growth.³² National defense had served as a catalyst for the TVA in the expansion of its power program.

Immediately following the war, demand for electricity in the Authority's service area and the United States in general stagnated as large defense industries reduced production. Nevertheless, the period of retrenchment was brief. The nation's electric utility industry constructed eleven million kilowatts of new generating capacity between 1945 and 1947. In the

²⁸ See, TVA, *The Kingston Steam Plant*, Technical Report No. 34, 5; Droze, "TVA, 1945-80," 68; and Lowitt, "TVA, 1933-45," 54-5. At one point in 1942, the TVA had 12 major dams under construction; see, Sherman M. Woodward, "TVA and Resource Development," report for information office, January 28, 1948, 19, NARA-SE, RG 142, OEDC, Box 115.

²⁹ Droze, "TVA, 1945-80," 68. For the fiscal year ending in 1940, the first full year after the TVA absorbed the properties and customers of the Tennessee Electric Power Company, the authority distributed 3.6 billion kilowatt-hours of electricity, and it ended the year with a total generating capacity of 958,000 kilowatts; see, TVA, *Annual Report, 1940*, 19-23. As defense spending began to increase in fiscal year 1942, the TVA expanded its capacity to almost 1.4 million kilowatts, distributing 6.5 billion kilowatt-hours of electricity with the majority of that used for war production; see, TVA, *Annual Report, 1942*, 3 and 7-8. By the end of the war in fiscal year 1945, the Authority generated almost 12 billion kilowatt-hours of electricity and distributed 10 billion of that in its service area with defense industries again consuming the lion's share of the total; see, TVA, *Annual Report, 1945*, 2.

³⁰ TVA, *Annual Report, 1945*, 45. In a portent for things to come, the Authority also completed its first coal-fired steam plant at Watts Bar in 1943 to ensure that the power program could meet the needs of the war effort in periods of drought. Nevertheless, hydroelectricity still accounted for 85 percent of the power that the system generated in fiscal year 1945.

³¹ TVA, *Annual Report, 1945*, 2. Also see, Hargrove, *Prisoners of Myth*, 60.

³² TVA, *Annual Report, 1945*, 57 and 69.

Tennessee Valley Region, the postwar lull was even shorter, lasting a scant ten months.³³ Two years after the end of the war, residential consumption in urban and rural communities in the Authority's service area had jumped sixty percent, a growth rate matched by small industries and businesses as economic reconversion resulted in the availability of a plethora of in-home appliances and an increase in consumer spending.³⁴ Although the region's larger industries expanded at a slower rate, they still increased their use of electricity by twenty-five percent from 1945 to 1947.³⁵

By the fall of 1947, however, the TVA's leadership believed that the agency had either already developed or was in the process of developing all of the economically viable hydroelectric sites in the Tennessee River watershed. Faced with a looming shortfall of generating capacity, the TVA requested funds for the construction of a coal-fired facility near Johnsonville, Tennessee, in its budget proposal for the 1949 fiscal year.³⁶ In this respect, the decision to build the Johnsonville Steam Plant represented the fruit of the wartime power boom, symbolizing the TVA's success in wringing every last kilowatt from the river.

At the same time, the Johnsonville Steam Plant reflected an important shift in the Authority's power program. Although Johnsonville was not the agency's first foray into coal-fired power, it marked the beginning of a new period of expansion defined by the construction of massive coal-fired steam-generating facilities. The TVA had completed the Watts Bar Steam Plant to meet the demands of the nation's defense industries during World War II, and the

³³ Droze, "TVA, 1945-80," 69.

³⁴ TVA, *The Johnsonville Steam Plant: A Comprehensive Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Six-Unit Plant*, Technical Report No. 31 (TVA: Knoxville, 1958), 4, copy found in NARA-SE, RG 142, OEDC, Box 586; for an excellent overview of the effect of reconversion on the explosion of consumer spending following World War II, see Lizabeth Cohen, *A Consumer's Republic: The Politics of Mass Consumption in Postwar America* (New York: Alfred A. Knopf, 2003).

³⁵ TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 4, copy found in NARA-SE, RG 142, OEDC, Box 586.

³⁶ See, TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 4 and 10, copy found in NARA-SE, RG 142, OEDC, Box 586; and Droze, "TVA, 1945-80," 69.

agency operated several smaller coal-fired power plants that it had absorbed from private utility companies in the 1930s. Nevertheless, these earlier facilities paled in comparison to the Johnsonville Steam Plant and the network of coal-fired plants that the TVA built during the 1950s and 1960s.

The Johnsonville Steam Plant and the TVA's New Coal-Fired Network

The Authority's fight to secure funding for the Johnsonville Steam Plant demonstrated the extent to which the tenets of the public power movement and Cold War politics shaped the power program's policy of coal-fired expansion. The TVA Act of 1933 required the agency to seek congressional approval for its power projects through the normal appropriations process. In the fall of 1947, the agency asked for funds to build the Johnsonville facility. In January 1948, Harry Truman's proposed budget for the 1949 fiscal year included the Authority's request. The prospect of the TVA building a new coal-fired steam plant in its service area engendered fierce opposition from the private utility industry and anti-New Deal conservatives.³⁷

In part, the hostility that surfaced over the Johnsonville Steam Plant reflected a rekindling of the public-private power fight from the 1930s, a conflict that pitted competing visions of economic growth and resource management, one defined by private markets with limited government interference and the other by public ownership and purpose.³⁸ Private utility executives argued that the TVA Act did not permit the Authority to build coal-fired plants. They worried that the Johnsonville facility would set a precedent for future expansion of the TVA's service area because the agency would no longer be tied to the hydroelectric capacity of the

³⁷ TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 10, copy found in NARA-SE, RG 142, OEDC, Box 586.

³⁸ This is a simplification. In fact, the public-private power fights of the 1930s also included divisions between the regional planning movement and the public power movement that complicated the fight for government owned utilities. The fight was not simply corporate interests versus public power reformers. See Chapter One.

river. For example, A. C. Spurr, the president of the Monongahela Power Company, suggested that the Johnsonville Steam Plant would open the door for the Authority to move its power operations into new communities in West Virginia, Virginia, North Carolina, South Carolina, and Georgia.³⁹ In its opposition to public power, the utility industry also insinuated that the TVA had benefited from government subsidies and its favorable tax status, claiming that the Authority's promotional campaigns and artificially low rates had lured heavy industries to the Tennessee Valley Region from other parts of the country.⁴⁰ Finally, as a government sponsored competitor, the TVA threatened to cause the "socialization of the electric industry."⁴¹

The charge of socialism was popular among critics of the Authority's power program during the post-World War II era, and especially during the Johnsonville fight. As the Cold War heated up, the TVA's power program became a prime example for conservatives of the type of government overreach that could undermine free-enterprise in the United States. Ernest Acker, the president of the Edison Electric Institute, an industry trade group, lamented that an appropriation for the proposed steam plant would be "another decisive crossroad on the [TVA's] march toward regional socialism on a large scale[.]"⁴² The president of the National Association of Electric Companies, another lobbying group, warned that the Authority's expansion marked the beginning of nationalization not only for utilities but for all industries.⁴³ Headlines in

³⁹ For Spurr see, John F. Callahan, "Utilities to Fight New TVA Project," *New York Times*, March 28, 1948, F1-F2. It is worth noting that when Spurr made his comments the TVA already served select communities in North Carolina, Virginia, and Georgia.

⁴⁰ John F. Callahan, "Utilities Fearful on Fight with TVA," *New York Times*, June 6, 1948, F1-F2; Clayton Kirkpatrick, "TVA: A Nation's 1st Big Venture into Socialism," *Chicago Daily Tribune*, May 3, 1948, 4; Callahan, "Utilities to Fight New TVA Project," *New York Times*, March 28, 1948, F1-F2; and Robert C. Albright, "Steam Generators Cause Row: Private Power Firms Win First Round in TVA Battle," *Washington Post*, April 24, 1948, 1-2. The TVA did not pay property taxes for its facilities, making "payments in lieu of taxes" instead. The Authority claimed these payments were equivalent to the local and state taxes that a private utility would pay. The TVA's opposition disagreed.

⁴¹ John F. Callahan, "TVA at Hearing 'Fared Very Badly,'" *New York Times*, April 25, 1948, F4; here, Callahan is quoting P. L. Smith of the National Association of Electric Companies.

⁴² Acker's quote is from "Power Interests set Battle Lines," *New York Times*, November 16, 1948, 45.

⁴³ Callahan, "Utilities Fearful on Fight with TVA," *New York Times*, June 6, 1948, F1-F2.

conservative newspapers referred to the TVA as the nation's "1st Big Venture into Socialism," and in Chicago, the editorial board of the right-leaning *Daily Tribune* denounced the TVA as the first step on the slippery slope to communism, suggesting that the agency was actively trying to turn the United States into a totalitarian state.⁴⁴

More substantively, the Authority's detractors claimed that the Johnsonville Steam Plant was unnecessary and that several viable, private sector options existed for meeting the electricity needs of the Tennessee Valley Region. According to advocates for the utility industry, private electric companies had already begun the process of building enough capacity to cover the estimated growth in demand. As a result, they argued, the Johnsonville facility was superfluous. It would be far less costly for the TVA to purchase power from private systems.⁴⁵ Similarly, the Authority could alter its contracts to grant municipalities and rural cooperatives the opportunity to obtain electricity directly from private wholesalers.⁴⁶ Some lobbyists also suggested that large industries and cities should simply construct their own generating facilities.⁴⁷ In short, the TVA's conservative opposition contended that the agency could achieve its goal of facilitating access to a large volume of cheap kilowatts without expanding its own production network. Ceding capacity to the private sector represented a potential solution to the Authority's problem of supply.

For its part, the TVA defended the Johnsonville Steam Plant, suggesting that the facility represented a necessary response to the growing power demands of the region. The Authority's leadership claimed that the agency had a statutory obligation to meet the electricity needs of the

⁴⁴ For headline see, Kirkpatrick, "TVA: A Nation's 1st Big Venture into Socialism," *Chicago Daily Tribune*, May 3, 1948, 4. For editorial see, "Another TVA Grab," *Chicago Daily Tribune*, May 2, 1948, 22.

⁴⁵ P. L. Smith, "TVA Steam Plant," letter to the editor, *Washington Post*, January 28, 1949, 24.

⁴⁶ Callahan, "TVA at Hearing 'Fared Very Badly,'" *New York Times*, April 25, 1948, F4. TVA contracts forbade municipalities and cooperatives from purchasing power directly from outside systems.

⁴⁷ Smith, "TVA Steam Plant," letter to the editor, *Washington Post*, January 28, 1949, 24.

consumers in its service area, and as noted above, the TVA maintained that it had already developed the economically viable hydroelectric sites on the Tennessee River and its tributaries. The agency also argued that a coal-fired steam plant located in central Tennessee would allow it to balance its load requirements between the eastern third of the valley, where most of its hydroelectric generators were installed, and the middle and western sections of its service area, in which residential and commercial consumption were growing more rapidly. By expanding into coal-fired power, the TVA would be able to balance its seasonal loads as well, using the Johnsonville facility to firm-up its supply of kilowatts in periods of low water.⁴⁸

The TVA's public pronouncements often employed the language of necessity and obligation, insisting that its service area suffered from an acute shortage of electricity. Nevertheless, the Authority's decision to construct the Johnsonville facility reflected a commitment to public power, energy abundance, and use that linked the agency with the liberal state's effort to foster the mass-consumption of goods and services after World War II.⁴⁹ The TVA's leadership, in particular Gordon Clapp, contrasted life in the Tennessee Valley before the arrival of the Authority with life after, drawing attention to the dramatic increases in electrical use while arguing that the agency's power policies had been responsible for the growth.⁵⁰ Furthermore, the TVA remained critical of private utilities, suggesting that if the Authority had to purchase power from other networks to meet future demand it would lead to increased rates

⁴⁸ TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 1-10, copy found in NARA-SE, RG 142, OEDC, Box 586.

⁴⁹ For examples see, Fred Hixson, "The Southeast: Defenders of TVA Worried by Moves in Congress," *New York Times*, April 18, 1948, E6; John P. Callahan, "Drive Against TVA Attacked by Clapp," *New York Times*, May 2, 1948, 101; and TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 1-10, copy found in NARA-SE, RG 142, OEDC, Box 586. Liz Cohen has made a compelling argument that the consumption of goods and services became an important part of national identity and civic participation in the United States after World War II and that the state facilitated consumption in multiple ways; see Cohen, *A Consumer's Republic*. Also see Chapter Three of this dissertation.

⁵⁰ Callahan, "Drive Against TVA Attacked by Clapp," *New York Times*, May 2, 1948, 101.

for customers and limit the agency's ability to carry out its mission.⁵¹ According to the TVA, coal-fired steam represented the easiest way to expand the supply of cheap kilowatts in the region while retaining control over the process of power production. For the Authority, an adequate supply of inexpensive electricity meant higher standards of living in the home along with the "fuller and better-balanced development of the resources of the region."⁵²

Congressmen and civic leaders from the Tennessee Valley supported the steam plant and the expansion of the TVA's power program. The agency's allies in the House of Representatives argued that a vote against the Johnsonville facility represented "a backward step" for the region.⁵³ Municipal leagues, women's clubs, unions, and other advocates for public power flooded Congress with "millions of letters and telegrams in support of the new steam plant."⁵⁴ The mayors of Nashville, Chattanooga, and Memphis all testified on behalf of the Authority and the importance of the expansion of the agency's power program for their cities.⁵⁵ Meanwhile, the *New York Times* and many of the major newspapers from the Tennessee Valley Region backed the TVA.⁵⁶

Support for the Johnsonville Steam Plant also coalesced around the power program's importance for national defense, specifically, the agency's role in supplying atomic research at Oak Ridge and aluminum manufacturers. News that the National Security Resources Board had undertaken a study of the nation's generating capacity suggested the important relationship

⁵¹ Callahan, "Drive Against TVA Attacked by Clapp," *New York Times*, May 2, 1948, 101; and TVA, *Annual Report, 1946*, 73-4; and TVA, *Annual Report, 1947* (Washington, D.C.: Government Printing Office, 1947), 56 and 65-6.

⁵² Quoted in TVA, *Annual Report, 1947*, 3; also see, TVA, *Annual Report, 1948* (Washington, D.C.: Government Printing Office, 1948), 79.

⁵³ "TVA Fight is Revived in Congress as House Body Blocks Steam Plant," *New York Times*, May 8, 1948, 1.

⁵⁴ John N. Popham, "McKellar Will Lead Battle for TVA Steam Plant Fund," *New York Times*, May 24, 1948, 38. Also see, Callahan, "Utilities Fearful on Fight with TVA," *New York Times*, June 6, 1948, F1-F2.

⁵⁵ Popham, "McKellar Will Lead Battle for TVA Steam Plant Fund," *New York Times*, May 24, 1948, 38.

⁵⁶ "A New Attack on TVA," *New York Times*, June 8, 1948, 24; and Mary Jane Lowe, "Oral History Interview with Walter Pulliam," part of Tennessee Valley Authority Oral History Collection: Valley Resident Series, March 28, 1991, 25-6, NARA-SE, RG 142, OHR, Box 7. Within the Tennessee Valley Region, the *Nashville Tennessean*, *Louisville Courier-Journal*, and *Knoxville News-Sentinel* were all staunch supporters of the TVA prior to the 1960s.

between electricity and preparedness for future conflicts.⁵⁷ Furthermore, at least one executive in the aluminum industry cited the TVA while arguing that national security necessitated an expansion of the United States' power resources.⁵⁸

Although the TVA did not initially claim that international concerns had prompted the need for the Johnsonville facility, Gordon Clapp, the agency's chairman, began promoting a kilowatts-for-defense narrative in the spring of 1948.⁵⁹ President Truman, in particular, vigorously supported the TVA's expansion into coal-fired power after meeting with Clapp in April of that year.⁶⁰ In a letter to the Senate Appropriations Committee that stressed the importance of the Johnsonville Steam Plant, Truman expressed his concern that the Authority continue to meet the needs of the nation's defense program, writing that "it [the expansion of the TVA's power program] is urgently needed at this time to meet potential requirements in the event of an emergency affecting the national security."⁶¹ By the late 1940s, the security state's apparatus was already beginning to take shape, and access to cheap sources of energy for the burgeoning military industrial complex became a necessity.⁶²

Senators and Representatives from the valley states also picked up the kilowatts-for-defense narrative. Along with fellow Tennessee representatives Estes Kefauver and John Jennings, Albert Gore, Sr., reminded his colleagues in the House that the TVA provided electricity for the atomic energy program at Oak Ridge as well as for numerous aluminum

⁵⁷ "Study of Power Set as Defense Measure," *New York Times*, April 6, 1948, 46.

⁵⁸ "Aluminum Increase Urged for Defense," *New York Times*, April 19, 1948, 14.

⁵⁹ John P. Callahan, "Utilities Indicate Spirited TVA Fight," *New York Times*, April 4, 1948, F1; and Callahan, "Drive Against TVA Attacked by Clapp," *New York Times*, May 2, 1948, 101.

⁶⁰ Callahan, "Utilities Indicate Spirited TVA Fight," *New York Times*, April 4, 1948, F1.

⁶¹ Quoted in Anthony Leviero, "TVA Steam Plant Backed by Truman," *New York Times*, May 27, 1948, 1.

⁶² On the rise of the security state, its strengths, and its weaknesses, see Melvyn P. Leffler, *A Preponderance of Power: National Security, the Truman Administration, and the Cold War* (Palo Alto: Stanford University Press, 1992); Douglas T. Stuart, *Creating the National Security State: A History of the Law that Transformed America* (Princeton: Princeton University Press, 2008); and Aaron Friedberg, *In the Shadow of the Garrison State: America's Anti-Statism and Its Cold War Strategy* (Princeton: Princeton University Press, 2000).

manufacturers that were vital to the United States Air Force.⁶³ Echoing President Truman, Gore warned that failing to build the steam plant “might prove to be calamitous...if it is later discovered that vastly increased amounts of power are urgently required for our national defense.”⁶⁴ In the Senate, Kenneth McKellar, also of Tennessee, a man who had once sparred with David Lilienthal over the direction of the TVA, came to the agency’s support, expressing sentiments similar to those of Gore and the President.⁶⁵

Still, conservative Republicans blocked the TVA plant during the spring and summer of 1948. The New Deal had not fared well in the 80th Congress. The end of World War II and the return of relative prosperity emboldened conservatives, who set about trying to dismantle the programs and policies developed during the Great Depression. Demobilization offered an opportunity to redefine the role of the state in American society and either reverse or limit the scope of New Deal legislation. In one prominent example, conservatives passed the Taft-Hartley Act over President Truman’s veto in 1947, curtailing some of the statutory gains that organized labor had made in the 1930s. To the extent that the Authority’s power program was emblematic of the liberal state’s involvement in the economy and its newfound role in promoting social welfare, critics of the New Deal bitterly opposed its expansion.⁶⁶

⁶³ “House Rejects a TVA Power Plan Requiring Steam-Generator Plant,” *New York Times*, May 12, 1948, 1 and 54. On Kefauver and Jennings, the former a Democrat and the latter a Republican, see, Popham, “McKellar Will Lead Battle for TVA Steam Plant Fund,” *New York Times*, May 24, 1948, 1 and 38.

⁶⁴ “TVA Fight is Revived in Congress as House Body Blocks Steam Plant,” *New York Times*, May 8, 1948, 3.

⁶⁵ Popham, “McKellar Will Lead Battle for TVA Steam Plant Fund,” *New York Times*, May 24, 1948, 1 and 38; and Callahan, “Utilities Fearful on Fight with TVA,” *New York Times*, June 6, 1948, F1-F2.

⁶⁶ For examples of scholarship on the travails of New Deal liberalism and the liberal state, see Alan Brinkley, *Liberalism and Its Discontents* (Cambridge: Harvard University Press, 1998); Alan Brinkley, “The New Deal and the Idea of the State,” in *The Rise and Fall of the New Deal Order, 1930-1980*, eds. Steve Fraser and Gary Gerstle (Princeton: Princeton University Press, 1989), 85-121; and Nelson Lichtenstein, “From Corporatism to Collective Bargaining: Organized Labor and the Eclipse of Social Democracy in the Postwar Era,” in *The Rise and Fall of the New Deal Order, 1930-1980*, eds. Steve Fraser and Gary Gerstle (Princeton: Princeton University Press, 1989), 122-52. For a discussion of the role of businessmen in the conservative attempts to roll back the New Deal, see Kim Phillips-Fein, *Invisible Hands: The Businessmen’s Crusade Against the New Deal* (New York: W. W. Norton & Company, Inc., 2009).

On May 7, 1948, Republicans on the House of Representatives' Appropriations Committee voted to remove funds for the Johnsonville Steam Plant from the federal budget for the upcoming fiscal year. Siding with industry advocates and conservative critics, the committee's report questioned whether the original TVA Act provided for the agency's move into coal-fired power, suggesting that it was unclear if the Authority actually had a statutory obligation to meet electric power demands in its service area that went beyond the hydroelectric potential of the Tennessee River and reiterating fears that the Johnsonville Steam Plant established a precedent for future expansion of the TVA's power program.⁶⁷ On May 11, less than a week later, the full House of Representatives sustained the committee's decision, eliminating Johnsonville from the appropriation bill. In the House's debate over the measure, the TVA's opponents cited the same concerns that the committee report had raised, with Representative John Taber of New York lamenting the role of the nation's taxpayers in subsidizing the electric bills of the Tennessee Valley Region.⁶⁸ Although the Authority's allies in the Senate amended the House bill to include money for the Johnsonville facility, the House remained opposed to any appropriation for coal-fired power, and the Senate agreed to withdraw the amendment after the conference deadlocked on June 19, 1948.⁶⁹

Following the Johnsonville Steam Plant's initial legislative defeat, President Truman redoubled his efforts in support of the TVA's appropriation request, registering his displeasure with the Authority's congressional opponents in several statements throughout the summer of

⁶⁷ "TVA Fight is Revived in Congress as House Body Blocks Steam Plant," *New York Times*, May 8, 1948, 1 and 3; also see, TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 10, copy found in NARA-SE, RG 142, OEDC, Box 586.

⁶⁸ "House Rejects a TVA Power Plan Requiring Steam-Generator Plant," *New York Times*, May 12, 1948, 1 and 54.

⁶⁹ TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 11-2, copy found in NARA-SE, RG 142, OEDC, Box 586.

1948, including his speech accepting the Democratic nomination for president.⁷⁰ When both houses reconvened in late July, Truman delivered another address asking for an emergency appropriation for the facility. The President argued that the country presently suffered from an “acute power shortage” in part because Congress’ earlier rejection of the TVA’s request had “cut sharply into our national electric power policy.”⁷¹ Nevertheless, neither house acted on the matter during the summer session.⁷²

In September 1948, the Authority again included funds for the Johnsonville Steam Plant in its proposal to the Bureau of the Budget for the 1950 fiscal year. In November, only two months later, the TVA asked that Congress pass a supplemental appropriation so that construction could begin in the spring of 1949, citing larger than expected increases in demand and the possibility that a power shortage might hamper the production of aluminum and other strategic materials. The Bureau of the Budget agreed, and President Truman included money for the facility in a request to Congress for supplemental appropriations for the 1949 fiscal year.⁷³

The debates in House of Representatives and the Senate regarding the supplemental appropriation for the steam plant followed the same script that they had the previous spring. TVA supporters touted the facility’s importance for national defense and the growth of the Tennessee Valley Region, and detractors claimed that the plant was unnecessary, that the TVA siphoned tax revenue and industries from the rest of the country, and that the agency’s power program represented the scourge of socialism. This time, however, concerns regarding upcoming power shortages and the importance of electricity for the defense industries in the

⁷⁰ TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 12, copy found in NARA-SE, RG 142, OEDC, Box 586.

⁷¹ “Text of President Truman’s Message to Extra Session of Congress,” *New York Times*, July 28, 1948, 4.

⁷² TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 12, copy found in NARA-SE, RG 142, OEDC, Box 586.

⁷³ TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 12, copy found in NARA-SE, RG 142, OEDC, Box 586.

Authority's service area won out.⁷⁴ Congress approved an emergency appropriation for three generating units at the Johnsonville facility, and President Truman signed the act on May 24, 1949. While it had taken the TVA nearly two years to get its initial funding for the Johnsonville Steam Plant approved, mounting fears regarding the United States preparedness for war and the outbreak of hostilities in Korea led Congress to appropriate money for three additional units by the summer of 1950.⁷⁵

The Johnsonville Steam Plant signaled the beginning of a second period of expansion for the Authority's power program. The TVA repeatedly included requests for extra units in its budgets throughout the 1950s. Between 1949 and 1953, Congress approved the construction of six additional coal-fired facilities for the Authority.⁷⁶ Including Johnsonville, the seven steam plants were all among the largest in the world at the time of their completion, and they utilized the latest advances in generating technology. By the end of the decade, the TVA had improved its overall capacity to almost eleven million kilowatts, a 300 percent gain over ten years.⁷⁷ The Authority also increased the volume of electricity that it generated every year from 1949 to 1957

⁷⁴ It must be noted that the 1948 election returned Democratic majorities in both the House of Representatives and the Senate while Republicans had controlled both houses in the 80th Congress. The reelection of Harry Truman also helped the TVA's cause.

⁷⁵ TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 12-4, copy found in NARA-SE, RG 142, OEDC, Box 586. Also see, Jay Walz, "House Unit Votes Half Billion In First Big 1949 Money Bill," *New York Times*, February 15, 1949, 1 and 16; and "Taber Fight on TVA Holds Up Fund Bill," *New York Times*, February 16, 1949, 2. For a broader discussion on the importance of the conflict in Korea and the rise of communist China to the early Cold War period, see Walter LaFeber, *America, Russia, and the Cold War, 1945-2006* (New York: McGraw-Hill, 2006[1967]); Melvin P. Leffler, *For the Soul of Mankind: The United States, the Soviet Union and the Cold War* (New York: Hill and Wang, 2007); John Lewis Gaddis, *The Cold War: A New History* (New York: Penguin, 2005); and Bruce Cumings, *Dominion from Sea to Sea: Pacific Ascendancy and American Power* (New Haven, Yale University Press, 2009).

⁷⁶ In order, the seven steam plants that Congress approved during this period were: Johnsonville, Widows Creek, Shawnee, Kingston, Colbert, John Sevier, and Gallatin. Prior to 1959, Johnsonville, Widows Creek, Kingston, Gallatin, and Colbert all received supplemental appropriations for additional units.

⁷⁷ TVA, *Annual Report, 1959*, 1-2 and 7, lists the total as of fiscal year 1959 as 10,997,210 kilowatts, suggesting that projects that had been approved and/or were under construction would leave the total at 13.8 million kilowatts by fall of 1963. The total at the end of fiscal year 1949 was 2,747,000 kilowatts, see TVA, "TVA Power, 1949," undated informational pamphlet, 3, NARA-SE, RG 142, Power Manager's File [hereafter: PMF], Box 17.

reaching a peak of 63.2 billion kilowatt-hours.⁷⁸ The vast majority of the new units were coal-fired, and in the 1954 fiscal year the Authority produced more than half of its electricity from coal for the first time.⁷⁹ By 1959, coal-fired power accounted for 73 percent of the kilowatt-hours that the TVA generated.⁸⁰ In this way, the Johnsonville facility represented the start of an important shift for the Authority and its power program that took place in the 1950s.

Accepting at face value the TVA's claim that the dearth of viable hydroelectric sites on the Tennessee River and its tributaries necessitated a shift to coal-fired power obscures the influence of politics and policy goals in shaping the development of the Authority's power program after World War II. Viewed solely from an engineering perspective, it was true that the TVA had developed the most advantageous hydroelectric sites in the Tennessee River watershed by 1947. It was also true that demand for electric power in the Authority's service area was increasing and that private utilities and opponents of the New Deal state offered a countervailing solution to the agency's problem of supply that relied on a vision of economic growth premised on free-enterprise. That said, the political context provided by the Cold War, the TVA's commitment to public power's consumption-centric policy goals and emphasis on the democratic virtues of governmental resource management, and the Authority's desire to continue an institutional narrative of technological progress did much more to shape the agency's system of coal-fired power plants in the 1950s and 1960s.

⁷⁸ TVA, *Annual Report, 1957*, 30-1; the TVA sold 57 billion kilowatt-hours in the 1957 fiscal year. In January of 1960, the TVA estimated that sales for fiscal year 1960 would top 60 billion kilowatt-hours; see, TVA, "TVA Power, 1959-1960," informational pamphlet, January, 1960, 16, UTK: Hodges, TVA PC, Box 4, Folder 8; this page has a graph that illustrates the growth in sales between 1949 and 1959.

⁷⁹ TVA, *Annual Report, 1954*, 1.

⁸⁰ TVA, "TVA Power, 1959-1960," informational pamphlet, January, 1960, 4, UTK: Hodges, TVA PC, Box 4, Folder 8.

The TVA's Consumption-Centric Ideology in the Postwar Era

As Chapter One illustrated, the TVA had initiated the implementation of a consumption-centric energy regime by the end of the 1930s, utilizing low rates and abundant supply to promote higher levels of use among residential customers and industries. Although the rationing of scarce materials slowed the Authority's ability to expand its system during World War II, the philosophy and policies of public power remained entrenched in the TVA's institutional culture, reasserting themselves in the late 1940s and 1950s.⁸¹ In speeches, informational and promotional pamphlets, and internal documents the Authority and its leadership articulated a role for cheap kilowatts in achieving economic growth and a quality in-home environment.⁸²

As noted above, TVA chairman Gordon R. Clapp emphasized the importance of electric power in establishing a healthy economy, equating the latter with robust growth and industrialization. Clapp had served as the Authority's general manager during David Lilienthal's tenure as chairman in the early 1940s, and Lilienthal had heavily influenced his protégé's understanding of the TVA's power program and the importance of cheap electricity. Although Clapp's successor, Herbert Vogel, was an agency outsider appointed by Dwight Eisenhower, a staunch opponent of the Authority, he embraced the consumption-centric regime that Lilienthal and Clapp instilled in the agency. Clapp's argument appeared irrefutable: "New industries take electric power. New industries create new jobs. New jobs create payrolls. Paychecks buy groceries, shoes, automobiles and gasoline, fishing tackle, boats, insurance, medical services,

⁸¹ For example, the primary metal used to make transmission lines, copper, was also essential for the war effort. As a result, the TVA and rural cooperatives found it difficult to build new power lines throughout the war. In fact, the TVA began asking residential customers to conserve power in the fall of 1941, something the agency would not do again until the 1970s. See, Winter, "Oral History Interview with Edward Falck," 7-8, NARA-SE, RG 142, OHR, Box 3; and TVA, *Annual Report, 1941*, 36; TVA, *Annual Report, 1942*, 7 and 16.

⁸² As noted above, Erwin Hargrove has argued that the TVA developed an entrenched institutional culture that focused on maintaining an abundant supply of cheap kilowatts in the post-World War II period; see, Hargrove, *Prisoners of Myth*, 4-8, 117-28, 136-47, and 155-8.

schooling. Electric power is part of all these transactions.”⁸³ Clapp located electricity at the bottom of a long food chain that linked the consumption of energy with growth in every facet of the economy, from industry to the service sector to recreation. Likewise, TVA reports and pamphlets referred to electricity as “one of the bed-rock necessities in a modern economy” while suggesting that an ample supply of electric power had encouraged the development of manufacturing throughout the Authority’s service area and improved productivity and income.⁸⁴

Throughout Clapp’s time as chairman, the TVA cast electricity as a tool for progress and as “a form of energy especially suited to motivate mass production in the industrial field.”⁸⁵ In particular, electric power provided flexibility on the shop floor and that the direct application of steam and water power did not; electricity also burned clean at the site of consumption, and it could easily be delivered in large volumes.⁸⁶ Industrialization would allow the region’s communities to take full advantage of their natural resources, including rich mineral reserves.⁸⁷ Prior to the arrival of the Authority, the Tennessee Valley’s manufacturing sector had lagged behind the rest of the country. Dominated by mono-crop agriculture that depleted soils of

⁸³ Clapp, “Power Supply,” 3, UTK: Hodges, TVA PC, Box 4, Folder 8.

⁸⁴ Sources for this sentence include: for “bed-rock necessities” see, TVA, “Facts About TVA Operations,” informational pamphlet, May 18, 1953, 14, UTK: Hodges, TVA PC, Box 1, Folder 1; for a pamphlet that argued that an ample supply of power was “a must in any dynamic economy” see, TVA, “A Report to the Nation from the Tennessee Valley Authority on its First Twenty-Five Years, 1933-1958,” 7, UTK: Hodges, TVA PC, Box 1, Folder 1; for a pamphlet suggesting that the power program encouraged manufacturing see, TVA, “TVA Power, 1959-1960,” informational pamphlet, January, 1960, 33, UTK: Hodges, TVA PC, Box 4, Folder 8; and on productivity and income see, TVA Office of Power, “Rate Reductions by the Distributors of TVA Power,” informational pamphlet, July, 1956, 12, UTK: Hodges, TVA PC, Box 4, Folder 8.

⁸⁵ Clapp, “Too Little Electricity,” 5, UTK: Hodges, TVA PC, Box 1, Folder 1.

⁸⁶ David E. Nye, *Electrifying America: Social Meanings of a New Technology, 1880-1940* (Cambridge: The MIT Press, 1990); and Sam H. Schurr, Calvin C. Burwell, Warren D. Devine, Jr., and Sidney Sonenblum, *Electricity in the American Economy: Agent of Technological Progress* (New York: Greenwood Press, 1990), 4 and 17-42. Regarding flexibility, a factory powered by electricity could have individual motors running each machine rather than use a single drive shaft to power the whole shop floor as was the case in factories that used direct application of steam or water power. This meant that individual motors could be shut off without having to shut down an entire operation and that machines could more easily be maneuvered on the shop floor allowing them to be arranged to facilitate efficient production rather than by their energy needs.

⁸⁷ See Chapter One of this dissertation; also see, TVA, “Tennessee Valley Resources: Their Use and Development,” internal report, December 1, 1947, 31, UTK: Hodges, TVA PC, Box 2, Folder n/a; and TVA, *Annual Report, 1947*, 3.

nutrients, the regional economy remained stunted, driving many young people to seek employment in the cities of the upper Midwest.⁸⁸ As one informational pamphlet on the power program put it, “A region prospers and grows in step with its industries. And industries require electric power.”⁸⁹ In the TVA’s narrative, the economic success of its service area depended on electricity.

As part of its ongoing commitment to the principles of the public power movement, the Authority also stressed the connection between the in-home use of electric power and social progress in the Tennessee Valley Region. The agency and its leadership argued that widespread access to cheap electricity made a standard of living based on high levels of energy consumption possible. As Gordon Clapp noted, affordable electric power “reduced human toil,” and it “brought conveniences and higher standards of material well-being” into the region’s homes.⁹⁰

The emphasis that the TVA placed on in-home appliances reflected the agency’s belief in the connection between the consumption of electricity and raised standards of living. For example, a 1956 pamphlet promoting the power program depicted a cornucopia overflowing with an electric fan, a refrigerator, a television set, a toaster, and an electric range, among other items.⁹¹ [Fig. 2.1] The picture illustrated that the bounty of TVA electricity was in the plethora of modern devices that it allowed residential customers to utilize. According to TVA employees, water pumps, water heaters, and washing machines bridged the divide between urban and rural

⁸⁸ See Chapter One of this dissertation; also see, Mark Winter, “Oral History Interview with Ralph E. McKnight,” part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, April 11, 1983, 36, NARA-SE, RG 142, OHR, Box 6; middle Tennessee, southwest Virginia, and western North Carolina planted tobacco while western Tennessee planted cotton, “We had a crop of young people who went to northern cities every year and we sold a crop of cotton down here. ... And they went out of here literally by the thousands every year – the young people moving out. And now they are coming back. They went because there wasn’t any opportunities here.”

⁸⁹ TVA, “TVA Power, 1956-57,” informational pamphlet, January, 1957, 9, UTK: Hodges, TVA PC, Box 4, Folder 8. This particular quote became a staple for the TVA and can be found verbatim in other brochures in this series, for example, TVA, “TVA Power, 1955-56,” informational pamphlet, January, 1956, 9, NARA-SE, RG 142, PMF, Box 17.

⁹⁰ Both quotes taken from, Clapp, “Too Little Electricity,” 5, UTK: Hodges, TVA PC, Box 1, Folder 1.

⁹¹ TVA Office of Power, “Rate Reductions by the Distributors of TVA Power,” informational pamphlet, July, 1956, 12, UTK: Hodges, TVA PC, Box 4, Folder 8.

living.⁹² Electric radios and, increasingly, televisions connected homes and communities with the outside world.⁹³ Meanwhile, electric lighting not only artificially lengthened the day but it burned cleaner and safer than oil and gas.⁹⁴ Electric heating, too, eliminated the need for dirty in-home coal furnaces, a boon for city dwellers.⁹⁵ Finally, it was assumed that technology lightened the burden of housework on women, allowing them to obtain outside employment or pursue leisure activities.⁹⁶ Whether they represented simple conveniences, savings in labor, a

⁹² Water pumps, in particular, made indoor plumbing a possibility for farms and small towns. No Author, "Conversation with W. C. Whisenant on Employee Orientation Program," May 26, 1982, 4, NARA-SE, RG 142, OHR, Box 1: "Only 35 percent of the people in Tennessee (other than the four large metropolitan areas) in 1954 had running water under pressure. They couldn't have a bathroom or water heater." No Author, "Conversation with Jim Ward on Employee Orientation Program," May 26, 1982, 9, NARA-SE, RG 142, OHR, Box 1. Also see, Winter, "Oral History Interview with G. O. Wessenauer," 32-3, NARA-SE, RG 142, OHR, Box 9; Mary Jane Lowe, "Oral History Interview with G. O. Wessenauer," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, May 22-23, 1990, 51-2, NARA-SE, RG 142, OHR, Box 10, "They could have indoor plumbing; they could have all the conveniences of city living. Their health would be better because of the clean water and septic tanks." In both of his interviews Wessenauer notes that the TVA worked with the Mississippi Department of Health to bring electric water pumps and plumbing to rural areas as means of combatting waterborne illness.

⁹³ The importance of the radio and television as purveyors of mass culture and information has been covered in a number of sources; for examples, see Robert S. Lynd and Helen Merrell Lynd, *Middletown in Transition: A Study in Cultural Conflicts* (New York: Harcourt, Brace and Company, 1937); Lizabeth Cohen, *Making a New Deal: Industrial Workers in Chicago, 1919-1939* (Cambridge: Cambridge University Press, 2008[1990]), 325-331; Cohen, *A Consumer's Republic*, 255 and 298-309; Karal Ann Marling, *As Seen on TV: The Visual Culture of Everyday Life in the 1950s* (Cambridge: Harvard University Press, 1994); Thomas Doherty, *Cold War, Cool Medium: Television, McCarthyism, and American Culture* (New York: Columbia University Press, 2003); and more generally on the nationalization of American culture, Warren I. Susman, *Culture as History: The Transformation of American Society in the Twentieth Century* (New York: Pantheon Books, 1984). TVA employees made it clear that the radio and the television were two of the most important appliances for households and isolated communities in the Tennessee Valley Region; see, No Author, "Conversation with Jim Ward on Employee Orientation Program," 31-2, NARA-SE, RG 142, OHR, Box 1; Edwin Best noted that the battery powered radios that his family had prior to the arrival of the TVA were not practical for everyday use, see Mary Jane Lowe, "Oral History Interview with Edwin J. Best, Sr.," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, May 14, 1991, 24-5, NARA-SE, RG 142, OHR, Box 1; also see, Clapp, "Too Little Electricity," 6, UTK: Hodges, TVA PC, Box 1, Folder 1, "Scattered neighborhoods become coherent communities through contact, talk, and planning."

⁹⁴ Lowe, "Oral History Interview with Edwin J. Best, Sr.," 24-5, NARA-SE, RG 142, OHR, Box 1.

⁹⁵ Several interviewees from the TVA's oral history projected remarked on the poor air quality in Knoxville, Nashville, and Chattanooga that resulted from the use of coal to heat individual residences and businesses; see, No Author, "Conversation with W. C. Whisenant on Employee Orientation Program," 9-10, NARA-SE, RG 142, OHR, Box 1; Lowe, "Oral History Interview with Edwin J. Best, Sr.," 10, NARA-SE, RG 142, OHR, Box 1; Mary Jane Lowe, "Oral History Interview with Joseph Swidler," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, June 18, 1991, no pagination, NARA-SE, RG 142, OHR, Box 8. Also see, "TVA is Seeking to Give Lead in Air Pollution Control," *New York Times*, February 1, 1970, F15; and Aubrey J. Wagner, "TVA's Role and Its Effect on the Environment," remarks before the Tennessee Group, Sierra Club, Nashville, Tennessee, November 12, 1971, 6, NARA-SE, RG 142, PMF, Box 138.

⁹⁶ Winter, "Oral History Interview with G. O. Wessenauer," 44, NARA-SE, RG 142, OHR, Box 9, "It meant that the wives could go out and work now and they couldn't before. They had to stay home, because it was just too much labor to be done there. They could live better. That's what it meant." And Lowe, "Oral History Interview with G.

cleaner home, or a safer home, appliances became iconic symbols of the middle and upper class American household.⁹⁷ In the Authority's narrative, inexpensive electricity formed the foundation of the modern home.⁹⁸



Figure 2.1: TVA Cornucopia – Picture from a TVA promotional pamphlet depicting a cornucopia overflowing with consumer goods. Source: TVA Office of Power, “Rate Reductions by the Distributors of TVA Power,” informational pamphlet, July 1956, 12, UTK: Hodges, TVA PC, Box 4, Folder 8.

O. Wessenauer,” 13-4, NARA-SE, RG 142, OHR, Box 10, “I don’t think too many people realize the importance of electrical energy in carrying out the chores that women had in the house. Electricity in the home meant washing machines, dryers, ranges, everything.” Also see, Clapp, “Too Little Electricity,” 5-6, UTK: Hodges, TVA PC, Box 1, Folder 1; and TVA Office of Power, “Rate Reductions by the Distributors of TVA Power,” informational pamphlet, July, 1956, 11, UTK: Hodges, TVA PC, Box 4, Folder 8. For a longer discussion of the TVA’s commitment to the idea that electricity lightened the burden on housewives see Chapter One of this dissertation. Many scholars have found claims regarding electric power, housework, and women to be dubious; see Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave* (New York: Basic Books, 1984); and Nye, *Electrifying America*, 238-86.

⁹⁷ If one wants to point to a specific event that demonstrated the symbolic importance of electric appliances in the cultural milieu of the postwar era it would be Vice President Richard Nixon’s “Kitchen Debate” with Soviet Premier Nikita Khrushchev at the American National Exhibition in Moscow in 1959; see, Elaine Tyler May, “Cold War–Warm Hearth: Politics and the Family in Postwar America,” in *The Rise and Fall of the New Deal Order, 1930-1980*, eds. Steve Fraser and Gary Gerstle (Princeton: Princeton University Press, 1989), 157-8.

⁹⁸ For example, Clapp, “Too Little Electricity,” 6, UTK: Hodges, TVA PC, Box 1, Folder 1, “Electric washing machines are replacing the backbreaking scrub board and tub – refrigeration, electric water heaters, and the electric range are transforming the requirements and outlets for human energies in manifold ways.”

The TVA's presentation of statistics regarding electricity usage in its service area further underscored the extent to which the tenets of the public power movement became entrenched in the Authority after World War II. The agency's annual reports and its promotional literature touted increases in the consumption of electricity that occurred in the Tennessee Valley Region throughout the late 1940s and 1950s. In fact, the Authority published a yearly brochure, "TVA Power," devoted entirely to the operation of the power program. The 1948 brochure demonstrated that the typical home in the Tennessee Valley Region consumed over four times as much electric power as it had in 1933, before the arrival of the TVA, while the 1952 brochure suggested that total residential use had quadrupled in the seven years since the end of the war.⁹⁹ Other issues depicted the year to year expansion of residential use as a part of an upward curve.¹⁰⁰ [Fig. 2.2] At the same time, "TVA Power" addressed surges in industrial and defense related consumption, illustrating the massive contribution that federal installations and large manufacturers made to the volume of electricity distributed in the region.¹⁰¹ The Authority's annual reports presented similar statistics.¹⁰²

Focusing on residential and industrial use privileged energy consumption as a marker of regional progress. The TVA's promotional literature often discussed yearly increases in the

⁹⁹ TVA, "TVA Power, 1948," undated informational pamphlet, 8, NARA-SE, RG 142, PMF, Box 17; and TVA, "TVA Power, 1952," informational pamphlet, December, 1952, 8, NARA-SE, RG 142, PMF, Box 17.

¹⁰⁰ For examples see, TVA, "TVA Power, 1950," informational pamphlet, December 31, 1950, 16, NARA-SE, RG 142, PMF, Box 17; TVA, "TVA Power, 1951," informational pamphlet, November, 1951, 8, NARA-SE, RG 142, PMF, Box 17; TVA, "TVA Power, 1955-56," informational pamphlet, January, 1956, 24, NARA-SE, RG 142, PMF, Box 17; and "TVA Power, 1956-57," informational pamphlet, January, 1957, 29, UTK: Hodges, TVA PC, Box 4, Folder 8.

¹⁰¹ For examples see, TVA, "TVA Power, 1957-58," informational pamphlet, January, 1958, 9, NARA-SE, RG 142, PMF, Box 17; and TVA, "TVA Power, '58-'59," informational pamphlet, March, 1959, 10, NARA-SE, RG 142, PMF, Box 17.

¹⁰² Almost every annual report notes the amount of electricity consumed by residential users as well as that consumed by large industries and the federal government.

number of customers using the agency's power.¹⁰³ The Authority also compared its rates and the volume of residential consumption in its service area to national averages, demonstrating that households in the Tennessee Valley Region consistently used more electricity while paying less than their peers throughout the country.¹⁰⁴ In short, TVA publications measured the relative health of the agency's service area in kilowatt-hours and cents. Increases in consumption relative to the rest of the United States indicated that the region was beginning to shed its status as a rural backwater. Meanwhile, the emphasis that the Authority placed on comparing its rates to those charged in in other areas of the country reflected the agency's belief that simply reducing the cost of electricity could have a large effect on overall use, implying that the path to progress was paved with inexpensive kilowatts and public power.

¹⁰³ For a few representative examples see, TVA, "TVA Power, 1948," undated informational pamphlet, 12, NARA-SE, RG 142, PMF, Box 17; TVA, "TVA Power, 1949," undated informational pamphlet, 12, NARA-SE, RG 142, PMF, Box 17; TVA, *Annual Report, 1950* (Washington, D.C.: Government Printing Office, 1950), 35-7; and TVA, *Annual Report, 1951*, 13.

¹⁰⁴ By the 1955 fiscal year, the TVA's residential customers used and average of 5,240 kilowatt-hours nearly twice as much power per household as the national average; see, "TVA Power, 1955-56," informational pamphlet, January, 1956, 24-5, NARA-SE, RG 142, PMF, Box 17. After World War II, TVA customers routinely used more power than the national average while paying lower rates; see, TVA, "TVA Power, 1946," undated informational pamphlet, no pagination, NARA-SE, RG142, PMF, Box 17; TVA, "TVA Power, 1948," undated informational pamphlet, 8, NARA-SE, RG 142, PMF, Box 17; TVA, "TVA Power, 1950," informational pamphlet, December 31, 1950, 16, NARA-SE, RG 142, PMF, Box 17; TVA, "TVA Power, 1951," informational pamphlet, November, 1951, 8 and 18, NARA-SE, RG 142, PMF, Box 17; TVA, "TVA Power, 1956-57," informational pamphlet, January, 1957, 22 and 29, UTK: Hodges, TVA PC, Box 4, Folder 8; and TVA, "TVA Power, '58-'59," informational pamphlet, March, 1959, 29 and 31, NARA-SE, RG 142, PMF, Box 17. Also see, TVA, *Annual Report, 1950*, 35; and TVA, *Annual Report, 1955*, 3.

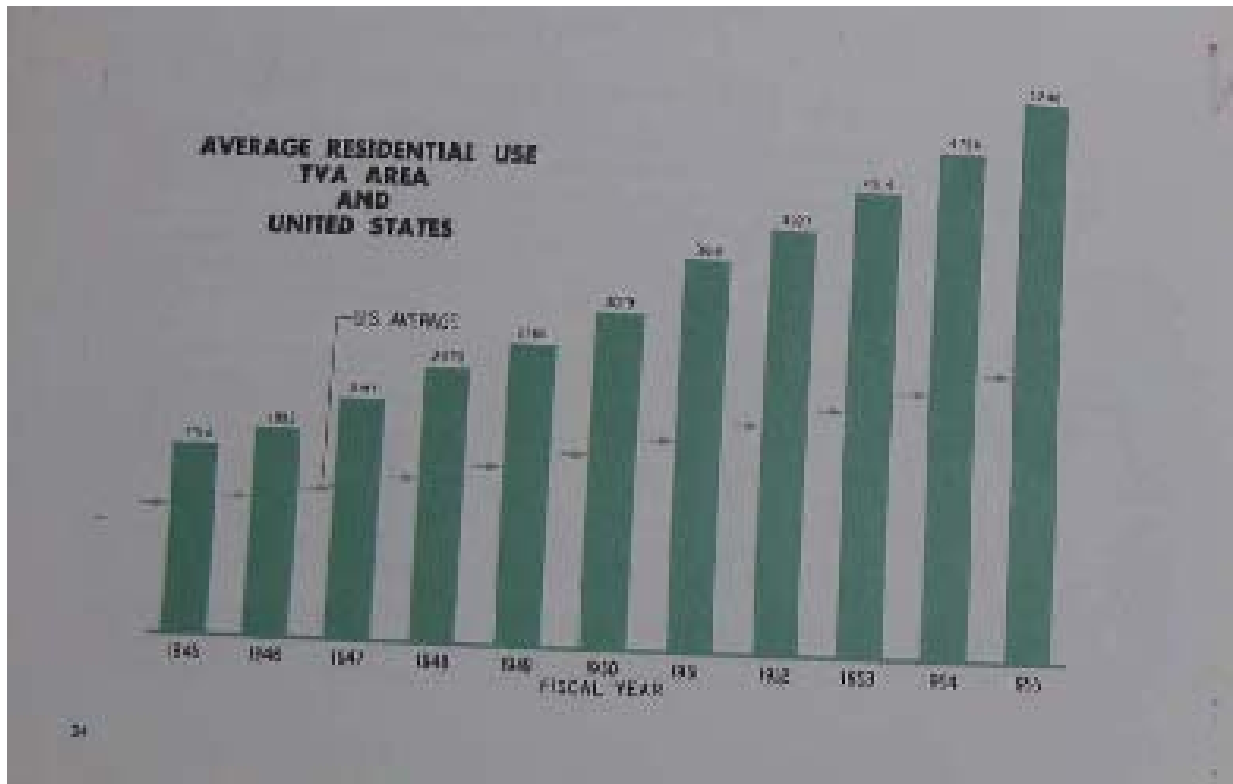


Figure 2.2: Residential Electricity Use, 1945-1955 – Average residential use in the TVA’s service area 1945-1955. Source: TVA, “TVA Power, 1955-56,” informational pamphlet, January, 1956, 24, NARA-SE, RG 142, PMF, Box 17.

Speaking years later, many of the TVA’s employees agreed that the goals of the public power movement remained synonymous with those of the Authority in the postwar era. H. N. Stroud and W. C. Whisenant, both of whom worked at the TVA after World War II, argued that the Authority was not simply selling power for the sake of selling power; instead, the agency “was promoting the benefits of what electricity could do” for the people of the region.¹⁰⁵ Others lamented the extent to which the power program dominated the agency in the 1950s, suggesting that those in charge of the TVA and especially its Office of Power believed that the agency “was

¹⁰⁵ Quote taken from, No Author, “Conversation with W. C. Whisenant on Employee Orientation Program,” 4, NARA-SE, RG 142, OHR, Box 1. Stroud put it this way, “That’s the way we encourage using electricity – not just to sell more, but to provide a benefit to the people. ... We were pushing a way of living.” See, No Author, “Conversation with H. N. Stroud about Employee Orientation Program,” May 28, 1982, 33, NARA-SE, RG 142, OHR, Box 133. According to Jim Ward, the TVA increased its capacity, “Not to build load for load’s sake, but to encourage people to use electricity to improve the quality of life in the home and on the farm.” See, No Author, “Conversation with Jim Ward on Employee Orientation Program,” 11, NARA-SE, RG 142, OHR, Box 1.

put on this planet to produce cheap kilowatts.”¹⁰⁶ John Ferris, who was in charge of industrial development in the 1930s and the early 1940s, regretted that “people [in the Authority] began to think more and more of power as a thing in itself” rather than as one part of a multipurpose conservation program.¹⁰⁷ Whether defending the TVA’s policies or criticizing its leadership, they all agreed that the Authority was still committed to generating an abundant supply of inexpensive electricity in the years following World War II. As A. A. Foster, a scientist in the agency’s Forestry, Fisheries, and Wildlife Development Division, ruefully acknowledged, “power is the heart of TVA.”¹⁰⁸

Although the Authority often claimed that increases in demand necessitated its construction program, in reality the agency was not passively subject to the whims of the energy market. In fact, the TVA’s leadership believed that an ever-increasing supply of electricity would stimulate the levels of consumption that the agency desired. In a speech before the Southern Economic Association in 1958, Dr. Frank Welch, a member of the Authority’s board of directors, delivered a succinct articulation of the agency’s position.

Power supply is vital to industry, commerce, and agriculture in the southern region. The one sure way for this region to falter in its industrial progress and development is to find itself without an adequate power supply to enable it to stay ahead of expanding needs. By adequate power supply I mean something more than just enough to meet today’s loads, more even than tomorrow’s loads of which we may have definite knowledge. *I mean supply which anticipates and*

¹⁰⁶ I will discuss internal criticism of the power program and the TVA’s consumption centric energy regime in Chapter Five. A vocal group of scientists within the agency challenged the Authority’s production strategies and its reliance on massive coal-fired power plants almost as soon as the TVA began building them in the late 1940s and 1950s. Mary Jane Lowe, “Oral History Interview with A. A. Foster,” part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, March 7, 1991, 15, NARA-SE, RG 142, OHR, Box 3. Foster also suggested that the TVA’s leaders “were basically a cheap kilowatt crowd” and that “The level of environmental thinking in TVA back then was appalling.” See, *Ibid.*, 16.

¹⁰⁷ Quoted in Hargrove, *Prisoners of Myth*, 104 (also see, page 62).

¹⁰⁸ Lowe, “Oral History Interview with A. A. Foster,” 28, NARA-SE, RG 142, OHR, Box 3.

*encourages developments now unknown – a supply of power which reflects the aspirations of this region and confidence in its future.*¹⁰⁹

Welch's statement demonstrated the TVA's understanding of the causal relationship between energy abundance and regional prosperity. Cheap kilowatts could be used as a tool to stimulate the expansion of industry. More generally, Welch's speech signaled that a policy of expansion had become institutionalized within the Authority. The agency's leadership believed that one of the best ways to ensure continued growth in the amount of energy consumed in its service area was to make certain that the supply of electricity always outstripped demand.¹¹⁰

Furthermore, Welch's articulation of electric power's role in fulfilling the aspirations of the region and instilling confidence in the future reinforced the TVA's mission of uplift and connected the agency's energy regime with broader cultural impulses in the United States. In a country that had experienced deprivation during the Great Depression and austerity during World War II, the unfettered consumption of goods and services became a defining feature of national identity in the 1950s and 1960s. Participation in the consumer economy tapped into foundational myths regarding upward mobility and the virtues of democratic society, creating a sense of social citizenship and belonging. A region and a people striving for prosperity required inexpensive kilowatts. In this way, the Authority characterized public power as one of the bulwarks of the American Dream because it increased popular access to electricity and an energy-intensive

¹⁰⁹ Dr. Frank J. Welch, "Electric Power Needs for Southern Industrial Development," (paper by Dr. Frank J. Welch, Director, Tennessee Valley Authority, before the Southern Economic Association, Atlanta, Georgia, November 22, 1958), 2, NARA-SE, RG 142, PMF, Box 138, emphasis my own.

¹¹⁰ As Gordon Clapp put it, "If you would destroy a region, you destroy its power supply. ... If you would build a region, you build an ever greater and greater supply of electric energy." See, Clapp, "Power Supply," 3, UTK: Hodges, TVA PC, Box 4, Folder 8; indeed, on page 3 Clapp also explicitly stated that the TVA had a policy of building capacity ahead of demand, "From the beginning of the TVA we have recommended and repeatedly urged that power in abundance must precede industrial development." His rhetoric on page 4 of the same document also suggested that this had become something of an article of faith for the Authority's leadership, "Each year – next year, the year after that, and each year after that – as far ahead as we can foresee the Tennessee Valley must add 750,000 kw of new power plant capacity if jobs in the region are to increase, if payrolls are to multiply, if the region's income is to continue to climb toward the national average." For a more detailed discussion of the process of promoting electricity, see Chapter Three of this dissertation.

lifestyle, allowing individuals and communities, for example, to take full advantage of the burgeoning market for appliances. The egalitarian rhetoric of the TVA's consumption-centric regime manifested itself in the extent to which the agency ensured widespread use of electric power.¹¹¹

The Authority's decision to achieve energy abundance by building a series of massive, coal-fired power plants illustrated its commitment to low rates. Continuing a policy that began before World War II, the agency's contracts with its distributors contained prescribed rate schedules for residential users. The TVA designed these schedules to promote the widespread adoption of in-home appliances by reducing the cost of electricity per kilowatt-hour consumed as the volume of use increased.¹¹² To ensure that its rates covered the cost of producing power, the Authority had to design its system of generating facilities to operate as inexpensively as possible. Given the abundance of coal in and around the Tennessee Valley Region and the absence of strict environmental regulations, coal-fired plants represented the most cost-effective choice for expansion in the 1940s and 1950s. Furthermore, larger facilities produced power more efficiently than smaller ones as a function of capital costs, allowing the Authority to charge its customers less per kilowatt-hour of electricity consumed. As G. O. Wessenauer, the manager of the TVA's Office of Power, declared in a 1946 speech, "Simply stated, these [the power program's] goals are maximum use of electricity by the greatest number of people at the lowest possible rates."¹¹³

¹¹¹ On the social citizenship and the aspirational qualities of consumer culture in the postwar era, see Cohen, *A Consumer's Republic*; and Suzanne Mettler, *Dividing Citizens: Gender and Federalism in New Deal Public Policy* (Ithaca: Cornell University Press, 1998).

¹¹² TVA Office of Power, "Rate Reductions by the Distributors of TVA Power," informational pamphlet, July, 1956, 4 and 11-2, UTK: Hodges, TVA PC, Box 4, Folder 8. Also see, No Author, "Conversation with Jim Ward on Employee Orientation Program," 9 and 19, NARA-SE, RG 142, OHR, Box 1; Lowe, "Oral History Interview with G. O. Wessenauer," 50, NARA-SE, RG 142, OHR, Box 10.

¹¹³ G. O. Wessenauer, "TVA and Rural Electrification," (presented by G. O. Wessenauer, Manager of Power, Tennessee Valley Authority, before the Annual Meeting of Members of the Tennessee Rural Electric Cooperative

The fact that the Authority located its coal-fired steam plants in rural areas also reflected the emphasis that the agency placed on consumption and consumers.¹¹⁴ As noted in Chapter One, the public power movement had envisioned electricity as source of clean energy even when it was produced in coal-fired steam plants.¹¹⁵ Instead of industries and homes fouling the atmosphere with smoke from their individual furnaces, instead of the soot, haze, and residue associated with candles or gas and oil lamps, electric energy allowed users to rid themselves of the noxious environmental side effects of generating power. By divorcing the consumption of power from the site of production, electric energy made a quality environment compatible with a growing, industrialized economy and the creature comforts of the modern home.¹¹⁶

Air pollution had been a major problem in Nashville, Knoxville, and Chattanooga. Due to surrounding topographical features, all three cities suffered from periods of atmospheric stagnation that prevented the dispersal of airborne pollutants. The situation was at its worst in

Association, at the Andrew Jackson Hotel, Nashville, Tennessee on January 8, 1946), 12, UTK: Hodges, TVA PC, Box 4, Folder 8. Similar sentiments were expressed in, Harwell and Caldwell, "TVA in Crisis: an interview with Gordon Clapp," 8, found in UTK: Hodges, TVA PC, Box 1, Folder 2; and TVA, "Dynamic Decade: TVA in the Nineteen-Fifties," undated informational pamphlet, 1, UTK: Hodges, TVA PC, Box 1, Folder 1. Indeed, a strain of Benthamite utilitarianism undergirded much of the TVA's power program and many of its other programs as well.

¹¹⁴ A variety of other factors influenced the TVA's decision when siting its facilities. Due to their size, the steam plants required a steady supply of water for cooling purposes, making a location on a river necessary. It was not happenstance that the Authority often chose locations on the Tennessee River and its tributaries. Proximity to coal fields and railroads was also a factor as the TVA tried to reduce the cost of transporting fuel to its facilities. Similarly proximity to load centers could help reduce the cost of transmission. Land values near the plant were also important.

¹¹⁵ In fact Gifford Pinchot's Giant Power proposal relied entirely on massive coal-fired steam plants located in isolated mining areas, yet he still argued that electricity represented a source of clean energy because it removed soot and smoke from homes and businesses; see Gifford Pinchot, "Governor Pinchot's Message of Transmittal," in *Report of the Giant Power Survey Board to the General Assembly of the Commonwealth of Pennsylvania*, eds. Morris Llewellyn Cooke and Judson C. Dickson (Harrisburg: The Telegraph Printing Co., 1925), iii-xiii.

¹¹⁶ William Cronon also demonstrates how the separation of production from consumption became necessary and defining feature of the modern industrialized economy that allowed consumers to remain ignorant of the environmental consequences of their participation in mass markets; see William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton & Co., 1991). More recently Michael Pollan has made a similar observation in regard to American cuisine and diet; see Michael Pollan, *The Omnivores Dilemma: A Natural History of Four Meals* (New York: Penguin Press, 2006).

winter when most of the area's urban residents used coal to heat their homes.¹¹⁷ The soft, bituminous coal that was plentiful in Tennessee emitted copious amounts of ash when burned. TVA employees recalled that smoke from residential furnaces and industries fouled the air in Knoxville, hanging like a cloud over the city.¹¹⁸ The same was true in Chattanooga where the soot could blacken the collar of a white shirt in one workday.¹¹⁹ In Nashville, TVA lawyer Joseph Swidler recalled that the air became so dark and thick with smoke that it was difficult to see across the street in the morning, noting that “[t]he news boys riding bicycles had handkerchiefs around their noses and mouths to help fight the soot and dirt, pollution.”¹²⁰ Even indoors, there was little respite from the noxious side effects of burning coal. The emissions from in-home furnaces inundated the air leaving a layer of dust on curtains and walls.¹²¹ The Authority promoted electricity as a solution to the coal-smoke problem in its service area, suggesting that electric power provided clean energy for the home while arguing that it was easier to regulate the air pollution from a single, state-of-the-art, coal-fired facility than the many small, inefficient furnaces and generators previously used in the region's homes and industries.¹²²

¹¹⁷ “TVA is Seeking to Give Lead in Air Pollution Control,” *New York Times*, February 1, 1970, F15; Aubrey J. Wagner, “TVA’s Role and Its Effect on the Environment,” remarks before the Tennessee Group, Sierra Club, Nashville, Tennessee, November 12, 1971, 6, NARA-SE, RG 142, PMF, Box 138; and No Author, “Conversation with W. C. Whisenant on Employee Orientation Program,” 9-10, NARA-SE, RG 142, OHR, Box 1.

¹¹⁸ “TVA is Seeking to Give Lead in Air Pollution Control,” *New York Times*, February 1, 1970, F15; Wagner, “TVA’s Role and Its Effect on the Environment,” remarks before the Tennessee Group, Sierra Club, Nashville, Tennessee, November 12, 1971, 6, NARA-SE, RG 142, PMF, Box 138; and No Author, “Conversation with W. C. Whisenant on Employee Orientation Program,” 9-10, NARA-SE, RG 142, OHR, Box 1; and Lowe, “Oral History Interview with Joseph Swidler,” no pagination, NARA-SE, RG 142, OHR, Box 8.

¹¹⁹ No Author, “Conversation with W. C. Whisenant on Employee Orientation Program,” 9-10, NARA-SE, RG 142, OHR, Box 1; on page 10 of the interview Whisenant notes that with all of the smoke, “You could see a layer and couldn’t see Chattanooga.”

¹²⁰ Lowe, “Oral History Interview with Joseph Swidler,” no pagination, NARA-SE, RG 142, OHR, Box 8.

¹²¹ Lowe, “Oral History Interview with Joseph Swidler,” no pagination, NARA-SE, RG 142, OHR, Box 8.

¹²² For promotional material see, W. D. Thompson to Scotty Bobo, July 6, 1973, NARA-SE, RG 142, PMF, Box 10; indeed, the Federal Power Commission used a similar narrative in its 1971 publication, “Managing the Power Supply and the Environment,” noting that situating plants in rural areas was a central element of pollution control prior to the 1970s; see, Federal Power Commission: Special Task Force on the Environment, “Managing the Power Supply and the Environment,” Report of the Federal Power Commission’s National Power Survey Special Task

The TVA's preference for expanding its power network by constructing massive, rurally-located, coal-fired facilities represented an outgrowth of the agency's continued commitment to the consumption-centric tenets of the public power movement. Rather than many small steam plants, the Authority's leaders opted for large generating stations because they reduced the infrastructural cost of production on a per-kilowatt basis as a result of their greater efficiency. Finally, the TVA chose to build its coal-fired power plants far away from major population centers to maintain electricity's image as a source of clean energy for consumers, a decision that reflected an acknowledgement of coal's environmental consequences and one that later undermined the agency's standing in the region.¹²³

Kilowatts-For-Defense

As a complement to the public power ideal, the Authority's kilowatts-for-defense narrative helped to build support for the agency's decision to pursue coal-fired electricity throughout the 1940s and 1950s. In fact, a link between the hydroelectric capacity of the Tennessee Valley and production for war had existed for several decades. As discussed in

Force on the Environment, July 1, 1971, 11, NARA-SE, RG142, PMF, Box 157. Also see, "Electric Power and Clean Air – Can We Have Both?" *Tennessee Valley Perspective*, Summer 1973, 3(4), 19-20; TVA, *Annual Report, 1967* (Washington, D.C.: Government Printing Office, 1967), 6; TVA, *Annual Report, 1968* (Washington, D.C.: Government Printing Office, 1968), 12; "TVA is Seeking to Give Lead in Air Pollution Control," *New York Times*, February 1, 1970, F15; and Wagner, "TVA's Role and Its Effect on the Environment," remarks before the Tennessee Group, Sierra Club, Nashville, Tennessee, November 12, 1971, 6, NARA-SE, RG 142, PMF, Box 138.

¹²³ In 1941, for example, the Authority rejected the Nashville suburb of Bordeaux as a site for a future facility because of its proximity to the downtown area. Although much of the electricity from the new plant would flow to the middle Tennessee city, the TVA recognized that Nashville already suffered from air quality issues. Building a coal-fired facility at Bordeaux would only exacerbate the problem, reflecting poorly on the cleanliness of TVA electricity while forcing the agency to include expensive pollution controls in the design of the plant. S. H. Woodward and W. H. Chambers, "Preliminary Report: Additional Power Generation Capacity in Steam Plants," internal report, June 20, 1941, 3, NARA-SE, RG 142, OEDC, Box 95. Later the TVA rejected a location on Kentucky Lake for its Paradise Steam because of the site's proximity to important recreation areas; see, TVA Division of Water Control Planning Project Planning Branch, *Summary Report of Site Selection Studies Northwestern Area Steam Plant* (Knoxville, TN, October 1959), 5, copy found in NARA-SE, RG 142, OEDC, Box 628; Memorandum, G. P. Palo to A. J. Wagner, "Northwestern Area Steam Plant," October 1, 1959, NARA-SE, RG 142, OEDC, Box 628; and TVA, *The Paradise Steam Plant: A Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Two-Unit Plant*, Technical Report No. 37 (Knoxville, TN: TVA, 1964), 11-15, copy found in NARA-SE, RG 142, OEDC, Box 636. Also see Chapter Three, Chapter Five, and Chapter Six.

Chapter One, the Wilson administration's primary reason for supporting legislation to build dams in the area around Muscle Shoals had been to produce nitrates for manufacturing munitions. In 1939, David Lilienthal had written to President Roosevelt, offering the services of the TVA should the United States enter the war in Europe. Less than a year later he outlined the Authority's ability to make nitrates as well as its plans for constructing six new dams to boost its hydroelectric capacity by 1942.¹²⁴ In a nationally broadcasted speech on May 12, 1941, Lilienthal articulated the importance of the Authority's power program for the United States, arguing that the agency was, "an important arm of our national defense" and "an illustration of how democracy prepares for war."¹²⁵ After the Japanese attacked Pearl Harbor, Gordon Clapp, who was then the TVA's general manager, suggested that the Authority should make it known that the agency had "become in fact the inner citadel of the nation's war production[.]"¹²⁶ Indeed, the TVA's leadership made a special effort to connect the Authority with the success of the war effort.

The conservative opposition to the TVA's power program did not disband after losing the fight over the Johnsonville Steam Plant. The charge of socialism proved to be an enduring criticism of the Authority at both the national and local levels. In particular, anti-TVA newspapers in western Kentucky accused the Authority of "Rank Communism" and suggested that Soviet Premier Nikita Khrushchev would "Feel Right at Home" in the Tennessee Valley Region, while the *Chicago Daily Tribune* and the *Wall Street Journal* published numerous articles decrying public power.¹²⁷ Dwight Eisenhower also became a vocal foe of the TVA

¹²⁴ Hargrove, *Prisoners of Myth*, 60.

¹²⁵ Both quotes from, TVA and David E. Lilienthal, "The TVA and National Defense: An Address by David E. Lilienthal, Director of the Tennessee Valley Authority, over the Columbia Broadcasting System on Monday, May 12, 1941, at 3:45 p.m.," 1, NARA-SE, RG 142, OEDC, Box 85.

¹²⁶ Quoted in Hargrove, *Prisoners of Myth*, 61.

¹²⁷ For two examples from a local paper see, "Electric Co-ops Putting KU Out of Business is Rank Communism," *Messenger-Times-Argus*, Central City, KY, October 1, 1959, 7; and "Mr. Khrushchev, You'll Feel Right at Home

during his time as president, earning praise from the conservative press for his efforts at impeding “the development of the socialistic monster known as the Tennessee valley authority[sic].”¹²⁸ Shortly after taking office, Eisenhower referenced the Authority as an example of “creeping socialism,” repeating claims that the TVA’s power program benefited from government subsidies in the form of tax receipts from the rest of the nation.¹²⁹ Although Eisenhower maintained that he did not wish to destroy the TVA and that he simply preferred that the federal government become more of a partner to private industry, his administration tried to prevent the Authority from expanding its power program in what became known as the Dixon-Yates controversy.¹³⁰

In 1953, the TVA requested an appropriation for a new steam plant that would help it meet the growing needs of the city of Memphis and the Atomic Energy Commission’s (AEC) facility near Paducah, Kentucky. Instead of approving the power plant, the Bureau of the Budget developed a compromise whereby the Authority would cede some of its service area to a private utility, the Mississippi Valley Generating Company, that was to be controlled by Edgar H. Dixon of the Middle South Utilities Corporation and Eugene A. Yates of the Southern Company. The Eisenhower administration did not want the TVA to continue its policy of expansion. Although the proposal fell apart in 1955 amid allegations that the private utilities involved had a conflict of interest with the consulting firm working on the plan and after the city of Memphis decided to

Visiting TVA,” *Messenger-Times-Argus*, Central City, KY, September 3, 1959, 1. Nationally see, “TVA Propaganda,” *Chicago Daily Tribune*, September 24, 1955, 12; “TVA Socialism and the Election,” *Chicago Daily Tribune*, October 9, 1954, 14; and “Vogel Testifies TVA Alone Should Build New Power Plants in its Area,” *Wall Street Journal*, August 10, 1954, 5.

¹²⁸ For quote see, “TVA Socialism and the Election,” *Chicago Daily Tribune*, October 9, 1954, 14; the fact that the *Daily Tribune* chose not to capitalize “valley” or “authority” is rather symbolic of its position on the TVA.

¹²⁹ “Eisenhower Points to the T.V.A. as ‘Creeping Socialism’ Example,” *New York Times*, June 18, 1953, 1.

¹³⁰ “Eisenhower Points to the T.V.A. as ‘Creeping Socialism’ Example,” *New York Times*, June 18, 1953, 1. Initially many of the TVA’s supporters also believed that Eisenhower appointed Herbert Vogel as chairman of the board of directors in 1954 with the understanding that Vogel would hinder the agency’s operations from the inside. Instead, Vogel became committed to the institution; see, Hargrove, *Prisoners of Myth*, 140-7.

build its own power plant, the Dixon-Yates controversy, along with an earlier attempt by a conglomeration of electric companies to build a generating facility in direct competition with the TVA near Joppa, Illinois, demonstrated the resilience of conservative opposition to the agency.¹³¹ The kilowatts-for-defense narrative became an important counterweight to Eisenhower and the rest of the Authority's critics.

Throughout the 1940s and 1950s, the TVA highlighted the power program's accomplishments during World War II. The Authority's annual reports portrayed increases in the agency's generating capacity as both necessary and helpful contributions to the war effort, emphasizing the importance of electricity to the production of munitions, aluminum, and the atomic bomb.¹³² Other publications that commemorated the Authority's first decades of service also discussed the connection between the TVA and the United States' successes in the war.¹³³

In speeches, the Authority's leadership and its employees celebrated the role of TVA electricity in buttressing national security.¹³⁴ For example, Harry Wiersema, the assistant to the

¹³¹ The most complete account of the Dixon-Yates controversy can be found in Aaron Wildavsky, *Dixon-Yates: A Study in Power Politics* (New Haven: Yale University Press, 1962); it is also addressed in Droze, "TVA, 1945-80," 73-4; and in passing in Hargrove, *Prisoners of Myth*, 142-4. In the earlier incident a group of utilities under the moniker Electric Energy, Inc., built a steam plant at Joppa, Illinois, as part of a competition with the TVA's new Shawnee (Kentucky) facility. Each plant was to provide approximately half of the power for the AEC's new facility at Paducah, Kentucky. The EEI's plant suffered from cost overruns and construction delays while charging higher rates for power, a fact that the TVA was more than happy to point out; see, TVA, "TVA, AEC, and EEInc," informational report, August 19, 1953, 3, UTK: Hodges, TVA PC, Box 4, Folder 8.

¹³² For example, "More than one-half the total increase in capacity, moreover, was achieved in the past 3 years in order to muster the power resources of the region for war, to meet the power demands of new industrial plants and to keep pace with the conversion and expansion of existing plants for war." Quoted in TVA, *Annual Report, 1943*, 34. Also see, TVA, *Annual Report, 1940*, 28; TVA, *Annual Report, 1941*, 1-3; TVA, *Annual Report, 1942*, 1-7 and 16; TVA, *Annual Report, 1943*, 1-2 and 34; TVA, *Annual Report, 1944* (Washington, D.C.: Government Printing Office, 1944), 1-2 and 37; and TVA, *Annual Report, 1945*, 1-2 and 57, the TVA did not discuss Oak Ridge until its 1945 report which came out after the United States had dropped atomic bombs over Hiroshima and Nagasaki.

¹³³ For examples see, TVA, "A Short History of the Tennessee Valley Authority, 1933-1956," 2, UTK: Hodges, TVA PC, Box 1, Folder 1; TVA, "A Report to the Nation from the Tennessee Valley Authority on its First Twenty-Five Years, 1933-1958," 6, UTK: Hodges, TVA PC, Box 1, Folder 1; Sherman M. Woodward, "TVA and Resource Development," report for information office, January 28, 1948, 18, NARA-SE, RG 142, OEDC, Box 115.

¹³⁴ For a later example see, TVA and Gordon R. Clapp, "Power Supply in the Development of the Region: Address by Gordon R. Clapp, Chairman of the Board, Tennessee Valley Authority, to the Kiwanis Club, Knoxville, Tennessee, December 4, 1952," 2, UTK: Hodges, TVA PC, Box 4, Folder 8; "During World War II, electric power from the TVA averted a crisis in aluminum production and kept new bombers flowing from assembly lines. The

chief engineer, argued that the Authority had expanded its power network at the behest of the Office of Production Management (the predecessor to the War Production Board), building dams in record time while supplying most of its electricity to defense industries.¹³⁵ As Wiersema noted, “it is undoubtedly in the production of electric power that the Authority is helping most in the war effort.”¹³⁶ It was easy for the TVA to shift its attention to the Cold War once the conflict in Korea and the nuclear arms race began. The agency emphasized its relationship with Oak Ridge National Laboratory and the Atomic Energy Commission.

The volume of electricity that the AEC consumed became an important and repeated element of the Authority’s narrative. The TVA’s annual report for 1945 claimed that the Manhattan Project had located one of its facilities at Oak Ridge specifically to take advantage of the Authority’s ability to provide a consistent supply of electric power in large quantities.¹³⁷ In a variety of lectures and publications, the TVA continually portrayed Oak Ridge, and later the Atomic Energy Commission, as having a voracious appetite for energy, noting variously that Oak Ridge had consumed 1.6 billion kilowatt-hours of electricity in 1945, that this total was almost as much as the entire state of Florida in the same year, that the Atomic Energy Commission had increased its demand for kilowatts by a factor of eleven between 1950 and 1955, and that in 1956 the AEC’s facilities at Oak Ridge and Paducah were projected to use twice as much power as the eight million residents of New York City.¹³⁸ According to the

prewar construction of TVA dams and power plants, claimed by critics as a waste, proved to be a stroke of foresight for our national defense.”

¹³⁵ Harry Wiersema, “The Tennessee Valley Authority in National Defense,” undated address, 3-4, NARA-SE, RG 142, OEDC, Box 95.

¹³⁶ Wiersema, “The Tennessee Valley Authority in National Defense,” 2, NARA-SE, RG 142, OEDC, Box 95.

¹³⁷ TVA, *Annual Report, 1945*, 1.

¹³⁸ For example regarding Florida and Oak Ridge’s consumption in 1945 see, O. S. Wessel, “Case-Study the Tennessee Valley Authority: The Power Program,” lecture for Public Administration 461 (no college given), March 12, 1953,3, NARA-SE, RG142, OEDC, Box 180; for the increases in the AEC’s demand see, TVA, “A Short History of the Tennessee Valley Authority, 1933-1956,” 4, UTK: Hodges, TVA PC, Box 1, Folder 1 ; and for comparison to New York City see Wessel, “What TVA Is,” 6, UTK: Hodges, TVA PC, Box 1, Folder 1.

Authority's annual report for 1956, "The power of the atom is realized only by using the power of electricity in immense quantities."¹³⁹

The TVA also described the agency's low rates as a boon for national security. As Gordon Clapp was quick to point out, even fractional differences in the cost of electricity could save the federal government millions of dollars per year given the quantity of power that the AEC's facilities used. Furthermore, Clapp noted that the Authority's policies had encouraged other providers to lower the rates that they charged to federal installations.¹⁴⁰ As it had with the production of aluminum in World War II, the Authority highlighted the importance of its vast quantities of inexpensive electricity to the development and maintenance of the United States' nuclear arsenal during the 1950s.

In this way, the TVA's evolving kilowatts-for-defense narrative supplemented its consumption-centric energy philosophy. The Authority's focus on the volume of electricity used by the AEC's facilities as well as the importance of maintaining low rates represented a justification for coal-fired expansion. After first reminding his audience at the University of Chicago in 1954 that the production of fissionable material required large quantities of energy, Gordon Clapp argued that the nation's development of nuclear weaponry would have been seriously delayed without the foresight of the Authority's leaders and their insistence on expanding the agency's generating capacity.¹⁴¹ Furthermore, Clapp contended that the power program's growth had to continue. Only one year earlier, in a speech before the Kiwanis Club of Memphis, he had noted that demand forecasts for the AEC's plants at Oak Ridge, Tennessee, and

¹³⁹ TVA, *Annual Report, 1956*, 1. According to another informational pamphlet on the power program, the AEC consumed more electricity than all but four other states in 1956, see TVA, "TVA Power, 1956-57," informational pamphlet, January, 1957, 11, UTK: Hodges, TVA PC, Box 4, Folder 8.

¹⁴⁰ Clapp, "Some Questions for Critics," 6-8, UTK: Hodges, TVA PC, Box 1, Folder 2; Clapp, "Power Supply," 7, UTK: Hodges, TVA PC, Box 4, Folder 8; and Coleman A. Harwell and Nat Caldwell, "TVA in Crisis: an interview with Gordon Clapp," special release by *Nashville Tennessean*, February 8, 1956, 7, found in UTK: Hodges, TVA PC, Box 1, Folder 2.

¹⁴¹ Clapp, "Too Little Electricity," 6 and 18, UTK: Hodges, TVA PC, Box 1, Folder 1.

Paducah, Kentucky, suggested that the two facilities alone would consume half of the 60 billion kilowatt-hours that the TVA was scheduled to produce in 1956.¹⁴² According to Clapp, “With the critical role of electrical energy in the nation’s defense program, an ample low-cost supply is necessary to assure the security of the nation and minimize the cost of its defense.”¹⁴³

Through its continued celebration of the agency’s role in powering the United States to victory during World War II, the Authority tied itself to the nation’s ability to project strength abroad while protecting the home-front, suggesting in large part that the country’s military achievements were due to the success of the TVA’s power policies. Similarly, the Authority’s new-found association with the AEC and the atomic bomb linked the agency to one of the enduring symbols of American might in the Cold War.¹⁴⁴ The legislative fight over the appropriation for the Johnsonville Steam Plant and subsequent battles with the Eisenhower administration only underscored the importance of national security in building public support for the TVA’s power program and its consumption-centric policies. As a result, the kilowatts-for-defense narrative became entrenched in the Authority during the 1950s, facilitating the agency’s push for coal-fired expansion.

Technology for the People

For the TVA, technology symbolized progress.¹⁴⁵ More importantly, the Authority’s engineering projects and the technological advances embedded therein became monuments to the agency and its role in improving the Tennessee Valley Region. The series of dams that the TVA

¹⁴² Clapp, “Some Questions for Critics,” 7, UTK: Hodges, TVA PC, Box 1, Folder 2.

¹⁴³ Clapp, “Too Little Electricity,” 6-7, UTK: Hodges, TVA PC, Box 1, Folder 1.

¹⁴⁴ As discussed later in this chapter the TVA also developed a public narrative linking the agency with technological progress. Therefore, the connection between the Authority’s power program and the atom buttressed two aspects of the Authority’s technopolitics.

¹⁴⁵ For a discussion of the link between technology, electricity, and progress as they relate to the TVA see, Creese, *TVA’s Public Planning*, 66-74 and 147-238. Creese’s focus is primarily architecture.

built along the Tennessee River and its watershed during the 1930s and 1940s illustrated the importance of technology to the Authority's self-narrative. The dams' completion marked the first time that all of the facilities regulating a major river had been integrated into a single system providing navigation, flood control, and hydroelectric power. Through the successful operation of its network of dams, the Authority demonstrated the efficacy of multipurpose river development, solidifying the agency's reputation for excellence in engineering.¹⁴⁶

Furthermore, the physical structures of the dams monumentalized the TVA and its vision of technology as a tool of progress in its service area. With their imposing size and concrete construction, the Authority's dams signified the strength of the TVA as an institution and its power in transforming the valley from a land of persistent poverty into one with the potential for growth. The Authority's engineers designed several of the dam sites to be aesthetically pleasing, blending them with their surroundings and reinforcing the idea that technology and the TVA had improved the region.¹⁴⁷ The Authority intended the dams to be tourist attractions in themselves, constructing visitor's centers at several of its projects, including Fontana and Norris Dam, and even selling souvenir post cards of the latter.¹⁴⁸ The New Deal had placed an emphasis on transforming and enhancing both the landscape and the nation's natural resources. In addition to the TVA, agencies like the Civilian Conservation Corps worked to reverse the consequences decades of improper land use.¹⁴⁹

¹⁴⁶ Wilmon Henry Droze, *High Dams and Slack Waters: TVA Rebuilds a River* (Baton Rouge: Louisiana State University Press, 1965); and Creese, *TVA's Public Planning*, 147-238.

¹⁴⁷ Creese, *TVA's Public Planning*, 147-238; Creese argues that Norris Dam, South Holston Dam, and Watauga Dam were the three facilities where the TVA most successfully created a pleasing aesthetic with the surrounding landscape.

¹⁴⁸ Creese, *TVA's Public Planning*, 147-238. I have an old postcard for Norris Dam in my possession. I have not been able to locate a similar postcard for a coal-fired steam plant.

¹⁴⁹ Sarah T. Phillips, *This Land, This Nation: Conservation, Rural America, and the New Deal* (Cambridge: Cambridge University Press, 2007); and Neil M. Maher, *Nature's New Deal: The Civilian Conservation Corps and the Roots of the American Environmental Movement* (Oxford: Oxford University Press, 2008).

The sheer size of the Authority's coal-fired facilities represented a continuation of the technological narrative that the agency's engineers crafted around its dams. The Johnsonville Steam Plant, for example, rose to the height of a 17-story building, dominating the rural landscape along the shores of Kentucky Lake.¹⁵⁰ The TVA's later facilities, like the Kingston Steam Plant, were even taller. Completed in 1955, the tallest of the initial smokestacks at Kingston towered some 300 feet over Watts Bar Lake while the stacks for the first two units at the Paradise Steam Plant, finished in 1963, were 600 feet tall. The plant itself at Paradise was the size of a 22-story building.¹⁵¹

The fact that the TVA located most of its coal-fired facilities in rural areas magnified their physical effect on the landscape. Situated next to farmland and wide reservoirs and among rolling hills, the Authority's power plants rose like islands amidst an otherwise bucolic countryside. The facilities' size and industrial character created a stark contrast with their surroundings, drawing attention to the plants as manifestations of the TVA and its role in modernizing the region. [Fig. 2.3, 2.4, 2.5, and 2.6]

¹⁵⁰ No Author, "Construction of Johnsonville and Widows Creek Steam Plants," article draft, June 30, 1950, 1, NARA-SE, RG 142, OEDC, Box 126.

¹⁵¹ Originally Kingston's first four smokestacks were 250 feet tall and its last five stacks were 300 feet tall. Later the TVA added a pair of 1,000 foot tall stacks to alleviate air pollution; see, TVA, *The Kingston Steam Plant*, Technical Report No. 34, 30; and TVA, *Annual Report, 1973* (Washington, D.C.: Government Printing Office, 1973), 39-43. For Paradise see, William R. Heffren, "Bonanza for Western Kentucky," *L&N Magazine*, 26(11), November 1960, 10-11 and 21, found in NARA-SE, RG 142, OEDC, Box 629; "Work Continues on Big TVA Steam Plant at Paradise," *The Park City Daily News*, Bowling Green, KY, September 4, 1960, 14; and TVA Division of Engineering Design, "Paradise Steam Plant: Final Design Report," Report No. 40-200, May 1964, 24, NARA-SE, RG 142, OEDC, Box 631.

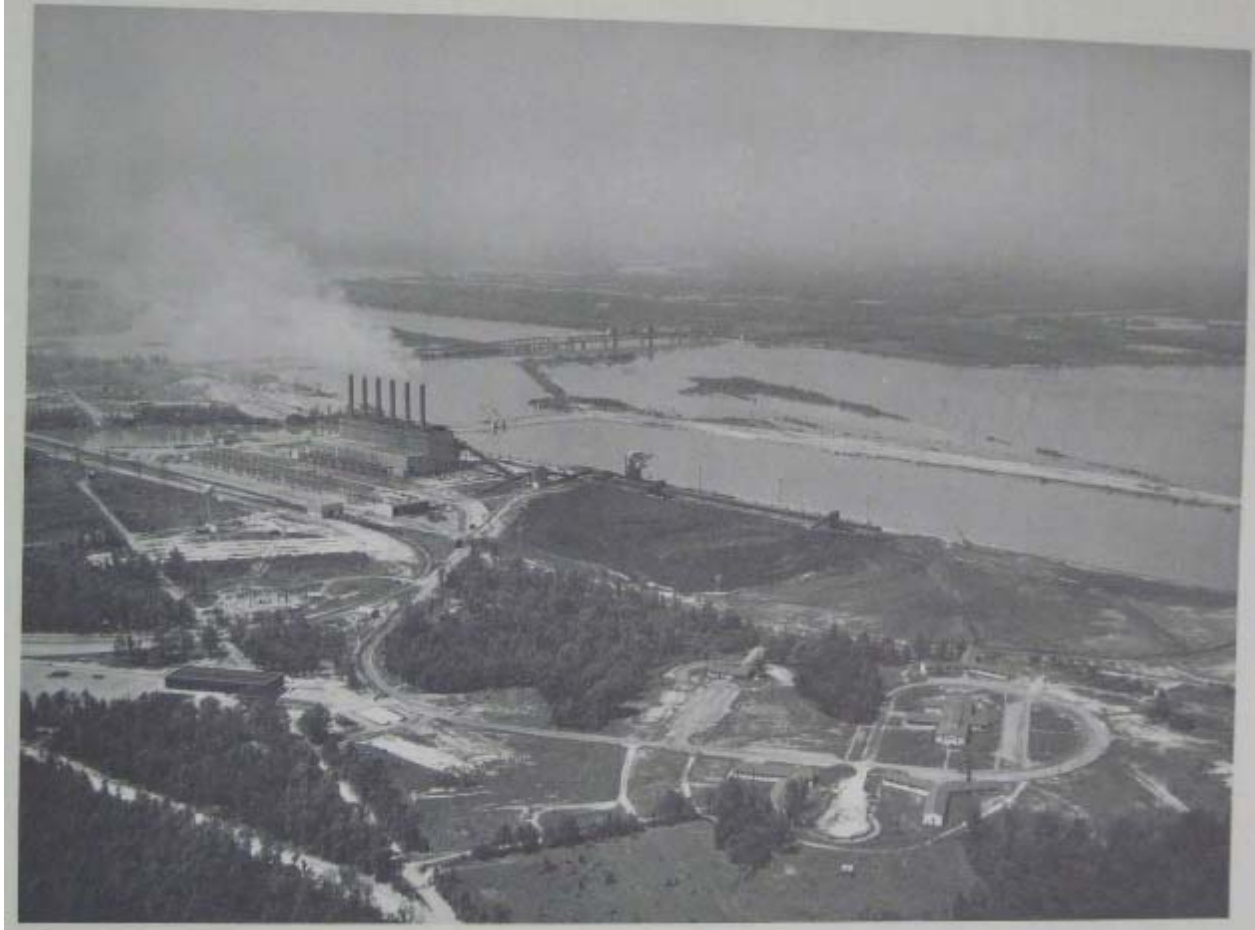


Figure 2.3: Johnsonville Steam Plant circa 1950s (a). Source: TVA, The Johnsonville Steam Plant: A Comprehensive Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Six-Unit Plant, Technical Report No. 31 (TVA: Knoxville, 1958), 30, copy found in NARA-SE, RG 142, OEDC, Box 586.

In addition to their imposing physical size, the Authority's coal-fired facilities utilized the latest advances in engineering, setting records for their overall capacity and the capacity of their individual generating units. With its six-unit, 750,000-kilowatt design, the Johnsonville Steam Plant was the second most powerful coal-fired facility in the world at the time of its completion.¹⁵² Furthermore, the plant's six generators, each rated to a maximum capacity of 125,000-kilowatts, were among the largest units ever built. They were capable of producing

¹⁵² H. J. Petersen, "Johnsonville Steam Plant of the TVA," reprinted from *Combustion*, December 1950, 2, NARA-SE, RG 142, OEDC, Box 578.

twice as much power as the generators used for the TVA's Watts Bar Steam Plant during World War II.¹⁵³ More importantly, the Johnsonville Steam Plant became a template for the Authority as it designed its system of coal-fired steam-generating facilities.

The TVA's leadership believed that massive power plants represented "the vanguard of new technology."¹⁵⁴ Throughout the 1950s and 1960s, the Authority's coal-fired steam plants pushed the boundaries of overall capacity and individual unit size to new heights.¹⁵⁵ The Kingston Steam Plant became the biggest facility in the world with a capacity of 1.6 million kilowatts upon its completion in 1955 only to be outdone by the TVA's Paradise Steam Plant in the 1960s and eventually the agency's Cumberland Steam Plant in 1973, a colossal facility that had a maximum capacity of 2.6 million kilowatts.¹⁵⁶ The Authority contracted for ever larger generators as well. The last five units at Kingston were capable of producing 180,000-kilowatts each while the first two units at Paradise were both rated at a massive 650,000-kilowatts, a number the TVA surpassed with the construction of a single 900,000-kilowatt unit for its Bull Run Steam Plant, the largest individual coal-fired steam turbine in the world prior to the agency's completion of an enormous third unit at the Paradise Steam Plant in 1969.¹⁵⁷ The physical size of the TVA's power plants only underscored the groundbreaking volume of

¹⁵³ Petersen, "Johnsonville Steam Plant of the TVA," reprinted from *Combustion*, December 1950, 3, NARA-SE, RG 142, OEDC, Box 578. Watts Bar's units were rated at a maximum of 60,000-kilowatts each; see, TVA, *Annual Report, 1954*, 16-7.

¹⁵⁴ Winter, "Oral History Interview with G. O. Wessenauer," 55, NARA-SE, RG 142, OHR, Box 9.

¹⁵⁵ See, Lowe, "Oral History Interview with G. O. Wessenauer," 16-7, NARA-SE, RG 142, OHR, Box 10; Wessenauer suggests on page 17 that part of the reason that the TVA shifted to nuclear power away from coal was that technological advances for coal-fired power were "slowing down."

¹⁵⁶ Kingston Steam Plant was the largest in the world from 1955 until 1963 see, TVA, *The Kingston Steam Plant*, Technical Report No. 34, 1; and "Celebration is Slated for Completion of T.V.A. Plant," *New York Times*, November 12, 1955, 25. Regarding Paradise Steam Plant and Cumberland Steam Plant see, TVA, *The Paradise Steam Plant Unit 3: The Planning, Design, Construction, Costs, and First Power Operations of the One-Unit Addition*, Technical Report No. 39 (TVA: Knoxville, 1979), 8.

¹⁵⁷ See, TVA, *Annual Report, 1954*, 16-7; TVA, *Annual Report, 1960* (Washington, D.C.: Government Printing Office, 1960), 8 and 10; TVA, *The Paradise Steam Plant Unit 3*, Technical Report No. 39, 8; "Expansion Plans Outlined by T.V.A.," *New York Times*, July 19, 1964, F22; and "New T.V.A. Generating Unit is Termed Largest in World," *New York Times*, November 21, 1965, F11.

kilowatts the facilities were capable of producing, further marking the plants as technological marvels.

The advances in engineering extended beyond capacity to the efficiency of the Authority's units. Although the agency's initial generators at Watts Bar had a heat-efficiency rating of 11,404 BTU per kilowatt-hour produced, the last five units at Kingston wielded a rating of 9,288 BTU per kilowatt-hour, and the massive single unit at Bull Run improved that to 8,391 BTU per kilowatt-hour.¹⁵⁸ To put the gains in efficiency in perspective, the Watts Bar facility required approximately one pound of coal to produce one kilowatt-hour of electricity while the TVA's Gallatin Steam Plant with a heat rating similar to that at Kingston could produce one kilowatt-hour from only twelve ounces of coal. Most power plants from the early 20th century required at least seven pounds of coal per kilowatt-hour.¹⁵⁹

The emphasis that the Authority's publications placed on the engineering advances present in each new facility demonstrated the extent to which the TVA designed and promoted its coal-fired power plants as monuments to the agency and its commitment to using technology to advance the region. The Authority's annual reports described the new steam plants in terms of kilowatts, focusing on capacity, unit size, and efficiency. By comparing the TVA's facilities to one another, the reports created a narrative of technological progress, depicting each plant as an improvement on those that came before it.¹⁶⁰

¹⁵⁸ TVA, *The Kingston Steam Plant*, Technical Report No. 34, 8-9.

¹⁵⁹ TVA, *Annual Report, 1954*, 16-7.

¹⁶⁰ For example see, TVA, *Annual Report, 1954*, 16-7. Many of the TVA's technical reports had tables that compared the engineering specifications of all of its steam plants; see, TVA, *The Kingston Steam Plant*, Technical Report No. 34, 8-9; TVA, *The Paradise Steam Plant*, Technical Report No. 37, 8-9, found in NARA-SE, RG 142, OEDC, Box 636; and TVA, *The Paradise Steam Plant Unit 3*, Technical Report No. 39, 8-9.



Figure 2.4: Johnsonville Steam Plant circa 1950s (b). Source: TVA, The Johnsonville Steam Plant: A Comprehensive Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Six-Unit Plant, Technical Report No. 31 (TVA: Knoxville, 1958), 16, copy found in NARA-SE, RG 142, OEDC, Box 586.

The Authority used its publications to assess its steam plants within a national and international context. The TVA was quick to point out when one of its facilities set a record for capacity or unit size, and the agency often noted that its system consistently produced electricity with greater efficiency than the national average for a major coal-fired power network.¹⁶¹ The

¹⁶¹ For comparisons regarding efficiency see, TVA, *Annual Report, 1954*, 36; TVA, *Annual Report, 1955*, 29; TVA, *Annual Report, 1956*, 5; and TVA, *Annual Report, 1957*, 32. In 1969, the Federal Power Commission noted that the TVA had the most efficient multi-plant steam generating system in the United States; see, TVA, *Annual Report, 1971* (Washington, D.C.: Government Printing Office, 1971), 30-1.

technical narrative that the Authority built around its steam plants underscored their symbolic value to the agency as “‘tools’ of progress” for the region.¹⁶²

Aesthetics and tourism also played a significant role in planning the TVA’s new facilities.¹⁶³ For example, the Johnsonville Steam Plant had “a very attractive observation deck” providing views of Kentucky Lake that the Authority hoped its visitors would find inspiring.¹⁶⁴ Throughout the 1950s, it was typical for the TVA to equip its coal-fired power plants with ample public parking, reception rooms, guides, observation routes through the facility, and windows and balconies.¹⁶⁵ As it had with the agency’s dams, the Authority’s leadership wanted the steam plants to enhance the public’s experience of the facilities’ surroundings. For the TVA, these steam plants demonstrated that its engineers continued to “advance the art” of designing public structures, giving the American taxpayer “something of which he can be proud.”¹⁶⁶ The Authority built its coal-fired facilities to have “the most attractive and interesting appearance” to the extent that doing so did not interfere with plant operations or drastically increase the costs of construction.¹⁶⁷

¹⁶² Quote from TVA, “Dynamic Decade: TVA in the Nineteen-Fifties,” undated informational pamphlet, 2, UTK: Hodges, TVA PC, Box 1, Folder 1.

¹⁶³ Walter Creese has argued that while aesthetics played a role in the interior design of the plants they did not affect the relationship between the facilities and the surrounding environment. In contrast to the Authority’s dams, Creese suggests that the steam plants’ exterior design created a sinister impression on the landscape. While Creese views the monstrous size of the facilities as problematic, I understand it as an extension of the TVA’s desire to demonstrate its worth to the Tennessee Valley Region. Creese focuses specifically on the Watts Bar Steam Plant, but he does touch on Johnsonville, Kingston, and Paradise; see, Creese, *TVA’s Public Planning*, 72 and 193-207.

¹⁶⁴ Arthur J. Fox, Jr., “TVA Dambuilders Turn to Steam,” reprinted from *Engineering News Record*, February 25, 1954, no pagination, UTK: Hodges, TVA PC, Box 4, Folder 6.

¹⁶⁵ Fox, Jr., “TVA Dambuilders Turn to Steam,” reprinted from *Engineering News Record*, February 25, 1954, no pagination, UTK: Hodges, TVA PC, Box 4, Folder 6. It appears that the steam plants were actually somewhat popular tourist destinations; see, “T.V.A. Popular in 1963; Visitors Total 11 Million,” *New York Times*, May 1, 1964, 65; it should be noted that the *Times*’ figures included visitors to dams as well as steam plants.

¹⁶⁶ Fox, Jr., “TVA Dambuilders Turn to Steam,” reprinted from *Engineering News Record*, February 25, 1954, no pagination, UTK: Hodges, TVA PC, Box 4, Folder 6.

¹⁶⁷ TVA, *The Kingston Steam Plant*, Technical Report No. 34, 27 and 30 (quote taken from 27).

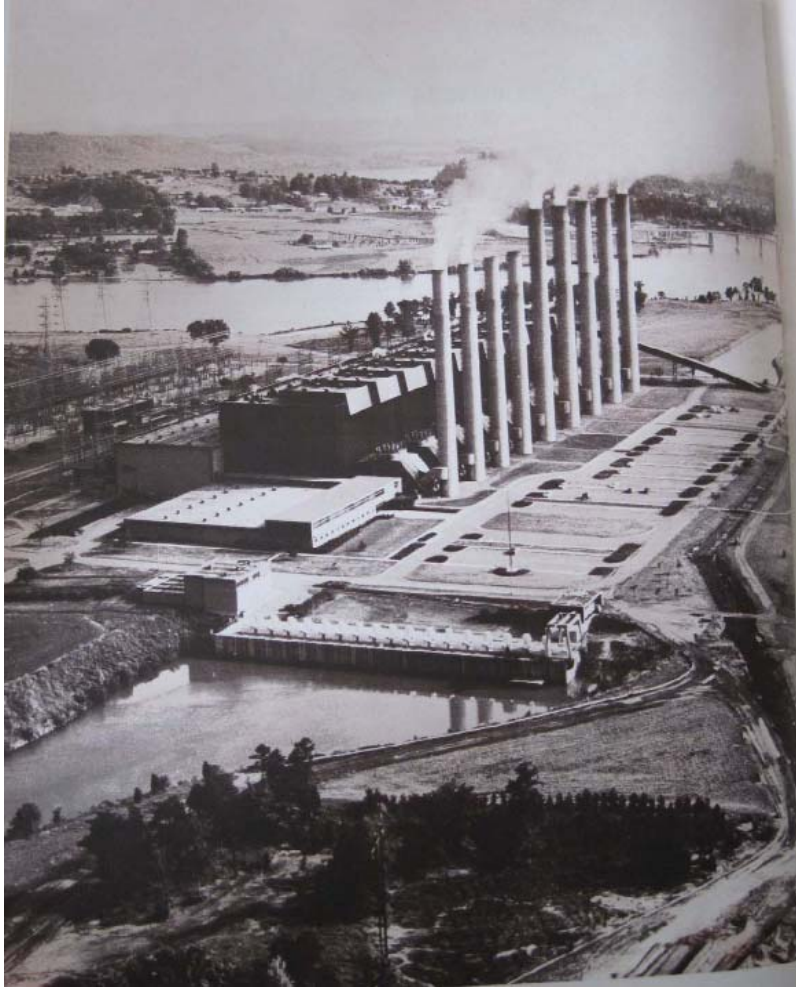


Figure 2.5: Kingston Steam Plant circa Late 1950s. Source: TVA, The Kingston Steam Plant: A Report on the Planning, Design, Construction, Costs, and First Power Operations, Technical Report No. 34 (Knoxville: TVA, 1965), interior leaf.

Furthermore, the TVA equipped the Kingston Steam Plant with a visitor's center and an observation deck that allowed guests to view the inside of the facility's turbine room and boiler room. In fact, the Authority made sure that Kingston's layout would permit the general public to visit the plant without disrupting power operations, suggesting a desire to use the facility to model the innovations that the agency had made in the arena of power production.¹⁶⁸ The TVA

¹⁶⁸ TVA, *The Kingston Steam Plant*, Technical Report No. 34, 27 and 30.

incorporated similar observation decks overlooking the generator room in many of its steam plants.¹⁶⁹

The contrast between the Authority's emphasis on isolation and its embrace of tourists highlighted the agency's attempts to control the public perception of its power program. While the TVA wanted its generating system to be invisible at the point of consumption to emphasize the cleanliness of electricity, the agency also designed its coal-fired facilities to exhibit its technocratic prowess to the general public. This dichotomy underscored the Authority's conception of modern power networks as engineering marvels that could be enjoyed both for the bounty of inexpensive energy they produced and for the way in which they produced it.¹⁷⁰

The TVA decision to construct the world's largest, most advanced coal-fired power plants reflected the importance of technology to the agency's institutional narrative. As Joseph Swidler, a long time legal counsel for the Authority, put it, "When the TVA did everything right...They built better dams and built them quicker. Built bigger and better steam plants and built them quicker."¹⁷¹ Continuing a tradition that began with the construction of its dams in the 1930s and 1940s, the Authority used its coal-fired facilities to project a public image that linked the agency and its engineering feats with progress. The TVA's emphasis on physical size, generating capacity, and efficiency illustrated its commitment to using technology to develop its service area while its focus on the aesthetics of its plants and their immediate surroundings

¹⁶⁹ For example, Paradise Steam Plant was also built with an overlook for visitors to view operations inside the facility; see, TVA Division of Engineering Design, "Paradise Steam Plant: Final Design Report," Report No. 40-200, May 1964, 15, NARA-SE, RG 142, OEDC, Box 631.

¹⁷⁰ This conceptualization of modern energy networks is similar to the way in which modern meatpacking separated consumers from the process of disassembling animals while also creating a marvel of efficiency in the slaughterhouse; see Cronon, *Nature's Metropolis*.

¹⁷¹ With the exception of the ellipsis, the punctuation in this quote is as it is transcribed in the TVA's archival documents; see, Lowe, "Oral History Interview with Joseph Swidler," no pagination, NARA-SE, RG 142, OHR, Box 8. For similar sentiments see, Winter, "Oral History Interview with G. O. Wessenauer," 55, NARA-SE, RG 142, OHR, Box 9; and Lowe, "Oral History Interview with G. O. Wessenauer," 16-7, NARA-SE, RG 142, OHR, Box 10.

demonstrated the desire to connect that technology with a new and improved landscape, creating a visual impression that coupled the past with modernity by superimposing symbols of the latter on the former.¹⁷² In large part, the Authority designed its coal-fired facilities to serve as public shrines for its power program and the benefits that the agency provided to the Tennessee Valley Region.



Figure 2.6: Paradise Steam Plant circa 1964. Source: TVA Division of Engineering Design, "Paradise Steam Plant: Final Design Report," Report No. 40-200, May, 1964, interior leaf, NARA-SE, RG 142, OEDC, Box 631.

¹⁷² Whether or not the TVA succeeded in creating an aesthetically pleasing amalgamation of the past and the present with its coal-fired steam plants is a different matter. It was certainly more successful with its dams. In Chapter Five and Chapter Six, I suggest that the Authority failed in this endeavor and that the steam plants became destructive forces for the communities in which they were placed. For a critical interpretation of the TVA's ability to blend past and present see, Creese, *TVA's Public Planning*, 204-7 and 337-44.

Conclusion – The Bond Revenue Act of 1959

Fittingly, the TVA's "dynamic decade" culminated in 1959 with the passage of the Bond Revenue Act.¹⁷³ The new legislation amended the TVA Act, allowing the Authority to issue its own bonds to raise money for new power installations. The agency's leadership had first presented Congress with a self-financing proposal in 1955, arguing that the appropriations process threatened to starve the power program of the extra capacity needed in the Tennessee Valley Region. The bill languished for nearly four years amid the concerns of private utilities that self-financing would truly allow the TVA to expand at will while the Authority demurred at the prospect of its bond issues being subject to the approval of Congress and the president. In the end a compromise was reached. Although the Bond Revenue Act prohibited the TVA from moving into new markets, capping the agency's service area, it did eliminate Congress' and the executive branch's ability to block funding for new generating units.¹⁷⁴ For the first time, the Authority had complete autonomy over the direction of its power program.

The Bond Revenue Act facilitated the TVA's continued expansion of its coal-fired power network. Over the next fifteen years, the Authority used its ability to issue bonds to construct three new coal-fired steam plants comprising six generating units, each of which was larger than any the TVA had previously built. In addition, the agency enlarged two of its existing facilities. Altogether, the Authority put more than seven million kilowatts of new coal-fired capacity into service after the passage of the Bond Revenue Act, almost doubling the amount of coal-fired power in its system.¹⁷⁵

¹⁷³ The phrase "dynamic decade" is a reference to a TVA publication of the same name that covered the 1950s; see, TVA, "Dynamic Decade: TVA in the Nineteen-Fifties," undated informational pamphlet, UTK: Hodges, TVA PC, Box 1, Folder 1.

¹⁷⁴ Hargrove, *Prisoners of Myth*, 150-4.

¹⁷⁵ The new, coal-fired power plants were: Bull Run (1-unit, 950,000 kilowatts), Paradise (3-units, 2,558,200 kilowatts), and Cumberland (2-units, 2,600,000 kilowatts). The size of the units expanded as well. The first two units at Paradise were approximately 700,000 kilowatts a piece; Bull Run's single unit was 950,000 kilowatts;

In this way, the Bond Revenue Act provided statutory support for the technopolitics that had shaped the development of the TVA's consumption-centric energy regime since the late 1930s and especially in the years following World War II. The Authority's leaders, including Lilienthal devotee Gordon Clapp, preferred to promote increased use among the region's residents and industries by maintaining an abundant supply of inexpensive kilowatts. Access to affordable electric power had become an important part of the social citizenship package coming out of the New Deal, and it was reflected in public agencies like the Rural Electrification Administration, the Bonneville Power Administration, and, of course, the TVA. The federal government also subsidized private utilities in their construction of new generating capacity during the same period.¹⁷⁶

At the heart of the public power ideal was the belief that the increased use of electricity promoted an American standard of living defined by the modern, electrified home with its associated appliances and decentralized industrial growth. Electric power was "not just another 'commercial product,'" and access to it was too important to be left to private utilities alone.¹⁷⁷ Rather, the United States required public power, "a new and bolder approach to the problem of energy supply" and an approach that benefited ordinary citizens while promoting the aspirations of the nation.¹⁷⁸ Furthermore, as an energy source that allowed one to separate consumption from the site of production, electricity made a lifestyle premised on high levels of energy use

Paradise's third unit was 1,150,200 kilowatts; and Cumberland's were each 1,300,000 kilowatts. The Authority also decided to add a 550,000 kilowatt unit to Widows Creek and a 550,000 kilowatt unit to Colbert after the passage of the Bond Revenue Act. In total, these units amounted to 7,208,200 of the 16,806,085 kilowatts that the TVA built in coal-fired power between 1940 and 1974. See, TVA, *The Paradise Steam Plant Unit 3*, Technical Report No. 39, 8-9. The Bond Revenue Act also facilitated the TVA's shift into nuclear power, beginning in the late 1960s.

¹⁷⁶ "U.S. 'Subsidy' Seen for Private Power," *New York Times*, October 1, 1953, 51. On social citizenship and consumerism, see Cohen, *A Consumer's Republic*; and Mettler, *Dividing Citizens*.

¹⁷⁷ Clapp, "National Power Policy," 3, UTK: Hodges, TVA PC, Box 1, Folder 1.

¹⁷⁸ Quote from Clapp, "Too Little Electricity," 3, UTK: Hodges, TVA PC, Box 1, Folder 1. The connection between public power and national aspirations is in reference to Welch, "Electric Power Needs for Southern Industrial Development," 2, NARA-SE, RG 142, PMF, Box 138.

seem compatible with environmental quality. A system of massive, rurally located, coal-fired steam plants represented the preferred means of achieving an abundant supply of inexpensive electric power that did not subject consumers to the nuisances associated with production.

In addition to its commitment to the tenets of the public power movement, the TVA developed a kilowatts-for-defense narrative that linked the growth of the agency's power program and its emphasis on low rates to national security. Rather than conflict with the Authority's effort to promote residential and industrial consumption, the TVA used its relationship with the Atomic Energy Commission and other defense agencies to justify and win support for its expansion into coal-fired power in the face of a determined conservative opposition. Finally, the Authority designed its coal-fired steam generating facilities to illustrate the agency's technological prowess. The TVA's power plants became monuments to the agency and the positive role that its engineers played in improving the quality of life in the Tennessee Valley Region. Thus, the Authority's decision to expand its power program by building a system of the world's largest, most technologically advanced, coal-fired generating stations while locating the facilities away from major population centers reflected the politics and policy goals that became entrenched in the institution and its leadership during the 1940s and 1950s.

The TVA's technopolitics and its foray into coal-fired power complicated the agency's relationship with the natural resources of its service area. With the untethering of the Authority's power program from the hydroelectric potential of the Tennessee River, the production of electricity ceased to be a subsidiary function of a balanced, multipurpose approach to watershed development. Instead, the pursuit of electric power became a primary means of fostering economic growth and improving the quality of life in the TVA's service area, a change

recognized by many of the agency's employees.¹⁷⁹ As a result, the Authority began to value the natural resources of the region in accordance with their importance for power production.¹⁸⁰ It is little surprise that some critics of the agency have accused it of becoming just another power company during this period.¹⁸¹

At the same time, the TVA's power program continued to rely on the agency's ability to manage the Tennessee River. The Authority's massive coal-fired facilities required a correspondingly large and steady supply of cooling water to function efficiently. Without the TVA's system of multipurpose dams, the agency would not have been able to construct or operate a network of enormous power plants in the Tennessee River Valley.¹⁸² While the transition to coal-fired electricity did represent a symbolic transformation in the Authority's relationship with the environment in its service area, it did not eliminate the link between the agency's power program and the multipurpose development of the Tennessee River.

The TVA's expansion of its power program after World War II also had an important effect on consumers. The Authority's abundant supply of cheap kilowatts shaped patterns of energy use and economic growth throughout the TVA's service area in the 1950s and 1960s. Chapter Three and Chapter Four delve into the role of TVA electricity in Nashville, Tennessee, and Huntsville, Alabama.

¹⁷⁹ See Chapter Five.

¹⁸⁰ Hargrove, *Prisoners of Myth*, 104 and 128.

¹⁸¹ For a further discussion of external opposition, see Chapter Six.

¹⁸² TVA, *The Kingston Steam Plant*, Technical Report No. 34, 13; TVA Division of Water Control Planning Project Planning Branch, *Summary Report of Site Selection Studies Northwestern Area Steam Plant*, 7-8, copy found in NARA-SE, RG 142, OEDC, Box 628; Memorandum G. P. Palo to A. J. Wagner, "Northwestern Area Steam Plant," October 1, 1959, NARA-SE, RG 142, OEDC, Box 628; and TVA, *The Paradise Steam Plant*, Technical Report No. 37, 11-15, copy found in NARA-SE, RG 142, OEDC, Box 636. A 1934 report noted that water conditions on the Tennessee River and its tributaries limited the number of sites available for large capacity steam plants; see, F. L. Wilkinson, Jr., "Report of Auxiliary Steam Plant Studies," August 31, 1934, NARA-SE, RG 142, OEDC, Box 32.

Chapter 3

Better Living in *The Electrical Center of America*:¹ Nashville Electric Service, Public Power, and Residential Consumption

At 12:01 a.m. on August 16, 1939, the Nashville Electric Service (NES) officially began providing the city of Nashville and Davidson County with electricity from the Tennessee Valley Authority.² Publicly owned and operated, NES replaced the Tennessee Electric Power Company (TEPCO), a private utility that had absorbed the local Nashville Railway & Light Company in 1922 and was itself a subsidiary of the Commonwealth & Southern Corporation.³ While coverage in Davidson County was better than in the Tennessee Valley Region as a whole and only slightly worse than the national average, few homes outside the city had access to electric

¹ The phrase (including emphasis) “Better Living in *The Electrical Center of America*” is taken from the following brochure: Tennessee Valley Authority, “Power and People In The Tennessee Valley the story of electrical development 1947-1949,” 1949, 3 Nashville Public Library, Special Collections, Nashville, TN, Nashville Electric Service Public Relations Records, Box 14, Folder 663. The TVA used the phrase “Electrical Center of America” in promotional materials throughout the postwar era, pairing it with an image showing a map of the United States that had a lightning bolt pointing toward the TVA’s service area, which was highlighted.

² Paul P. Hembree, “The Role and History of Nashville Electric Service” (Public Lecture, Nashville Public Library – Green Hills Branch, January 15, 1973), 8, Nashville Public Library, Nashville Room, Nashville, TN [hereafter: NPLNR], Stacks.

³ On May 1, 1882, the Brush Electric Company turned on the community’s first electric light in a ceremony at the state capitol building. The decades that followed marked a period of consolidation consistent with trends in the utility industry as a whole. Created in 1903 via merger, Nashville Railway & Light became ensconced in the complicated system of holding companies that defined the utility industry in the 1910s and 1920s, and it was acquired by the newly formed Tennessee Electric Power Company in 1922 (according to Paul Hembree, NR&L retained its corporate identity until 1930). TEPCO itself was but one of eleven private electric utilities in the southeast and midwest that the New York based holding company Commonwealth & Southern Corporation controlled. On the growth and consolidation of private utilities and electric street cars, see “Outline to be Followed in Talk on ‘History of the Tennessee Electric Power Company,’” undated (c. 1930s), 1-7, Nashville Public Library, Special Collections, Nashville, TN [hereafter: NPLSC], Nashville Electric Service Public Relations Records [hereafter: NESPRR], Box 1, Folder 10; NES, “Friendly Service News,” promotional pamphlet, April 1941, NPLSC, NESPRR, Box 4, Folder 52; Hembree, “The Role and History of Nashville Electric Service,” 2-3, NPLNR, Stacks; and Donald H. Doyle, *Nashville in the New South, 1880-1930* (Knoxville: University of Tennessee Press, 1985), 87-91. On the consolidation of utilities throughout the United States in general, see Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983); and David E. Nye, *Electrifying America: Social Meanings of a New Technology, 1880-1940* (Cambridge: MIT Press, 1990).

power in 1939.⁴ Furthermore, the cost of electricity remained higher in Nashville than in communities that already received service from the TVA. The gaps in the existing power network and the comparatively high price that TEPCO charged per kilowatt-hour suggested that much room for growth existed in Nashville and Davidson County.⁵

In the tradition of the public power movement, the Authority promoted in-home electricity use as a tool for improving standards of living in the Tennessee Valley Region. At the local level, the TVA relied on publicly owned municipal utilities and rural cooperatives to carry out its energy regime. It did not sell power to any private electric companies in the region; instead, the agency stipulated that communities establish public utilities to deliver electricity to customers. The Authority's distributors worked hard to facilitate residential consumption. Although the Authority did provide advertising and infrastructural support, it did not sell electric power directly to individuals or, for that matter, most businesses.⁶

⁴ Only one in four farms in Davidson County had access to electricity in 1939. Approximately fifteen percent of farms in the Tennessee Valley Region had access to electricity in 1939 while the average nationwide was around twenty-seven percent; see, "Growth of the Nashville Electric Service," undated document c.1949, National Archives and Records Administration Southeast Branch, Morrow, GA [hereafter: NARA-SE], Record Group 142 [hereafter: RG 142], Office of the General Manager Administrative Files, 1933-1957 [hereafter: GMAF], Box 150; TVA, *Annual Report, 1940* (Washington, D.C.: Government Printing Office, 1940), 28-9; and U.S. Department of Commerce, Bureau of the Census, "Series S 108-119. Growth of Residential Service, and Average Price for Electric Energy: 1902 to 1970," in *Historical Statistics of the United States Colonial Times to 1970, Part 2* (Washington, D.C.: Government Printing Office, 1975), 827. On the failure of private utilities to expand service, see Nye, *Electrifying America*, 260-77 and 292-304, Nye suggests that utilities did not seriously consider widespread residential electrification before 1918; Ronald C. Tobey, *Technology as Freedom: The New Deal and the Electrical Modernization of the American Home* (Berkeley: University of California Press, 1996) 10-21; Gifford Pinchot, "Governor Pinchot's Message of Transmittal," in *Report of the Giant Power Survey Board to the General Assembly of the Commonwealth of Pennsylvania*, eds. Morris Llewellyn Cooke and Judson C. Dickson (Harrisburg: The Telegraph Printing Co., 1925), xi-xii; and Morris Llewellyn Cooke, "General Report of Director to Board," in *Report of the Giant Power Survey Board to the General Assembly of the Commonwealth of Pennsylvania*, eds. Morris Llewellyn Cooke and Judson C. Dickson (Harrisburg: The Telegraph Printing Co., 1925), 37-46.

⁵ On TEPCO's rates, see NES, "The Spring Campaigner," promotional pamphlet, March 1940, NPLSC, NESPRR, Box 1, Folder 21; and NES, "Better Living with Electricity," promotional pamphlet, October 1949, No. 6, NPLSC, NESPRR, Box 18, Folder 8. Also see Hembree, "The Role and History of Nashville Electric Service," 9, NPLNR, Stacks. Average residential rate for TVA customers calculated using data from TVA, *Annual Report, 1935* (Washington, D.C.: Government Printing Office, 1936), 33; also see TVA, *Annual Report, 1940*, 25.

⁶ The TVA's leaders believed strongly in the benefits that inexpensive kilowatts could provide for the inhabitants of the agency's service area, and their belief shaped the continued growth of the Authority's generating system and its transition to coal-fired power; see Chapter Two of this dissertation.

Nevertheless, most of the literature on the TVA's power program lacks a substantive investigation of its implementation in the cities and towns of the Tennessee Valley Region. Rather, it focuses on internal institutional squabbles and private utilities' opposition to the expansion of the Authority's generating system.⁷ Additionally, few scholars have investigated how the broader public power movement's consumption-centric philosophy supported the political economy of the post-World War II era and shaped electrical development nationwide.⁸

This chapter analyzes residential electricity use and the TVA's energy regime in Nashville and Davidson County. The Nashville Electric Service—the city's newly created public distributor—joined with local politicians and businessmen to promote the consumption of

⁷ Some of the best scholarship on the TVA itself says little if anything substantive about the operation of its power program at the local level beyond the fact that the Authority did not sell power directly to residential customers and most businesses; see Erwin C. Hargrove, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990* (Knoxville: University of Tennessee Press, 1994); *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983); Marc J. Roberts and Jeremy S. Bluhm, *The Choices of Power: Utilities Face the Environmental Challenge* (Cambridge: Harvard University Press, 1981); Aaron Wildavsky, *Dixon-Yates: A Study in Power Politics* (New Haven: Yale University Press, 1962); Nancy L. Grant, *TVA and Black Americans: Planning for the Status Quo* (Philadelphia: Temple University Press, 1990); Sarah T. Phillips, *This Land, This Nation: Conservation, Rural America, and the New Deal* (Cambridge: Cambridge University Press, 2007); and Philip Selznick, *TVA and the Grass Roots: A Study in the Sociology of Formal Organization*, second edition (New York: Harper & Row, Publishers, 1966); although Selznick and Phillips do well to discuss the local level applications of the Authority's agricultural program. The lone exception is Victor Hobday, who addresses the bureaucratic relationship between the public distributors in the Tennessee Valley Region and the TVA without commenting extensively on the social history of electricity in individual communities; see Victor C. Hobday, *Sparks at the Grassroots: Municipal Distribution of TVA Electricity in Tennessee* (Knoxville: University of Tennessee Press, 1969).

⁸ For examples of scholars who elide the public power movement and energy from their analysis of the political economy of the postwar era, see Lizabeth Cohen, *A Consumer's Republic: The Politics of Mass Consumption in Postwar America* (New York: Knopf, 2003); Suzanne Mettler, *Dividing Citizens: Gender and Federalism in New Deal Public Policy* (Ithaca: Cornell University Press, 1998); Meg Jacobs, *Pocketbook Politics: Economic Citizenship in Twentieth Century America* (Princeton: Princeton University Press, 2007); Elaine Tyler May, *Homeward Bound: American Families in the Cold War Era* (New York: Basic Books, 1988); Adam Rome, *The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism* (Cambridge: Cambridge University Press, 2001); and Tobey, *Technology as Freedom*. Several other classic works on suburbanization and development say little about energy or electric power; see Kenneth T. Jackson, *The Crabgrass Frontier: The Suburbanization of America* (Oxford: Oxford University Press, 1985); Matthew Lassiter, *The Silent Majority: Suburban Politics in the Sunbelt South* (Princeton: Princeton University Press, 2006); and Thomas Sugrue, *The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit* (Princeton: Princeton University Press, 2005). The scholarship on electrical development does not discuss the public power movement's influence after the New Deal. For examples, see Hughes, *Networks of Power*; Nye, *Electrifying America*; Christopher F. Jones, "Energy Landscapes: Coal Canals, Oil Pipelines, Electricity Transmission Wires in the Mid-Atlantic, 1820-1930" (PhD diss., University of Pennsylvania, 2009), 1-31 and 325-65; and Todd Andrew Needham, *Power Lines: Phoenix and the Making of the Modern Southwest* (Princeton: Princeton University Press, forthcoming 2014).

inexpensive kilowatts in an effort to enrich the lives of area residents and achieve their progressive vision for the city's future, albeit a vision that did not always include minorities or the poor. In addition to implementing the rate reductions that the TVA mandated, the Electric Service and its partners improved Davidson County's electrical infrastructure, sponsored community events, and designed advertising campaigns that associated electricity and electric appliances with convenience, modernity, and environmental quality, encouraging Nashvillians, and specifically white, middle-class consumers, to renegotiate their relationship with the region's natural resources by linking an energy-intensive lifestyle with social progress. Household electricity use exploded between 1944 and 1964, an era whose spirit Vice President Richard Nixon captured in 1959 when he lauded the electric kitchen as the embodiment of a quintessentially American standard of living in his famed debate with Soviet Premier Nikita Khrushchev. Across the United States, the era of mass consumption that followed World War II relied on plentiful, affordable energy. The modern, single-family, suburban home replete with year-round climate control and myriad appliances would not have been accessible to many working- and middle-class Americans were it not for the widespread availability of inexpensive electric power. Metropolitan Nashville was one of the most electrified areas in the world according to the statistics that NES reported in the 1950s and 1960s.⁹ Indeed, the distributor

⁹ Nationwide electricity use increased by 300 percent; see Nashville Electric Power Board, "Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report," 1964, 7-8, NPLSC, NESPRR, Box 12, Folder 618. The reference to metropolitan Nashville being one of the most electrified areas in the world is from "Progress Report," *Tennessean*, July 28, 1949, 10. As early as 1949, NES touted the use of electricity in its service area as well as the coverage of its system, suggesting that Nashville and Davidson County ranked among the most electrified communities in the United States; see NES, "Residential Sales of Electricity Largest Portion of Total in Nashville," undated press release, c.1949, 2, NPLSC, NESPRR, Box 1, Folder 19; and NES, "Nashville in Top Group of Cities for Residential Use of Electricity," undated c.1949, NPLSC, NESPRR, Box 1, Folder 19. For other references to the volume of electricity used per residential customer and Nashville's rank relative to other areas in the 1950s and 1960s; see NES, "Doorway to a Brighter Tomorrow: Electric Center: New Home of Nashville Electric Service A Business with 98,000 Customers Owned By The People Of Nashville," c.1952, 1, NPLSC, NESPRR, Box 12, Folder 615; Nashville Electric Power Board, "Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report," 1964, 8, NPLSC, NESPRR, Box 12, Folder 618; and NES, "Our Job At Nashville Electric Service," 1970, 20, NPLSC, NESPRR, Box 14, Folder 641. On Nixon, see Elaine Tyler May, "Cold War–Warm

declared in 1964 that the motto, “Better Living ELECTRICALLY,” had become “a Way of Life,” for residents in the community, meaning that “our home-living jobs and tasks and pleasure pursuits are made easier and better and cheaper by the abundant use of electricity.”¹⁰

In this way, the tenets of public power and the TVA’s energy regime supported a political economy that promised to improve the lives of ordinary Americans by democratizing access to goods and services. In practice, however, the Authority’s regime promoted new patterns of resource use that benefited elites and the white middle class to the detriment of minorities and the poor. Numerous scholars, including Lizabeth Cohen, Suzanne Mettler, and Meg Jacobs, have argued both that the ability to participate in economic life as a consumer became a marker of social citizenship in the United States following the New Deal and that the politics of mass-consumption reinforced white privilege. The policies that the liberal state adopted did increase the purchasing power of most Americans but did not reduce social or economic inequality. The TVA’s regime was no different.

From Private to Public

The Authority and NES relied on the support of the mayor’s office, groups like the Nashville Chamber of Commerce, and influential individuals, including Silliman Evans, Sr., the owner and publisher of the *Tennessean*, to facilitate the transition to public power in Nashville and Davidson County. Unsurprisingly, the region’s private utilities resisted the TVA. The Commonwealth & Southern Corporation quickly signed an agreement with the Authority prohibiting the agency and its distributors from selling electricity in areas already supplied by

Hearth: Politics and the Family in Postwar America,” in *The Rise and Fall of the New Deal Order, 1930-1980*, eds. Steve Fraser and Gary Gerstle (Princeton: Princeton University Press, 1989), 157-8.

¹⁰ All quotes from Nashville Electric Power Board, “Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report,” 1964, 7, NPLSC, NESPRR, Box 12, Folder 618, capitalization and punctuation in original.

C&S subsidiaries, including TEPCO.¹¹ Still, the Tennessee Electric Power Company found itself in competition with the TVA throughout the 1930s, which forced it to lower the rates that it charged residential customers in Nashville. TEPCO accused the Authority of building power lines to communities in violation of the contract that the public agency had signed with the Commonwealth & Southern, and it claimed that the TVA mailed public power propaganda to TEPCO customers, meddled in local power board elections, and pressured individual towns and major manufacturers to switch their service to the Authority.¹² Furthermore, the Tennessee Electric Power Company argued that the TVA and public power represented a threat to free enterprise.¹³ In an effort to enjoin the Authority from expanding its service area, TEPCO filed a lawsuit in 1936 with nineteen other private utilities against the agency, claiming, among other things, that the TVA's electric rates amounted to unlawful regulation and that the Authority and the Public Works Administration had conspired to force the private distributors to sell their

¹¹ The original agreement was signed in 1934, but it was set to expire in 1936 with the completion of Norris Dam; see Thomas K. McCraw, *Morgan vs. Lilienthal: The Feud within the TVA* (Chicago: Loyola University Press, 1970), 63-80.

¹² On TEPCO's rate reductions in the 1930s, see TEPCO, "The Tennessee Electric Power Company: Report to Stockholders" December 31, 1936, 15, NPLSC, NESPRR, Box 1, Folder 10; TEPCO, "Cheaper Electricity for your Home: An Explanation of the New Residence Rates of The Tennessee Electric Power Co." promotional pamphlet, undated circa 1934, NPLSC, NESPRR, Box 1, Folder 10; and Donald H. Doyle, *Nashville Since the 1920s* (Knoxville: University of Tennessee Press, 1985), 105. The private utility also initiated new promotional programs, soliciting cooperation from local appliance dealers by staging contests for salesmen and awarding prizes, including a trip to the Kentucky Derby, to those who outperformed their peers; see TEPCO, "Derby Dope Sheet," 1937, NPLSC, NESPRR, Box 3, Folder 44; Letter, Daniel E. O'Sullivan, Resident Manager, Churchill Downs to Maxwell E. Benson, Advertising Manager, TEPCO, March 13, 1934, NPLSC, NESPRR, Box 3, Folder 45; and Letter, Maxwell E. Benson, Advertising Manager, NES to Dartnell Corporation, February 6, 1941, NPLSC, NESPRR, Box 3, Folder 45. NES held a similar campaign in 1941. On the TVA's supposed violations, see TEPCO, "Violations by TVA of Letter and Spirit of January 4, 1934, Contract" undated, NSPLC, NESPRR, Box 1, Folder 7; and TEPCO, "The Tennessee Electric Power Company: Report to Stockholders" December 31, 1936, 5-7, NPLSC, NESPRR, Box 1, Folder 10. In at least one instance, the private utility accused the TVA of telling the citizens of Chapel Hill, Tennessee, that the agency's legal staff would be able to find a loophole that would enable the community to leave its current contract with TEPCO. Furthermore, the utility argued that the TVA poached the business of manufacturers in the region, suggesting that the Authority had convinced Monsanto that TEPCO would be unable to provide the chemical giant's plant in Columbia, Tennessee, with enough electricity at reasonable prices. Indeed, Monsanto signed a power contract with the TVA in 1936. Although I have not been able to substantiate these allegations in the TVA's files at the southeast branch of the National Archives, they seem plausible given the level of animosity between the Authority and local private utilities.

¹³ Doyle, *Nashville Since the 1920s*, 106.

systems to the TVA. In January 1939, however, the United States Supreme Court refused to hear the utilities' case, ruling that the private companies did not have legal standing.¹⁴

In addition to TEPCO, the most vocal opposition to the TVA in Nashville came from several Vanderbilt University professors, including Donald Davidson, John Crowe Ransom, Allen Tate, and Robert Penn Warren. The men had originally been part of the Fugitives, a group of social critics that disavowed the sentimentality that pervaded Southern literature and culture. By the 1930s, they had shifted their focus, developing an agrarian critique of the New South and its emphasis on economic and social modernization through industrialization, science, and technology.¹⁵ Davidson, in particular, questioned the modernizing instincts of Nashville's civic leaders, lamenting the effects of commercialization and suburbanization on the city center and the local environment. Not only had the community's businessmen removed the trees that shaded downtown streets to make way for shops and paved sidewalks but smoke from furnaces and factories blanketed the area for months at a time.¹⁶ In his two-part history of the Tennessee River, Davidson expressed a similar disdain for the TVA, an agency that he regarded as the embodiment of progressive reformers' misguided faith in the technocratic impulses that he so loathed in Nashville's civic leadership. Davidson also viewed the Authority both as an arm of

¹⁴ The case, which became known as *Tennessee Electric Power Company (TEPCO) vs. TVA*, followed an earlier decision by the United States Supreme Court that held that the Authority could sell surplus power from its hydroelectric facilities to communities in the Tennessee Valley. Undeterred by this earlier defeat, TEPCO and its co-plaintiffs argued that the TVA's power program was unconstitutional. Although lower courts initially ruled in TEPCO's favor, the United States District Court for Eastern Tennessee sided with the TVA in 1938 prior to the Supreme Court's refusal to hear the case. For a more detailed account of the case, which became known as *Tennessee Electric Power Company (TEPCO) vs. TVA*, and the battle between the TVA and the region's private utilities, see Thomas K. McCraw, *TVA and the Power Fight, 1933-1939* (Philadelphia: J.B. Lippincott Company, 1971), 67-121; Hargrove, *Prisoners of Myth*, 46; Richard Lowitt, "The TVA, 1933-45," in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 42-3; and George Haimbaugh, Jr., "The TVA Cases: A Quarter Century Later" *Indiana Law Journal* v. 41, n. 2 (1996), 197-227. For the case itself, see *Tennessee Electric Power Co. et al. v. Tennessee Valley Authority et al.* 306 U.S. 118, January 30, 1939.

¹⁵ For more on the Fugitives in Nashville and their agrarian shift, see Doyle, *Nashville Since the 1920s*, 3-18.

¹⁶ As Davidson put it, "Civilization has gone and in its place... more commercial greed than ever, less honor, less public spirit, less religion, less of the grace and beauty of life." Quoted in Doyle, *Nashville Since the 1920s*, 17.

the federal government and as representative of northern industrialists' attempts to dominate the South and its culture.¹⁷

Davidson and his colleagues never garnered broad support within Nashville. Neither, for that matter, was TEPCO able to convince the city's leading businessmen that public power embodied a dire threat to free enterprise.¹⁸ As Donald Doyle has noted in his history of Nashville, the private utility's final newspaper advertisement compared TEPCO's demise to southern literary classics, including Edward A. Pollard's *Lost Cause* and John Sergeant Wise's *The End of an Era*, adding the following lament, "And so private ownership and initiative withdrew in favor of Government. The Company[TEPCO]—pioneer citizen and taxpayer—which for more than half a century served the people of the State of Tennessee—was liquidated."¹⁹ While TEPCO went out of business, the city's residents were already celebrating the arrival of public power.²⁰

The ceremony welcoming NES and the TVA to Nashville was reminiscent of the lighting of the city's first electric lamp fifty-seven years earlier. Ten thousand people thronged the area outside the War Memorial Building on the night of August 19, 1939. Bathed in the glow of street lamps and floodlights, the crowd overwhelmed Memorial Square, with many attendees gathering on neighboring rooftops. Patricia Ann Cummings, the daughter of Nashville's mayor, best captured the pomp and circumstance of the evening when she hit a switch and illuminated a massive sign overlooking the throng that spelled "TVA" in an array of incandescent bulbs.²¹

Following a five second blackout that left a single kerosene lamp "flickering feebly" as a lone

¹⁷ Donald Davidson, *The Tennessee Volume II: The New River, Civil War to TVA* (New York: Rinehart & Co., Inc., 1948), 176-333.

¹⁸ Doyle, *Nashville Since the 1920s*, 3-18 and 105-6.

¹⁹ Doyle, *Nashville Since the 1920s*, 106.

²⁰ Doyle, *Nashville Since the 1920s*, 106.

²¹ "TVA Power Given Roaring Welcome," *Tennessean*, August 20, 1939, 1 and 2; Hembree, "The Role and History of Nashville Electric Service," 9, NPLNR, Stacks; and Doyle, *Nashville Since the 1920s*, 106.

reminder of the pre-electric past, a chorus of shouts, whistles, horns, and bells greeted Patricia Cummings' relighting of Memorial Square.²² As the *Tennessean* reported, a "new era of better living and economic progress through cheap electric power" had finally arrived.²³

Nashville's civic leaders had helped ease the community's transition to public power. Before Congress passed the TVA Act, the Nashville Chamber of Commerce organized a valley-wide association that included state and local officials as well as other chambers of commerce. Association members pledged their future support for the proposed agency and its mission, offering to "cooperate in every way possible with the TVA."²⁴ In 1936, as the conflict between TEPCO and the Authority was heating up, a local citizens group known as the TVA Power League asked Nashvillians to sign petitions pledging their support for public power. Mayor Cummings also championed the Authority's power program, and he backed legislation that would bring TVA electricity to Nashville and Davidson County.²⁵ With its emphasis on achieving economic and social modernization through an abundant supply of cheap kilowatts, public power fueled the progressive vision of the city's elite.

Silliman Evans, Sr., the owner and publisher of the *Tennessean*, became one of the Authority's most vociferous proponents. Originally from Texas, Evans worked for several newspapers in Waco, Houston, and Fort Worth before taking a job as an assistant to the postmaster general in 1932. A supporter of Franklin Delano Roosevelt, he decided to get back into the newspaper business in the mid-1930s to provide editorial support for the New Deal in

²² "TVA Power Given Roaring Welcome," *Tennessean*, August 20, 1939, 1 and 2 ("flickering feebly" is on 2).

²³ "TVA Power Given Roaring Welcome," *Tennessean*, August 20, 1939, 1.

²⁴ Quoted in Doyle, *Nashville Since the 1920s*, 104.

²⁵ Hembree, "The Role and History of Nashville Electric Service," 5-6, NPLNR, Stacks.

the South. In 1937, Evans purchased the *Tennessean* at a bankruptcy auction, using the paper to shape popular opinion on the Authority and public power.²⁶



Figure 3.1: “The Magic Pen” – A Tom Little cartoon that appeared in the *Tennessean*, celebrating the arrival of public power in Nashville. Source: Tom Little, “The Magic Pen,” *Tennessean*, August 15, 1939, 4.

The *Tennessean*'s political cartoonist, Tom Little, often portrayed the TVA's power program as a boon for municipalities throughout the region. [Fig. 3.1] In one of his drawings, Little celebrated the Authority's acquisition of Nashville's distribution system, depicting a hand labeled “TVA POWER” ringing the city's doorbell.²⁷ [Fig. 3.2] Little's use of electric sparks to illustrate the resulting chime was indicative of the positive effect that he envisioned affordable electricity would have on Nashville's future. A second cartoon in the same issue showed the

²⁶ Doyle, *Nashville Since the 1920s*, 87. Doyle argues that many businessmen in Nashville supported the New Deal and Roosevelt during the 1930s.

²⁷ *Tennessean* August 20, 1939. Also reproduced in Doyle, *Nashville Since the 1920s*, 107.

letters “TVA” towering over a rural landscape framed by sparks.²⁸ [Fig. 3.3] The image’s title, “Over Our Land,” established the Authority’s role as a benevolent protector of the region’s interests, suggesting that the power program was an enduring symbol of the agency’s commitment to the people of Nashville and Davidson County. Together, Little’s cartoons captured the efforts of the city’s civic leaders to shape popular opinion about the TVA, highlighting the extent to which the support of men like Silliman Evans, Sr. and his employees at the *Tennessean* helped smooth the transition to public power.²⁹

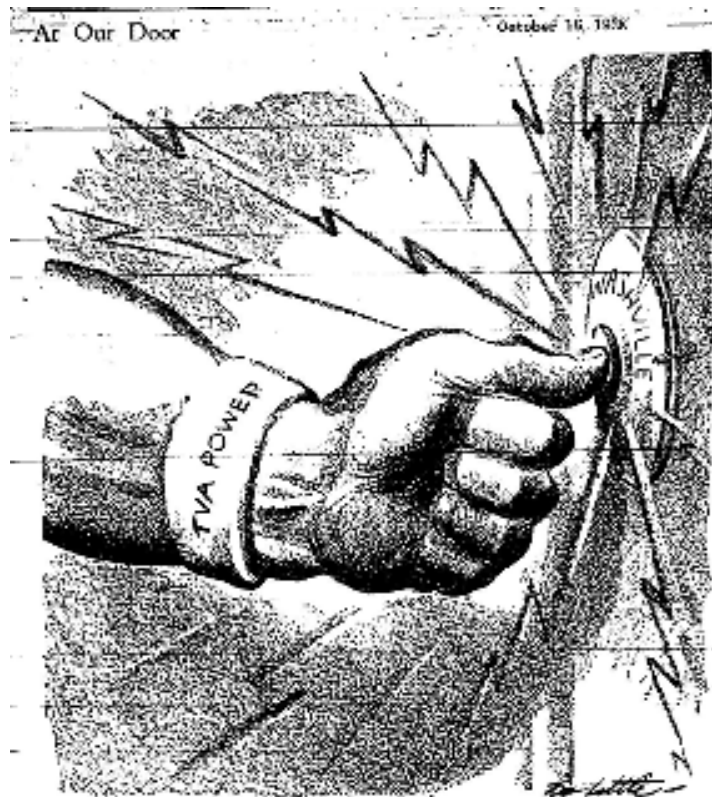


Figure 3.2: “At Our Door” – A Tom Little cartoon that appeared in the *Tennessean* the morning after Nashville celebrated its switch to TVA power. Source: Tom Little, “At Our Door,” *Tennessean*, August 20, 1939, 2.

²⁸ *Tennessean* August 20, 1939. Also reproduced in Doyle, *Nashville Since the 1920s*, 107.

²⁹ Little and Evans remained important proponents of NES and the Authority following World War II. Thirteen years after the Electric Service began supplying area with TVA electricity, Little published a piece commemorating the opening of the utility’s new office building, summarizing public power’s effect on the community in one word, “PROGRESS.” See Tom Little, “More Than a Mere Building PROGRESS,” *Tennessean*, November 3, 1949, 18.

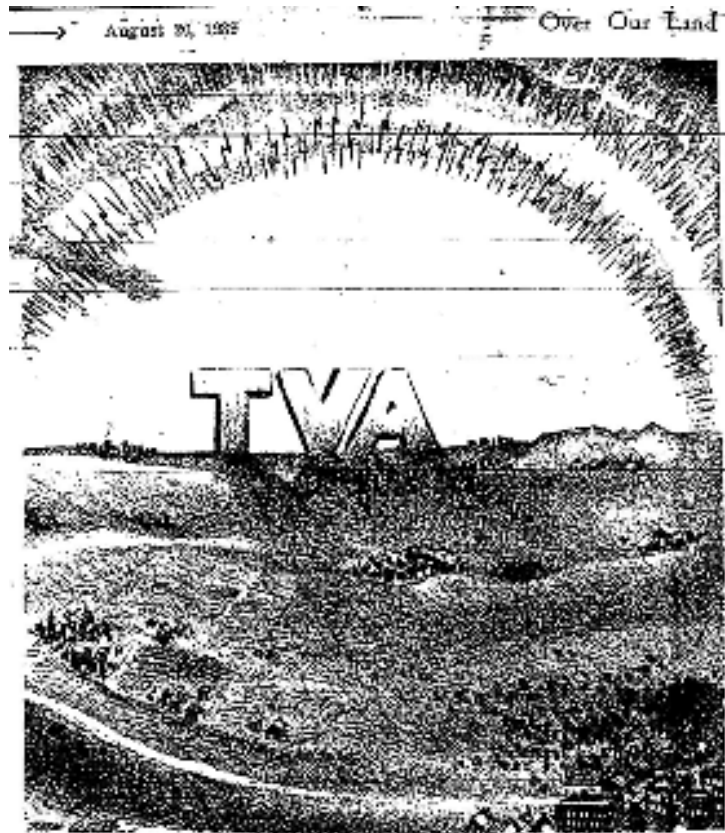


Figure 3.3: “Over Our Land” – A Tom Little cartoon depicting the TVA lighting up the countryside in the Tennessee Valley Region. Source: Tom Little, “Over Our Land,” Tennessean, August 20, 1939, 2.

The Authority also cultivated a positive relationship with local businessmen through the operation of Nashville’s new municipal power board.³⁰ In an effort to claim that its power program was subject to popular control, the TVA required cities to establish new public boards to monitor and direct the activities of utilities that supplied them with electricity. Members were to serve for set terms that were renewable. Although the positions were theoretically open to any member of the voting public, in practice, prominent businessmen dominated the rolls of the local boards. As it had with its agricultural programs, the TVA did little to enforce true grassroots

³⁰ Nashville did not have a power board during the time private utilities like TEPCO supplied it with electricity.

control of its power operations, preferring to work with existing community leaders to ensure their continued favor.³¹

Nashville's Electric Power Board (EPB) was no exception. Appointed by the mayor and confirmed by the city council, the Board's original members counted themselves among the community's business elite.³² J. D. Goodpasture, the EPB's original chairman was a former manufacturer and financier; Martin A. Hayes was an executive in the insurance industry, J. T. Ward owned WLAC, a local radio station; Leon Gilbert was a real estate magnate; and William C. Baird was a flour and grain broker.³³ The presence of these men on the city's power board and their stature in the community lent credibility to the newly created Electric Service, the TVA, and the operation of the agency's power program.

Widespread acceptance of public power in Nashville did not hinge on questions of constitutionality or the perception that the Authority was a socialist threat to free enterprise. Instead, residents and local businessmen were more concerned that a public utility would become a pawn in metropolitan politics.³⁴ The machine of Mayor Hilary Howse had controlled Nashville from 1909 to 1915 and again from 1923 until his death in 1938, and many worried that the corruption that characterized the Howse regime would lead to mismanagement and poor quality electric service. Although Thomas L. Cummings, Howse's successor, had led campaigns for reform in the 1930s, it was only after he agreed that the city council should have the ability to confirm or reject his nominees for the electric power board that popular support coalesced in

³¹ On power boards, see Hobday, *Sparks at the Grassroots*, 32-73. In rural areas, the TVA relied on the support of cooperatives that held yearly meetings for members to elect their leaders. On the Authority's reliance on local elites for the operation of its agricultural program, see McCraw, *Morgan vs. Lilienthal*, 11-6; Hargrove, *Prisoners of Myth*, 26-8; and Selznick, *TVA and the Grass Roots*.

³² Hembree, "The Role and History of Nashville Electric Service," 7, NPLNR, Stacks.

³³ Hembree, "The Role and History of Nashville Electric Service," 7, NPLNR, Stacks.

³⁴ Hembree, "The Role and History of Nashville Electric Service," 6, NPLNR, Stacks.

favor of the shift to public power.³⁵ Underscoring the perceived importance of Cummings' acquiescence years later, an editorial in the *Tennessean* noted, "The most important factor in the success of this publicly owned electric system...has been its freedom from the corrupting influence of partisan politics."³⁶

Furthermore, the TVA permitted Nashville's new Electric Power Board to hire former TEPCO employees to manage NES.³⁷ J. P. W. Brown, the first general manager at NES, had held the same post at TEPCO's Nashville office. Similarly, James E. Carnes, the Electric Service's first assistant general manager, and J. M. Davidson, who served as treasurer and the assistant secretary, both continued in their former jobs.³⁸ When J. P. W. Brown died less than six months after his appointment as general manager, the Power Board elevated Carnes to replace him.

While five of six men whom the Board considered were former TEPCO employees, the choice of Carnes represented a particular commitment to continuity. At the time of his promotion in 1940, he had spent thirty-six years working for the city's electric utilities. Having moved to the area in 1904 from Galveston, Texas, Carnes started as an errand boy at Nashville Railway & Light before working his way into upper management during the TEPCO era. As if to underscore his dedication to the status quo, Carnes expressed the desire to "carry on the policies" of his predecessor, managing NES for the good of the utility and the community.³⁹

³⁵ On the importance of the mayor's decision; see Hembree, "The Role and History of Nashville Electric Service," 6, NPLNR, Stacks. On corruption in Nashville politics and the Howse machine in the early twentieth century, see Doyle *Nashville Since the 1920s*, 64-84.

³⁶ "Keep Politics Out," *Tennessean*, May 12, 1952, clipping in NPLSC, NESPRR, Box 2, Folder 27. Local residents also commented on the importance of the Electric Power Board's apolitical nature; see Mrs. W. A. Meadows, "Letter to the Editor: What Nashville Needs," *Tennessean*, May 2, 1952, 24.

³⁷ In fact, 450 local TEPCO employees transferred directly to NES after the switch to public power; see "Transfer of TEPCO Ends Long Battle," *Tennessean*, August 16, 1939, 1.

³⁸ "TEPCO Officials Get NES Posts," *Banner*, August 22, 1939, clipping in NPLSC, NESPRR, Box 1, Folder 13.

³⁹ Quote from "J.E. Carnes Unanimously Elected to Head NES," *Banner*, January 19, 1940, clipping in NPLSC, NESPRR, Box 1, Folder 13. For more on Carnes and his background, see "J.E. Carnes to be Named NES General

Local newspapers lauded the choice of Carnes as general manager, noting that he was known as “one of the real pioneers” in the development of electricity for residential use in Nashville and that he was well respected for his work in the community.⁴⁰ James G. Stahlman, the editor of the conservative *Banner*, praised the decision, calling Carnes a consummate professional with a business mind “always with the idea of service to the people of Nashville.”⁴¹ Carnes’ successor, John L. Sisk, had also worked for years as the power manager first for TEPCO and later for NES.⁴²

The Tennessee Electric Power Company never had a problem with the quality of its service, at least in the city itself, or the competence of its local leaders and employees. Nashville’s elite generally approved of the private utility. While public power embodied a vision “greater than any of which the founders of TEPCO ever dreamed,” its promise of rate reductions was by far its greatest allure.⁴³ As discussed below, municipal distributors—whether private or public—did not fully control the cost of electricity for residential and commercial customers in the communities they served.⁴⁴ Their retail rates were dependent in large part on the rate that

Manager,” *Banner*, January 9, 1940, clipping in NPLSC, NESPRR, Box 1, Folder 13; and “N. E. S. Plans to Make Sales; Carnes Choice: Private Drives to Move Appliances Said Lagging: Power Profit Seen,” *Tennessean*, January 10, 1940, clipping in NPLSC, NESPRR, Box 1, Folder 13. J. P. W. Brown died of a stroke in December of 1939; see Hembree, “The Role and History of Nashville Electric Service,” 9, NPLNR, Stacks.

⁴⁰ Quote from “TEPCO Officials Get NES Posts,” *Banner*, August 22, 1939, clipping in NPLSC, NESPRR, Box 1, Folder 13. On Carnes and his background, also see “J.E. Carnes to be Named NES General Manager,” *Banner*, January 9, 1940, clipping in NPLSC, NESPRR, Box 1, Folder 13; and “N. E. S. Plans to Make Sales; Carnes Choice: Private Drives to Move Appliances Said Lagging: Power Profit Seen,” *Tennessean*, January 10, 1940, clipping in NPLSC, NESPRR, Box 1, Folder 13.

⁴¹ James G. Stahlman, “From the Shoulder,” *Banner*, January 10, 1940, clipping in NPLSC, NESPRR, Box 1, Folder 13. Carnes also received support from the *Tennessean*; see “Board’s Choice,” *Tennessean*, January 11, 1940, clipping in NPLSC, NESPRR, Box 1, Folder 13.

⁴² Sisk served as general manager from 1951 until 1967; see NES, “40 Years Service: Annual Operating Report July 1, 1978 – June 30, 1979,” 1979, 4, NPLSC, NESPRR, Box 13, Folder 631.

⁴³ “Nashville and TVA Power,” *Tennessean*, August 20, 1939, 2. In part, the *Tennessean*’s deprecating stance towards TEPCO in the wake of its sale probably reflected Silliman Evans’ desire to prevent his alienation among the private business community as well as NES’ new managers, all of whom were former TEPCO employees.

⁴⁴ Several other factors influenced the rates that private distributors charged. In the early twentieth century, power companies often had to appeal to state utility boards to raise their rates. In Tennessee, the Tennessee Public Service Commission regulated private electric companies until the arrival of the TVA. Following the passage of the Federal Power Act of 1935, the Federal Power Commission (itself a creation of the Water Power Act of 1920) also regulated

they paid to wholesale providers. Nashville's transition to public power was less a switch from the Tennessee Electric Power Company to NES than from the Commonwealth & Southern Corporation to the TVA. By allowing the Electric Power Board to hire TEPCO's former staff to run Nashville's new public distributor, the Authority ensured a minimal disruption in service for the city's civic leaders and affluent residents. The agency's conservative approach helped build support among local elites for public power, and it was reminiscent of the TVA's agricultural programs elsewhere in the region.⁴⁵ Particularly in Nashville, the backing of prominent businessmen helped legitimize NES and strengthen the Authority's energy regime. Other than the agrarians and TEPCO, no serious opposition existed to public power.

Low Rates: Power for All

At the local level, the implementation of low TVA rates became a defining feature of the transition to public power and a key component of the promotional narrative that distributors and their supporters developed. The Authority's presence in the region had already affected the cost of electricity in Nashville prior to the community's transition to public power. As recently as 1930, TEPCO had charged Nashvillians almost seven cents per kilowatt-hour, a marked improvement over the twelve cents that individuals paid Nashville Railway & Light in 1909, but still almost one cent higher than the national average reported in the *Wall Street Journal*.⁴⁶

private utilities through its oversight of the interstate wholesale market. In the 1970s and 1990s, federal legislation deregulated much of the utility market. Results, predictably, have been mixed; see Mary M. Timney, *Power for the People: Protecting States' Energy Policy Interests in an Era of Deregulation* (Armonk: M.E. Sharpe, 2004).

⁴⁵ The TVA made a concerted effort to work through local elites in the implementation of its agricultural programs; see Selznick, *TVA and the Grass Roots*; and Phillips, *This Land, This Nation*, 1-148.

⁴⁶ TEPCO charged 6.76 cents per kilowatt-hour in 1930 while the national average hovered around 6.06 cents; see NES, "The Spring Campaigner," promotional pamphlet, March 1940, NPLSC, NESPRR, Box 1, Folder 21; and "Electric Dollar Has High Value," *Wall Street Journal*, June 26, 1930, 10. The NR&L rate is from October 1909; see NES, "Friendly Service News," promotional pamphlet, March 1941, NPLSC, NESPRR, Box 1, Folder 5. For national average in 1930, also see U.S. Department of Commerce, Bureau of the Census, "Series S 108-119. Growth

While TEPCO more than halved its rates again to an average of 2.7 cents per kilowatt-hour by the late 1930s, touting the fact that only thirteen utilities in the United States charged their customers less in 1937, it began to take rate reduction seriously only after the creation of the Tennessee Valley Authority.⁴⁷

The cost of electricity continued to plummet after NES began distributing TVA power in the community. Following the creation of the Electric Service, the typical consumer paid a mere 1.83 cents per kilowatt-hour.⁴⁸ By 1949, the average price had dropped to 1.34 cents, and only a decade later, it had fallen to less than one cent, a rate that remained largely unchanged through the 1960s.⁴⁹ When one adjusts for inflation, the trend becomes even more pronounced. The 2.7 cents per kilowatt-hour that Nashvillians paid to TEPCO in the late 1930s would have been equivalent to paying the Electric Service 4.6 cents in 1949 and more than seven cents in 1969.⁵⁰ The TVA reported similar trends throughout its service area.⁵¹

of Residential Service, and Average Price for Electric Energy: 1902 to 1970,” in *Historical Statistics of the United States Colonial Times to 1970, Part 2* (Washington, D.C.: Government Printing Office, 1975), 827.

⁴⁷ By the late 1930s, TEPCO had lowered its rates to an average of 2.7 cents per kilowatt-hour; see NES, “Better Living with Electricity,” promotional pamphlet, October 1949, No. 6, NPLSC, NESPRR, Box 18, Folder 8. Paul Hembree suggests that TEPCO’s final rates were 2.64 cents per kilowatt-hour; see Hembree, “The Role and History of Nashville Electric Service,” 9, NPLNR, Stacks. For claim regarding rates, see TEPCO, “We Have Been Serving Nashville Since 1882 ... or 4 years Before Football Was Heard of on Vanderbilt Campus,” 1937, NPLSC, NESPRR, Box 1, Folder 10. Regarding TEPCO’s emphasis on rate reductions after 1933, see above and TEPCO, “The Tennessee Electric Power Company: Report to Stockholders” December 31, 1936, 15, NPLSC, NESPRR, Box 1, Folder 10.

⁴⁸ The figure of 1.83 cents is reported in NES, “Nashville Electric Service 1939-1974 Thirty-Five Years of Service,” promotional pamphlet, 1974, 19, NPLSC, NESPRR, Box 13, Folder 630; and NES, “30th Annual Report 1968-1969,” 1969, 30, NPLSC, NESPRR, Box 13, Folder 623. Paul Hembree suggests that the rate had lowered to 1.99 cents per kilowatt-hour 10.5 months after the Electric Service took over; see Hembree, “The Role and History of Nashville Electric Service,” 9, NPLNR, Stacks.

⁴⁹ NES, “Better Living with Electricity,” promotional pamphlet, October 1949, No. 6, NPLSC, NESPRR, Box 18, Folder 8; and NES, “40 Years Service: Annual Operating Report July 1, 1978 – June 30, 1979,” 1979, 18, NPLSC, NESPRR, Box 13, Folder 631.

⁵⁰ Calculated using CPI Inflation calculator found at Bureau of Labor Statistics, “CPI Inflation Calculator,” accessed September 22, 2013, http://www.bls.gov/data/inflation_calculator.htm. In 2010 dollars, TEPCO’s rate of 2.7 cents per kilowatt-hour would be equivalent to paying 42.4 cents. In 2014, NES charges an average of 9.3 cents per kilowatt-hour depending on the season.

⁵¹ The TVA suggested that residents paid 1.49 cents per kilowatt-hour during the fiscal year ending in 1950, a reduction of approximately seventy-five percent from 1933 according to the *Tennessean*. In 1970s, the Authority reported that rates had hovered around five cents per kilowatt-hour. By 1965 rates in the region had fallen to 0.92 cents, less than half the average nationwide of 2.28 cents per kilowatt-hour. For data, see TVA, *Annual Report*,

The Nashville Electric Service and the city's Electric Power Board had little control over the price of electricity in Davidson County. The Authority dictated the retail rates that its distributors could charge residential and commercial customers in the contracts that it signed with municipal utilities and rural cooperatives. Although the TVA eventually introduced multi-tiered schedules that gave public providers some discretion to lower the cost of electricity beyond the existing rates, the agency never fully delegated control over pricing in its service area. Instead, the Authority's consumption-centric energy regime focused on improving access to electric power for individuals and communities rather than involving the public in the rate setting process.⁵²

The Electric Service and its supporters built a public narrative that emphasized the advantages of low-cost electricity to the residents of Nashville and Davidson County. A script that the distributor developed for a promotional event in 1940 called for NES' representatives to remind audience members that they had paid almost seven cents per kilowatt-hour only one decade earlier before explaining how much money homes could save using water heaters and electric ranges under the utility's new rate schedule. As the script's preface explained: "Your women listeners should be reminded at every opportunity that 'now you have the cheapest electricity in the United States for cooking with electricity and for automatic electric water

1950 (Washington, D.C.: Government Printing Office, 1950), 35; TVA, *Annual Report, 1965* (Washington, D.C.: Government Printing Office, 1965), xii; TVA, *Annual Report, 1970* (Washington, D.C.: Government Printing Office, 1970), 24; and "It Helps Us All," *Tennessean*, December 30, 1949, clipping in NPLSC, NESPRR, Box 20, Folder 12.

⁵² For a discussion of the TVA's control over the rate setting process, see "Tennessee Valley Authority Act of 1933," in *The Statutes at Large of the United States of America from March 1933 to June 1934: Part I, Public Laws*, vol. 48 (Washington: GPO, 1934), 58-72; Hobday, *Sparks at the Grassroots*, 32-109; and Hargrove, *Prisoners of Myth*, 54-6. On the creation of multi-tiered rate schedules, see TVA, *Annual Report, 1961* (Washington, D.C.: Government Printing Office, 1961) 49-50.

heating—and for all electric purposes.’’⁵³ Throughout the post-World War II period, NES continued to highlight the low cost of power in Davidson County. A 1949 newsletter that the utility mailed to customers noted that Nashvillians paid less than half as much for their electricity as other consumers across the United States, a reality that remained unchanged two decades later according to the distributor’s annual report for the 1968-1969 fiscal year.⁵⁴ Employee recruiting materials and training manuals from the 1940s and 1950s also emphasized the relative affordability of the Electric Service’s rates compared to national averages, underscoring the distributor’s intent to spread the gospel of cheap electricity.⁵⁵

Perhaps most importantly, the Electric Service promoted low-cost power as a means to democratize consumption. According to NES, the TVA’s rates had made it “so that not a few homes, but ALL homes, could use all the electricity they wanted.”⁵⁶ The Electric Service often referenced the number of residences in Nashville and Davidson County that contained specific appliances, suggesting that the plethora of devices proved the egalitarian character of the public power movement’s consumption-centric policies.⁵⁷ The distributor congratulated itself in a 1949

⁵³ “Memorandum to Home Economics Director Conducting Electric Cooking School – Monday, Tuesday, Wednesday – March 4, 5, 6, at War Memorial Auditorium,” undated likely in conjunction with 1940 Electric Show that took place March 5-8, 1, NPLSC, NESPRR, Box 1, Folder 22.

⁵⁴ “Better Living with Electricity,” promotional pamphlet, October 1949, No. 6, NPLSC, NESPRR, Box 18, Folder 8; and NES, “30th Annual Report 1968-1969,” 1969, 31, NPLSC, NESPRR, Box 13, Folder 623.

⁵⁵ NES, “The Best Place in Nashville.... to Work,” 1944, 7, NPLSC, NESPRR, Box 13, Folder 635; NES, “Our Job At Nashville Electric Service,” c.1952, 7, NPLSC, NESPRR, Box 13, Folder 639; and NES, “Our Job At Nashville Electric Service,” 1970, 20, NPLSC, NESPRR, Box 14, Folder 641.

⁵⁶ NES, “Friendly Service News,” promotional pamphlet, January 1941, NPLSC, NESPRR, Box 4, Folder 52, capitalization in original.

⁵⁷ For examples, see NES, “The News,” newsletter, Summer 1948, Vol. V, No. 6, 1-2, NPLSC, NESPRR, Box 2, Folder 24; NES, “Better Living with Electricity” promotional pamphlet, July 1949, No. 4, NPLSC, NESPRR, Box 1, Folder 5; NES, “Nashville in Top Group of Cities for Residential Use of Electricity,” undated c.1949, NPLSC, NESPRR, Box 1, Folder 19; NES, “Better Living with Electricity” promotional pamphlet, September 1950, NPLSC, NESPRR, Box 18, Folder 8; and NES, “Annual Report of Operations Year Ended June 30, 1964 Nashville Electric Service,” July 29, 1964, Appendix B, NPLSC, NESPRR, Box 12, Folder 617. In 1964, NES released statistics as part of its annual report comparing the number of appliances in service in 1939 with 1964; see NES, “Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report,” 1964, 8, NPLSC, NESPRR, Box 12, Folder 618. A 1949 ad that ran in the *Banner* suggested that two out of three homes in Nashville and Davidson County used electricity for cooking; see NES, untitled advertisement, *Banner*, April 5, 1949, 3. In 1966, NES reported that

advertisement that ran in local newspapers, noting that four out of seven customers in its service area had electric ranges “**BECAUSE** Nashville’s Low Electric Rates Are Far Below The National Average—In Fact Among The Cheapest In The Country.”⁵⁸ It was, therefore, “Little Wonder That So Many Homes Enjoy Low Cost Electric Cooking.”⁵⁹

Nashville’s civic leaders also pointed to the widespread use of electricity after 1939 as evidence of the benefits of public power for the community, repeating many of the same arguments that the Electric Service itself made regarding the importance of low rates. Editorials in local newspapers suggested that the cost of electricity in Nashville facilitated the in-home consumption of electric power, observing that the residential use had increased in the years after NES and the TVA began supplying the area.⁶⁰ According to the *Tennessean*, the statistics made “an impressive case for the merits of public ownership and low power rates.”⁶¹ In this way, the Electric Service’s supporters contributed to the distributor’s promotional narrative, linking cheap electricity with growth and prosperity.

The rate reductions that the Authority implemented in Nashville represented an important component of the agency’s consumption-centric energy regime. Democratizing the use of electricity had always been an important goal of the larger public power movement.⁶² At the

over half the homes in its service area had electric heat; see NES, “Annual Operating Report July 1, 1965 – June 30, 1966,” July 27, 1966, 10, NPLSC, NESPRR, Box 12, Folder 620.

⁵⁸ NES, untitled advertisement, *Banner*, April 5, 1949, 3, boldface and capitalization in original.

⁵⁹ NES, untitled advertisement, *Banner*, April 5, 1949, 3, capitalization in original.

⁶⁰ For example, “The consumer, receiving the benefits of such low rates, is encouraged to use more and more power.” See “Keep Politics Out,” *Tennessean*, May 12, 1952, clipping in NPLSC, NESPRR, Box 2, Folder 27.

⁶¹ “Progress Report,” *Tennessean*, July 28, 1949, 10. The *Tennessean* also suggested that low rates had helped boost the local economy, “The real secret [of economic growth] lies in the low power rates the TVA brought.” See “It Helps Us All,” *Tennessean*, December 30, 1949, clipping in NPLSC, NESPRR, Box 20, Folder 12.

⁶² Gifford Pinchot, “Governor Pinchot’s Message of Transmittal,” in *Report of the Giant Power Survey Board to the General Assembly of the Commonwealth of Pennsylvania*, eds. Morris Llewellyn Cooke and Judson C. Dickson (Harrisburg: The Telegraph Printing Co., 1925), iv-v.

local level, the transition to public power meant an emphasis on inexpensive kilowatts and their benefits both for individuals and the community.⁶³

Production, Transmission, and Wiring: Infrastructure at the Local Level

The implementation of the TVA's consumption-centric energy regime also relied on infrastructural improvements. As noted in Chapter Two, the Authority embraced coal-fired expansion in the late 1940s because of its commitment to maintaining an abundant supply of low-cost power. In Nashville and Davidson County, community leaders advocated the construction of new generating facilities, and the Electric Service worked to upgrade the power grid, while partnering with local developers to insure the installation of adequate home wiring.

As early as 1940, Nashville's Chamber of Commerce and the mayor's office petitioned the TVA to build a new, more powerful steam plant outside of the city limits. According to its proponents, the proposal promised to solidify the TVA's generating capacity in middle and western Tennessee while providing much needed electricity to the residents and businesses of Davidson County. Furthermore, the location's proximity to area coal fields was ideal, reducing the cost of obtaining fuel.⁶⁴ At the same time, the effort to replace Nashville's existing steam

⁶³ NES and the city's civic leadership drew attention to the falling price of electric power following the TVA's arrival, arguing that cheap kilowatts were both the cause of and an excuse for in-home use. A pamphlet that NES sent customers in January 1941 explicitly stated that low rates were an excuse to use more electricity, wishing Nashvillians a happy new year before claiming, "**Nowadays ... with low TVA rates ... you really Save money by using more Light.**" See NES, "Friendly Service News," promotional pamphlet, January 1941, NPLSC, NESPRR, Box 4, Folder 52, boldface and capitalization in original.

⁶⁴ Letter, R. B. Beal, Nashville Chamber of Commerce to Dr. H. A. Morgan, Dr. David Lilienthal, and Senator James P. Pope, TVA, June 21, 1940, NARA-SE, RG 142, GMAF, Box 149. Beal noted in a 1941 letter that both Mayor Cummings and Silliman Evans, Sr. supported a new power plant for Nashville; see Letter, R. B. Beal, Nashville Chamber of Commerce to David E. Lilienthal, TVA, May 29, 1941, NARA-SE, RG 142, GMAF, Box 150. Also see Letter, C. N. Vester, Nashville Builders Trade Council to David Lilienthal, TVA, June 13, 1941, RG 142, GMAF, Box 150; Memorandum, C. L. Karr to William C. Pitts, "Nashville Steam Plant – Smoke Abatement," September 10, 1941, NARA-SE, RG 142, GMAF, Box 150; and S. H. Woodward and W. H. Chambers, "Preliminary Report: Additional Power Generation Capacity in Steam Plants," internal report, June 20, 1941, 3 and Figure 1, NARA-SE, RG 142, Office of Engineering Design and Construction, Project Histories and Reports [hereafter: OEDC], Box 95.

plant with one located on the urban fringe highlighted another benefit of low-cost electric power for consumers, cleaner air.⁶⁵

Like many urban areas that relied primarily on coal for their energy needs, Nashville suffered periods of poor air quality in the early twentieth century. Soot blanketed the city's skyline so consistently that it became immortalized in popular literature. Writing in 1904 under the penname O. Henry, William Sydney Porter compared the smog that plagued the community to a London fog mixed with malaria, gas leaks, and the odor of honeysuckle.⁶⁶ Problems persisted decades later. Joseph Swidler, a lawyer for the TVA who lived in Nashville during the years before and after World War II, recalled that the smoke from homes and businesses made it difficult to see across the street in the morning and that newspaper boys often wore kerchiefs over their nose and mouth to protect themselves from the dust.⁶⁷ At times, the pollution was so thick that it obscured the entire downtown area.⁶⁸ Air quality became an important political issue in Nashville with the editorial board of the *Tennessean* adding smoke abatement to its list of urgently needed reforms in the 1930s.⁶⁹ Although the city council passed a law regulating airborne emissions in 1941, the local Exchange Club, a group committed to Nashville's growth and development, continued to lobby in favor of a stricter anti-pollution ordinance while suggesting that the only way for the community to achieve the progress of "a clean aggressive

⁶⁵ Letter, Thomas L. Cummings, Mayor to David E. Lilienthal, TVA, January 18, 1941, NARA-SE, RG 142, GMAF, Box 150. Internal TVA memos suggested that Nashville's civic leaders were complaining about emissions at the Nashville Steam Plant in an effort to convince the Authority to build a new facility outside of the city; see Memorandum, C. L. Karr to William C. Pitts, "Nashville Steam Plant – Smoke Abatement," September 10, 1941, NARA-SE, RG 142, GMAF, Box 150.

⁶⁶ O. Henry [William Sydney Porter], "A Municipal Report," 1904, reprinted in *The Best Short Stories of O. Henry*, eds. Bennett A. Cerf and Van H. Cartmell (New York: Modern Library, 1994), 322-40.

⁶⁷ Mary Jane Lowe, "Oral History Interview with Joseph Swidler," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, June 18, 1991, no pagination, NARA-SE, RG 142, Oral History Records [hereafter: OHR], Box 8.

⁶⁸ Doyle, *Nashville Since the 1920s*, 5 and 115.

⁶⁹ The *Tennessean* continued to place smoke abatement on its list of priorities well into the 1950s; see, *Tennessean*, May 3, 1952, 4.

city like Memphis” was for residents to refuse to tolerate the “inexcusable filth” that resulted from the burning of coal.⁷⁰

The TVA had purchased the existing Nashville Steam Plant from TEPCO along with the private utility’s other properties in 1939. Built in 1907 and located on the Cumberland River adjacent to the business district, the facility burned nine hundred tons of coal per day, more than all of the community’s other industries combined.⁷¹ In January 1941, Mayor Thomas L. Cummings noted in a letter to the Authority’s chairman, David Lilienthal, that the plant was the source of numerous complaints from residents and that it had become an “embarrassment to the City of Nashville” as the local government tried to improve air quality in the downtown area.⁷² The city smoke inspector made numerous visits to the facility during the following nine months, citing it for violating Nashville’s air pollution regulations and meeting with plant operators to discuss potential solutions. The city attorney also requested the TVA’s full cooperation in smoke abatement, ostensibly to set a positive example for local manufacturers. Business owners whose stores were located near the facility also submitted written protests to the Authority, arguing that the steam plant’s emissions soiled the buildings in which they operated as well as their merchandise, hurting profits.⁷³

⁷⁰ On the smoke ordinance, see George R. Zepp, *Hidden History of Nashville* (Charleston: The History Press, 2009), 104-7. On the Exchange Club, see “Club Urged To Support Proposed Smoke Ordinance,” *Tennessean*, September 14, 1947, clipping in NPLSC, NESPRR, Box 18, Folder 8.

⁷¹ Memorandum, C. L. Karr to William C. Pitts, “Nashville Steam Plant – Smoke Abatement,” September 10, 1941, NARA-SE, RG 142, GMAF, Box 150.

⁷² Letter, Thomas L. Cummings, Mayor to David E. Lilienthal, TVA, January 18, 1941, NARA-SE, RG 142, GMAF, Box 150.

⁷³ Regarding the efforts of the city smoke inspector, see Letter, Gordon R. Clapp, TVA to W. C. Cherry, City Attorney, September 26, 1941, NARA-SE, RG 142, GMAF, Box 150; Letter, Gordon R. Clapp, TVA to W. C. Cherry, City Attorney, September 15, 1941, NARA-SE, RG 142, GMAF, Box 150; and Memorandum, C. L. Karr to William C. Pitts, “Nashville Steam Plant – Smoke Abatement,” September 10, 1941, NARA-SE, RG 142, GMAF, Box 150. On the TVA setting a positive example, see Letter, W. C. Cherry, City Attorney to Gordon Clapp, TVA, August 29, 1941, NARA-SE, RG 142, GMAF, Box 150. For complaints from business owners, see Letter, L. P. Thweatt, H. G. Hill Company to TVA, June 19, 1941, NARA-SE, RG 142, GMAF, Box 150.

Nashville's political leaders, its Chamber of Commerce, and its Builders Trade Council wanted the TVA to build a new, larger coal-fired steam plant on a site west of town overlooking the Cumberland River near the old Tennessee Central Railroad Bridge in the community of Bordeaux.⁷⁴ Situated amidst a bucolic landscape of softly sloping fields that the Authority already owned, the plant's proposed location sat approximately three miles from the shops and office buildings of the downtown business district.⁷⁵ Replacing the TVA's existing facility with one in Bordeaux would remove a major source of air pollution from the city center without reducing the Authority's ability to provide either Nashville or the region with low-cost electric power. The area between Bordeaux and the business district was home to many of the city's African American residents as well as two historically black universities, Fisk and Tennessee State.⁷⁶ The African American community rather than Nashville's white business elites, government officials, and consumers would thus bear the brunt of the proposed steam plant's emissions.

⁷⁴ Letter, R. B. Beal, Nashville Chamber of Commerce to David E. Lilienthal, TVA, May 29, 1941, NARA-SE, RG 142, GMAF, Box 150; Letter, C. N. Vester, Nashville Builders Trade Council to David Lilienthal, TVA, June 13, 1941, RG 142, GMAF, Box 150; Memorandum, C. L. Karr to William C. Pitts, "Nashville Steam Plant – Smoke Abatement," September 10, 1941, NARA-SE, RG 142, GMAF, Box 150; Letter, R. B. Beal, Nashville Chamber of Commerce to Dr. H. A. Morgan, Dr. David Lilienthal, and Senator James P. Pope, TVA, June 21, 1940, NARA-SE, RG 142, GMAF, Box 149; S. H. Woodward and W. H. Chambers, "Preliminary Report: Additional Power Generation Capacity in Steam Plants," internal report, June 20, 1941, 3 and Figure 1, NARA-SE, RG 142, OEDC, Box 95.

⁷⁵ S. H. Woodward and W. H. Chambers, "Preliminary Report: Additional Power Generation Capacity in Steam Plants," internal report, June 20, 1941, 3 and Figure 1, NARA-SE, RG 142, OEDC, Box 95.

⁷⁶ The area known as North Nashville became home to many of the city's black residents in the 1920s and 1930s. It included successful black businessmen and professionals who lived in a cluster around Fisk University as well as Nashville's black poor. In addition there was an enclave of poor white residents who lived in North Nashville in a neighborhood known as Mud Flats. On the demographics of North Nashville, see Doyle, *Nashville Since the 1920s*, 42-8 and 222-34; and Metropolitan Planning Commission, *A Study of Nonwhite Residential Distribution in Nashville, Tennessee in 1940, 1950, 1960, and 1970* (Nashville, 1975). Bordeaux itself became a thriving black suburb in the 1950s and 1960s; it also became the location of Nashville's landfill, and it served as a site for the state hospital for individuals with tuberculosis; see Joey Garrison, "Nashville Rising: Bordeaux, Whites Creek – Bordeaux Neighborhood Survives Decades of Challenges," *Tennessean*, March 29, 2013. As in many areas throughout the South, Nashville has had a history of sacrificing the environment in communities populated by the poor and minorities. For a longer discussion of the general environmental problems of the poor and minorities in the South, see Robert D. Bullard, *Dumping in Dixie: Race, Class, and Environmental Quality* (Boulder: Westview Press, 1990). For an excellent analysis of the effect of petroleum refineries on poor black communities in Louisiana, see Steve Lerner, *Diamond: A Struggle for Environmental Justice in Louisiana's Chemical Corridor* (Cambridge: MIT Press, 2005).

Ultimately, the TVA did not close the Nashville Steam Plant until the 1960s, citing the impending energy needs of defense industries in the region while noting that it had made every effort to comply with the local smoke ordinance. According to the Authority, it had already decided to upgrade the scrubbers that TEPCO had installed in 1937 to capture dust, and plant employees monitored visible emissions “every minute of the day.”⁷⁷ Furthermore, the TVA never built a facility at Bordeaux. The agency’s engineers believed that prevailing winds in the area would blow polluted air from the proposed plant back over the city.⁷⁸ Nevertheless, Nashville’s business community and its political elite liked the idea of building new coal-fired facilities in remote locations. Following World War II, the same groups who had suggested that the TVA construct a plant at Bordeaux lobbied in favor of the Authority’s plans to erect even larger coal-fired generating stations in rural communities, including the agency’s Johnsonville Steam Plant, which was located approximately seventy-five miles west of the city.⁷⁹ One of electricity’s great advantages was that it could be transmitted over long distances.⁸⁰ The

⁷⁷ Quoted in Letter, Gordon R. Clapp, TVA to W. C. Cherry, City Attorney, September 15, 1941, NARA-SE, RG 142, GMAF, Box 150. Also see Memorandum, C. L. Karr to William C. Pitts, “Nashville Steam Plant – Smoke Abatement,” September 10, 1941, NARA-SE, RG 142, GMAF, Box 150; and Memorandum, J. M. Peavey to Raiford Hathcote, “Letter from H. G. Hill Company,” August 6, 1941, NARA-SE, RG 142, GMAF, Box 150.

⁷⁸ A new steam plant would have required expensive pollution controls to prevent the smoke and soot that it produced from exacerbating conditions in the downtown commercial district; see S. H. Woodward and W. H. Chambers, “Preliminary Report: Additional Power Generation Capacity in Steam Plants,” internal report, June 20, 1941, 3, NARA-SE, RG 142, OEDC, Box 95.

⁷⁹ Allen Pettus, “Midstaters Happy About Steam Plant,” *Tennessean*, February 20, 1949, clipping in NPLSC, NESPRR, Box 20, Folder 12; “When the Battle Is Won,” *Tennessean*, April 15, 1949, clipping in NPLSC, NESPRR, Box 20, Folder 12; “No Time To Lag,” *Tennessean*, May 1, 1949, clipping in NPLSC, NESPRR, Box 20, Folder 12; J. Lacy Reynolds, “Cumberland Vital In Growing TVA Plan,” *Tennessean*, October 23, 1949, 1 and 6; “Let the Cumberland Serve,” *Tennessean*, November 11, 1949, clipping in NPLSC, NESPRR, Box 20, Folder 12; “Call to Action,” *Tennessean*, January 13, 1950; and Letter, R. A. Coleman, president of Nashville Electrical Dealers Association to All Members of NEDA and Electric Show Exhibitors, May 27, 1948, Box 2, Folder 24. In addition to noting the support of Mayor Cummings, Coleman’s letter demonstrated that local trade groups were also interested in the construction of Johnsonville, claiming that “This matter is vital to all of us in the electrical appliance business since our collective security and progress depend in a large measure on an unailing and adequate supply of electric power in the Nashville area.”

⁸⁰ Electricity’s cleanliness at the point of consumption was an important component of the public power movement’s campaign to make electric power affordable for all communities and individuals; see Pinchot, “Governor Pinchot’s Message of Transmittal,” iii-xiii. As discussed below, both NES and the TVA focused on cleanliness in many of their promotional materials; for example, see TVA, “Power and People In The Tennessee Valley the story of

construction of new power plants outside of the city limits facilitated the removal of coal-fired furnaces from the downtown business district without limiting the amount of energy available to local residents and industries. Instead, it shifted production away from areas that white middle- and upper-class residents frequented to those populated by minorities and the rural poor.⁸¹

While businessmen and politicians focused their efforts on supporting the expansion of the TVA's production capacity, the Electric Service committed itself to improving the electrical infrastructure of the greater Nashville metropolitan area. For NES, upgrading the local power network was an integral component of its implementation of the Authority's consumption-centric energy regime. On April 10, 1946, NES General Manager James E. Carnes wrote a letter to the chairman of the Electric Power Board, William C. Baird, outlining the shortcomings of the distributor's transmission system. The existing electric grid lacked the carrying capacity necessary to facilitate the high levels of residential use that Carnes and NES envisioned for the community. Already the demand that the distributor was experiencing in the Franklin Pike area south of the city was dangerously close to exceeding the maximum load that its network was capable of transmitting.⁸² The system that NES had inherited from TEPCO relied on older 13.8 kilovolt power lines. Although the grid had functioned reasonably well in the early 1940s, it was already showing signs of weakness prior to World War II in neighborhoods that had high rates of consumption. During the war itself, shortages of raw materials limited expansion; by 1946,

electrical development 1947-1949," promotional pamphlet, 1949, NPLSC, NESPRR, Box 14, Folder 663; NES, "Gold Medallion a National Hallmark of quality for Nashville Homes," promotional pamphlet, c.1970, NPLSC, NESPRR, Box 14, Folder 648; NES, untitled advertisement, *Banner*, April 5, 1949, 3; NES, "Friendly Service News," promotional pamphlet, February 1941, NPLSC, NESPRR, Box 1, Folder 5; NES, "Bless Your Electric Servants!" commercial script, c.1949, NPLSC, NESPRR, Box 1, Folder 15; NES, "Friendly Service News," promotional pamphlet, April 1941, NPLSC, NESPRR, Box 4, Folder 52; and NES, "Friendly Service News," promotional pamphlet, May 1941, NPLSC, NESPRR, Box 4, Folder 52. The separation of consumers from the production of goods and services became a defining feature of the modern age that had important implications for the environmental history of economic development; see William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton & Co., 1991).

⁸¹ The TVA preferred isolated rural areas for its steam plants; see Chapter Two, Chapter Five, and Chapter Six.

⁸² Letter, General Manager of NES to W. C. Baird, Chair of Electric Power Board, April 10, 1946, Nashville Electric Service Office Files, Nashville, TN [hereafter: NESOF], NES System Files Folder [hereafter: NSFF].

however, Carnes argued that the distributor could no longer delay needed upgrades.⁸³ In a separate letter to R. E. Argersinger, the vice president of Stone & Webster Engineering Corporation, the Electric Service's general manager summarized the studies that NES had conducted regarding the health of its power network, describing the situation as dire. The system was so overloaded that "abnormal voltage conditions [existed] over a considerable part of the area, and in many sections, it [was] almost impossible to maintain satisfactory service."⁸⁴

James E. Carnes and his staff at NES presented the public utility's outdated grid as a serious threat to its mission. In his letter to R. E. Argersinger, Carnes noted that NES was supporting approximately 41,000 refrigerators, 25,000 electric ranges, 12,000 electric water heaters, and 10,000 electric space heaters. The utility anticipated that the amount of electricity that its 57,363 residential customers used would grow rapidly, especially as more Nashvillians replaced their existing coal-fired furnaces with electric units.⁸⁵ In fact, the average system-wide load in Davidson County had risen by approximately 6,000 kilowatts a year between 1939 and 1946, peaking at 100,000 kilowatts in December 1945.⁸⁶

To accommodate the burgeoning level of consumption, Carnes and the Electric Service's engineers proposed the construction of a new sixty-nine kilovolt grid.⁸⁷ Completed in 1949, the

⁸³ Letter, General Manager of NES to W. C. Baird, Chair of Electric Power Board, April 10, 1946, NESOF, NSFF; and Letter, General Manager of NES to R. E. Argersinger, Vice President of Stone & Webster Engineering Corporation, May 14, 1946, NESOF, NSFF.

⁸⁴ Letter, General Manager of NES to R. E. Argersinger, Vice President of Stone & Webster Engineering Corporation, May 14, 1946, NESOF, NSFF.

⁸⁵ Letter, General Manager of NES to R. E. Argersinger, Vice President of Stone & Webster Engineering Corporation, May 14, 1946, NESOF, NSFF. The distributor expected to add upwards of 3,000 residences with electric heat to its lines within the next five years.

⁸⁶ Letter, General Manager of NES to W. C. Baird, Chair of Electric Power Board, April 10, 1946, NESOF, NSFF; and Letter, General Manager of NES to R. E. Argersinger, Vice President of Stone & Webster Engineering Corporation, May 14, 1946, NESOF, NSFF. NES studies predicted that demand would continue to grow, reaching 175,000 kilowatts in the early 1950s. In the next 25 years, the Electric Service expected that its power grid would have to be capable of handling loads as high as 300,000 kilowatts.

⁸⁷ Letter, Arthur E. Case, NES to Merrill Demerit, TVA Office of Power, March 26, 1946, NESOF, NSFF. Sixty-nine kilovolt lines were becoming standard nationwide with many utility companies transitioning to higher voltage networks. Similarly, the TVA preferred the Electric Service's plans for a sixty-nine kilovolt system rather than the

upgraded transmission system formed a loop around the downtown business district and improved electrical supply to the first ring of suburbs.⁸⁸ In particular, NES solidified its power supply in relatively affluent, white neighborhoods, adding substations in Hillsboro-Green Hills, Antioch, and the Radnor Lake area south of the city and in Madison and Donelson to the north and east in the early 1950s. The expansion of the Nashville's electrical infrastructure was integral to the growth of its suburbs and facilitated the movement of white residents to the urban fringe following World War II. The city's sprawl would not have been possible without cheap electric power.⁸⁹

At the same time, NES worked to make electricity available on every farm in the rural sections of Davidson County. Prior to the public distributor's arrival in 1939, only twenty-six percent of the county's nearly 3,000 farms had access to electric power. One year later more than sixty percent of local farmhouses were electrified, and by the end of World War II, approximately seventy-five percent of all of the farms in Davidson County had connected to the electric grid.⁹⁰ That figure soared to ninety-five percent in 1949.⁹¹ NES built more than 500

distributor's alternative that called for forty-six kilovolt lines. The increased voltage would enable NES to fulfill its "responsibility for the welfare of the community" something that could only be accomplished by "insisting on a high standard of service." Both quotes from Letter, R. E. Argersinger, Vice President of Stone & Webster Engineering Corporation to W. C. Baird, Chair of Electric Power Board, June 12, 1946, NESOF, NSFF.

⁸⁸ In addition to its existing substations, South, located approximately three miles southeast of the downtown area along Lebanon Pike (U.S. Highway 70) near Fesslers lane; West, six miles away at the intersection of 63rd Avenue North and Morrow Road; and Central, near the Cumberland River along First Avenue, the Electric Service suggested that the new units ought to be Watkins Park, at Watkins Park between 16th and 17th Avenues North; East, along Gallatin Pike near Hart Lane in East Nashville; Sharondale, near the intersection of Sharondale Drive and Woodlawn Drive between the communities of Hillsboro and Belle Meade; and Battlefield, along Thompson Lane in Berry Hill. See James C. Campbell, Jr., "Relaying a Tight 69 KV System" (paper presented at Protective Relaying Conference, Georgia Institute of Technology, Atlanta, GA, May 16-17, 1968), Figure 1. On the extent of suburban development in the immediate postwar period; see Helen Drowota, "Oral History Interview with Dr. Frank F. Drowota, Jr.," November 20, 1980, NPLSC, Century III Nashville: Nashville Heritage Project.

⁸⁹ "69 KV Stations," November 11, 1963, NESOF, NSFF. On racial composition of communities, see Doyle, *Nashville Since the 1920s*, 222-34; and Metropolitan Planning Commission, *A Study of Nonwhite Residential Distribution in Nashville, Tennessee in 1940, 1950, 1960, and 1970* (Nashville, 1975).

⁹⁰ "Growth of the Nashville Electric Service," undated document c.1949, NARA-SE, RG 142, GMAF, Box 150.

⁹¹ Around 1949, NES reported that 96 percent of all homes in its service area used electricity while Gordon Clapp estimated that 93 percent of farms in Davidson County had electric power in 1952; see NES, "Residential Sales of Electricity Largest Portion of Total in Nashville," undated press release c.1949, NPLSC, NESPRR, Box 1, Folder

miles of line its service area between 1939 and 1949, extending its power network to 2,500 new customers.⁹² The agency's rural extension group employed several agricultural engineers whose job it was to advise farmers on the economic benefits of electricity and to assist customers in the process of installing and upgrading the wiring in their homes and on their properties.⁹³ The fact that NES had electrified almost every farm in the county, exceeding the national average of eighty percent, stood as a testament to the Electric Service and its effort to expand the transmission infrastructure in Nashville and the surrounding countryside.⁹⁴

NES also worked with public and private developers to ensure that individual homes had adequate wiring. Following the transition to public power, builders began constructing subdivisions containing houses that relied on electricity for most if not all of their energy needs. The Electric Service invited Nashvillians to tour the new community that the United States Housing Authority erected for workers at the Vultee Aircraft Corporation in 1941 on Thompson Lane near the present day airport, noting specifically that every unit in the development was all-electric.⁹⁵ The trend toward electrified homes continued after World War II with James Carnes observing that NES expected 2,000 to 3,000 houses with electric heat to be built in the next half

19; and "Clapp Calls NES Job 'Outstanding,'" *Banner*, May 12, 1952, clipping in NPLSC, NESPRR, Box 2, Folder 27.

⁹² In 1949 alone, NES constructed eighty-four miles of rural line, connecting 398 homes and increasing the size of its service area to 700 square miles; see Untitled press release, c. September 24, 1949, NPLSC, NESPRR, Box 1, Folder 16; "Progress Report," *Tennessean*, July 28, 1949, 10; NES, "Residential Sales of Electricity Largest Portion of Total in Nashville," undated press release c.1949, NPLSC, NESPRR, Box 1, Folder 19; and "Clapp Calls NES Job 'Outstanding,'" *Banner*, May 12, 1952, clipping in NPLSC, NESPRR, Box 2, Folder 27.

⁹³ Dorothy Garrott, "Peace-Time Program Gains Momentum as Reconversion Gets Under Way at NES," December 1945; NPLSC, NESPRR, Box 2, Folder 30.

⁹⁴ For percentage of electrified farms nationwide, see Anne Mayberry, "Out of Darkness," *Rural Cooperatives* (May/June 2010): 18-21.

⁹⁵ Each of the 300 units had "Modern automatic electric water heating; cool, clean electric cooking; electric refrigeration, and modern better light for better sight." See NES, "Friendly Service News," April 1941, NPLSC, NESPRR, Box 4, Folder 52. Another 200 homes became available for Vultee workers in May; see NES, "Friendly Service News," May 1941, NPLSC, NESPRR, Box 4, Folder 52. The suburb known as Donelson, north of the present day airport, east of downtown Nashville was also developed during the war as a community for Vultee workers.

decade.⁹⁶ Despite the completion of Nashville's first natural gas pipeline in 1946, the distributor reported that it was still common for local builders to wire homes for electric kitchen appliances and heating systems two decades later. The fiscal year ending in 1966 marked the eighth straight year that developers constructed more than 4,000 new homes equipped with electric heat.⁹⁷ Furthermore, the majority of new public housing projects constructed after 1960 were all-electric.⁹⁸

NES offered free consultations to customers hoping to convert older properties to electric heat, a service that the distributor advertised in targeted mailers and pamphlets.⁹⁹ The public utility also partnered with developers on the construction of subdivisions, inspecting and certifying the wiring in new homes so that the properties would be eligible for federally backed mortgages thereby facilitating brisk sales and movement to the urban fringe.¹⁰⁰ The TVA encouraged its distributors to conduct campaigns promoting adequate wiring, and the Authority

⁹⁶ Letter, General Manager of NES to R. E. Argersinger, Vice President of Stone & Webster Engineering Corporation, May 14, 1946, NESOF, NSFF.

⁹⁷ On the natural gas pipeline, see Doyle, *Nashville Since the 1920s*, 109. 1966 was also the first time that over half of the homes in Davidson County had electric heat. On the yearly construction of electrically heated homes, see NES, "Annual Operating Report July 1, 1965 – June 30, 1966," July 27, 1966, 10, NPLSC, NESPRR, Box 12, Folder 620; also see NES, "Annual Operating Report July 1, 1964 – June 30, 1965," July 28, 1965, 7-8, NPLSC, NESPRR, Box 12, Folder 619; NES, "Annual Report of Operations Year Ended June 30, 1963 Nashville Electric Service," July 31, 1963, 7, NPLSC, NESPRR, Box 12, Folder 616. In 1964, NES reported that 80 percent of new homes in its service area were all-electric; see, Nashville Electric Power Board, "Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report," 1964, 7, NPLSC, NESPRR, Box 12, Folder 618.

⁹⁸ NES, "Annual Report of Operations Year Ended June 30, 1963 Nashville Electric Service," July 31, 1963, 5, NPLSC, NESPRR, Box 12, Folder 616.

⁹⁹ NES conducted 196 consultations and converted 259 homes in the 1967-1968 fiscal year; see NES, "Annual Operating Report July 1, 1967 – June 30, 1968," July 31, 1968, 10, NPLSC, NESPRR, Box 13, Folder 622; also see NES, "Annual Operating Report July 1, 1968 – June 30, 1969," July 16, 1969, 10, NPLSC, NESPRR, Box 13, Folder 624; and NES, "Annual Operating Report July 1, 1969 – June 30, 1970," July 15, 1970, 10, NPLSC, NESPRR, Box 13, Folder 625.

¹⁰⁰ The Federal Housing Administration set standards for wiring on homes to determine eligibility for federally backed mortgages; see, Tobey, *Technology as Freedom*, 108-11. For examples of NES' efforts to certify wiring in its service area; see NES, "Annual Operating Report July 1, 1967 – June 30, 1968," July 31, 1968, 10, NPLSC, NESPRR, Box 13, Folder 622; NES, "Annual Operating Report July 1, 1968 – June 30, 1969," July 16, 1969, 10, NPLSC, NESPRR, Box 13, Folder 624; and NES, "Annual Operating Report July 1, 1969 – June 30, 1970," July 15, 1970, 9, NPLSC, NESPRR, Box 13, Folder 625. NES also conducted promotional campaigns regarding wiring featuring a "villain" named "Skimpy Wiring" that was an amalgam of circuits and plugs; see NES, "Skimpy Wiring Says: 'Watch Me Mess Up This Home with Overloaded Electric Circuits!' Rewire *NOW* on Easy Terms," 1957; NPLSC, NESPRR, Box 6, Folder 100.

often sent advisors to rural areas to help farmers upgrade the electrical infrastructure on their properties.¹⁰¹

In Nashville, NES' participation in the Gold Medallion Program epitomized the utility's effort to encourage residents to use more electricity by improving the wiring their homes. The National Electrical Manufacturers Association, the Edison Electric Institute, and General Electric jointly started the Gold Medallion Program in 1957 as part of the private utility industry's Live Better Electrically campaign, itself a clone of the Better Living Electrically promotions that the TVA and its distributors initiated after World War II. The program quickly gained prominence nationwide.¹⁰² To be certified as a Gold Medallion Home, a property had to rely solely on electric power, and it had to have adequate wiring for the operation of a plethora of appliances, including a range, refrigerator, dishwasher, washing machine, clothes dryer, and water heater. In addition, the house had to be equipped with electric heat and enough air conditioning capacity to keep its interior twenty degrees cooler than the exterior temperature in the summer. Finally, there were requirements for lighting.¹⁰³ Homeowners received a medallion that they could affix

¹⁰¹ The TVA started its Electrical Development Program in 1948. The EDP promoted adequate wiring and encouraged distributors to do so as well. In addition, the EDP created the Tennessee Valley Adequate Wiring Bureau to certify the wiring in homes; see TVA, "Power and People In The Tennessee Valley the story of electrical development 1947-1949," promotional pamphlet, 1949, 3 and 11-2, NPLSC, NESPRR, Box 14, Folder 663.

¹⁰² As discussed below, NES and the TVA first used "Better Living Electrically" in preparation for its 1948 Electric Show; see NES, "See you at the ELECTRIC SHOW," advertisement, 1948, NPLSC, NESPRR, Box 1, Folder 22. In 1951, the J. D. Brown of the TVA's Electrical Development Department called on other public utilities to adopt similar narratives at the American Public Power Association's annual conference; J. D. Brown, "Better Public Relations Through The Annual Report," in *Proceedings: American Public Power Association Eighth Annual Convention* (paper presented at the eight annual conference of the American Public Power Association, Chattanooga, Tennessee, May 7-9, 1951), 33-7. On the Gold Medallion Program and the Live Better Electrically campaign, see TVA, *Annual Report, 1962* (Washington, D.C.: Government Printing Office, 1962), 46; and "Gold Medallion Home Gives Buyer Electric Excellence," *The Morning Record*, Meriden, CT, February 12, 1964, 12. Although he does not draw a connection between the Live Better Electrically campaign and the TVA, Adam Rome also discusses the 1956 origins of LBE and the Gold Medallion Program in his book *The Bulldozer in the Countryside*; see Rome, *The Bulldozer in the Countryside*, 74-5.

¹⁰³ NES, "Gold Medallion a National Hallmark of quality for Nashville Homes," promotional pamphlet, c.1970, NPLSC, NESPRR, Box 14, Folder 648. Homes also had to have a kitchen exhaust fan.

to the exterior of their property that advertised its technological amenities and signified their status as consumers, serving as a marker of prestige in an era of mass-consumption.¹⁰⁴

The Electric Service sponsored the Gold Medallion Program in Nashville and Davidson County, explaining the conditions to developers, mailing informational pamphlets to customers, and conducting open houses. One brochure that NES sent to residents described the program and contained pictures of Gold Medallion homes in the distributor's service area, focusing on well-lit rooms and sparkling kitchens.¹⁰⁵ Although TVA annual reports noted that its distributors often promoted higher standards for wiring than those required to achieve Gold Medallion status, NES ran advertisements encouraging Nashvillians to participate in the program, taking out full page spreads in the *Tennessean* and the *Banner* while putting up four billboards around the city.¹⁰⁶ In addition to highlighting local infrastructure's importance for the implementation of the TVA's energy regime, the campaign on behalf of the Gold Medallion Program illustrated the Electric Service's role in advertising.

The Promotion of Progress

The implementation of the Authority's consumption-centric policies at the local level involved the year-round promotion of electricity and its applications for in-home use. In Nashville, the Electric Service employed a variety of marketing strategies encouraging residents to purchase appliances and consume more power. NES and its partners used community-wide

¹⁰⁴ On the importance of consumption and consumerism to identity in the postwar era, see Cohen, *A Consumer's Republic*.

¹⁰⁵ NES, "Gold Medallion a National Hallmark of quality for Nashville Homes," promotional pamphlet, c.1970, NPLSC, NESPRR, Box 14, Folder 648

¹⁰⁶ The Electric Service also included several residences that had obtained a Gold Medallion rating in its parade of homes in the late 1960s and 1970s. On relative superiority of wiring standards in Tennessee Valley Region, see TVA, *Annual Report, 1965*, 36; on billboards, see NES, "Annual Operating Report July 1, 1970 – June 30, 1971," July 16, 1971, Appendix D, NPLSC, NESPRR, Box 13, Folder 626; on full page advertisements, billboards, and Parade of Homes, see and NES, "Annual Operating Report July 1, 1969 – June 30, 1970," July 15, 1970, Appendix D, NPLSC, NESPRR, Box 13, Folder 625.

events to educate Nashvillians on the benefits of using electricity and to celebrate the improved standard of living made possible by cheap kilowatts and public power.¹⁰⁷ Especially in the decades following World War II, the electric shows that NES staged with help from area businesses were emblematic of the distributor's promotional policy.

The Electric Service held its first major event of the postwar period in 1948. The distributor organized and financed the aptly named 1948 Electric Show in collaboration with several business organizations and media outlets. In particular, the Nashville Electrical Dealers Association (NEDA), a local trade group of shop owners that was committed to the promotion of appliance sales and the use of electricity in the home, worked with NES to plan and execute the Show. Featuring a fist grasping a lightning bolt above a refrigerator, range, and water heater, the Dealers Association's seal captured its understanding of the role that electric energy could play in the lives of Nashville's residents, suggesting that the use of in-home appliances allowed one to harness the power of electricity to achieve a better a standard of living.¹⁰⁸ The NEDA developed a long-term partnership with Electric Service, co-sponsoring events on a yearly basis throughout the 1950s.¹⁰⁹

¹⁰⁷ For "Give Better Electrically" slogan, see NES, "Annual Report of Operations Year Ended June 30, 1963 Nashville Electric Service," July 31, 1963, Appendix B, NPLSC, NESPRR, Box 12, Folder 616. It appears that give better electrically or its variations became a yearly promotion; see NES, "Annual Report of Operations Year Ended June 30, 1964 Nashville Electric Service," July 29, 1964, Appendix B, NPLSC, NESPRR, Box 12, Folder 617; and NES, "Annual Operating Report July 1, 1964 – June 30, 1965," July 28, 1965, Appendix B, NPLSC, NESPRR, Box 12, Folder 619.

¹⁰⁸ Refrigerators, ranges, and water heaters had featured prominently in multiple NES ad campaigns in the 1940s, and their use on the NEDA's seal symbolically linked the agency with the Electric Service. For a picture of the seal, see the following advertisement in the *Tennessean*, "See you at the ELECTRIC SHOW," *Tennessean*, May 16, 1948, clipping in NPLSC, NESPRR, Box Oversize Drawer 1, Folder 1; the ad contains the NEDA's slogan, "Quality Products, Dependable Service, Reliable Dealings," and the following enticement to Nashvillians, "Here's your chance to see firsthand that longed-for world of Better Living... Electrically." For examples of NES ad campaigns featuring refrigerators, ranges, and water heaters in the 1940s, see NES, "Friendly Service News," March 1941, NPLSC, NESPRR, Box 1, Folder 5; and Letter, Hatch Show Print to Maxwell Benson, NES, February 16, 1940, NPLSC, NESPRR, Box 1, Folder 20. The NEDA's support was facilitated by the Electric Service's decision not to sell appliances; see "Power Board Votes No Sale of Appliances," *Tennessean*, August 4, 1939, 1 and 2.

¹⁰⁹ Although the distributor and the Dealers Association did not hold an electric show in 1949, they did put on a weeklong promotional campaign that they called "Electric Appliance Days" in the stores of individual retailers. Letter, R. F. Linsert to All Nashville Electrical Dealers Participating in NEDA "Electric Appliance Days," April 21,

For the 1948 Show, the Dealers Association and NES coordinated the planning committee that was responsible for placing advertisements in local newspapers and for building support and cooperation among appliance retailers, also signing musical acts and decorating the exhibit hall.¹¹⁰ Both the *Tennessean* and the *Banner* provided the 1948 Show with favorable coverage, and radio stations ran nightly spots in an effort to boost attendance.¹¹¹ Finally, the Electric Service asked participating stores to publicize the event in the weeks leading up to opening night.¹¹² Individual retailers were responsible for obtaining and supplying merchandise for the Electric Show, and each vendor also agreed to include only those devices that were powered by electricity in its display. In support of the dealers, NES donated space in its

1949, NPLSC, NESPRR, Box 2, Folder 25; Memorandum, Marvin Carden, general manager of Electric Appliance Days to All Members of Nashville Electrical Dealers Association, March 19, 1949, NPLSC, NESPRR, Box 2, Folder 25; Letter, William Hall, NES to Electrical Distribution and Manufacturers (who donated prizes), April 13, 1949, NPLSC, NESPRR, Box 2, Folder 25. In 1950, the two groups staged their second postwar show, this time at the state fairgrounds; see NES, "Better Living with Electricity," promotional pamphlet, June 1950, NPLSC, NESPRR, Box 18, Folder 8. In 1951, the NEDA and NES held a Spring Electric Carnival; see Memorandum, "Spring Electric Carnival May 7 thru May 19, 1951," undated, NPLSC, NESPRR, Box 2, Folder 26. In 1952, they held another Electric Show in conjunction with the opening of the new Electric Center; see NES, "Opens Today! 1952 ELECTRIC SHOW," undated, unassigned newspaper advertisement, NPLSC, NESPRR, Box Oversize Drawer 1, Folder 1. As late as 1969, the public distributor was still cosponsoring an electric show. In fact, TEPCO and NR&L had organized similar events. It was, therefore, somewhat unsurprising that NES would continue the tradition in Nashville given the number of TEPCO employees who remained in leadership positions. NES held prewar shows in 1940 and 1941.

¹¹⁰ "Electric Show – 1948: Committees," February 12, 1948, NPLSC, NESPRR, Box 1, Folder 22; Letter, William D. Hall, NES to All Exhibitors, February 26, 1948, NPLSC, NESPRR, Box 1, Folder 22; NES, "Electric Show – 1948, May 18 thru May 22, Information for Exhibitors," undated, NPLSC, NESPRR, Box 1, Folder 22.

¹¹¹ For examples of advertising, see NES, "See you at the ELECTRIC SHOW," *Tennessean*, May 18, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22; and "Electric Show Will Be Held May 18-22," *Banner*, May 13, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22. For coverage, see "An Illuminating Development: Movie Star Feeling Awaits Visitors at Electric Show," *Tennessean*, May 16, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22; "7,500 Attend Opening of Electric Show," *Banner*, May 19, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22. The Newspaper Printing Corporation, a venture that was owned and operated by Silliman Evans, Sr., in addition to being the company that published the *Tennessean* and the *Banner*, ensured a flood of advertising and provided financing for the 1948 Show as well as many others after World War II, ultimately replacing the NEDA as the public distributor's primary co-sponsor by the end of the 1960s; see, Letter, R. F. Linsert to All Nashville Electrical Dealers Participating in NEDA "Electric Appliance Days," April 21, 1949, NPLSC, NESPRR, Box 2, Folder 25; and "Who Can Resist the Great Temptation: 1969 Home Show, March 16-23, All New," promotional pamphlet, 1969, NPLSC, NESPRR, Box 1, Folder 2. On radio advertising, see Letter, William Hall, NES to All Exhibitors and Distributors of Appliances, May 11, 1948, NPLSC, NESPRR, Box 1, Folder 22. In 1949, at least radio stations, WMAK and WKDA agreed to charge NES a reduced rate for advertising; see Letter, Robert E. Cooper, WKDA to Richard Linsert, NES, April 29, 1949, NPLSC, NESPRR, Box 2, Folder 26; and untitled, undated program list for WMAK, NPLSC, NESPRR, Box 2, Folder 26.

¹¹² Letter William Hall, NES to All Exhibitors and Distributors of Appliances, May 11, 1948, NPLSC, NESPRR, Box 1, Folder 22.

downtown offices to exhibit appliances and provided free tickets to give to customers.¹¹³ The distributor and its partners set up more than forty booths for a total of twenty-nine different retailers inside the Viaduct Parkways building at the corner of Church Street and 10th Avenue near the downtown business district, designing the 1948 Show “to exhibit to the Nashville public...the latest developments in electric appliances and service.”¹¹⁴ Additionally, the Electric Service planned cooking demonstrations that modeled the benefits of electric ranges, providing a tutorial for those more accustomed to using gas or wood.¹¹⁵

More than an appliance fair, however, NES billed the 1948 Electric Show as a community extravaganza, creating a carnival atmosphere that both promoted and celebrated the modern home as well as a lifestyle premised on high levels of electrical consumption. The Electric Service employed newspaper ads, direct mailers, billboards, bus cards, light pole cards, street banners, air planes, and radio spots to make the event into a spectacle.¹¹⁶ The same advertisements that touted refrigerators and ranges also noted other attractions, including free appliance raffles and live entertainment provided by Milton Estes and Owen Bradley. The Electric Service gave away upwards of five thousand dollars in prizes throughout the week long

¹¹³ Letter, William Hall, NES to All Electrical Appliance Distributors, April 8, 1948, NPLSC, NESPRR, Box 1, Folder 22; NES, “Electric Show – 1948, May 18 thru May 22, Information for Exhibitors,” undated, NPLSC, NESPRR, Box 1, Folder 22; Letter, William Hall, NES to All Exhibitors at Electric Show, April 19, 1948, NPLSC, NESPRR, Box 1, Folder 22; and NES and NEDA, “Contract for Space,” 1948, NPLSC, NESPRR, Box 2, Folder 23. Each vendor also had to supply prizes that could be given away in nightly raffles.

¹¹⁴ Quote from “An Illuminating Development: Movie Star Feeling Awaits Visitors at Electric Show,” *Tennessean*, May 16, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22. Also see NES, “See you at the ELECTRIC SHOW,” advertisement, 1948, NPLSC, NESPRR, Box 1, Folder 22. Curious customers might also visit the Electric Service’s booth to learn more about various “convenient, low cost electric heating systems.” Quote from “You’re Invited To The Electric Show; Free Admission,” *Trades and Labor News*, May 13, 1948, found in NPLSC, NESPRR, Box 1, Folder 22. There were even two televisions on display, “A glimpse of things to come.” See “Electric Show Offers Gadgets With New Look,” *Tennessean*, May 20, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22.

¹¹⁵ On appliance demonstrations; see NES, “See you at the ELECTRIC SHOW,” *Tennessean*, May 18, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22. NES home economists held cooking demonstrations all year long at the distributor’s offices; see NES, “The News,” newsletter, Summer 1948, Vol. V, No. 6, 9, NPLSC, NESPRR, Box 2, Folder 24.

¹¹⁶ “Nashville Reports on Electric Show,” *Electrical Retailers News*, June 28, 1948, 7, NPLSC, NESPRR, Box 2, Folder 24; and NES, “The News,” newsletter, Summer 1948, Vol. V, No. 6, 3, NPLSC, NESPRR, Box 2, Folder 24.

Show, while Estes and Bradley were among the more recognizable country artists of the early post-World War II era, performing regularly for programs on WSM radio and NBC's Grand Ole Opry broadcasts.¹¹⁷

The star of the 1948 Electric Show was the Titan, the world's largest commercial light bulb. Typically used on Hollywood movie sets, the 10,000 watt behemoth consumed electricity at the rate of eight average-sized homes.¹¹⁸ As the *Tennessean* proclaimed, after viewing the massive light bulb, "Nashvillians may know for a fleeting instant Tuesday night what it feels like to be Bob Hope or Hedy Lamarr!"¹¹⁹ If the Titan itself symbolized the glamorous lifestyle that one could achieve through the operation of appliances and the consumption of large volumes of electricity, then its placement as the center piece of the 1948 Show alluded to NES' role in making an improved standard of living available to Nashville's residents through the distribution of inexpensive kilowatts.

As a community and commercial event, the 1948 Electric Show was a success. On its first night, a line stretched for almost four blocks around the corner of the Viaduct Parkways building, prompting the police to open the doors twenty minutes early to ease the congestion and accommodate the people massing outside.¹²⁰ More than 30,000 patrons visited the Parkways over the course of five days.¹²¹ The *Banner* and the *Tennessean* as well as several trade magazines, provided the 1948 Show with positive reviews, and NES proudly declared that it was

¹¹⁷ NES, "See you at the ELECTRIC SHOW," advertisement, 1948, NPLSC, NESPRR, Box 1, Folder 22. The entertainment also included the soloist Snooky Lanson, a relative newcomer but a rising star, who got his start as a member of Bradley's orchestra.

¹¹⁸ "You're Invited To The Electric Show; Free Admission," *Trades and Labor News*, May 13, 1948, found in NPLSC, NESPRR, Box 1, Folder 22; and "An Illuminating Development: Movie Star Feeling Awaits Visitors at Electric Show," *Tennessean*, May 16, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22.

¹¹⁹ "An Illuminating Development: Movie Star Feeling Awaits Visitors at Electric Show," *Tennessean*, May 16, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22.

¹²⁰ NES, "The News," newsletter, Summer 1948, Vol. V, No. 6, 3, NPLSC, NESPRR, Box 2, Folder 24.

¹²¹ NES reported the official attendance variously at either 30,576 or 30,605 for five days; see Letter, William D. Hall, NES Sales Promotion Manager to All Electrical Dealers and Distributors Who Were Exhibitors at the 1948 Electric Show, May 26, 1948, NPLSC, NESPRR, Box 2, Folder 24; and NES, "The News," newsletter, Summer 1948, Vol. V, No. 6, 3, NPLSC, NESPRR, Box 2, Folder 24.

the “Best attended and most successful Electric Show ever held” in the city.¹²² Noting that some dealers felt that the number of customers clamoring for attention made it too difficult to sell their wares, NES retorted that “the important fact is they CAME, they SAW, they GAPPED at the most alluring display of electrical appliances ever before assembled under one roof in Nashville.”¹²³ The Show’s attendees did more than gawk. The Electric Service reported that the event had resulted in \$84,000 of appliance sales, with dealers amassing close to 1,800 prospects for big ticket items such as ranges, refrigerators, water heaters, and freezers. The interest demonstrated by the number of visitors and the amount of devices sold augured well for the rest of the summer, a season that usually saw a drop in retail trade for electrical equipment.¹²⁴ As an editor for *Electrical Merchandising* observed, the 1948 Electric Show was “indicative of the appliance sales boom in the South.”¹²⁵

The 1948 Show highlighted the Electric Service’s role in promoting residential consumption at the local level. The cooking demonstrations that NES held were part of the utility’s larger effort to increase electricity use by educating Nashvillians about the advantages of

¹²² Quote from “Nashville Reports on Electric Show,” *Electrical Retailers News*, June 28, 1948, 7, NPLSC, NESPRR, Box 2, Folder 24. R. A. Coleman, the president of the NEDA, also suggested that the 1948 iteration was the best Electric Show to date; see Letter, R. A. Coleman, President of Nashville Electrical Dealers Association to All Members of NEDA and Electric Show Exhibitors, May 27, 1948, NPLSC, NESPRR, Box 2, Folder 24. For other examples of positive press, see Amasa B. Windham, “Reports of Business from *Electrical Merchandising*’s Regional Editors: The South,” *Electrical Merchandising*, July 15, 1948, 7, NPLSC, NESPRR, Box 2, Folder 24; “Interest Strong in All Lines At Nashville Electric Show – Home Heating Appliances Get Especially Good Reception – Attendance Tops Prewar Mark,” *Retailing Home Furnishings*, May 23, 1948, NPLSC, NESPRR, Box 1, Folder 22; “An Illuminating Development: Movie Star Feeling Awaits Visitors at Electric Show,” *Tennessean*, May 16, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22; “7,500 Attend Opening of Electric Show,” *Banner*, May 19, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22.

¹²³ NES, “The News,” newsletter, Summer 1948, Vol. V, No. 6, 3, NPLSC, NESPRR, Box 2, Folder 24.

¹²⁴ Figures for 1948 Show and suggestion of sales decline in summer from “Nashville Reports on Electric Show,” *Electrical Retailers News*, June 28, 1948, 7, NPLSC, NESPRR, Box 2, Folder 24. In fact, the Electric Service’s home and industrial heating also exhibit “drew large numbers of people and many inquiries.” Quote from NES, “The News,” newsletter, Summer 1948, Vol. V, No. 6, 3 and 9, NPLSC, NESPRR, Box 2, Folder 24; on interest in residential heating, also see “Interest Strong in All Lines At Nashville Electric Show – Home Heating Appliances Get Especially Good Reception – Attendance Tops Prewar Mark,” *Retailing Home Furnishings*, May 23, 1948, NPLSC, NESPRR, Box 1, Folder 22.

¹²⁵ Amasa B. Windham, “Reports of Business from *Electrical Merchandising*’s Regional Editors: The South,” *Electrical Merchandising*, July 15, 1948, 7, NPLSC, NESPRR, Box 2, Folder 24.

specific devices. The Electric Service employed a team of home economists who conducted tutorials throughout the year at the distributor's main office, visiting schools and women's clubs in addition to making house calls.¹²⁶ In conjunction with the demonstrations and smaller campaigns that NES ran for individual appliances, the big biennial shows underscored the commitment of the utility and its partners in the business community to the promotion of in-home electricity use.¹²⁷

Similar events became regular features throughout the TVA's service area in the 1950s. The Tennessee Valley Public Power Association (TVPPA), the collective to which the individual distributors in the region belonged, worked with the TVA to support rural cooperatives and smaller municipalities by developing and providing funding for travelling exhibitions that toured

¹²⁶ NES, "The News," newsletter, Summer 1948, Vol. V, No. 6, 9, NPLSC, NESPRR, Box 2, Folder 24; NES, "Better Living Electricity," promotional pamphlet, June 1949, NPLSC, NESPRR, Box 1, Folder 5; NES, "Doorway to a Brighter Tomorrow: Electric Center: New Home of Nashville Electric Service A Business with 98,000 Customers Owned By The People Of Nashville," c.1952, 4-5, NPLSC, NESPRR, Box 12, Folder 615. NES home economists also contacted newcomers to welcome them to the community and fielded some 8,000 calls per year; see NES, "Annual Report of Operations Year Ended June 30, 1963 Nashville Electric Service," July 31, 1963, Appendix B, NPLSC, NESPRR, Box 12, Folder 616; and NES, "Annual Operating Report July 1, 1965 – June 30, 1966," July 27, 1966, 29, NPLSC, NESPRR, Box 12, Folder 620.

¹²⁷ In addition to many small campaigns, NES ran one other major promotion annually. The Electric Service collaborated with another trade group, the Nashville Home Builder's Association, on an annual Parade of Homes in the 1960s that highlighted houses that used electricity for most of their energy needs. Lasting for approximately one week every October, the Parade routinely drew more than 20,000 visitors, creating a seasonal bookend for the utility's electric shows. Often, the homes chosen for the "Parade" were part of newly built subdivisions. The 1963 event focused on twelve units in the Glengarry Park neighborhood east of the city near the airport. In other years, however, NES proudly noted of the "Parade" that "It's All Over Town," symbolizing the widespread acceptance of the all-electric ideal in its service area. While the Home Builders Association was responsible for choosing and showing the homes involved in the Parade, the Electric Service contributed advertising for the event in newspapers, on the radio, in bill stuffers, and on billboards. See NES, "Annual Report of Operations Year Ended June 30, 1963 Nashville Electric Service," July 31, 1963, Appendix B, NPLSC, NESPRR, Box 12, Folder 616; NES, Annual Report of Operations Year Ended June 30, 1964 Nashville Electric Service," July 29, 1964, Appendix B, NPLSC, NESPRR, Box 12, Folder 617; NES, "Annual Operating Report July 1, 1965 – June 30, 1966," July 27, 1966, Appendix D, NPLSC, NESPRR, Box 1, Folder 620; NES, "Annual Operating Report July 1, 1966 – June 30, 1967," July 26, 1967, Appendix D, NPLSC, NESPRR, Box 12, Folder 621; NES, "Annual Operating Report July 1, 1967 – June 30, 1968," July 31, 1968, Appendix D, NPLSC, NESPRR, Box 13, Folder 622; NES, "Annual Operating Report July 1, 1968 – June 30, 1969," July 16, 1969, Appendix D, NPLSC, NESPRR, Box 13, Folder 624; and NES, "Annual Operating Report July 1, 1969 – June 30, 1970," July 15, 1970, 8-9 and Appendix D, NPLSC, NESPRR, Box 13, Folder 625. For representative sample of other, smaller campaigns, see NES, "Annual Report of Operations Year Ended June 30, 1963 Nashville Electric Service," July 31, 1963, Appendix B, NPLSC, NESPRR, Box 12, Folder 616; and NES, "Annual Report of Operations Year Ended June 30, 1964 Nashville Electric Service," July 29, 1964, Appendix B, NPLSC, NESPRR, Box 12, Folder 617.

the area.¹²⁸ In the summer and fall of 1950, the TVPPA sponsored its first Home and Farm Electrical Exposition (HFEE). The HFEE visited fifty-one communities in the Tennessee Valley Region over the course of six months, setting up its tents and trailers in fields throughout Alabama, Tennessee, Kentucky, and Mississippi. Like the shows that NES staged, the TVPPA intended the Exposition to be a community event featuring live entertainment. It was not unusual for the HFEE to attract crowds in excess of 3,500 people to its appliance demonstrations and musical performances. Schools bused students to the Exposition for puppet shows and general lessons on electricity and electrical appliances. The children often related their experiences to their parents, serving as free publicity and increasing the size of audiences in the evening. In total, the 1950 Home and Farm Electrical Exposition drew more than 370,000 visitors in its tour of the region. In addition to home lighting and items like ranges, refrigerators, water heaters, and washing machines, the Exposition featured grain grinders and chain saws as well as electric milking parlors and chicken brooders. TVA agricultural engineers demonstrated each piece of equipment, highlighting the ways in which electricity made farms more efficient and lucrative.¹²⁹

Access to electricity transformed rural life. The electric tools that the HFEE promoted, especially milking parlors and chicken brooders, did in fact increase farm productivity.¹³⁰ The installation of electric lights was a cause for celebration. As Gabriel Wessenauer, the Authority's power manager and one of the figures most responsible for implementing the

¹²⁸ Although NES did not require the TVPPA's assistance in planning promotional activities, it joined the organization in 1949, helping the agency defend the Authority against the private utility; see "Nashville Board Joins TV Group," *Tennessean*, November 1, 1949, clipping in NPLSC, NESPRR, Box 18, Folder 8.

¹²⁹ On the 1950 Home and Farm Electrical Exposition, see TVPPA, "1950 TVPPA Home and Farm Electrical Exposition," promotional pamphlet, undated, Tennessee Valley Authority Library, Knoxville [hereafter: TVALK], Tennessee, 621.3 T29t.

¹³⁰ Electric chicken brooders and grain grinders allowed farmers to produce more eggs from the same chickens and grind more grain with less labor. Electric milking parlors made it easier to sterilize and store milk, making it possible for farmers to sell their milk with a Grade A rating for more money. Similarly, electric refrigerators and freezers reduced the risks of food spoilage.

agency's energy regime, recalled, "It was a very inspiring thing for me to see electricity come to a home for the first time. They had one light bulb, and they thought that was wonderful."¹³¹

Radios connected many isolated houses and communities to the nation, a fact that TVA board members often touted. Although battery powered radios had existed previously, they were not practical for everyday use.¹³² Electricity also had important public health benefits. It allowed many farms to receive running water for the first time. Throughout the Tennessee Valley Region, the Authority and its distributors partnered with state agencies to convince local farmers to install electric pumps and indoor plumbing.¹³³ Following World War II, the TVA created its

¹³¹ In fact, the TVA files in the southeast branch of the National Archives contain several pictures of families posing outside their homes with various lamps and light fixtures to document the first time they received TVA power. For Wessenauer's quote, see Mary Jane Lowe, "Oral History Interview with G. O. Wessenauer," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, May 22-23, 1990, 51, NARA-SE, RG 142, OHR, Box 10. Also see Mary Jane Lowe, "Oral History Interview with Ettie Marie Hunt Baggett," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, December 4, 1992, 16-25, NARA-SE, RG 142, OHR, Box 1; and No Author, "Conversation with Jim Ward on Employee Orientation Program," May 26, 1982, 11, NARA-SE, RG 142, OHR, Box 1. More generally on the importance of light to modern living, see David E. Nye, *Electrifying America: Social Meanings of a New Technology, 1880-1940* (Cambridge: The MIT Press, 1990), 29-84; and Wolfgang Schivelbusch, *Disenchanted Night: The Industrialization of Light in the Nineteenth Century*, trans. Angela Davies (Berkeley: University of California Press, 1988).

¹³² On the importance of radio and, later, television to households in the Tennessee Valley Region, see No Author, "Conversation with Jim Ward on Employee Orientation Program," 31-2, NARA-SE, RG 142, OHR, Box 1; on battery powered radios, see Mary Jane Lowe, "Oral History Interview with Edwin J. Best, Sr.," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, May 14, 1991, 24-5, NARA-SE, RG 142, OHR, Box 1; also see, Clapp, "Too Little Electricity," 6, UTK: Hodges, TVA PC, Box 1, Folder 1, "Scattered neighborhoods become coherent communities through contact, talk, and planning." Other residents of rural communities that did have some access to electricity noted that power was only available for four or five hours per night prior to the TVA; see Mary Jane Lowe, "Oral History Interview with Ettie Marie Hunt Baggett," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, December 4, 1992, 16-25, NARA-SE, RG 142, OHR, Box 1. Numerous other sources have commented on the role of radio and television as purveyors of mass culture; see Robert S. Lynd and Helen Merrell Lynd, *Middletown in Transition: A Study in Cultural Conflicts* (New York: Harcourt, Brace and Company, 1937); Lizabeth Cohen, *Making a New Deal: Industrial Workers in Chicago, 1919-1939* (Cambridge: Cambridge University Press, 2008[1990]), 325-331; Cohen, *A Consumer's Republic*, 255 and 298-309; Karal Ann Marling, *As Seen on TV: The Visual Culture of Everyday Life in the 1950s* (Cambridge: Harvard University Press, 1994); Thomas Doherty, *Cold War, Cool Medium: Television, McCarthyism, and American Culture* (New York: Columbia University Press, 2003); and more generally on the nationalization of American culture, Warren I. Susman, *Culture as History: The Transformation of American Society in the Twentieth Century* (New York: Pantheon Books, 1984).

¹³³ State departments of health supported the installation of plumbing and electric pumps for reasons of sanitation; see Mark Winter, "Oral History Interview with G. O. Wessenauer," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, June 29, 1983, 32-3, NARA-SE, RG 142, OHR, Box 9; and Lowe, "Oral History Interview with G. O. Wessenauer," 51-2, NARA-SE, RG 142, OHR, Box 10.

Electrical Development Program, sending staff to rural households across its service area “to encourage people to use electricity to improve the quality of life in the home and on the farm.”¹³⁴

More than simply promoting consumption for the sake of consumption, municipal distributors like the Electric Service, rural cooperatives, and the Authority linked residential electricity use and an energy-intensive lifestyle with social progress. “Democracy on the March” meant a range and refrigerator for every kitchen, a washing machine and water heater for every home, and perfect lighting for every room, made possible by cheap kilowatts for all.¹³⁵

A Vision of Better Living

NES promoted the electrified home as a marker of a modern standard of living. The slogan “Better Living – Electrically” adorned advertisements for the 1948 Electric Show, and along with several variants became an oft repeated line for the distributor following World War II.¹³⁶ Beginning in 1949, NES used the phrase “Better Living with Electricity” as the header for pamphlets that it mailed to customers in conjunction with monthly bills.¹³⁷ The slogan

¹³⁴ No Author, “Conversation with Jim Ward on Employee Orientation Program,” 11, NARA-SE, RG 142, OHR, Box 1. For more on the Electrical Development Program, see TVA, “Power and People In The Tennessee Valley the story of electrical development 1947-1949,” promotional pamphlet, 1949, 3 and 11-2, NPLSC, NESPRR, Box 14, Folder 663.

¹³⁵ The phrase “Democracy on the March” is in reference to David Lilienthal’s triumphalist history of the TVA by the same name; see David E. Lilienthal, *TVA: Democracy on the March* (New York: Harper & Row, 1944).

¹³⁶ The exact slogan appears in NES, “See you at the ELECTRIC SHOW,” advertisement, 1948, NPLSC, NESPRR, Box 1, Folder 22. Variants can be found in NES, “Bless Your Electric Servants!” commercial script, c.1949, NPLSC, NESPRR, Box 1, Folder 15; NES, “T.V.A. Jubilee Days: Low Rates Contribute to Better Living Standards in Nashville,” advertisement copy, c.1949, NPLSC, NESPRR, Box 1, Folder 16; NES, “Residential Sales of Electricity Largest Portion of Total in Nashville,” undated press release, c.1949, 2, NPLSC, NESPRR, Box 1, Folder 19; NES, “Doorway to a Brighter Tomorrow: Electric Center: New Home of Nashville Electric Service A Business with 98,000 Customers Owned By The People Of Nashville,” c.1952, 3, NPLSC, NESPRR, Box 12, Folder 615; Nashville Electric Power Board, “Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report,” 1964, 7, NPLSC, NESPRR, Box 12, Folder 618; and NES, “Annual Operating Report July 1, 1965 – June 30, 1966,” July 27, 1966, Appendix D, NPLSC, NESPRR, Box 12, Folder 620.

¹³⁷ The Electric Service’s files at the Nashville Public Library have a copy of “Better Living with Electricity” from June 1949 that is labeled number three; see NES, “Better Living with Electricity,” promotional pamphlet, June 1949, NPLSC, NESPRR, Box 1, Folder 5. Copies exist through September 1950; NES, “Better Living with Electricity,” promotional pamphlet, September 1950, NPLSC, NESPRR, Box 18, Folder 8.

developed great appeal in the electric industry.¹³⁸ “Live Better Electrically,” became a rallying cry among private utilities, trade groups, and electrical equipment manufacturers in the 1950s with General Electric, the Edison Electric Institute, and the National Electrical Manufacturers Association collaborating on the Live Better Electrically campaign beginning in 1956.¹³⁹ For the Electric Service, “Better Living with Electricity” captured the public agency’s consumption-centric mission and its vision for Nashville.¹⁴⁰

Convenience was an important trope in NES’ better living narrative, with the agency touting the presumed advantages in comfort and leisure that electricity could provide for its customers in pamphlets and other advertisements.¹⁴¹ Electric ranges allowed the “modern housewife” to set a timer and “enjoy her afternoon” without constantly tending to the temperature of her oven, and electric water heaters provided a home “with plenty of hot water at the turn of a faucet.”¹⁴² Electric refrigerators “cut down on frequent tiresome trips to the grocery

¹³⁸ At the 1951 American Public Power Association conference, J. D. Brown from the TVA’s Electrical Development Department suggested that other public power distributors use variants of “Better Living” in their own promotional work. J. D. Brown, “Better Public Relations Through The Annual Report,” in *Proceedings: American Public Power Association Eighth Annual Convention* (paper presented at the eight annual conference of the American Public Power Association, Chattanooga, Tennessee, May 7-9, 1951), 33-7.

¹³⁹ On the origins of the LBE campaign, see Rome, *The Bulldozer in the Countryside*, 74-5.

¹⁴⁰ Throughout the postwar period, the Electric Service argued that it was through “Electrical Living” that area residents could enjoy a “Brighter, Happier Today and Tomorrow.” Both quotes from NES, “15 Years of Service,” promotional pamphlet, 1954, NPLSC, NESPRR, Box Oversize Drawer 1, Folder 17.

¹⁴¹ As noted in Chapter One and Chapter Two, scholars have taken a dim view of these claims, suggesting that electric appliances rarely reduced the amount of housework for women even if they did make certain individual tasks easier; see Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave* (New York: Basic Books, 1984); and David E. Nye, *Electrifying America: Social Meanings of a New Technology, 1880-1940* (Cambridge: The MIT Press, 1990), 238-86. NES tried to entice area residents with the “latest, loveliest and most useful household conveniences[.]” For example, electric water heaters were, among other things “convenient, safe and dependable” while electric ranges meant “cool, clean, convenient cooking.” Similarly, the all-electric kitchen was the “convenient, modern” kitchen. First quote from NES, “Friendly Service News,” promotional pamphlet, March 1941, NPLSC, NESPRR, Box 1, Folder 5; second from NES, “Bless Your Electric Servants!” commercial script, c.1949, NPLSC, NESPRR, Box 1, Folder 15; third from NES, “Gold Medallion a National Hallmark of quality for Nashville Homes,” promotional pamphlet, c.1970, 3, NPLSC, NESPRR, Box 14, Folder 648; and fourth from NES, “Doorway to a Brighter Tomorrow: Electric Center: New Home of Nashville Electric Service A Business with 98,000 Customers Owned By The People Of Nashville,” c.1952, 3, NPLSC, NESPRR, Box 12, Folder 615.

¹⁴² All quotes from NES, “Bless Your Electric Servants!” commercial script, c.1949, NPLSC, NESPRR, Box 1, Folder 15.

store” while home freezers did away with “laborious old-fashioned canning operations.”¹⁴³ Vacuum cleaners made “back-breaking, hand sweeping and picking up of dust and trash” unnecessary just as electric irons saved women from “the tiresome labor that made ironing a most disliked task in most homes.”¹⁴⁴ Indeed, the dishwasher was among “the greatest of all labor-saving electric appliances...a boon, not only for the housewife, but for the many husbands who [were] regularly inveigled into drying the dishes, pots and pans.”¹⁴⁵ Because they reduced the physical toil associated with household tasks, electric appliances represented the pathway to a better quality of life according to NES, bringing “new comfort, leisure and opportunity for gracious living.”¹⁴⁶ The utility’s supporters, including Silliman Evans, Sr., agreed. An article in the *Tennessean* opined that the devices that NES promoted had “simplified living to the point that the heavy part of the day’s work at home [was] lifting the fork from the plate to the mouth.”¹⁴⁷

The use of appliances for better living also separated the modern American household from its supposedly inferior forebears. The Nashville Electric Service’s promotional materials from the decades before and after World War II made copious use of the term “modern” to describe the lifestyle that could be achieved through the use of large volumes of electricity.¹⁴⁸ Furthermore, NES juxtaposed past and present in its advertisements to reinforce its positive, uncomplicated vision of modernity. As one press release from the late 1940s suggested, “The

¹⁴³ Quotes from NES, “Bless Your Electric Servants!” commercial script, c.1949, NPLSC, NESPRR, Box 1, Folder 15.

¹⁴⁴ Quotes from NES, “Bless Your Electric Servants!” commercial script, c.1949, NPLSC, NESPRR, Box 1, Folder 15.

¹⁴⁵ NES, “Bless Your Electric Servants!” commercial script, c.1949, NPLSC, NESPRR, Box 1, Folder 15.

¹⁴⁶ NES, “Better Living with Electricity,” promotional pamphlet, October 1949, NPLSC, NESPRR, Box 18, Folder 8.

¹⁴⁷ “Electric Show Offers Gadgets With New Look,” *Tennessean*, May 20, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22.

¹⁴⁸ Thus, the “modern homemaker” stored food in her “modern homefreezer[sic],” cooked meals on her “modern electric range,” and cleaned dishes in her “modern automatic dishwasher.” NES, “Bless Your Electric Servants!” commercial script, c.1949, NPLSC, NESPRR, Box 1, Folder 15.

transition from the well and water bucket days of household drudgery to modern living, has been made possible only with electricity.”¹⁴⁹ Similarly, the scripted cooking demonstration at the TVPPA’s 1950 Home and Farm Electrical Exposition made it clear that the electric range and the all-electric kitchen were desirable symbols of modernity and an American standard of living. In the skit, a fashionably dressed TVA home economist extolled the virtues of cooking electrically while another woman, slouching and outfitted in a well-worn dress and bonnet, listened intently.¹⁵⁰ The disparity between the actors’ clothing and posture left little doubt that the new all-electric kitchen represented a future of glamor and prosperity, a definite improvement on the image of the old, disheveled woman and the pre-electric past. By equating the use of appliances and electricity with a modern lifestyle that they implied was synonymous with better living, distributors like the Electric Service made an energy-intensive way of life defined by the electrified home seem not only desirable but necessary. In short, one had to consume large volumes of electric power to participate fully in postwar American society.¹⁵¹

NES also suggested that better living with electricity meant improvements in environmental quality. The elimination of dirt and soot from the home became an important and repeated component of the distributor’s marketing campaigns as the utility focused on electric appliances that were “smokeless and clean.”¹⁵² In particular, NES emphasized the gains that area residents could make by transitioning to an all-electric kitchen, encouraging housewives to “COOK CLEAN...ELECTRICALLY” and suggesting that the “*Flameless* radiant heat” of a new electric range was “*perfect* for cooking” because it was safer than wood or gas and did not

¹⁴⁹ NES, “Residential Sales of Electricity Largest Portion of Total in Nashville,” undated press release c.1949, NPLSC, NESPRR, Box 1, Folder 19.

¹⁵⁰ TVPPA, “1950 TVPPA Home and Farm Electrical Exposition,” promotional pamphlet, undated, 5, TVALK, Tennessee, 621.3 T29t.

¹⁵¹ On the importance of consumerism and consumption as well as technology to national identity in the postwar era, see Cohen, *A Consumer’s Republic*; Tobey, *Technology as Freedom*; Mettler, *Dividing Citizens*; Jacobs, *Pocketbook Politics*, 179-265; and Galbraith, *The Affluent Society*.

¹⁵² NES, “Friendly Service News,” promotional pamphlet, April 1941, NPLSC, NESPRR, Box 4, Folder 52.

produce the soot or grime that other ranges did.¹⁵³ Instead, electric cooking was both “carefree” and the perfect way to “[keep] your kitchen shining bright.”¹⁵⁴

In addition to the electric range, NES promoted electric heat beginning in the 1940s as a clean replacement for the thousands of individual coal-fired furnaces that city dwellers used to warm their houses and apartments.¹⁵⁵ At the 1948 Electric Show, NES operated a massive sixty foot exhibit, twice the size of those provided for private retailers, that showcased the latest advances in a variety of heating systems, including a new form radiant space heating that relied on coils placed in a home’s ceiling and an electric steam generator that could be used in residences and commercial establishments.¹⁵⁶ Throughout the next three decades, NES tried to entice Nashvillians to get rid of the existing coal-fired furnaces in their older houses and apartments, routinely offering free consultations on the costs of conversion in direct mailers, while working with developers to install electric heat in as many new units as possible.¹⁵⁷ The

¹⁵³ “COOK CLEAN” from NES, “41,373 Of Nashville’s 71,124 Residential Electric Customers COOK ELECTRICALLY,” *Banner*, April 5, 1949, 3; “*Flameless*” and “*perfect*” from NES, “Friendly Service News,” promotional pamphlet, February 1941, NPLSC, NESPRR, Box 1, Folder 5. Capitalization, ellipses, underline, and italics in originals.

¹⁵⁴ NES, “41,373 Of Nashville’s 71,124 Residential Electric Customers COOK ELECTRICALLY,” *Banner*, April 5, 1949, 3. In similar advertisements that focused on the cleanliness of electric ranges relative to wood burning or gas stoves, the TVA argued that the “modern way to cook is the Electric Way.” See TVA, “Power and People In The Tennessee Valley the story of electrical development 1947-1949,” promotional pamphlet, 1949, 25, NPLSC, NESPRR, Box 14, Folder 663.

¹⁵⁵ Throughout the TVA’s service area, residential heating units that were powered by the region’s soft, bituminous coal produced the haze and smoke that inundated many communities. “TVA is Seeking to Give Lead in Air Pollution Control,” *New York Times*, February 1, 1970, F15; Aubrey J. Wagner, “TVA’s Role and Its Effect on the Environment,” remarks before the Tennessee Group, Sierra Club, Nashville, Tennessee, November 12, 1971, 6, NARA-SE, RG 142, Power Manager’s File [hereafter: PMF], Box 138; and No Author, “Conversation with W. C. Whisenant on Employee Orientation Program,” May 26, 1982, 9-10, NARA-SE, RG 142, OHR, Box 1. Lowe, “Oral History Interview with Joseph Swidler,” no pagination, NARA-SE, RG 142, OHR, Box 8.

¹⁵⁶ “You’re Invited To The Electric Show; Free Admission,” *Trades and Labor News*, May 13, 1948, found in NPLSC, NESPRR, Box 1, Folder 22; “Interest Strong in All Lines At Nashville Electric Show – Home Heating Appliances Get Especially Good Reception – Attendance Tops Prewar Mark,” *Retailing Home Furnishings*, May 23, 1948, NPLSC, NESPRR, Box 1, Folder 22; and NES, “The News,” newsletter, Summer 1948, Vol. V, No. 6, 3 and 9, NPLSC, NESPRR, Box 2, Folder 24.

¹⁵⁷ See above and NES conducted 196 consultations and converted 259 homes in the 1967-1968 fiscal year; see NES, “Annual Operating Report July 1, 1967 – June 30, 1968,” July 31, 1968, 10, NPLSC, NESPRR, Box 13, Folder 622; also see NES, “Annual Operating Report July 1, 1968 – June 30, 1969,” July 16, 1969, 10, NPLSC, NESPRR, Box 13, Folder 624; and NES, “Annual Operating Report July 1, 1969 – June 30, 1970,” July 15, 1970, 9-10, NPLSC, NESPRR, Box 13, Folder 625.

distributor was quick to point out that electricity did not pollute the home with soot or ash, allowing “walls, drapes and furnishings [to] keep their fresh new look.”¹⁵⁸ TVA officials similarly noted that electric heat could alleviate the nuisance that stemmed from individual, unregulated coal-fired furnaces, a sentiment shared by many civic boosters in Nashville.¹⁵⁹ As the editorial board of the *Tennessean* observed in a 1949 article touting the advantages of electrically heated houses, “Perhaps this [electric heat] holds the secret of conquering Nashville’s smoke problem.”¹⁶⁰

Along with a cleaner environment for consumers, NES emphasized the comfort of in-home temperature control as a primary benefit of electricity, asking customers to “Let Electric Appliances Keep You Cool in Hot Weather.”¹⁶¹ A pair of 1949 pamphlets claimed not only that electric ovens were specifically designed to seal in heat but that laboratory research had shown that kitchen temperatures remained ten to sixteen degrees cooler when cooking with electricity rather than gas or wood in an oven or on a range.¹⁶² According to the distributor, “COOL ELECTRIC COOKING cooks the food, not the cook,” making the electric range “the best

¹⁵⁸ NES, “Gold Medallion a National Hallmark of quality for Nashville Homes,” promotional pamphlet, c.1970, 7, NPLSC, NESPRR, Box 14, Folder 648

¹⁵⁹ For TVA officials, see W. D. Thompson to Scotty Bobo, July 6, 1973, NARA-SE, RG 142, PMF, Box 10; the Federal Power Commission used a similar narrative in its 1971 publication, “Managing the Power Supply and the Environment,” noting that situating plants in rural areas was a central element of pollution control prior to the 1970s; see, Federal Power Commission: Special Task Force on the Environment, “Managing the Power Supply and the Environment,” Report of the Federal Power Commission’s National Power Survey Special Task Force on the Environment, July 1, 1971, 11, NARA-SE, RG142, PMF, Box 157. On TVA, also see “Electric Power and Clean Air – Can We Have Both?” *Tennessee Valley Perspective*, Summer 1973, 3(4), 19-20; TVA, *Annual Report, 1967* (Washington, D.C.: Government Printing Office, 1967), 6; TVA, *Annual Report, 1968* (Washington, D.C.: Government Printing Office, 1968), 12; “TVA is Seeking to Give Lead in Air Pollution Control,” *New York Times*, February 1, 1970, F15; and Wagner, “TVA’s Role and Its Effect on the Environment,” remarks before the Tennessee Group, Sierra Club, Nashville, Tennessee, November 12, 1971, 6, NARA-SE, RG 142, PMF, Box 138.

¹⁶⁰ “Progress Report,” *Tennessean*, July 28, 1949, 10.

¹⁶¹ NES, “Better Living with Electricity,” promotional pamphlet, June 1950, NPLSC, NESPRR, Box 18, Folder 8, capitalization in original. In other instances, NES encouraged Nashvillians to “Cook Cool Electrically,” touting the advantages of using electric ranges and ovens. Quote, including capitalization, from NES, “Better Living with Electricity,” promotional pamphlet, June 1949, No. 3, NPLSC, NESPRR, Box 18, Folder 8.

¹⁶² NES, “Better Living with Electricity,” promotional pamphlet, June 1949, No. 3, NPLSC, NESPRR, Box 1, Folder 5; and NES, “Better Living with Electricity,” promotional pamphlet, July 1949, No. 4, NPLSC, NESPRR, Box 1, Folder 5.

prescription known for over-heated, over-humidified kitchens.”¹⁶³ Nothing, however, symbolized the extent to which electricity and the modern electrified home could improve the relationship between residential consumers and their environment better than year round climate control. Electric heating units kept the home “in the comfort zone” while providing “gentle, even, comfortable heat for every nook and cranny” of every room.¹⁶⁴ More importantly, air conditioners made total climate control a real possibility, and NES prioritized their promotion beginning in the summer of 1952.¹⁶⁵ The perfect “Tonic for Jangled Nerves” on a warm day, the availability of affordable air conditioning meant that there was no reason to “Simmer” through the hottest months of the year.¹⁶⁶ It was now possible to “Be Cool All Summer Along.”¹⁶⁷

¹⁶³ For “cooks the food,” see NES, “41,373 Of Nashville’s 71,124 Residential Electric Customers COOK ELECTRICALLY,” *Banner*, April 5, 1949, 3, capitalization in original. For “best prescription,” see NES, “Better Living with Electricity,” promotional pamphlet, September 1949, No. 5, NPLSC, NESPRR, Box 18, Folder 8. In addition to kitchen appliances, NES promoted electric water heaters and clothes dryers as devices that could help customers renegotiate their relationship with the environment, providing Nashville residents with greater control over their surroundings. Water heaters made year-round access to large volumes of hot water convenient and affordable while clothes dryers made every day a “Sun day.” See NES, “30th Annual Report 1968-1969,” 1969, 11, NPLSC, NESPRR, Box 13, Folder 623; NES, “Annual Operating Report July 1, 1968 – June 30, 1969,” July 16, 1969, Appendix D, NPLSC, NESPRR, Box 13, Folder 624; and NES, “Gold Medallion a National Hallmark of quality for Nashville Homes,” promotional pamphlet, c.1970, 5, NPLSC, NESPRR, Box 14, Folder 648. As the distributor exhorted its customers, regarding clothes dryers “Push a button ... make your own sunshine.” See NES, untitled photograph of parade float, October 1960, NPLSC, NESPRR, Box 10, Folder 499.

¹⁶⁴ For quotes, see NES, “Gold Medallion a National Hallmark of quality for Nashville Homes,” promotional pamphlet, c.1970, 7, NPLSC, NESPRR, Box 14, Folder 648, as NES put it, there were “No drafts or cold spots!”

¹⁶⁵ NES, “The News,” newsletter, 1952, Vol. 6, No. 14, 6, in NES, *The Electric Center Scrap Book, 1944-1952*, c.1952, NPLSC, NESPRR, Box 2, Folder 30. NES held promotions both for individual air conditioning units and for central air; see NES, “Annual Report of Operations Year Ended June 30, 1964 Nashville Electric Service,” July 29, 1964, Appendix B, NPLSC, NESPRR, Box 12, Folder 617; and NES, “Annual Operating Report July 1, 1965 – June 30, 1966,” July 27, 1966, Appendix D, NPLSC, NESPRR, Box 12, Folder 620.

¹⁶⁶ “Jangled” from NES, “Annual Operating Report July 1, 1970 – June 30, 1971,” July 16, 1971, Appendix D, NPLSC, NESPRR, Box 13, Folder 626; and “Simmer” from NES, “Annual Operating Report July 1, 1964 – June 30, 1965,” July 28, 1965, Appendix B, NPLSC, NESPRR, Box 12, Folder 619, capitalization in originals.

¹⁶⁷ Quote, including capitalization, from NES, “Annual Operating Report July 1, 1964 – June 30, 1965,” July 28, 1965, Appendix B, NPLSC, NESPRR, Box 12, Folder 619. Other ads connected central air conditioning with modern living, suggesting that it was “The Modern Trend”; see NES, “Annual Operating Report July 1, 1965 – June 30, 1966,” July 27, 1966, Appendix D, NPLSC, NESPRR, Box 12, Folder 620. Also see, “Do you shop in stores without it? Not if you can help it! Air conditioning is just as wonderful in your home.” From NES, “Better Living with Electricity,” promotional pamphlet, June 1950, NPLSC, NESPRR, Box 18, Folder 8. “The Comfortable Life,” in NES, “Annual Operating Report July 1, 1972 – June 30, 1973,” July 18, 1973, Appendix E, NPLSC, NESPRR, Box 13, Folder 629; “Remember Last Summer,” in NES, “Annual Operating Report July 1, 1969 – June 30, 1970,” July 15, 1970, Appendix D, NPLSC, NESPRR, Box 13, Folder 625; and “Cool Aid Against Summer Heat,” in NES, “Annual Operating Report July 1, 1967 – June 30, 1968,” July 31, 1968, Appendix D, NPLSC, NESPRR, Box 13,

Focusing on convenience, cleanliness, and climate control, NES juxtaposed the electrified home with a pre-electric past to connect residential electricity use with the image of a modern American lifestyle defined by the consumption of energy.

Nashville's Progressive Electric Mindedness

The consumption-centric policies that NES put into practice bore fruit as Nashvillians embraced public power and electric living. The new office complex that the distributor opened at the corner of Church Street and 12th Avenue on May 12, 1952, served as a physical manifestation of the utility's success. Aptly named the Electric Center, the facility garnered plaudits from the *Tennessean* in a twenty-five-page special edition, highlighting the popularity of both the TVA and NES as well as the importance of inexpensive electricity in the lives of local residents.¹⁶⁸ The Electric Service explicitly stated that its decision to move its main office outside of the downtown business district reflected the growing number of customers that it supplied outside of the city limits, symbolizing the agency's success in making electricity accessible throughout Davidson County and hinting at the role that cheap kilowatts had played in facilitating suburbanization.¹⁶⁹ The new facility mirrored the infrastructural improvements that the distributor made in Nashville's transmission system, allowing NES to maximize the efficiency of its operations by housing all of its various departments, including its technicians

Folder 622. Similarly, an NES billboard read, "keep your cool. get an electric room air conditioner"; see NES, "30th Annual Report 1968-1969," 1969, 11, NPLSC, NESPRR, Box 13, Folder 623.

¹⁶⁸ "NASHVILLE ELECTRIC SERVICE Doorway to a Brighter Tomorrow," *Tennessean*, special edition, May 11, 1952, copy found in NPLSC, NESPRR, Box Oversize Drawer 1, Folder 3. The ceremony celebrating the Electric Center's opening also reflected the support that NES had in the community and from the TVA's leadership; see "Clapp Opens NES Center At 3 Today," *Tennessean*, May 12, 1952, clipping in NPLSC, NESPRR, Box 2, Folder 27; "Clapp Calls NES Job 'Outstanding'" *Banner*, May 12, 1952, clipping in NPLSC, NESPRR, Box 2, Folder 27; and "Guest List for Building Dedication," c.1952, NPLSC, NESPRR, Box 2, Folder 29.

¹⁶⁹ On site selection, see NES, "'The Electric Center Scrap Book, 1944-1952,' Introductory Leaf," in NES, *The Electric Center Scrap Book, 1944-1952*, c.1952, NPLSC, NESPRR, Box 2, Folder 30; and "NES to Build Church Street Service Center," *Tennessean*, October 13, 1944, 1 and 4, in NES, *The Electric Center Scrap Book, 1944-1952*, c.1952, NPLSC, NESPRR, Box 2, Folder 30.

and its customer service representatives, at a single site. Just as the utility encouraged Nashvillians to modernize their own homes, the Electric Center was a modern structure that NES used to provide consumers with the latest advances in quality electric service.¹⁷⁰

At the same time, the Center's architectural features monumentalized the role of electricity in the creation of a modern American standard of living, simultaneously reinforcing NES's stature in, and contribution to, the community. The *Tennessean* praised the decision to erect the new facility out of limestone rather than brick, suggesting that in keeping with the design of many recently constructed buildings in the downtown area the complex would be "welcomed by all citizens with an eye to the city's beauty and faith in its progressive future."¹⁷¹ Symbolically, then, the Electric Center's aesthetic integration within the architectural milieu of Nashville's newly redeveloped business district and government offices reflected the extent to which public power had become synonymous with continued metropolitan growth and prosperity.

The rotating floodlight that crowned the Center served as a beacon for the citizens of Nashville, representing the promise of better living that access to cheap electricity provided. With the expectation that it would be visible at night from most of the city's neighborhoods, NES intended the light to be "a permanent reminder of the blessings of abundant electric power in our Nashville community."¹⁷² Underscoring the hold that the new structure had on the local

¹⁷⁰ Nashville Electric Service claimed that its new Electric Center was unique and that it was the first utility in the country to build brand new facilities to house its operations rather than converting older structures. NES also claimed that representatives of utilities from around the country visited the Electric Center to incorporate aspects of its design in their own facilities; see, NES, "'The Electric Center Scrap Book, 1944-1952,' Introductory Leaf," in NES, *The Electric Center Scrap Book, 1944-1952*, c.1952, NPLSC, NESPRR, Box 2, Folder 30. NES also took out ads in local newspapers touting the efficiency of its new building's design; see, NES, "A Report of Progress," advertisement, *Nashville Banner*, June 12, 1951, clipping in NPLSC, NESPRR, Box 2, Folder 28.

¹⁷¹ "Another Sign of Progress," *Nashville Tennessean*, November 2, 1949, 18.

¹⁷² For quote see, NES, "A Report of Progress," advertisement, *Nashville Banner*, June 12, 1951, clipping in NPLSC, NESPRR, Box 2, Folder 28; regarding visibility see, Allen Pettus, "NES May Swing Trade Westward," *Nashville, Tennessean*, November 3, 1949, 1 and 6.

imagination, Reverend Frank F. Drowota, Jr., the pastor at the Woodmont Christian Church, developed an entire sermon around the Center, arguing that it was a “mark of hope” and “modern science,” a “symbol of the future—lighting our world in an atomic age.”¹⁷³ Local cartoonist Tom Little agreed. In a sketch that ran in the *Tennessean* entitled “More Than a Mere Building,” Little depicted the domed roof of the Electric Center with radiating beams illuminating a single, capitalized word, “PROGRESS.”¹⁷⁴ [Fig. 3.4] As a separate editorial put it, the structure represented “what plentiful, cheap electric power has done and will do for this community.”¹⁷⁵ The Center’s distinctive dome and beacon, a bejeweled crown for a building that was itself representative of NES’s achievements and its mission, became an enduring image that defined Nashville Electric Service in the postwar period.¹⁷⁶

The complex’s opening ceremony coincided with the first day of the 1952 Electric Show. Held on site, the Show featured exhibits from forty-seven vendors housed in fifty-two booths as well as a series of paintings in homage to the TVA’s accomplishments in the region. The six day festival drew a record 118,000 visitors, almost four times the number of people who viewed the 1948 Show, demonstrating the widespread interest in electricity and in-home appliances that had developed in four short years.¹⁷⁷ In NES’ own estimation, the 1952 event was the “finest

¹⁷³ For the quotes from Drowota see, “Our New Home,” in NES, *The News*, employee newsletter, 1952, vol. 6, no. 14, 2, in NES, *The Electric Center Scrap Book, 1944-1952*, c.1952, NPLSC, NESPRR, Box 2, Folder 30. On Drowota’s life, see Helen Drowota, “Oral History Interview with Dr. Frank F. Drowota, Jr.,” November 20, 1980, NPLSC, Century III Nashville: Nashville Heritage Project.

¹⁷⁴ Tom Little, “More Than a Mere Building,” *Tennessean*, November 3, 1949, 18.

¹⁷⁵ “Another Sign of Progress,” *Tennessean*, November 3, 1949, 18.

¹⁷⁶ As Leon Gilbert, the chairman of Nashville’s Electric Power Board in the 1950s, argued, “Not only does it [the Center] add to and blend with the architectural beauty of our city – more than that it is symbolic of a vision that looks toward a brighter tomorrow.” “Clapp Opens NES Center At 3 Today,” *Tennessean*, May 12, 1952, clipping in NPLSC, NESPRR, Box 2, Folder 27. In fact, NES still uses the dome and beacon as its trademark, printing the image on its vehicles and letterhead. The complex still serves as the distributor’s main office building.

¹⁷⁷ The Electric Service also gave away 34 major appliances totaling \$8,200 in prize raffles. For attendance and prize figures see, cutting from *Public Power*, July 1952, 9, in NES, *The Electric Center Scrap Book, 1944-1952*, c.1952, NPLSC, NESPRR, Box2 Folder 30. The *Banner* reported 53 exhibits, while the NES’s own promotional material suggested the number was 52 exhibits and 47 vendors; see, “Clapp Calls NES Job ‘Outstanding’” Nashville

Electric Show ever held in Nashville,” a sentiment in which local businessmen concurred, noting the brisk sale of appliances that occurred both during and after the fair.¹⁷⁸ According to an editorial in the *Tennessean*, “a visit to the show and a tour of the new NES building will be an enlightening experience to those of our citizens who may wish to discover the full impact cheap electric power has exerted upon our civilization.”¹⁷⁹

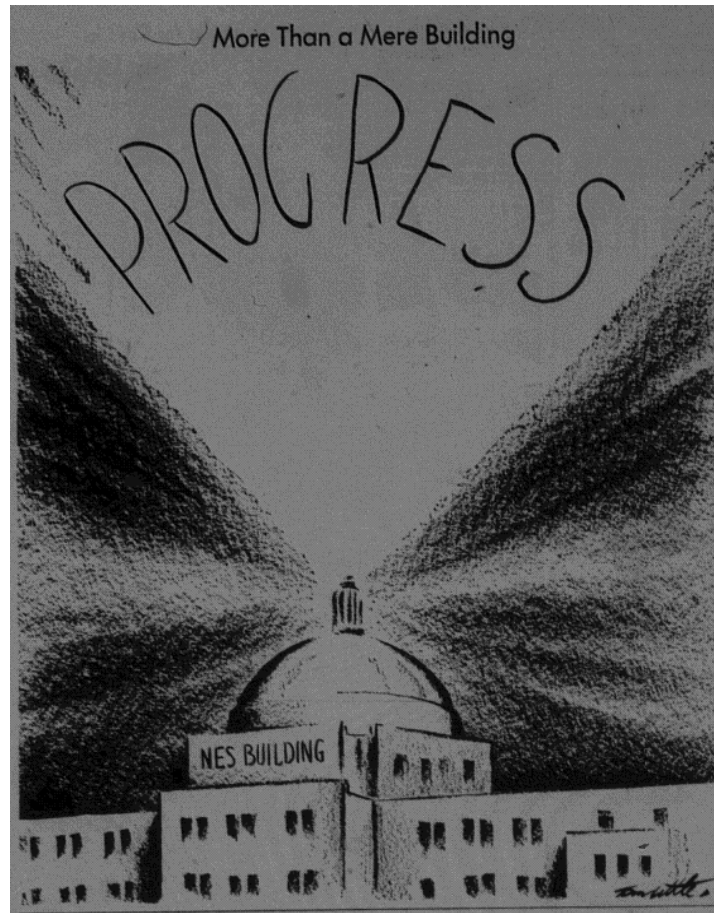


Figure 3.4: “More Than a Mere Building” – A Tom Little cartoon celebrating NES’ proposed Electric Center in 1949. Source: Tom Little, “More Than a Mere Building,” *Tennessean*, November 3, 1949, 18.

Banner, May 12, 1952, clipping in NPLSC, NESPRR, Box 2, Folder 27; and NES, “Opens Today! 1952 ELECTRIC SHOW,” 1952, NPLSC, NESPRR, Box Oversize Drawer 1, Folder 1.

¹⁷⁸ NES, *The News*, employee newsletter, 1952, vol. 6, no. 14, 1-2, in NES, *The Electric Center Scrap Book, 1944-1952*, c.1952, NPLSC, NESPRR, Box 2, Folder 30, quote from page 1.

¹⁷⁹ “Keep Politics Out,” *Nashville Tennessean*, May 12, 1952, clipping in NPLSC, NESPRR, Box 2, Folder 27.

Despite the sentiments expressed in the *Tennessean*, one did not need to visit the Electric Center to appreciate the importance of inexpensive kilowatts and electric living in Nashville. Electricity use skyrocketed following the transition to public power. Between 1939 and 1968, NES increased the number of residences that it served in Davidson County from 52,384 to approximately 138,000.¹⁸⁰ Throughout the 1950s and 1960s, the utility's customers often consumed more than three times as much electricity as the average nationwide, making metro Nashville one of the most electrified areas not only in the United States but in the entire world. By 1970, Nashvillians used almost 20,000 kilowatt-hours of electric power per year in their homes.¹⁸¹

The growth of electric heating and cooling marked the distributor's greatest success. Although only sixteen homes had electric heat in 1940, more than fifty percent of NES' customers did by 1966.¹⁸² Air conditioning followed a similar upward trajectory, with the number of units that Electric Service supported rising from forty-seven in 1939 to 212,000 in

¹⁸⁰ Hembree, "The Role and History of Nashville Electric Service," 8, NPLNR, Stacks; and James C. Campbell, Jr., "Relaying a Tight 69 KV System" (paper presented at Protective Relaying Conference, Georgia Institute of Technology, Atlanta, GA, May 16-17, 1968), 2.

¹⁸¹ In 1954, Nashvillians used 7,394 kilowatt-hours on average versus 2,415 nationwide. The figures for 1959 were 11,149 kilowatt-hours compared to 3,455 nationally; and for 1964, 14,900 versus 4,367 nationally. In 1967, the averages were 16,368 kilowatt-hours and 5,312. For statistics on use comparing Nashville to national average, see Nashville Electric Power Board, "Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report," 1964, 8, NPLSC, NESPRR, Box 12, Folder 618; and NES, "Annual Operating Report July 1, 1966 – June 30, 1967," July 26, 1967, 8, NPLSC, NESPRR, Box 12, Folder 621. As early as 1949, NES touted the use of electricity in its service area as well as the coverage of its system, suggesting that Nashville and Davidson County ranked among the most electrified communities in the United States; see NES, "Residential Sales of Electricity Largest Portion of Total in Nashville," undated press release, c.1949, 2, NPLSC, NESPRR, Box 1, Folder 19; and NES, "Nashville in Top Group of Cities for Residential Use of Electricity," undated c.1949, NPLSC, NESPRR, Box 1, Folder 19. For other references to the volume of electricity used per residential customer and Nashville's rank relative to other areas in the 1950s and 1960s; see NES, "Doorway to a Brighter Tomorrow: Electric Center: New Home of Nashville Electric Service A Business with 98,000 Customers Owned By The People Of Nashville," c.1952, 1, NPLSC, NESPRR, Box 12, Folder 615; Nashville Electric Power Board, "Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report," 1964, 8, NPLSC, NESPRR, Box 12, Folder 618; and NES, "Our Job At Nashville Electric Service," 1970, 20, NPLSC, NESPRR, Box 14, Folder 641. For 1970, the reported average was 19,879 kilowatt-hours, not quite three times the national average of 6,663; see NES, "Annual Operating Report July 1, 1969 – June 30, 1970," July 15, 1970, 7, NPLSC, NESPRR, Box 13, Folder 625.

¹⁸² For heating stats in 1940, see NES, "40 Years Service: Annual Operating Report July 1, 1978 – June 30, 1979," 1979, 13, NPLSC, NESPRR, Box 13, Folder 631. NES, "Annual Operating Report July 1, 1965 – June 30, 1966," July 27, 1966, 10; NPLSC, NESPRR, Box 12, Folder 620.

1969—more than one unit for every NES customer.¹⁸³ The distributor and its supporters claimed that Nashville had more electrically heated and air conditioned homes than any other city in the United States.¹⁸⁴ For NES and the city’s civic leaders, both the amount of electricity that Nashvillians used and the number of appliances in area households served as evidence of the community’s “progressive ‘electric-mindedness’” and indicated residents’ “complete acceptance of electric living with cheap TVA Power.”¹⁸⁵

Low-cost electricity also transformed suburban architecture.¹⁸⁶ After World War II, the single-story ranch home became the most common design among builders of tract housing because of its inexpensive and simple construction. In terms of energy consumption, the ranch was comparatively inefficient relative to its size. Two-story homes used less power to heat or cool the same number of rooms because of their smaller footprint. In building new subdivisions, developers also indiscriminately removed trees, eliminating natural windbreaks and sources of shade that had partially regulated indoor temperatures. Because electric power was so cheap,

¹⁸³ The 212,000 figure and the 47 air conditions for 1939 most likely include commercial purchases as well. Also, it is ambiguous whether 212,000 figure is the number of units purchased over thirty years or the number in operation as of 1969. Because NES reported data for other appliances in terms of the number in use, I have chosen to treat air conditioners similarly. NES, “Annual Operating Report July 1, 1968 – June 30, 1969,” July 16, 1969, “Highlights of Report,” NPLSC, NESPRR, Box 13, Folder 624; and NES, “Nashville Electric Service 1939-1974 Thirty-Five Years of Service,” 1974, 5, NPLSC, NESPRR, Box 13, Folder 630.

¹⁸⁴ “City May Lead In Cooling, Too,” *Tennessean*, August 16, 1964, 7; and NES, “LIVE BETTER ELECTRICALLY,” *Tennessean*, August 16, 1964, 8-9. In 1974, NES celebrated its 100,000th electrically heated house, suggesting that the figure was more than anywhere else in the world and that more than 75 percent of new homes in the area had electric heat; see NES, “Nashville Electric Service 1939-1974 Thirty-Five Years of Service,” 1974, 12-13; NPLSC, NESPRR, Box 13, Folder 630.

¹⁸⁵ For quotes, “progressive” is from NES, “Better Living with Electricity,” October 1949, no. 6, NPLSC, NESPRR, Box 18, Folder 8; and “complete acceptance” is from NES, “Sales of Major Electric Appliances in August Sets All Time Record: Nashville Dealers Report Sales Which Defy Reports of Any Recession or Depression,” c.1949, NPLSC, NESPRR, Box 1, Folder 15.

¹⁸⁶ In Nashville, the changing landscape is best demonstrated by the area around Green Hills some four miles from the downtown business district. Green Hills was relatively open farmland in 1945, but now it is one of the more congested residential and commercial areas in metropolitan Nashville. On Green Hills in 1945, see Helen Drowota, “Oral History Interview with Dr. Frank F. Drowota, Jr.,” November 20, 1980, NPLSC, Century III Nashville: Nashville Heritage Project. On the prominence of ranch style constructions in Nashville after World War II, see Nashville Electric Power Board, “Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report,” 1964, 7, NPLSC, NESPRR, Box 12, Folder 618.

energy efficiency simply did not matter.¹⁸⁷ A photograph in a 1964 NES pamphlet promoting electric living captured the community's embrace of an energy-intensive lifestyle; it depicted a new subdivision bereft of many trees and populated by single-story houses studded with air conditioning units. [Fig. 3.5] Another NES brochure noted that "Nashville folks, with an age-old tradition for gracious living, have discovered that cheap, abundant electric power makes living easier,[sic] and more pleasant in their homes."¹⁸⁸ As far as Nashvillians were concerned, "NES [was] right in the heart of TENNESSEE."¹⁸⁹



Figure 3.5: Suburban Tract Housing – Unnamed Nashville suburb circa 1964. Source: Nashville Electric Power Board, "Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report," 1964, 7, NPLSC, NESPRR, Box 12, Folder 618.

¹⁸⁷ On the popularity of the ranch nationwide, its lack of energy efficiency, and the removal of trees that provided windbreaks and shade, see Rome, *The Bulldozer in the Countryside*, 47-86. The TVA began to take an interest in conservation and energy efficiency in the 1970s as energy prices began to rise; see TVA, *Annual Report, 1971* (Washington, D.C.: Government Printing Office, 1971), 25. The agency and its distributors began inspecting properties for customers offering to help reduce the cost of insulating homes; see TVA, *Annual Report, 1978* (Washington, D.C.: Government Printing Office, 1978), 15.

¹⁸⁸ R. Earl Briggs, "Key to the City: The Newcomer's Key to Nashville," 1963 revised edition, 46, NPLSC, NESPRR, Box12, Folder 614; punctuation in original.

¹⁸⁹ Briggs, "Key to the City: The Newcomer's Key to Nashville," 1963 revised edition, 46, NPLSC, NESPRR, Box12, Folder 614. In the original there is a box around the letter "NES" in Tennessee.

The Limits of Better Living

Despite NES' emphasis on improving access to electricity throughout Nashville and Davidson County, the Electric Service's promotional materials denigrated the black poor. In the early 1940s, the distributor's modernization narrative often portrayed African Americans as well-meaning simpletons who did not understand how to operate in-home appliances, associating the black community with an inferior pre-electric past. A cartoon that NES printed in a pamphlet it mailed to customers depicted a white salesman asking a black man named Mose how he was enjoying his new washing machine. Mose replied, "Man, evuh time I gits in dat thing it knock me down."¹⁹⁰ Similarly, a second NES cartoon featured a black maid named Petunia ironing her employer's shirt on an ironing board that she had propped inside an open refrigerator while exclaiming, "Dese lektric 'frigeators sho' does keep you cool!"¹⁹¹ In a caption below Petunia, NES claimed that the cartoon was based on an actual account received from a customer, noting wryly that Petunia had "found a new use for her mistress' refrigerator."¹⁹²

Both cartoons made use of racial caricature to suggest that ignorance of electricity and electric appliances relegated one to second class status. The name Mose itself referenced the husband of the Aunt Jemima character from Quaker Oats Company advertisements as well as a standard Vaudevillian folk stereotype, while Petunia was a prototypical mammy figure.¹⁹³ The mispronunciation of common words by Mose and Petunia in the cartoons marked both as uneducated and unfit for polite society just as their misappropriation of basic appliances revealed

¹⁹⁰ NES, "Friendly Service News," promotional pamphlet, January 1941, NPLSC, NESPRR, Box 4, Folder 52.

¹⁹¹ NES, "Friendly Service News," promotional pamphlet, April 1941, NPLSC, NESPRR, Box 4, Folder 52.

¹⁹² NES, "Friendly Service News," promotional pamphlet, April 1941, NPLSC, NESPRR, Box 4, Folder 52.

¹⁹³ On the proliferation of the Uncle Mose and mammy characters in popular culture, see Kenneth W. Goings, *Mammy and Uncle Mose: Black Collectibles and American Stereotyping* (Bloomington, Indiana University Press, 1994); and Patricia A. Turner, *Ceramic Uncles & Celluloid Mammies: Black Images and Their Influence on Culture* (New York: Anchor, 1994).

their primitivism. The effect of presenting these relatively generic racial caricatures in stark contrast to more competent white customers in other advertisements underscored the Electric Service's implicit effort to correlate the consumption of electricity and the proper use of modern devices with local standards of civility, including Jim Crow.

The vast majority of the Electric Service's promotional materials featured only white consumers enjoying the benefits of electricity. Pictures of the distributor's electric shows and other events that were published in newspapers and pamphlets rarely contained black patrons, and they were even less likely to portray integrated crowds. Similar patterns persisted in many of the photographs that TVA employees made at events throughout the Tennessee Valley Region.¹⁹⁴ The notable absences of black customers and integrated audiences in the promotional images used by NES and the Authority created a visual narrative of electric living that excluded African Americans.

The location of the Electric Center complemented the efforts of Nashville's civic leaders to displace black residents from the downtown area through urban renewal projects. The site that the distributor chose for its new office complex was home to several low-income tenements that primarily served African Americans. Both local newspapers welcomed the utility's decision to build there, suggesting that the Center represented a marked improvement for the blocks around the corner of Church Street and 12th Avenue; as the *Tennessean* noted, "NES [had] cleared away

¹⁹⁴ Certainly, some communities segregated their shows. Although I have not uncovered evidence that NES officially segregated its events in Nashville, the fact that the distributor's photos focused primarily on white customers was telling. While judging the race of individuals based on black and white photographs is methodologically problematic, many audiences in pictures taken at NES or TVA events do not appear to be integrated; see TVA, "Power and People In The Tennessee Valley the story of electrical development 1947-1949," 1949, 7, NPLSC, NESPRR, Box 14, Folder 663. Similarly, many of NES' advertisements for its Electric Shows featured only white characters; see NES, "See you at the ELECTRIC SHOW," *Tennessean*, May 18, 1948, clipping in NPLSC, NESPRR, Box 1, Folder 22.

an unsightly area of Negro tenements which was rapidly degenerating into a slum area.”¹⁹⁵ The Center wiped away neighborhoods and people who did not fit the image of a rapidly expanding, affluent, and modern city that the distributor and local elites advanced, reinforcing the association of electric living and the appliance-filled home with middle- and upper-class white consumers. As in other parts of the country, urban renewal and suburban growth came at the expense of minorities and the poor in Nashville. The construction of the Electric Center was no exception, demonstrating the extent to which NES’ implementation of the TVA’s consumption-centric energy regime valued white suburbanites over the city’s African American residents.¹⁹⁶

Conclusion

Almost thirty years after it began providing Davidson County with electricity from the Tennessee Valley Authority and twenty one years after its first major postwar event, the Nashville Electric Service opened its 1969 Home Show at the state fairgrounds. The Nashville Electrical Dealers Association, the Nashville Home Builders Association, the city’s chamber of commerce, and the Newspaper Printing Corporation, the entity that published the *Tennessean* and the *Banner*, co-sponsored the weeklong extravaganza that included 115 exhibitors, musical acts, and a live demonstration by NES home economist Betty Dale involving the latest advance

¹⁹⁵ Quote from Allen Pettus, “New NES Building Bids Opened,” *Tennessean*, November 2, 1949, 1 and 6. Also see “Another Sign of Progress,” *Tennessean*, November 3, 1949, 18. For the *Banner*, see “NES Pole Yard, Spur Track Site Being Cleared” *Banner*, c.1945, in NES, *The Electric Center Scrap Book, 1944-1952*, c.1952, NPLSC, NESPRR, Box 2, Folder 30.

¹⁹⁶ Similarly, the Capitol Hill Redevelopment Project that began in 1949 bulldozed several blocks in the neighborhood known as Hell’s Half Acre below the state capitol building. For the proponents of the project, Hell’s Half Acre represented the epitome of urban blight, an impoverished, largely African American neighborhood in which there were still homes that were not connected to the electric grid. Critics noted that the project functioned mostly to remove black families from the downtown area, placing them in new public housing projects that, rather symbolically, contained all-electric units. Doyle, *Nashville Since the 1920s*, 121-9. In fact, Nashville’s Capitol Hill Redevelopment Project was the first urban renewal project approved under the Federal Housing Act of 1949. For a critique of urban renewal in the United States in the twentieth century, see Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1961).

in electric cooking, the microwave oven. Featuring an Adam and Eve motif and apple-shaped pamphlets, advertising for the event asked, “Who Can Resist the Great Temptation?”¹⁹⁷

By 1969, however, Nashvillians had already given in to the temptation of better living that residential electricity use provided. Only one year earlier, the community had surpassed 74,000 all-electric homes, meaning that over fifty percent of NES’ customers used electricity for all of their household energy needs.¹⁹⁸ In contrast, only one in three residences in Davidson County was equipped for natural gas.¹⁹⁹ Eighty percent of new construction in the early 1960s was all-electric, while six out of seven Nashvillians used electric ranges in 1969.²⁰⁰ The typical residential customer in Davidson County used 19,879 kilowatt-hours in 1970, only slightly less than three times the average for all homes nationwide and more than twelve times what households in the city had used three decades earlier.²⁰¹ In a country that consumed thirty-six percent of the world’s electricity despite only accounting for six percent of its population, more kilowatt-hours, in fact, than the United Kingdom, the Soviet Union, West Germany, and Japan combined, Nashville’s residents were second to none.²⁰²

Residential use formed an integral component of the TVA’s energy regime. While the Authority lowered rates, the agency relied on its distributors and supporters to spread the gospel

¹⁹⁷ NES, “Who Can Resist the Great Temptation: 1969 Home Show, March 16-23, All New,” promotional pamphlet, 1969, NPLSC, NESPRR, Box 1, Folder 2, capitalization in original; and Kay Morris, “Show Will Display Heap O’ Livin’,” *Banner*, March 1969, 1 and 3, clipping in NPLSC, NESPRR, Box 1, Folder 2.

¹⁹⁸ With roughly 138,000 residential customers, the distributor reported approximately 74,000 all-electric units; see James C. Campbell, Jr., “Relaying a Tight 69 KV System” (paper presented at Protective Relaying Conference, Georgia Institute of Technology, Atlanta, GA, May 16-17, 1968), 2.

¹⁹⁹ The Nashville Gas Company counted approximately 43,000 residential and commercial customers in 1964 while NES served 139,274 customers in the same year; see “Nashville, Tennessee: Gas Turns Village into City,” *Mueller Record* (February 1964): 3-5; and NES, “Annual Report of Operations Year Ended June 30, 1964 Nashville Electric Service,” July 29, 1964, Highlights of Report, NPLSC, NESPRR, Box 12, Folder 617.

²⁰⁰ Nashville Electric Power Board, “Live Better Electrically: NES – Geared to Progress – Silver Anniversary Report,” 1964, 7, NPLSC, NESPRR, Box 12, Folder 618. For percentages regarding number of homes cooking with electricity, see NES, “The NES News,” newsletter, vol. 9, no. 7, January-February 1969, 1, NPLSC, NESPRR, Box 1, Folder 1.

²⁰¹ NES, “Annual Operating Report July 1, 1969 – June 30, 1970,” July 15, 1970, 7, NPLSC, NESPRR, Box 13, Folder 625; and Hembree, “The Role and History of Nashville Electric Service,” 8, NPLNR, Stacks.

²⁰² NES, “The NES News,” newsletter, vol. 9, no. 7, January-February 1969, 1, NPLSC, NESPRR, Box 1, Folder 1.

of public power at the local level. In Nashville, NES and its partners among the civic elite worked to upgrade the community's electrical infrastructure, lobbying for the construction of new generating stations, improving the existing transmission system, and ensuring the installation of adequate wiring. The distributor and its backers also created a promotional narrative of better living that linked in-home consumption with modern conveniences and a quality environment for upper- and middle-class white consumers, suggesting that social progress could be achieved through inexpensive kilowatts.

More broadly, the history of NES in Nashville demonstrates how the ideals of public power reinforced a political economy of mass consumption that treated development as a social good. The availability of inexpensive sources of energy, including low-cost electricity, was a prerequisite for the suburban growth that characterized the 1950s and 1960s, making the presumed benefits of the single-family detached home replete with every imaginable modern convenience affordable for the United States' burgeoning middle-class for the first time.²⁰³ Along with cheap gasoline and the construction of the interstate highway system, the expansion of the electric grid and access to inexpensive kilowatts facilitated the massive demographic shift that transformed the American countryside in the postwar era.²⁰⁴

The energy-intensive lifestyle that the Authority and its distributors popularized also encouraged consumers to renegotiate their relationship with the environment. As Adam Rome has noted, the development of the urban fringe that occurred after World War II represented a

²⁰³ In fact, one could argue that a suburban, energy-intensive lifestyle defined what it meant to be middle-class for many Americans in the postwar era. Although neither addresses energy directly, this argument is implicit in the works of Liz Cohen, Kenneth Jackson, and Adam Rome; see Cohen, *A Consumer's Republic*; Jackson, *The Crabgrass Frontier*; and Rome, *The Bulldozer in the Countryside*.

²⁰⁴ Scholars of urban development and expansion have long noted the importance of infrastructural improvements to growth; see Sam Bass Warner, *Streetcar Suburbs: The Process of Growth in Boston, 1870-1900* (Cambridge: Harvard University Press, 1978[1962]). Although he does not analyze the importance of energy use per se, Kenneth Jackson does note how the development of highways and the interstate system facilitated suburbanization; see Jackson, *The Crabgrass Frontier*. Also see Rome, *The Bulldozer in the Countryside*.

monumental reordering of the way in which many Americans interacted with natural resources.²⁰⁵ In addition to facilitating the alteration of the physical landscape, access to large volumes of affordable energy made year-round climate control in the form of heating and air conditioning possible, permitting individuals to break free from the dictates of seasonal fluctuations in temperature. Perhaps nothing symbolized modern living's mastery of the environment more in postwar American than the air conditioned home. Furthermore, because it was clean at the point of use, inexpensive electricity represented a potential pathway to environmental quality for consumers. Theoretically, at least, it allowed individuals to enjoy the material advantages of an energy-intensive lifestyle without experiencing the pollution that resulted from burning large volumes of coal.²⁰⁶

Although it did lead to widespread increases in the consumption of electricity, the TVA's energy regime did little to reduce social and economic inequality contrary to the rhetoric of agency leaders. As numerous scholars have demonstrated, the politics and policies that undergirded the political economy of mass consumption favored upper- and middle-class whites.²⁰⁷ Similarly, the Authority's regime reinforced the position of existing elites in the communities of the Tennessee Valley Region. Nashville's leading businessmen, for example, dominated its municipal power board, and the growth of the city's electric grid mirrored the flight of white residents to the urban fringe. "Democracy on the March" may have implied better living for all, but the vision that local boosters and NES promulgated of a modern, electrified

²⁰⁵ Rome, *The Bulldozer in the Countryside*.

²⁰⁶ The argument that coal-fired electric power was clean for consumers rested on an assumption, now proven false, that the emissions from coal-fired power plants only affected areas around the facilities themselves. In part, this assumption resulted from older understandings of pollution as a solely visible entity. Later, increased scientific understanding of acid precipitation and atmospheric carbon dioxide loading undermined this earlier thesis. For a discussion of the socially constructed nature of pollution, see Peter Thorsheim, *Inventing Pollution: Coal, Smoke, and Culture in Britain Since 1800* (Athens: Ohio University Press, 2006).

²⁰⁷ Mettler, *Dividing Citizens*; Cohen, *A Consumer's Republic*; Jacobs, *Pocketbook Politics*; Jackson, *The Crabgrass Frontier*; and Galbraith, *The Affluent Society*.

Nashville had little use for minorities and the poor except as foils to highlight the benefits of inexpensive electricity.

Chapter 4

Powering the Sunbelt: Electricity and Economic Development in the Tennessee Valley Region

*Electricity is the tool that man uses to make himself master of his environment. It is also the tool which makes possible the development of highly complicated missiles for defense of his environment or for giant rockets with which to explore other cosmic environments.*¹

– Huntsville Electric Service, 1965

Driving south on Interstate-65 from Nashville, Tennessee, subdivisions and farms give way to rolling, wooded hillsides. Upon entering Alabama, the hills and trees that line the highway recede, leaving an open expanse of fields dotted with houses. There, 224 feet tall and towering over the landscape, a Saturn IB rocket stands guard at the state welcome center. More than a mere oddity meant to attract the attention of weary travelers, the rocket, juxtaposed as it is with its surroundings, symbolizes rather dramatically the changes that occurred in northern Alabama and, specifically, the communities of Huntsville and Decatur both during and after World War II. Prior to the war, Huntsville had been known as the watercress capital of the world owing to the plant's abundance in the streams that spilled off the neighboring Cumberland Plateau. The nickname captured the city's roots in the plantation economy of the antebellum period and associated it with a standard of "gracious living" that defined romanticized visions of the Old South.² Thus, where cotton had been king, the aerospace, electrochemical, and electrometallurgical industries now dominated. Federal defense spending, private investment, and the expansion of manufacturing beyond textiles had pushed northern Alabama into the New

¹ Huntsville Electric Service, "Years of Transition: 25th Anniversary – Electric System – Huntsville Utilities," 1965, 12, Huntsville-Madison County Public Library, Heritage Room, Huntsville, AL, Huntsville – Utilities – Electric System.

² Sam Jones, "Huntsville – The City that Technology Built," *Tennessee Valley Perspective* 1(Fall 1970): 27.

South.³ But what of the TVA's energy regime? What role did it play in shaping economic growth and the use of natural resources in the Authority's service area?

As discussed in the first two chapters of this dissertation, the advocates of public power and the TVA's leadership touted electricity as a form of energy that could facilitate development by expanding the number of sites at which industrial processes could be profitably carried out. They connected this argument with the conservation movement's larger understanding of resource consumption and environmental degradation, suggesting that electricity-based manufacturing offered a more efficient, lucrative, and less destructive way of managing a community's natural resources. In a region suffering from soil depletion and a stagnating monocrop economy, industrialization represented a means for improving local standards of living. The Authority justified the expansion of its generating capacity and its transition to coal-fired power by emphasizing the importance of electric power for defense installations and private manufacturers.⁴

³ Bruce Schulman has advanced this narrative about the South as whole in the post-World War II period. He argues that the rise of the military industrial complex, the expansion of research, and the increasing number of high-tech industries helped break the hold of cotton and textiles in the region and became defining features of the Sunbelt economy and the New South. Schulman claims that federal defense spending and the actions of business progressives, a term coined by George B. Tindall to describe local boosters, mostly businessmen and politicians, helped foment these changes. For the most part, Schulman dismisses the importance of the TVA or its power program, although it should be noted that his focus includes many areas of the South not located within the Authority's service area. See Bruce J. Schulman, *From Cotton Belt to Sunbelt: Federal Policy, Economic Development, and the Transformation of the South, 1938-1980* (Oxford: Oxford University Press, 1991); and George B. Tindall, *The Emergence of the New South, 1913-1945* (Baton Rouge: Louisiana State University Press, 1967).

⁴ See Chapter One and Chapter Two of this dissertation. Also see Daniel Schaffer, "Benchmark Report on Environmental Quality: A Historical Perspective," TVA Cultural Resources Program (February, 1983), 25-9, University of Tennessee at Knoxville, John C. Hodges Library, Special Collections [hereafter: UTK: Hodges], Energy, Environment, and Resource Center Records [hereafter: EERC], Box 3, Folder 4; TVA Budget Staff, "Progress in the Tennessee Valley, 1933-1952," May, 1952, 1, UTK: Hodges, TVA Reports, 1933-1973, Box 4, Folder NA; Clapp, *The TVA: An Approach to the Development of a Region*, 53; and Mark Winter, "Oral History Interview with Ralph E. McKnight," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, April 11, 1983, 36, National Archives and Records Administration Southeast Branch, Morrow, GA [hereafter: NARA-SE], Record Group 142 [hereafter: RG 142], Oral History Records [hereafter: OHR], Box 6; David E. Lilienthal, "The Future of Industry in the Tennessee Valley Region," address before the Tennessee Valley Institute of the University of Chattanooga, Tennessee, April 21, 1934, NARA-SE, RG 142, Office of Engineering Design and Construction, Project Histories and Reports [hereafter: OEDC], Box 23; Sherman M. Woodward, "TVA

Scholars have questioned what effect if any the TVA's power program had on development in the Tennessee Valley Region. Some have concluded that no causal relationship existed between inexpensive electricity and economic growth.⁵ Others have downplayed the importance of the Authority's energy regime, focusing instead on the importance of so-called business progressives and military spending in bringing to fruition a vision of the South that was no longer beholden to cotton.⁶ While it was true that prospective manufacturers, applied research firms, and the federal government analyzed a variety of factors when deciding where to locate new plants, laboratories, and installations, it was equally true that access to cheap, abundant electric power was a priority for certain companies and defense projects. The chemical and primary metals industries, for example, grew faster than any others in the TVA's service area in the 1940s.⁷ Both relied on energy-intensive modes of production. It seems shortsighted, then, to dismiss the importance of the Authority's power program in the region given the considerable overlap between the agency's economic goals and those of local actors. One need not believe that affordable electricity alone lured businesses and federal dollars to the Tennessee

and Resource Development," report for information office, January 28, 1948, 3, NARA-SE, RG 142, OEDC, Box 115; TVA, "Tennessee Valley Resources: Their Use and Development," internal report, December 1, 1947, 31, UTK: Hodges, TVA Pamphlet Collection 1934-1960 [hereafter: TVA PC], Box 2, Folder n/a; and TVA, *Annual Report, 1947* (Washington, D.C.: Government Printing Office, 1947), 3; TVA, "TVA Power, 1956-57," informational pamphlet, January, 1957, 9, UTK: Hodges, TVA PC, Box 4, Folder 8; TVA, "TVA Power, 1955-56," informational pamphlet, January, 1956, 9, NARA-SE, RG 142, Power Manager's File [hereafter: PMF], Box 17; Sarah T. Phillips, *This Land, This Nation: Conservation, Rural America, and the New Deal* (Cambridge: Cambridge University Press, 2007), 84-8; Schulman *From Cotton Belt to Sunbelt*, 15-20 and 39-62; and Howard W. Odum, *Southern Regions of the United States* (Chapel Hill: University of North Carolina Press, 1936); and Erwin C. Hargrove, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990* (Knoxville: University of Tennessee Press, 1994).

⁵ Bruce C. Netschert, "Electric Power and Economic Development," in *The Economic Impact of TVA*, ed. John R. More (Knoxville: University of Tennessee Press, 1967), 1-23; and Stefan H. Robock, "An Unfinished Task: A Socio-Economic Evaluation of the TVA Experiment," in *The Economic Impact of TVA*, ed. John R. Moore (Knoxville: University of Tennessee Press, 1967), 105-20.

⁶ Schulman *From Cotton Belt to Sunbelt*. Again, it should be noted that Schulman's focus includes areas of the South not located within the Authority's service area.

⁷ John V. Krutilla, "Economic Development: An Appraisal," in *TVA: The First Twenty Years, A Staff Report*, ed. Roscoe C. Martin (Knoxville: University of Tennessee Press, 1956), 226.

Valley Region or that all firms valued electric power equally to accept that the TVA's energy regime shaped patterns of development in the Authority's service area.

This chapter analyzes the relationship between the TVA's consumption-centric energy regime, economic development, and the environment in Huntsville and Decatur, Alabama, after 1940. Access to an abundant supply of cheap electric power lured major defense programs and engineering firms to the area, as Huntsville grew from a small cotton town into a preeminent center for rocket and guided missile research. TVA electricity also attracted industry with major chemical and metallurgical manufacturers opening new facilities in both communities in the post-World War II era. In addition to providing inputs like inexpensive electric power, the Authority and its distributors cooperated with civic leaders and businessmen to sponsor development agencies that recruited new corporations and federal installations. What was once one of the poorest parts of the country became a thriving corridor for electrochemical manufacturing and national defense. Economic growth, however, did not eliminate inequality. Instead, it privileged new patterns of resource consumption that benefited the affluent and the middle class to the detriment of minorities and the poor. While the TVA and business progressives welcomed the transformation of fields into factories and laboratories, entire rural communities found themselves displaced, and others found that toxic effluents had irreparably damaged the soil and streams that they relied on for subsistence. The Authority's energy-intensive vision of modernity and progress stood at the nexus of these influences and outcomes.

Cotton and Textiles in the Huntsville-Decatur Corridor

Prior to the arrival of the TVA, cotton and textiles dominated life in Huntsville and Decatur. Both communities were located in a corridor along the Tennessee River that contained

some of the most productive soil in Alabama. The area had attracted planters from Virginia, Georgia, and the Carolinas in the antebellum period, becoming a thriving center of cotton production in which towns like Huntsville and Decatur served as the main markets for those wishing to export their crops.⁸

While cotton remained important after the Civil War, local leaders began to show interest in industrializing the region. Huntsville's first textile mills opened in the 1880s and Decatur became an important junction for two railroads, the Southern and the Louisville and Nashville. Despite their success, both the mills and the railroads merely reinforced the existing mono-crop economy. The rise of textiles provided little incentive for land owners to deviate from cotton cultivation, and the mills themselves did not siphon a significant number of workers from the fields, operating for the most part in rhythm with the area's seasonal shifts in labor. The railroads facilitated the extraction of agricultural resources from the region, providing a necessary means for bypassing the obstacle to shipping that Muscle Shoals presented on the Tennessee River. Other industries found it difficult to establish themselves in either community, and as discussed in Chapter One, Henry Ford's grand scheme for developing the region through private investment fell victim to partisan squabbles in Congress in the 1920s. In addition to its textile operations, Huntsville only counted four manufacturing facilities in 1940, and one of them processed cottonseed oil while a second prepped cotton stock for use in the mills. In Decatur, an ironworks that had opened after the coming of the railroads and a wood products factory both closed by 1900. Two decades later, only the railroads and two textile companies remained.⁹

⁸ Herman Frederick Otte, *Industrial Opportunity in the Tennessee Valley of Northwestern Alabama* (New York: Columbia University Press, 1940), 1-10; Huntsville Industrial Expansion Committee, "Huntsville Has What It Takes," 1947, 18, Huntsville-Madison County Public Library, Heritage Room, Huntsville, AL [hereafter: HPLHR], Stacks; Luther J. Carter, "Huntsville: Alabama Cotton Town Takes Off into the Space Age," *Science* 155(March 10, 1967): 1225; and Patricia Dolan, "Huntsville – Space City, U.S.A.," *General Electric Challenge* 3(March 1968): 44.

⁹ Otte, *Industrial Opportunity*, 1-55. On the failure of Henry Ford's plan to develop Muscle Shoals and create an industrial corridor in the region, see Chapter One of this dissertation as well as Judson King, *The Conservation*

Business groups and private power companies had tried to promote industrial growth in the region. In Huntsville, the chamber of commerce served as the primary vehicle for attracting manufacturers. In a 1919 pamphlet, the organization touted the city's many advantages, citing its proximity to raw materials, access to electricity, and its "wonderful supply of efficient labor" among the primary reasons for companies to locate factories in the area.¹⁰ The Alabama Power Company (APC) was also among the Huntsville-Decatur corridor's most avid supporters of industry. The APC maintained an office of economic development that encouraged companies to relocate to the region. It was responsible both for contacting interested businesses and ensuring the existence of a sufficient supply of electricity.¹¹ Despite the efforts of groups like the Huntsville-Madison County Chamber of Commerce and the APC, neither Huntsville nor Decatur had much success luring industry prior to the arrival of the TVA.

During the Great Depression, former sharecroppers and those who had lost family farms to foreclosure went to Huntsville and Decatur looking for work in the cities' textile factories. Many of the mills, however, were also in distress, and several closed while those that remained slowed to a crawl. Without other industries to support the influx of rural residents, Huntsville and Decatur had little to offer those in need of work.¹²

Fight: From Theodore Roosevelt to the Tennessee Valley Authority (Washington, DC: Public Affairs Press, 1959), 42-4 and 98-122; Paul K. Conkin, "Intellectual and Political Roots," in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 14-7; and Preston J. Hubbard, *Origins of the TVA: The Muscle Shoals Controversy, 1920-1932* (Nashville: Vanderbilt University Press, 1961), 120-40.

¹⁰ The pamphlet's title, "Happy Hustling Huntsville," further reflected the chamber's desire to promote the municipality as a bustling business center rather than a sleepy cotton town; see Otte, *Industrial Opportunity*, 54-5 and n. 19.

¹¹ Charles W. Crawford, "Oral History of the Tennessee Valley Authority: Interview with Barrett Shelton, Sr.," June 18, 1970, 22, Memphis State University Oral History Research Office, accessed March 15, 2014, <https://archive.org/details/oralhistoryofte00shel> [hereafter: MSUOHRO]; and Tom D. Johnson, "Annual Meeting of Chamber of Commerce Hartselle, Alabama," February 28, 1952, North Alabama Industrial Development Association Historical Files, Decatur, AL [hereafter: NAIDAHF], unfiled speech.

¹² Otte, *Industrial Opportunity*, 1-55; and Huntsville Industrial Expansion Committee, "Huntsville Has What It Takes," 1947, 18, Huntsville-Madison County Public Library, Heritage Room, Huntsville, AL [hereafter: HPLHR], Stacks.

Similar patterns of economic decline plagued many communities throughout the Tennessee Valley Region. Farm prices remained low, while the generational subdivision of family plots and the soil depletion that resulted from mono-crop agriculture, over-planting, row-cropping, and drought made it difficult for individuals or families to earn a living from the land. Annual household incomes in the region were less than half the national average.¹³ The number of manufacturers in the valley continued to lag behind the United States as a whole, and many young men and women migrated to cities in the upper Midwest in search of jobs and opportunities that did not exist at home.¹⁴

Noting the relative abundance of important mineral reserves among other manufacturing inputs, academics and policymakers argued that the solution to the economic and environmental woes of the Tennessee Valley and the South in general lay not only in agricultural reform but also the promotion of new industries that could better utilize the area's wealth of natural resources.¹⁵ The cooperative relationship that the TVA cultivated with local communities and civic leaders coalesced around a shared vision that emphasized the link between prosperity,

¹³ In 1929, annual incomes in the region were 44percent of the national average; see Daniel Schaffer, "Benchmark Report on Environmental Quality: A Historical Perspective," TVA Cultural Resources Program (February, 1983), 25-9, UTK: Hodges, EERC, Box 3, Folder 4; TVA Budget Staff, "Progress in the Tennessee Valley, 1933-1952," May, 1952, 1, UTK: Hodges, TVA Reports, 1933-1973, Box 4, Folder NA; Gordon Clapp, *The TVA: An Approach to the Development of a Region* (Chicago: Chicago University Press, 1955), 53.

¹⁴ See Chapter One of this dissertation. Also see Daniel Schaffer, "Benchmark Report on Environmental Quality: A Historical Perspective," TVA Cultural Resources Program (February, 1983), 25-9, UTK: Hodges, EERC, Box 3, Folder 4; TVA Budget Staff, "Progress in the Tennessee Valley, 1933-1952," May, 1952, 1, UTK: Hodges, TVA Reports, 1933-1973, Box 4, Folder NA; Clapp, *The TVA: An Approach to the Development of a Region*, 53; and Mark Winter, "Oral History Interview with Ralph E. McKnight," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, April 11, 1983, 36, NARA-SE, RG 142, OHR, Box 6.

¹⁵ Phillips, *This Land, This Nation*, 84-8; Schulman *From Cotton Belt to Sunbelt*, 15-20 and 39-62; and Odum, *Southern Regions of the United States*. TVA staff certainly pressed the claim that industrialization would benefit its service area; see David E. Lilienthal, "The Future of Industry in the Tennessee Valley Region," address before the Tennessee Valley Institute of the University of Chattanooga, Tennessee, April 21, 1934, NARA-SE, RG 142, OEDC, Box 23; Sherman M. Woodward, "TVA and Resource Development," report for information office, January 28, 1948, 3, NARA-SE, RG 142, OEDC, Box 115; TVA, "Tennessee Valley Resources: Their Use and Development," internal report, December 1, 1947, 31, UTK: Hodges, TVA PC, Box 2, Folder n/a; and TVA, *Annual Report, 1947* (Washington, D.C.: Government Printing Office, 1947), 3; TVA, "TVA Power, 1956-57," informational pamphlet, January, 1957, 9, UTK: Hodges, TVA PC, Box 4, Folder 8; and TVA, "TVA Power, 1955-56," informational pamphlet, January, 1956, 9, NARA-SE, RG 142, PMF, Box 17. Also see Chapter One and Chapter Two of this dissertation.

cheap electricity, and growth. Particularly in Huntsville and Decatur, progress was predicated on finding an alternative to cotton.

Electric Power, World War II, and the Huntsville Arsenal

The availability of inexpensive TVA electricity became one of the most important factors that influenced Huntsville's economic transformation. The Authority started supplying Huntsville with electric power in 1940 following the resolution of the *TEPCO* case. Previously, the Alabama Power Company, a private distributor that was a subsidiary of the Commonwealth & Southern Corporation, had served Huntsville; however, it had only just begun to extend its lines outside of the city center, providing electricity to less than 6,000 customers.¹⁶ The transition to public power brought with it a commitment to low rates and increased supply along with a promise that the region would become more hospitable to industry as a result.¹⁷ Beginning with the military buildup prior to the United States entry into World War II, the TVA's power program helped attract federal defense projects to the area.

On June 8, 1941, Lieutenant Colonel Charles E. Loucks of the Chemical Warfare Service (CWS) visited Huntsville in search of a location for a new installation. While the CWS already operated a manufacturing plant at the Edgewood Arsenal in Maryland, it had recently received a

¹⁶ Alabama Power built its first rural line in 1924. This was one of the first in the entire state of Alabama. "A History of Huntsville's Utility Systems," undated pamphlet, 6, HPLHR, HUES; "Huntsville's Electric Utility – Largest Municipal Electric System in Alabama," undated fact sheet, HPLHR, HUES; "Electricity in City an Old, Old Story," *Huntsville Times*, September 11-17, 1967, clipping in HPLHR, Huntsville – Utilities – Electric System [hereafter: HUES]; and Huntsville Electric Service, "Years of Transition: 25th Anniversary – Electric System – Huntsville Utilities," 1965, 2-4, HPLHR, HUES. For more information on the TEPCO case see Chapter One of this dissertation.

¹⁷ For more information on the public power movement's understanding of the causal relationship between cheap electricity and industrialization see Chapter One and Chapter Two.

congressional appropriation to construct a second facility.¹⁸ As its name implied, the CWS produced chemical agents for the Army, ranging from toxins like mustard gas and phosgene, to incendiaries, to colored smoke for grenades.¹⁹ Major General William N. Porter, the Chemical Warfare Service's chief, directed Loucks to find a site comprised of approximately 30,000 acres that had access to highway and rail transportation but was far enough inland to avoid enemy attack. Importantly, Porter also specified that the location have a sufficient supply of inexpensive electric power.²⁰ Electricity was a vital resource for the CWS. The manufacture of many of the agents that the Chemical Warfare Service produced involved energy-intensive processes. For example, the white phosphorus that the army used in various incendiaries and in smoke grenades had to be separated from phosphate ore in large electric-arc furnaces. Both the TVA and Monsanto had begun manufacturing the substance in the Tennessee Valley Region during the late 1930s—the former at its Florence, Alabama, facility and that latter at a plant in Columbia, Tennessee. Both benefited from the cheap kilowatts that the Authority generated.²¹

Huntsville met all of Porter's requirements. It was distant from the coast. The community had adequate rail connections, and the TVA's development of the Tennessee River permitted increased barge traffic. Labor was plentiful and relatively cheap. Furthermore, the Authority's power program ensured the CWS a source of affordable electricity.²² A committee of Huntsville's civic leaders took Lt. Col. Loucks and his civilian engineer to view several locations. The most promising proved to be a 33,000 acre tract southwest of the city that

¹⁸ Helen Brents Joiner, *The Redstone Arsenal Complex in the Pre-Missile Era: A History of Huntsville Arsenal, Gulf Chemical Warfare Depot, and Redstone Arsenal, 1941-1949* (Redstone Arsenal, AL: Historical Division U.S. Army Missile Command, 1966), 1-2.

¹⁹ Leo P. Brophy, Wyndham D. Miles, and Rexmond C. Cochrane, *The Chemical Warfare Service: From Laboratory to Field* (Washington, D.C.: Government Printing Office, 1959).

²⁰ Joiner, *Redstone Arsenal Complex in the Pre-Missile Era*, 1-2; and Kaylene Hughes, "Two 'Arsenals of Democracy,'" *The Historic Huntsville Quarterly Of Local Architecture & Preservation* 17(Winter-Spring 1991): 50-1.

²¹ Brophy, Miles, and Cochrane, *From Laboratory to Field*, 373-4.

²² Joiner, *Redstone Arsenal Complex in the Pre-Missile Era*, 1-2.

contained rolling wooded hills and some of the best agricultural land in Madison County.²³ Ten days after Loucks' visit, Maj. Gen. Porter chose the Huntsville site over nine others, pointing to the availability of TVA power as one of the community's primary advantages.²⁴ The city would not have received the Chemical Warfare Service's installation were not for its access to an abundant supply of electricity from the Tennessee Valley Authority. In 1943, during the height of production, the Army's contract with the TVA called for the agency to supply the arsenal with a maximum load of 35,000 kilowatts, a gargantuan figure for a single facility considering the fact that the entire city of Nashville, Tennessee, required a wartime peak of 100,000 kilowatts.²⁵

For local leaders, the Huntsville Arsenal was cause for celebration. The *Huntsville Times* ran a special edition on the evening of July 3, 1941, touting the arrival of the of the \$40 million installation. The paper's front page included a photograph of several local leaders receiving the news while surrounded by beaming citizens. Fire trucks raced through the town to deliver the edition to newsstands, their sirens blaring.²⁶

The Chemical Warfare Service's decision quickly resulted in the city receiving two more military facilities. The Ordnance Corps, the branch of the Army responsible for producing munitions, chose to build Redstone Arsenal on land adjacent to the CWS' installation to house a chemical shell loading plant. The location minimized the cost and danger of transporting volatile

²³ Hughes, "Two 'Arsenals of Democracy,'" 52; and "A Center for Rockets and Jet Propulsion," *The Rohm & Haas Reporter*, November-December 1952, 15, Marshall Space Flight Center Archives, Marshall Space Flight Center, AL [hereafter: MSFCA], Holger N. Toftoy Papers [hereafter: HNTP], Box 4.

²⁴ Joiner, *Redstone Arsenal Complex in the Pre-Missile Era*, 1-2; and Hughes, "Two 'Arsenals of Democracy,'" 50-1. The nine other sites included Florence, AL (which was also part of the TVA's service area), Tuscaloosa, AL, Kansas City, MO, St. Louis, MO, Memphis, TN (part of the TVA's service area), Toledo, OH, El Dorado, AR, and Charleston, WV.

²⁵ TVA, *Annual Report, 1943* (Washington, D.C.: Government Printing Office, 1943) Appendix B, "First Supplement to Power Contract Between Tennessee Valley Authority and United States Army, War Department, Chemical Warfare Service, Huntsville Arsenal," 172-3; Letter, General Manager of NES to W. C. Baird, Chair of Electric Power Board, April 10, 1946, Nashville Electric Service Office Files, Nashville, TN [hereafter: NESOF], NES System Files Folder [hereafter: NSFF]; and Letter, General Manager of NES to R. E. Argersinger, Vice President of Stone & Webster Engineering Corporation, May 14, 1946, NESOF, NSFF.

²⁶ Hughes, "Two 'Arsenals of Democracy,'" 51; and "Huntsville Gets Chemical War Plant; Cost Over \$40,000,000," *Huntsville Times*, July 3, 1941, Extra 1.

compounds as the Huntsville Arsenal produced many of the chemicals that the Ordnance Corps used at Redstone.²⁷ The Army, meanwhile, constructed the Huntsville Chemical Warfare Depot—later known as the Gulf Chemical Warfare Depot—on land taken from the southernmost portion of the Huntsville Arsenal along the Tennessee River, providing a location to stockpile munitions prior to shipment as well as a point of entry for supplies.²⁸

The CWS broke ground on its facility on August 5, 1941. Within six months its first production line went into operation.²⁹ On March 6, 1942, the Gulf Chemical Warfare depot officially opened, and only a few weeks later the Ordnance Corps loaded its first shells at Redstone.³⁰ At their peak, the three installations employed over 10,000 people, more than any other industry in Huntsville, and their presence resulted in a sixty-eight percent increase in the total number of jobs in the community between 1940 and 1944.³¹

Wolverine Tube: Electricity and Private Development

In addition to the military, private companies that utilized energy-intensive manufacturing process located new facilities in the Huntsville-Decatur corridor to take advantage

²⁷ Redstone also received electricity from the TVA. Furthermore, white phosphorus had to be transported in water to avoid explosion. Locating the arsenals adjacent to one another reduced logistical issues associated with transport. Mary T. Cagle, “History of Redstone Arsenal,” undated, Public Information Office, Redstone Arsenal; Hughes, “Two ‘Arsenals of Democracy,’” 52; Joiner, *Redstone Arsenal Complex in the Pre-Missile Era*, 91-2 and 99; and Brophy, Miles, and Cochrane, *From Laboratory to Field*, 374.

²⁸ Joiner, *Redstone Arsenal Complex in the Pre-Missile Era*, 58-9.

²⁹ Hughes, “Two ‘Arsenals of Democracy,’” 56.

³⁰ Hughes, “Two ‘Arsenals of Democracy,’” 57; and Joiner, *Redstone Arsenal Complex in the Pre-Missile Era*, 97-8.

³¹ I have found contradictory information regarding employment. Redstone staff estimated that the peak employment during World War II for both arsenals was between 15,000 and 20,000; see “Your Redstone Arsenal,” undated speech, MSFCA, HNTP, Box 4; however, other estimates vary, see Cleo Cason and Winona Stroup, “The Early Years of Redstone Arsenal,” *The Huntsville Historical Review* 1 (July 1971): 37 and 39. Cason and Stroup suggest that Huntsville Arsenal employed 6,707 people at its peak in May 1944, while Redstone employed 4,274 at its peak in February 1945. In his study of Huntsville’s economy Robert A. Myers cites a 1963 study commissioned by the City Planning Commission that calculated that the arsenals led to an overall employment increase of sixty-eight percent in the community between 1940 and 1944, reaching a peak of 30,000 jobs; see Robert A. Myers, “Planning for Impact: A Case Study of the Impact of the Space Program on Huntsville, Alabama” (MA Thesis, New York University, 1967), 31.

of the Authority's cheap electricity. Wolverine Tube, a division of the Calumet and Hecla Consolidated Copper Company, began searching for a new site to manufacture copper tubing in the fall of 1945. The Wolverine cast a wide net, sending preliminary questionnaires to 274 towns and municipalities. After winnowing the initial field to twenty-one communities in seven states, the company conducted extensive follow-up surveys that assessed each location on a variety of factors.³² Wolverine planned to utilize several energy-intensive methods to form copper tubing in its factory, including the Rosenqvist and Beebe Processes with their "large demand for electric current."³³ Wolverine had conducted tests on the commercial viability of the Rosenqvist Process since the early 1940s, and the company's engineers had determined that it yielded a superior product compared to conventional methods. The Rosenqvist Process allowed metal to be cold-worked—a procedure used to strengthen metal by bending or stressing it almost to its breaking point—more intensively without fracturing, reducing the need to use scrap in forming new tubing and resulting in fewer rejected pieces. The Beebe Process, which Wolverine had just started testing, promised to make similarly efficient use of resources.³⁴ The low rates that the TVA's distributors charged industrial customers and the Authority's ability to guarantee delivery of large volumes of electricity meant that the agency's service area represented "the ideal location."³⁵

The Decatur Chamber of Commerce (DCC) certainly agreed, emphasizing the town's supply of cheap electric power in a letter to Wolverine in November 1945. According to the

³² Wolverine Tube Division, "Postwar Plans of Wolverine Tube Division: A Survey and Recommendations for Plant Expansion," June 18, 1946, 11-5, NAIDAHF, Wolverine Tube [hereafter: WT]; and Wolverine Tube Division, "Characteristics of 21 Locations Resulting from Initial Screening," June 18, 1946, 1-18, NAIDAHF, WT.

³³ Wolverine Tube Division, "Postwar Plans of Wolverine Tube Division: A Survey and Recommendations for Plant Expansion," June 18, 1946, 2-15 (for quote see 11), NAIDAHF, WT.

³⁴ Wolverine Tube Division, "Postwar Plans of Wolverine Tube Division: A Survey and Recommendations for Plant Expansion," June 18, 1946, 4-11, NAIDAHF, WT.

³⁵ Wolverine Tube Division, "Characteristics of 21 Locations Resulting from Initial Screening," June 18, 1946, 1, NAIDAHF, WT.

DCC, the cost of electricity in Decatur “makes possible the use of electric power for almost any purpose.”³⁶ The Chamber of Commerce claimed that the town’s situation was relatively unique and that few utilities could compete with its public distributor, Decatur Utilities, which was controlled by the Decatur Municipal Utilities Board. Only Eugene, Oregon charged industrial customers less per kilowatt-hour.³⁷ The DCC expressed confidence in the quality of electric service in the community, claiming that because it was part of the TVA system Decatur’s supply of electricity was “unlimited” and interruptions were “very rare.”³⁸

Wolverine quickly eliminated the remaining communities in which it deemed the price of electric power to be too expensive or the supply to be inadequate. For example, the company’s site selection report noted that the private utility that served Gadsden, Alabama, had rates that were twenty-five percent higher than the lowest rate that the TVA charged in other parts of the state, while the private distributor in Clarksdale, Mississippi, did not have enough capacity to support a factory. Similar problems undermined many of the bids that Wolverine considered as the company listed the high cost of power as a primary disadvantage in its assessment of eleven of its twenty-one semifinalists.³⁹ All three of the finalists for the company’s new plant—Tupelo (MS), Decatur, and Huntsville—distributed TVA electricity. Tupelo and Decatur used the Authority’s lowest rate schedule, and Wolverine believed that Huntsville would reduce its rates to match within five years. Compared to the price that the company paid in Detroit, Michigan,

³⁶ Letter, John M. Nelson, Decatur Chamber of Commerce to H.Y. Bassett, Calumet & Hecla Consolidated Copper Company, November 26, 1945, NAIDAHF, WT, Folder Wolverine Tube Division Calumet & Hecla Consolidated Copper Company, Decatur, Alabama [hereafter: WTD].

³⁷ Letter, John M. Nelson, Decatur Chamber of Commerce to H.Y. Bassett, Calumet & Hecla Consolidated Copper Company, November 26, 1945, NAIDAHF, WT, Folder WTD.

³⁸ Letter, John M. Nelson, Decatur Chamber of Commerce to H.Y. Bassett, Calumet & Hecla Consolidated Copper Company, November 26, 1945, NAIDAHF, WT, Folder WTD. As Nelson put it, “We place them [our power facilities] up against any city.”

³⁹ Wolverine Tube Division, “Characteristics of 21 Locations Resulting from Initial Screening,” June 18, 1946, 1-18, NAIDAHF, WT. An inadequate supply of white male labor and the presence of unions resulted in several of the other towns from the TVA’s service area being removed from consideration.

each of the communities represented a bargain.⁴⁰ With little to differentiate its finalists from an electrical standpoint, the company settled on Decatur because the town had better transportation infrastructure. Nevertheless, Wolverine listed “plentiful low-cost power” as the number one reason for locating its facility on the Decatur riverfront.⁴¹ The plant officially opened on August 23, 1948, consuming approximately two million kilowatt-hours of electricity every month at full capacity with a standing demand of five thousand kilowatts.⁴²

Much like the installations that the Chemical Warfare Service and the Ordnance Corps built at Huntsville six years earlier, Wolverine Tube’s Decatur factory came to represent industrial progress. The *Decatur Daily*, the local newspaper, celebrated the factory’s first decade in operation by observing a correlation between the company’s growth and that of the town. From an initial staff of ninety-seven, the plant had expanded to employ approximately 750 workers while Decatur’s population had risen from a little over 20,000 to almost 30,000 residents. The newspaper also noted that Wolverine conducted business totaling \$600,000 with 100 area vendors in 1958. In the ten years since it opened its facility, the company had contributed \$32,000,000 in payroll to the community. In this way, Wolverine materially abetted the expansion of a modern manufacturing sector at Decatur, symbolizing the promise of an industrial future driven by private corporations and public power.⁴³

⁴⁰ Wolverine Tube Division, “Postwar Plans of Wolverine Tube Division: A Survey and Recommendations for Plant Expansion,” June 18, 1946, 13-5, NAIDAHF, WT; and Wolverine Tube Division, “Characteristics of 21 Locations Resulting from Initial Screening,” June 18, 1946, 1-12, NAIDAHF, WT. The public distributors in Decatur and Tupelo only charged industrial customers four mills per kilowatt-hour, and although it was higher, the price of electricity in Huntsville was still just 4.5 mills. Wolverine paid ten mills per kilowatt-hour at its facility in Detroit.

⁴¹ Memorandum, “Wolverine Tube Division of Calumet & Hecla, Incorporated,” undated, NAIDAHF, WT, Folder WTD.

⁴² Memorandum, “Wolverine Tube Division of Calumet & Hecla, Incorporated,” undated, NAIDAHF, WT, Folder WTD; and “10th ‘Birthday’ – Wolverine Birthday Will Mark Milestone in Decatur Growth,” *Decatur Daily*, August 17, 1948, clipping in NAIDAHF, WT, Folder WTD.

⁴³ “10th ‘Birthday’ – Wolverine Birthday Will Mark Milestone in Decatur Growth,” *Decatur Daily*, August 17, 1948, clipping in NAIDAHF, WT, Folder WTD. Wolverine had spent \$20,000 at twenty local vendors in 1948.

Business Progressives, Distributors, and the Maturation of a Growth Strategy

In addition to providing businesses with access to cheap electricity, the TVA and its distributors collaborated with local boosters to recruit federal projects and private investment to the Huntsville-Decatur corridor. As Bruce Schulman argues, these boosters, mostly white collar professionals, formed the foundation of a new commercial elite that wrested power from wealthy landowners in communities throughout the south after World War II.⁴⁴ In Huntsville and Decatur, newspapermen, lawyers, doctors, and engineers joined with businessmen and public officials to dominate politics and shape economic development. Together, they promoted a vision of progress premised on the growth of industry and research.

Barrett Shelton, the publisher of the *Decatur Daily* and a staunch proponent of industrialization had lived in the Tennessee Valley his entire life. Shelton had taken over the newspaper from his father in 1924, and he used the *Daily* to win public support for industrialization and public power. Shelton also helped form Decatur's first chamber of commerce and served on its public utility board.⁴⁵ He was initially skeptical of the Authority, warming to the agency and its mission only after meeting with David Lilienthal in 1933. Decatur was in the depths of the Great Depression. Seven of the town's eight banks had closed, and cotton was selling for only five cents per pound. Shelton had expected that the TVA to implement an economic plan that involved little input from local residents, but Lilienthal informed him that the Authority would only provide the tools for Decatur's success, among them low-cost power. As Shelton recalled years later, Lilienthal had smiled when asked what the

⁴⁴ Schulman, *From Cotton Belt to Sunbelt*.

⁴⁵ Crawford, "Interview with Barrett Shelton, Sr.," 1-11, MSUOHRO. I can confirm that Shelton was a member of the Decatur Municipal Utilities Board in the post-World War II period although I do not know the exact dates of his service there. See Letter, James H. Johnson, H. A. Wyatt, and Barrett Shelton to unnamed executives at Monsanto and American Viscose, July 10, 1950, part of North Alabama Associates, "A Study Relating to the Project of the Chemstrand Corporation," July 14, 1950, NAIDAHF, Chemstrand File [hereafter: CF].

TVA would do for the community and said, “I’m not going to do anything. You’re going to do it.”⁴⁶ The Authority’s approach to development in the Tennessee Valley Region was to rely on the impetus of local leaders and private industry. The director’s did not want to appear to be dictating to the agency’s service area.⁴⁷ Shelton’s experience with David Lilienthal and the TVA in Decatur foreshadowed the agency’s role in promoting industrial growth throughout the region.

As early as 1944, Huntsville’s civic leaders had become concerned that the economic boost provided by the Chemical Warfare Service and the Ordnance Corps would evaporate with the cessation of hostilities. The city had recently failed in its bid to become the site of the TVA’s regional development office, further stoking fears that future projects might be diverted elsewhere. Local businessmen and white collar professionals often gathered at George M. Mahoney’s clothing store to deliberate different plans for promoting growth. The shop was centrally located in downtown Huntsville and functioned as a *de facto* second office for the chamber of commerce—Mahoney was an active member, having served as president in 1938 and 1939.⁴⁸

On September 7, 1944, a group that included Mahoney, Reese T. Amis, the publisher of the *Huntsville Times*, and Karl A. Woltersdorf, the general manager of the Huntsville Electric Service, met with Fitzgerald Hall, president of the Nashville, Chattanooga, and St. Louis Railroad, to discuss the city’s problems. The men decided that forming a new body committed

⁴⁶ Crawford, “Interview with Barrett Shelton, Sr.,” 10, MSUOHRO. Shelton recounted the same exchange in a speech before the United Nations Conference on the Conservation and Utilization of Resources; see Barrett Shelton, “The Decatur Story,” United Nations Scientific Conference on the Conservation and Utilization of Resources, September 5, 1949, MSFCA, HNTP, Box 10.

⁴⁷ The TVA also preferred to rely on local elites in the operation of its agricultural programs; see Thomas K. McCraw, *Morgan vs. Lilienthal: The Feud within the TVA* (Chicago: Loyola University Press, 1970), 11-6; Hargrove, *Prisoners of Myth*, 26-8; and Philip Selznick, *TVA and the Grass Roots: A Study in the Sociology of Formal Organization*, second edition (New York: Harper & Row, Publishers, 1966). On the TVA’s reliance on local elites to promote residential consumption, see Chapter Three of this dissertation.

⁴⁸ “Bid Dreams, Bigger Plans: Huntsville’s First Guidance System Launched an Economy,” *Initiatives*, Huntsville-Madison County Chamber of Commerce (December 2006), 22.

solely to expanding industry in Huntsville represented the best way to accomplish their goals of achieving long-term economic growth in the community. Four days later, they convened approximately one hundred businessmen from the Huntsville area to create the aptly named Huntsville Industrial Expansion Committee (HIEC). The new organization was nominally separate from the chamber of commerce but relied on many of the same staff. Its leadership included Huntsville's commercial elite. In addition to Mahoney, who was the HIEC's first president, M. B. Spragins, the chairman of the First National Bank of Huntsville, Lawrence Goldsmith, who owned the oldest automobile dealership in the city, and Woltersdorf were among the men who served on the Expansion Committee's board of directors.⁴⁹

The TVA provided the HIEC with advice on developing a recruitment strategy for Huntsville. Woltersdorf, in particular, sought the guidance of the Authority's chairman, David Lilienthal, who agreed to meet with the Expansion Committee soon after its founding.⁵⁰ Lilienthal counseled the group to refrain from simply soliciting funds to "buy" industries from other regions.⁵¹ Conservative opposition to the TVA had accused the agency and its service area of poaching manufacturers from New England.⁵² Instead, the chairman suggested that the HIEC focus on the production of promotional materials that highlighted the community's resources. The Expansion Committee published its first pamphlet, "Huntsville Has What It Takes," in

⁴⁹ Michael D. Ward, *Shaping History: The University of Alabama Huntsville Foundation* (Huntsville: The University of Alabama Huntsville Foundation, 2008), 21-4. The initial meeting also included Fitzgerald Hall, the president of the Nashville, Chattanooga & St. Louis Railroad, Brownlee Curley, an industrialist from Nashville, and Robert Strickland, the president of the Trust Company of Atlanta.

⁵⁰ Letter, David E. Lilienthal to K. A. Woltersdorf, September 9, 1944, NARA-SE, RG 142, Office of the General Manager Administrative Files, 1933-1957 [hereafter: GMAF], Box 108; and Memorandum, Gordon R. Clapp to Miss Reames, untitled, September 2, 1944, NARA-SE, RG 142, GMAF, Box 108.

⁵¹ Letter, George M. Mahoney, to David E. Lilienthal, August 11, 1945, NARA-SE, RG 142, GMAF, Box 108.

⁵² The TVA made a distinct effort to distance its power program from any claims that it might have lured industry from other parts of the country; see TVA, *Annual Report, 1959* (Washington, D.C.: Government Printing Office, 1959), 88.

1947.⁵³ According to the sixty-three page brochure, the city was “Geared to Industry,” providing companies with an opportunity “to manufacture products in an ideal location.”⁵⁴

Although it also touched on things like transportation infrastructure, labor, nearby markets, and living conditions, access to inexpensive electricity formed a central component of the Expansion Committee’s narrative. “Huntsville Has What It Takes,” noted that the city was situated “**in the heart of the mighty Tennessee Valley**—a valley of power” where industries could receive “continuous and abundant low-cost” electricity from the TVA.⁵⁵ Arguing that the community’s “large supply of electric power” had lured defense installations to the area in World War II, the Expansion Committee claimed that Huntsville was ripe for the “peacetime development of industries where availability of low-cost power is a consideration.”⁵⁶ Subsequent HIEC brochures continued to tout the advantages of TVA electricity for prospective manufacturers suggesting that the Authority’s “vast generating complex” meant that the Huntsville’s supply of inexpensive kilowatts was theoretically “unlimited.”⁵⁷ Furthermore, the Expansion Committee observed that the community benefited from the fact that the TVA Act classified each municipal distributor and rural cooperative in the Tennessee Valley Region as a “preferred customer,” meaning that they would be the last to have their service curtailed during a power shortage.⁵⁸ As a result, the “accommodation of large industrial loads can be assured.”⁵⁹

In this way, the Authority relied on the region’s business progressives to help implement its

⁵³ Letter, George M. Mahoney to David E. Lilienthal, August 11, 1945, NARA-SE, RG 142, GMAF, Box 108; Letter, George M. Mahoney to David E. Lilienthal, May 20, 1946, NARA-SE, RG 142, GMAF, Box 108; Letter, David E. Lilienthal to George M. Mahoney, May 23, 1946, NARA-SE, RG 142, GMAF, Box 108; and Huntsville Industrial Expansion Committee, “Huntsville Has What It Takes,” 1947, HPLHR, Stacks.

⁵⁴ Huntsville Industrial Expansion Committee, “Huntsville Has What It Takes,” 1947, 2 (for “ideal location”) and 5 (for “Geared to Industry”), HPLHR, Stacks.

⁵⁵ Boldface in original, see Huntsville Industrial Expansion Committee, “Huntsville Has What It Takes,” 1947, 2 (for “valley of power”) and 12 (for “continuous and abundant”), HPLHR, Stacks.

⁵⁶ Huntsville Industrial Expansion Committee, “Huntsville Has What It Takes,” 1947, 13, HPLHR, Stacks.

⁵⁷ Huntsville Industrial Expansion Committee, “Information Kit: Facts & Figures on Living in Huntsville Madison County Alabama,” 1964, 16.

⁵⁸ Huntsville Industrial Expansion Committee, “Where Space Begins,” undated c. 1960s, 11.

⁵⁹ Huntsville Industrial Expansion Committee, “Where Space Begins,” undated c. 1960s, 11.

energy regime and disseminate its message of low rates and abundant supply to interested industries, taking advantage of the considerable overlap between the agency’s vision of economic development in its service area and the goals of community leaders.

The TVA’s local distributors formed the third prong of the agency’s regime, helping to foster growth in the region. While the Authority supported the HIEC by consulting on the appropriateness of promotional strategies, Huntsville’s public power provider—the Huntsville Electric Service (HES)—focused on improving the city’s power network. The public utility’s general manager, Karl Woltersdorf, had not only helped found the HIEC but he believed strongly in the importance of inexpensive electricity for industry, a belief that he institutionalized at HES.⁶⁰ A pamphlet celebrating the opening of the distributor’s new office complex touted the agency’s role in guiding the city’s development, noting that “before Huntsville can grow an adequate supply of electricity must be available.”⁶¹ Woltersdorf initiated a period of intensive expansion following the community’s transition to public power, extending lines throughout Madison County. In 1948, the county was the first in both the state of Alabama and the entire Tennessee Valley Region to be completely electrified.⁶² Affordability also remained an imperative for Woltersdorf. Under his guidance, the distributor consistently maintained low TVA rates, “so necessary for progress in our area.”⁶³ It was “electric power which will help you build a better home life, increase business activity, expand industrial output.”⁶⁴

⁶⁰ As Woltersdorf put it in a note to customers printed in an HES pamphlet, “The growth of the Huntsville Electric System has had to keep ahead of the city’s progress. We’ve worked constantly, improving and expanding our distribution system so we could supply the electrical demands made by a progressive community.” See Huntsville Electric Service, “Introducing Huntsville’s Electric Service Center,” undated, 1, HPLHR, HUES.

⁶¹ Huntsville Electric Service, “Introducing Huntsville’s Electric Service Center,” undated, 7, HPLHR, HUES.

⁶² Huntsville Electric Service, “Years of Transition: 25th Anniversary – Electric System – Huntsville Utilities,” 1965, 4, HPLHR, HUES.

⁶³ Huntsville Electric Service, “Introducing Huntsville’s Electric Service Center,” undated, 7, HPLHR, HUES.

⁶⁴ Huntsville Electric Service, “Introducing Huntsville’s Electric Service Center,” undated, 13, HPLHR, HUES.

The TVA's distributors also became deeply involved in the operation of local development agencies. As noted above, Karl Woltersdorf was a founding member of the HIEC, and Barrett Shelton, who served on the Decatur Municipal Utilities Board in addition to his job as the publisher of the *Decatur Daily*, had helped create Decatur's first chamber of commerce.⁶⁵ In March 1949, the two men joined Tom D. Johnson to form the North Alabama Associates (NAA).⁶⁶ Although Johnson did not work for the TVA or one of its distributors at the time, he had experience in the field of industrial recruitment as an employee of Alabama Power's economic development office in the 1920s.⁶⁷ All three men believed in the importance of cheap electric power to transforming the region's economy.⁶⁸ The Associates partnered with public utilities in the Huntsville-Decatur corridor whenever possible, meeting with staff to design promotional campaigns and target specific companies best suited to the resources available in individual communities.⁶⁹ Furthermore, the NAA relied on the Authority's distributors as its

⁶⁵ See Letter, James H. Johnson, H. A. Wyatt, and Barrett Shelton to unnamed executives at Monsanto and American Viscose, July 10, 1950, part of North Alabama Associates, "A Study Relating to the Project of the Chemstrand Corporation," July 14, 1950, NAIDAHF, CF.

⁶⁶ Tom D. Johnson, "Activities Report, March 1 to March 31, Inclusive," 1949, NAIDAHF, Activities Report – March 1949 – January 1952 [hereafter: AR]. The group also included George Elliott and Charlie Shaver of Huntsville and Quince Eddens and Johnnie Caddell of Decatur. The North Alabama Associates still exists although it has changed its name to the North Alabama Industrial Development Association. I would like to thank the organization and its staff for graciously allowing me to view their collections.

⁶⁷ Tom D. Johnson, "Annual Meeting of Chamber of Commerce Hartselle, Alabama," February 28, 1952, NAIDAHF, unfiled speech.

⁶⁸ I have touched on Woltersdorf above. Shelton noted in an interview years later that "You will find that the availability of electric power is the big thing in attracting industry to your area." See Crawford, "Interview with Barrett Shelton, Sr.," 18, MSUOHRO. Johnson, meanwhile praised Gordon Clapp's promotion of electricity as a bulwark for industrial growth thusly, "He [Clapp] is so right in the last paragraph on page 4 of his speech. Today as we are working so diligently on industrial development, there is nothing that will destroy or nullify our work so completely as the lack of power – as he so well put it, 'If you would destroy a region, you destroy its power supply. If you would build a region, you a build an ever greater and greater supply of electric energy.'" See Letter, T. D. Johnson to Edward A. Ackerman, December 9, 1952, NAIDAHF, Tennessee Valley Authority File [hereafter: TVAF].

⁶⁹ Tom D. Johnson, "Annual Meeting of Chamber of Commerce Hartselle, Alabama," February 28, 1952, NAIDAHF, unfiled speech.

sole source of funding. Without their financial assistance, the North Alabama Associates would not have been able to carry out its mission.⁷⁰

The development agencies that the TVA and its distributors supported played a fundamental role in luring manufacturers to the Huntsville-Decatur corridor. While the HIEC and the DCC focused on their individual communities, Woltersdorf, Johnson, and Shelton envisioned the NAA as an organization that would encourage industrialization throughout northern Alabama.⁷¹ Johnson, in particular, traveled widely in the region, assessing potential sites for interested businesses.⁷² In Decatur, he worked closely with Monsanto and the American Viscose Corporation to bring their joint subsidiary, Chemstrand, to the community in the summer of 1950. Monsanto and American Viscose had created Chemstrand to develop and produce synthetic fibers that could be used in the manufacture of clothing.⁷³ For Johnson and the NAA, the new company represented an excellent opportunity to build on the diverse set of industries that had moved to Decatur since the end of World War II. The recruiting materials that the North Alabama Associates prepared for Monsanto and American Viscose highlighted Decatur's ability to provide factories with access to large volumes of cheap TVA electricity.⁷⁴ Other manufacturers also sent Chemstrand's parent companies letters on behalf of the NAA that discussed the importance of electric power in their decision to open facilities in the area while

⁷⁰ Huntsville Electric Service, "Years of Transition: 25th Anniversary – Electric System – Huntsville Utilities," 1965, 14, HPLHR, HUES; and Tom D. Johnson, "Annual Meeting of Chamber of Commerce Hartselle, Alabama," February 28, 1952, NAIDAHF, unfiled speech.

⁷¹ It should also be noted that the NAA maintained a relationship with the TVA as well, much like the DCC or the HIEC. For example, Tom Johnson often met with industrial development staff at the Authority. See Tom D. Johnson, "Activities Report, June 1 to June 31, Inclusive," 1949, NAIDAHF, AR

⁷² Tom D. Johnson, "Annual Meeting of Chamber of Commerce Hartselle, Alabama," February 28, 1952, NAIDAHF, unfiled speech. His travels are also noted in various activities reports in the NAIDA files.

⁷³ In this respect, Chemstrand was further symbolic of the region's effort to move beyond cotton agriculture and textiles as the company represented the replacement of natural fibers with synthetic reflecting the rise of the electrochemical economy in the Tennessee Valley.

⁷⁴ Letter, Q. E. Eddens to unnamed executives at Monsanto and American Viscose, July 14, 1950, part of North Alabama Associates, "A Study Relating to the Project of the Chemstrand Corporation," July 14, 1950, NAIDAHF, CF. See following leaflet for information quantifying the number of power interruptions in Decatur between 1947 and 1950.

Decatur's Municipal Utilities Board pledged to extend power lines to the new plant site free of charge.⁷⁵ On September 27, 1950, the *Decatur Daily* announced that Monsanto and American Viscose had chosen the town for Chemstrand's factory.⁷⁶ The facility would require a standing capacity of 6,500 kilowatts.⁷⁷

The chemical giants' decision demonstrated how the recruitment strategies of local development organizations and public distributors combined with access to inexpensive electricity to attract private industry to the Tennessee Valley Region in the post-World War II period. While Tom Johnson and the NAA had spent countless hours lobbying executives at Monsanto and American Viscose, taking company representatives on tours of the eventual plant site and ensuring the property's availability, the Decatur Municipal Utility Board and the TVA guaranteed that any new facility would be privy to an abundant supply of cheap kilowatts.⁷⁸ The efforts of these groups certainly influenced Monsanto and American Viscose. Fred Gronemeyer, the chief engineer of organic chemicals at Monsanto, specifically cited the "spirit" of men like Tom Johnson and his colleagues at the North Alabama Associates as well as Chemstrand's

⁷⁵ For example of a private company discussing the advantages of TVA electricity, see Letter, Charles Norman, Southern Steel Nut Company to unnamed executives at Monsanto and American Viscose, July 11, 1950, part of North Alabama Associates, "A Study Relating to the Project of the Chemstrand Corporation," July 14, 1950, NAIDAHF, CF. For the Municipal Utilities Board's pledge, see Letter, James H. Johnson, H. A. Wyatt, and Barrett Shelton to unnamed executives at Monsanto and American Viscose, July 10, 1950, part of North Alabama Associates, "A Study Relating to the Project of the Chemstrand Corporation," July 14, 1950, NAIDAHF, CF.

⁷⁶ "Chemstrand Corporation to Build 'Multi-Million Dollar' Plant Here," *Decatur Daily*, September 27, 1950, 1. Rather symbolically, the headline appeared above news that United States Marines had captured Seoul, South Korea from invading Communist forces.

⁷⁷ Letter, Q. E. Eddens to unnamed executives at Monsanto and American Viscose, July 14, 1950, part of North Alabama Associates, "A Study Relating to the Project of the Chemstrand Corporation," July 14, 1950, NAIDAHF, CF.

⁷⁸ On Johnson's meetings with officials from Monsanto and American Viscose, see Tom D. Johnson, "Activities Report, May and June, 1950," 1950, NAIDAHF, AR. On guarantees regarding power supply, see Letter, Q. E. Eddens to unnamed executives at Monsanto and American Viscose, July 14, 1950, part of North Alabama Associates, "A Study Relating to the Project of the Chemstrand Corporation," July 14, 1950, NAIDAHF, CF; and Letter, James H. Johnson, H. A. Wyatt, and Barrett Shelton to unnamed executives at Monsanto and American Viscose, July 10, 1950, part of North Alabama Associates, "A Study Relating to the Project of the Chemstrand Corporation," July 14, 1950, NAIDAHF, CF.

ability to obtain a large amount of electric power at a “reasonable cost” as two of the primary reasons why Monsanto and American Viscose chose Decatur for their new plant.⁷⁹

Rocket City U.S.A.

Nothing shaped the Huntsville-Decatur corridor or demonstrated the continued importance of the TVA’s energy regime in the 1950s and 1960s more than the Army’s rocket and guided missile research program. Military spending transformed the South during the Cold War.⁸⁰ For many local politicians and business leaders, attracting the right installation meant the difference between sustaining the economic momentum achieved during World War II and sliding back into the malaise of the early twentieth century. Their fears were well-founded. In Huntsville, for example, the Army designated all of its facilities as surplus in 1947, putting them up for sale at least three different times.⁸¹ The competition for federal dollars was fierce, and TVA electricity represented one of the Tennessee Valley Region’s greatest assets.

Initial uncertainty over the Authority’s ability to improve its generating capacity threatened the Huntsville-Decatur corridor’s prospects for obtaining future defense projects. As noted in Chapter Two, conservatives in the 80th Congress had blocked the TVA’s plan to expand its power network via the construction of a large coal-fired steam plant at Johnsonville, Tennessee. Prior to 1959, the Authority legally could not raise its own funds to pay for building generating facilities, relying on appropriations from Capitol Hill instead.⁸² The prospect of an electricity shortage in the TVA’s service area was cause for serious concern for the military in

⁷⁹ “Vast Amount of Work Behind Chemstrand’s Location Here: Every Factor Needed Found at Site,” *Decatur Daily*, September 27, 1950, 1-2 (both quotes on page 1).

⁸⁰ Schulman, *From Cotton Belt to Sunbelt*.

⁸¹ Joiner, *Redstone Arsenal Complex in the Pre-Missile Era*, 75-87 and 132; and Cason and Stroup, “The Early Years of Redstone Arsenal,” 42.

⁸² See Chapter Two of this dissertation for an extended comment on the TVA’s transition to coal-fired power.

the late 1940s given the energy-intensive nature of many of its programs. Army officials had chosen sites in the Tennessee Valley Region for installations like Oak Ridge and the Chemical Warfare Service's production plant because of the availability of TVA power.⁸³ The Authority's inability to guarantee future capacity had immediate consequences for Huntsville. In 1948, the Air Corps declined to build its new wind tunnel test facility at the Huntsville Arsenal, citing the fact that the TVA had not yet received approval for its Johnsonville Steam Plant.⁸⁴ The lack of an adequate power supply was enough to remove a community from consideration for future military projects.⁸⁵

In fact, Tom Johnson and Karl Woltersdorf had made a concerted effort to convince the Air Corps that the Huntsville Arsenal would have access to enough electricity to meet the needs of a wind tunnel test center. The two men had grown increasingly worried about the future of the Huntsville and Redstone Arsenals. The installations were scheduled to be sold unless the Chemical Warfare Service and the Ordnance Corps found another purpose for them, and there was no guarantee that the government would find a private buyer who wanted to use the facilities for manufacturing.⁸⁶ In a meeting with officials from the Army's procurement branch on March 22, 1949, Woltersdorf provided an updated projection of the availability of electricity in the

⁸³ On Oak Ridge, see Richard Lowitt, "TVA, 1933-45," in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 54; Wilmon H. Droze, "The TVA, 1945-80: The Power Company," in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 68; TVA, *Annual Report, 1945* (Washington, D.C.: Government Printing Office, 1945), 1; TVA, *Annual Report, 1946* (Washington, D.C.: Government Printing Office, 1946), 1; and TVA, "TVA, AEC, and EEInc," informational report, August 19, 1953, 3, UTK: Hodges, TVA PC, Box 4, Folder 8.

⁸⁴ Holger N. Toftoy, October 20, 1948 entry in "Diary 5 June 48 to 30 Dec 48," MSFCA, HNTP, Box 2; and Tom D. Johnson, "Activities Report, March 1 to March 31, Inclusive," 1949, NAIDAHF, AR.

⁸⁵ Congress finally appropriated funding for the Authority's Johnsonville facility in May 1949. In part this saga underscored just how vital the TVA's transition to coal-fired power ultimately was for cities like Huntsville. TVA, *The Johnsonville Steam Plant: A Comprehensive Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Six-Unit Plant*, Technical Report No. 31 (TVA: Knoxville, 1958), 12-4, copy found in NARA-SE, RG 142, OEDC, Box 586. Also see Chapter Two.

⁸⁶ On July 20, 1949, the United States Army Corps of Engineers informed Johnson that bids would be accepted for farming on Huntsville Arsenal; see Tom D. Johnson, "Activities Report, July 1 Through July 31, 1949," 1949, NAIDAHF, AR.

Huntsville area.⁸⁷ Three weeks later, Johnson contacted Colonel Paul H. Dane at Wright Field in Dayton, Ohio, to discuss the Air Corps' plans. Dane noted that Huntsville appeared to satisfy most of the requirements for a wind tunnel with the exception that the Air Corps had been unable to obtain a firm commitment from the TVA regarding electric power at the site. Alarmed that this should still be the case, Johnson relayed the information to other members of the NAA. At the urging of his colleagues, Woltersdorf asked Gabriel O. Wessenauer, the manager of the Authority's Office of Power, to send Dane a formal guarantee that the Air Corps' facility would receive the necessary volume of electricity from the TVA if it were placed in Huntsville.⁸⁸ Johnson remained in close contact with the Air Corps in the coming months, visiting Col. Dane in Dayton as well as officials in St. Louis, Missouri. To help bolster the community's chances, the HIEC also put together a brochure on the city that highlighted its access to electric power and the pleasant lifestyle that area residents enjoyed. On November 10, 1949, however, the Air Corps announced that it would place the installation at Camp Forrest near Tullahoma, Tennessee. For Johnson, the news was a "bitter pill to swallow—a great disappointment."⁸⁹

Nevertheless, TVA electricity was still luring new defense projects to Huntsville.

Unbeknownst to Johnson and Woltersdorf, Colonel Holger N. Toftoy of the Ordnance Corps had begun searching for a new site to house the Army's guided missile and rocket research team. In

⁸⁷ While the Senate would not act for several weeks, the House of Representatives had approved an appropriation for the TVA's Johnsonville plant in February. Tom D. Johnson, "Activities Report, March 1 to March 31, Inclusive," 1949, NAIDAHF, AR; and TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 12-4, copy found in NARA-SE, RG 142, OEDC, Box 586.

⁸⁸ Wessenauer acquiesced on April 18, 1949. Tom D. Johnson, "Activities Report, April, 1949," 1949, NAIDAHF, AR.

⁸⁹ Johnson, meanwhile, toured other locations that he believed were still in the running to receive the facility, convincing himself that only the Huntsville Arsenal possessed the combination of utilities, natural resources, and living conditions that the Air Corps required. For quote see Tom D. Johnson, "Activities Report, November, 1949," 1949, NAIDAHF, AR. Also see Tom D. Johnson, "Activities Report, October, 1949," 1949, NAIDAHF, AR; Tom D. Johnson, "Activities Report, September, 1949," 1949, NAIDAHF, AR; Tom D. Johnson, "Activities Report, August, 1949," 1949, NAIDAHF, AR; Tom D. Johnson, "Activities Report, July 1 to July 31, Inclusive," 1949, NAIDAHF, AR; Tom D. Johnson, "Activities Report, June 1 to June 30, Inclusive," 1949, NAIDAHF, AR; and Tom D. Johnson, "Activities Report, May 1 to May 31, Incl.," 1949, NAIDAHF, AR.

1945, Toftoy had spearheaded the mission to bring Wernher von Braun and his coterie of scientists from Germany to the United States. Toftoy initially settled the Germans at Fort Bliss in Texas.⁹⁰ By 1948, the rocket research program had grown so large that the Ordnance Corps decided to centralize its operations in one location.⁹¹ Toftoy studied numerous sites throughout the United States, including Redstone Arsenal, which he visited in July 1948.⁹² Whereas the Air Corps had found the community's supply of electricity to be lacking, Toftoy made a more bullish assessment of its resources. Out of all the locations considered for the project, he determined that Redstone alone combined excellent utilities, including access to electric power, with adequate transportation and suitable living conditions for von Braun and his team.⁹³ Indeed, the abundant supply of electricity available in the Huntsville area was a deciding factor for Toftoy.⁹⁴ On June 1, 1949, the Ordnance Corps reactivated Redstone Arsenal; a few months later, the Army approved the transfer of the rocket and guided missile program to the site. On April 1, 1950, Redstone absorbed Huntsville Arsenal, becoming one installation under the control of the Ordnance Corps.⁹⁵ The rocket program would more than make up for the loss of the Air Corps' wind tunnel.

The combination of inexpensive electricity, local promotion, and the presence of a defense installation that was vital to national interests during the Cold War led to the industrial growth that Huntsville's civic leaders had long desired. Before the Army publicly announced the

⁹⁰ Brigadier General H. N. Toftoy, "The History of Army Missile Development," undated speech c.1956, MSFCA, HNTP, Box 3.

⁹¹ Cagle, "History of Redstone Arsenal," 8.

⁹² Holger N. Toftoy, July 23, 1948 entry in "Diary 5 June 48 to 30 Dec 48," MSFCA, HNTP, Box 2.

⁹³ Memorandum, Maj. Gen. H. S. Saylor to Chief of Ordnance, "Rocket Laboratory," August 2, 1948, MSFCA, HNTP, Box 3. Of the sites considered, only two others had utilities that were rated "good," and neither of those sites was available for immediate use.

⁹⁴ "History and Operation of Redstone Described," *Huntsville Times*, January 21, 1955, 9; Memorandum, Lt. Col. W. J. Durrenberger to General Quinton, "Role of Redstone Arsenal in the Guided Missile Program," May 2, 1951, MSFCA, HNTP, Box 4. Toftoy listed the "practically unlimited power supply" as one of the Tennessee Valley's greatest assets in a speech in 1955 at Athens College; see Brig. Gen. H. N. Toftoy, "A Challenge in Education and Industry," March 28, 1955, MSFCA, HNTP, Box 10.

⁹⁵ Cagle, "History of Redstone Arsenal," 8-10.

decision to move the rocket program to Redstone, two private contractors, Rohm & Haas and the Thiokol Corporation, leased space on the arsenal to investigate the use of solid fuel propellants.⁹⁶ The North Alabama Associates continued recruiting new businesses to the area as well. In a letter to Boeing, the NAA touted the benefits of locating an office near Redstone, noting among other things that “Electric energy costs are low and generating facilities large.”⁹⁷ The Associates had contacted at least thirteen corporations with ties to the aerospace industry by December 31, 1950.⁹⁸ Over the next fifteen years, more than thirty companies involved in the development of rockets and missiles moved to the community, including aircraft manufacturers like Boeing, Lockheed, and Northrup. Additionally, IBM and Chrysler located research and engineering divisions in Huntsville, while General Electric provided logistical support for the scientists at Redstone.⁹⁹ The arrival of these research and engineering firms fundamentally altered the economy of the city.

The aerospace sector became the dominant source of employment and a primary driver of growth in Huntsville and Madison County. By the early 1960s, the rocket program accounted for 31,000 of the area’s 45,000 jobs. A report by the Huntsville Planning Commission found that another 10,000 workers depended indirectly on the rising payrolls at Redstone Arsenal and its associated industries for their livelihood.¹⁰⁰ Annual retail sales in the city almost quadrupled between 1948 and 1962, while the median family income rose from \$2,370 to \$6,386 per year.¹⁰¹

⁹⁶ Tom D. Johnson, “Activities Report, October, 1949,” 1949, NAIDAHF, AR.

⁹⁷ Letter T. D. Johnson to W. M. Allen, President Boeing Air Plane Company, November 15, 1950, NAIDAHF, AR.

⁹⁸ Tom D. Johnson, “Studies And/Or Reports Transmitted to Prospects During October, November and December, 1950 by North Alabama Associates,” in “Activities Report, December, 1950,” 1950, NAIDAHF, AR.

⁹⁹ Thomas Franklin Moring, “The Impact of Space Age Spending on the Economy of Huntsville, Alabama” (MS Thesis, Massachusetts Institute of Technology, 1964), 17-8.

¹⁰⁰ These figures included both agricultural and non-agricultural employment; see Myers, “Planning for Impact,” 61-3.

¹⁰¹ When one accounts for inflation the median family income in 1960 is still more than double what it was in 1950. Approximately forty percent of Huntsville residents made less than \$2,000 per year in 1949 while in 1959 forty percent made more than \$7,000; see Myers, “Planning for Impact,” 93-5.

By the 1960s, estimates suggested that the arsenal added approximately \$175,000,000 annually to the local economy.¹⁰² Redstone's increasing importance coincided with cotton's decline. Only a few small firms employing approximately one hundred people remained after the Lincoln Mills, the last major manufacturing plant, shut its doors in 1956.¹⁰³

The fate of the Lincoln Mills symbolized the changes that occurred in Huntsville's economy in the post-World War II period. As recently as 1940, the mill had employed 1,700 people with a payroll of \$2,700,000, but the textile firm folded after the Korean War when the Army's demand for canvas dropped. In 1957, a group of thirty-five local businessmen led by Carl T. Jones, an engineer who helped design Huntsville's airport, and several other members of the HIEC, purchased the complex, renovating it for future commercial use. Less than one year later, Milton Cummings, a textile magnate turned aerospace industrialist, who had recently reconstituted Brown Engineering, a failing tool and die company, as an aeronautical research firm opened an office in the former mill.¹⁰⁴ Boeing and the Chrysler Corporation Space Division quickly moved in as well, and by 1965 the building housed several laboratories and engineering operations as well as an electronic assembly line and a state of the art flight simulator. The newly christened Huntsville Industrial Center supported 6,000 jobs and a payroll of over \$42,000,000, a figure approximately seven times greater than that of Lincoln Mills at its peak after one accounts for inflation. The firms that moved in also consumed a massive amount of energy. The complex's maximum electric demand increased from 3,700 kilowatts in 1956 to over 5,800 kilowatts in 1965, reflecting both the importance of inexpensive electricity to the

¹⁰² Myers, "Planning for Impact," 78.

¹⁰³ Myers, "Planning for Impact," 63; and Huntsville Electric Service, "Years of Transition: 25th Anniversary – Electric System – Huntsville Utilities," 1965, 5, HPLHR, HUES.

¹⁰⁴ Huntsville Electric Service, "Years of Transition: 25th Anniversary – Electric System – Huntsville Utilities," 1965, 5, HPLHR, HUES; and Carter, "Huntsville: Alabama Cotton Town Takes Off into the Space Age," 1227; and "Bid Dreams, Bigger Plans: Huntsville's First Guidance System Launched an Economy," *Initiatives*, Huntsville-Madison County Chamber of Commerce (December 2006), 26-7 and 39.

aerospace industry and the extent to which the expansion of rocket and guided missile research resulted in the creation of a modern energy-intensive economy in Huntsville.¹⁰⁵

As Huntsville's economy grew so did the community as a whole. From a total of only 16,000 residents in 1950, the city swelled to include more than 72,000 people in 1960, an increase of nearly 340 percent, doubling in size again only five years later.¹⁰⁶ Although Huntsville had ranked fourteenth in the state in terms of population a decade earlier, it trailed only Birmingham, Mobile, and Montgomery in 1960, becoming "the central urban core of northern Alabama" according to one researcher who studied the effects of Redstone and the aerospace sector on the area.¹⁰⁷ The city expanded geographically as well, ballooning from less than five square miles in 1950 to more than one hundred in 1965.¹⁰⁸ As the Huntsville Electric Service argued in its silver anniversary report, the rocket and guided missile program had facilitated the community's "dramatic evolution from a 135-year old cotton town to a flourishing industrial city."¹⁰⁹ Multiple magazine and journal articles concurred. Including titles that proclaimed "Alabama Cotton Town Takes Off into the Space Age" and referring to Huntsville as "The City that Technology Built," these publications contended that aerospace industry had produced a "modern, pulsating, progressive" metropolis.¹¹⁰

Huntsville's boosters adopted the rocket program as a symbol of the community's modern identity. As noted above, the community had been known as the watercress capital of

¹⁰⁵ Huntsville Electric Service, "Years of Transition: 25th Anniversary – Electric System – Huntsville Utilities," 1965, 5, HPLHR, HUES.

¹⁰⁶ Huntsville had a population of 143,000 in 1965. Myers, "Planning for Impact," 27 and 76.

¹⁰⁷ Myers, "Planning for Impact," 79 and 82 (quote on page 82).

¹⁰⁸ Myers, "Planning for Impact," 36.

¹⁰⁹ Huntsville Electric Service, "Years of Transition: 25th Anniversary – Electric System – Huntsville Utilities," 1965, 4, HPLHR, HUES.

¹¹⁰ For "Cotton Town Takes Off," see Carter, "Huntsville: Alabama Cotton Town Takes Off into the Space Age," 1224; for "City that Technology Built," see Jones, "The City that Technology Built," 25-9; and for "modern, pulsating, progressive," see Dolan, "Huntsville – Space City, U.S.A.," 42.

the world in the decades prior to World War II.¹¹¹ As early as 1953, however, “Rocket City, USA” began appearing on pamphlets used to recruit industry to the area.¹¹² The new moniker caught on quickly, and only three years later, it graced the cover of *Newsweek* as part of a special report on the Redstone Arsenal.¹¹³ The HIEC’s promotional brochures referenced the rocket program throughout the 1960s and 1970s, noting Redstone’s role in making possible iconic moments such as the launch of the first satellite to orbit the earth and the moon landing while anointing Huntsville the space capital of the world.¹¹⁴ Among many launch vehicles, Von Braun and his team designed both the Saturn rockets that powered the Apollo missions and the Jupiter missile, capable of carrying nuclear payloads. Other organizations also embraced the city’s new identity. For example, the Rotary Club included a rocket in its official seal and titled its weekly bulletin, the “Rotary Rocket.”¹¹⁵ From watercress to rockets, from cotton belt to Sunbelt, the community’s boosters linked economic development with civic progress.

During the postwar period, the Huntsville-Decatur corridor’s business elite consolidated their power. The TVA’s energy regime supported these elites by facilitating the transformation of the region’s economy. Men like Carl Jones, who helped redevelop Huntsville’s Lincoln Mills, and Milton Cummings, who invested in firms that focused on applied research, profited from the rise of the aerospace sector. Others, including Cummings’ nephew, Charles Cummings, shaped the city’s economic growth and its physical expansion by purchasing farmland and converting it

¹¹¹ Jones, “The City that Technology Built,” 27.

¹¹² John McCormick and James Record, Huntsville, Alabama: Rocket City, U.S.A. (Strode, 1953). Also noted in Ward, *Shaping History*, 29.

¹¹³ See *Newsweek*, January 30, 1956.

¹¹⁴ Huntsville Industrial Expansion Committee and First National Bank, “This is Huntsville,” undated c. 1965, 2-3, HPLHR, Stacks; and Huntsville Industrial Expansion Committee and Huntsville-Madison County Chamber of Commerce, “Huntsville, Alabama” (Woodland Hills, CA: Windsor Publications, Inc., 1974), 11, HPLHR, Stacks.

¹¹⁵ Rotary International, “Rotary Rocket: Huntsville, Alabama, Rocket City, U.S.A.,” May 21, 1963, copy in MSFCA, HNTP, Box 4. Berachah Academy, a local high school, put on a play in 1973 that celebrated Redstone’s role in shaping the community after World War II; see Maynelle L. Harwell, “This Valley,” May 10, 1973, copy of script in HPLHR, Stacks. Indeed, scientists at the arsenal took pride in the extent to which the city embraced the rocket program; see “Redstone Arsenal, Army Ordnance Center for Guided Missiles,” undated speech, MSFCA, HNTP, Box 4.

into office parks.¹¹⁶ Businessmen in Huntsville and Decatur also benefited from the influx of white collar professionals who came to the area in search of jobs either at Redstone or private defense contractors. The payrolls from these firms as well as electrochemical and metallurgical manufacturing plants contributed to the health of the corridor's economy.¹¹⁷ Furthermore, local leaders partnered with Von Braun to bring a satellite campus of the University of Alabama to Huntsville. Along with cheap electricity and the rocket program, the new institution became a magnet for private investment in the 1960s and 1970s that served the economic interests of the region's commercial elite.¹¹⁸

Environment and the Energy-Intensive Industrial Economy

The transition from cotton and textiles to rockets and manufacturing implied a fundamental shift in the use of natural resources in the Huntsville-Decatur corridor. For the TVA and local boosters, this shift represented one of the benefits of the creation of an energy-intensive economy in northern Alabama. As discussed above, studies of the South in the 1920s and 1930s had focused on prevailing agricultural practices as one of the primary causes of

¹¹⁶ "Bid Dreams, Bigger Plans: Huntsville's First Guidance System Launched an Economy," *Initiatives*, Huntsville-Madison County Chamber of Commerce (December 2006), 39.

¹¹⁷ Myers, "Planning for Impact," 56-101; and Ward, *Shaping History*, 63-80.

¹¹⁸ In addition to attracting private investment, the rocket program and its leadership played a direct role in transforming the local community college from a two year technical school into a major research institution. In 1961, Wernher von Braun lobbied the Alabama legislature to improve the educational infrastructure in the state. In particular, von Braun believed that Redstone's continued success relied on the establishment of a university capable of supporting high level graduate and post-graduate work in aeronautical science and engineering. He noted that the California Institute of Technology and the University of California – Los Angeles had both spurred and sustained the development of the aerospace industry in southern California. Von Braun suggested that placing a similar institution of higher learning at Huntsville would ensure that that the area remained a desirable location for rocket and guided missile research. The university became a second vehicle for bringing investment to the community. Many of the same civic leaders who had participated in the HIEC, the chamber of commerce, and the NAA created a new organization, the University of Alabama, Huntsville Foundation. The group purchased local farmland for the purpose of creating industrial parks for engineering firms to complement the work of university faculty. See Ward, *Shaping History*, 53-80.

environmental degradation and economic stagnation in the region.¹¹⁹ The Authority, in particular, suggested that row cropping, overplanting, and the generational subdivision of property contributed directly to the persistence of low standards of living in its service area.¹²⁰ In short, there were simply too many farmers and too much land tied up in cultivation. Converting fields into factories, laboratories, and office parks would allow the Tennessee Valley to take advantage of its abundant supply of electric power to develop local mineral reserves that were both vast and potentially lucrative. Monsanto and American Viscose, for example, located Chemstrand's new facility on a site that had been a patchwork of farms abutting the Tennessee River. [Fig. 4.1] As a manufacturer of synthetic fibers, the company further symbolized the shift away from cotton towards a new pattern of resource consumption.¹²¹ For companies like Rohm & Haas, which opened its Josiah Gorgas Laboratory in 1952 on an unused section of the Redstone Arsenal, the intermingling of factories and fields signified the development of an integrated landscape of industrial progress in which research laboratories and production plants coexisted with bucolic farms, all framed by the majesty of the foothills of the Cumberland Plateau.¹²² [Fig. 4.2] The Huntsville-Decatur corridor could be both prosperous and beautiful according to the narrative of the TVA and local boosters.

¹¹⁹ Phillips, *This Land, This Nation*, 84-8; and Schulman, *From Cotton Belt to Sunbelt*, 15-20 and 39-62; for contemporary study, see Odum, *Southern Regions of the United States*.

¹²⁰ David E. Lilienthal, "The Future of Industry in the Tennessee Valley Region," address before the Tennessee Valley Institute of the University of Chattanooga, Tennessee, April 21, 1934, NARA-SE, RG 142, OEDC, Box 23; Sherman M. Woodward, "TVA and Resource Development," report for information office, January 28, 1948, 3, NARA-SE, RG 142, OEDC, Box 115; TVA, *Annual Report, 1945*, 6-7; and TVA, *Annual Report, 1946*, 24.

¹²¹ For an aerial photograph of the site chosen for Chemstrand's plant, see "Chemstrand Corporation to Build 'Multi-Million Dollar' Plant Here," *Decatur Daily*, September 27, 1950, 1. Chemstrand's product was called Acrilan, a synthetic fiber similar to nylon. The company suggested that it could be used in the manufacture of clothing among other possibilities; see "Wait Till You Get Your Hands on Acrilan," unassigned newspaper advertisement, undated, NAIDAHF, CF.

¹²² "A Center for Rockets and Jet Propulsion," *The Rohm & Haas Reporter*, November-December 1952, 15, MSFCA, HNTP, Box 4.

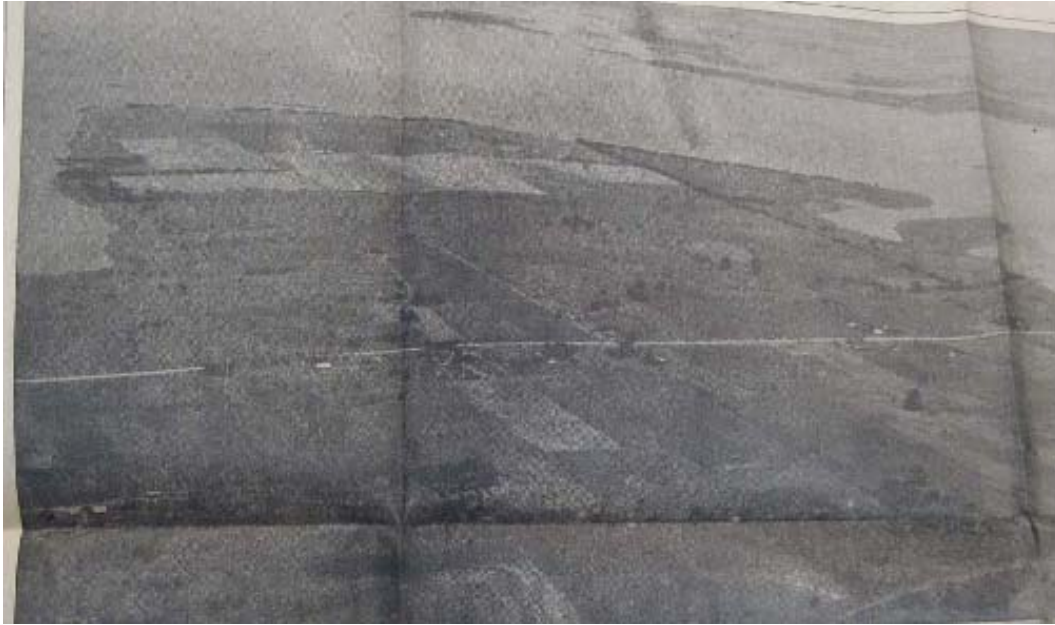


Figure 4.1: Chemstrand Site – Farmland that became the site for the new Chemstrand facility along the Tennessee River at Decatur, Alabama. Source: “Chemstrand Corporation to Build ‘Multi-Million Dollar’ Plant Here,” Decatur Daily, September 27, 1950, 1.

Industrial growth also displaced communities and poisoned environments. In Huntsville, the properties that the Chemical Warfare Service and the Ordnance Corps purchased in 1941 comprised approximately 36,000 acres of rolling terrain located southwest of the city toward the Tennessee River. The tracts were among the most agriculturally productive in the county. Cotton dominated the fields, but farmers also raised livestock and tended a variety of other crops, including corn, hay, and peanuts. Of the nearly 6,000 people who called the fifty-seven square mile area home, seventy-six percent were African American, and although sharecropping was common, many residents, black and white, owned their own farms. Most of the 550 families who lived and worked on the land had done so for generations, and local patterns of resource consumption had seemingly changed little since Reconstruction. Electricity was entirely non-existent in 1941. Most houses did not have access to indoor plumbing, running water, or telephones. Those who had refrigerators, washing machines, and radios used kerosene, gasoline,

or batteries to operate them. Roads were few in number and unpaved while tractors remained a rarity in the fields.¹²³

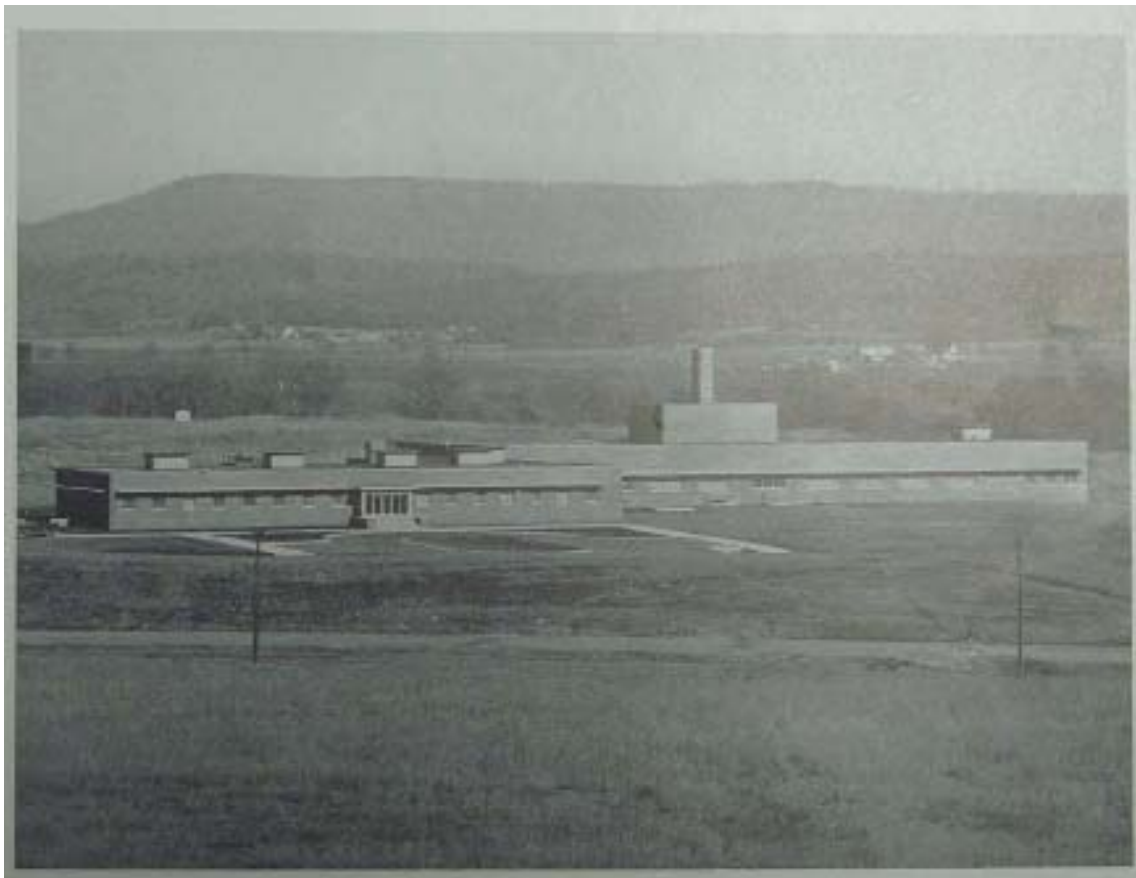


Figure 4.2: Josiah Gorgas Laboratory – A photograph of Rohm & Haas’ Josiah Gorgas Laboratory on the Redstone Arsenal property framed by the Cumberland Plateau and open land. Source: “A Center for Rockets and Jet Propulsion,” The Rohm & Haas Reporter, November-December 1952, 15, MSFCA, HNTP, Box 4.

Life in the agricultural communities outside of Huntsville was hard. Most families, black and white, were poor and worked in the fields tending cotton. McKinley Jones, an African American man who grew up near Indian Creek on land that is now part of Redstone Arsenal, recalled travelling to Huntsville to sell eggs and vegetables door-to-door to the city’s wealthy

¹²³ The description of the environment and its inhabitants is based on those provided by Kaylene Hughes, Mary Cagle, and Beverly Curry; see Hughes, “Two ‘Arsenals of Democracy,’” 52-3; Cagle, “History of Redstone Arsenal,” 2; and Beverly S. Curry, *The People Who Lived on the Land that is Now Redstone Arsenal: Pond Beat, Mullins Flat, Hickory Grove, The Union Hill Cumberland Presbyterian Church Area, and the Elko Area* (Summerland Key, FL: Self-Published, 2006), 13-30 generally and 72 for the use of kerosene, gasoline, and batteries to power appliances.

white residents.¹²⁴ For tenants and sharecroppers, this was one of the few ways to earn extra cash. Most subsisted on the produce from their gardens and the meat from hogs that they kept on their farms. Their houses were usually two and three room structures with a detached smokehouse and an outhouse. The poorest families lived closest to the Tennessee River and often relied on fish to supplement their diets. The wealthiest residents owned their own property. Many, like Percy Joiner, had purchased land that some of their ancestors had worked as slaves. Other managed farms for absentee landlords. Jim Crow shaped local racial disparities; for example, schools were segregated, and African Americans had little recourse to the law. There were, however, black property owners who rented to white sharecroppers, and some of the most respected people in the area were African American. More importantly, a deep sense of community persisted among the families who farmed the land that became the Huntsville and Redstone arsenals. Neighbors were willing to help each other either by sharing work or food. Many residents were related, and it was common to have siblings owning adjacent properties.¹²⁵

As with many wartime projects, property owners had little recourse but to sell their holdings to the government for the price they were offered. Tenants, of course, had even less say in the matter. The CWS and the Ordnance Corps did lease open land to farmers, but the gesture was largely symbolic. The Army cooperated with the Farm Security Administration and the Alabama Relocation Corporation (ARC), a private group sponsored by the United States Department of Agriculture, to help individuals and families move. The ARC purchased land to serve as a temporary stop gap for displaced residents before they settled elsewhere. For some, these temporary homes became permanent. Many others remained in the Huntsville area, either

¹²⁴ Curry, *The People Who Lived on the Land*, 31-67.

¹²⁵ Curry, *The People Who Lived on the Land*, 13-145.

in the city itself or in Madison County. The construction of the arsenals resulted in the dissolution of several agricultural communities.¹²⁶

The transformation of fields into factories, laboratories, and office parks in the name of economic progress continued in the postwar period. In the 1950s, for example, Chemstrand built a new plant in Decatur, while in Huntsville, the HIEC and the Huntsville City Planning Commission constructed Research Park. The 3,000 acre tract reserved space and hosted infrastructure for engineering firms near Redstone and the University of Alabama, Huntsville. The Park repurposed land cultivated by approximately fifty farmers to create a complex that would employ 6,500 workers by 1965 for companies like Dow Chemical and IBM.¹²⁷

The region's new electrochemical industries also emitted effluents that damaged local environments, poisoning streams, wildlife, and people. In the 1970s, the Alabama Department of Conservation, the Army, and the TVA conducted separate studies on the waterways downstream from Redstone Arsenal that indicated the presence of dichlorodiphenyltrichloroethane (DDT) in the Tennessee River and two of its tributaries, the Huntsville Spring Branch and Indian Creek.¹²⁸ DDT achieved worldwide acclaim in the 1940s and 1950s as a powerful insecticide. The United States Army had used the chemical to great effect during World War II, and the TVA employed

¹²⁶ The Farm Security Administration was only authorized to provide a small moving stipend to those without funds to do so on their own and to grant loans "to those with farming experience." The agency also kept a list of properties available for lease or purchase in the area, and it advised families as to the suitability of new tracts for farming. See Hughes, "Two 'Arsenals of Democracy,'" 53-4.

¹²⁷ Other companies included Airinc Research Corporation, Airwork Corporation, Astro-Space Laboratories, DeVault Ultra Precision Company, Hayes International, Lear Siegler, Inc., and the Stanford Research Institute. According to HES, the Park had "highly sophisticated electrical needs," requiring "huge chunks of electric power." For quotes see "New Power Station Opens," *Huntsville Times*, March 21, 1968, clipping in HPLHR, HUES. For other information, see Carter, "Huntsville: Alabama Cotton Town Takes Off into the Space Age," 1227; and Huntsville Electric Service, "Years of Transition: 25th Anniversary – Electric System – Huntsville Utilities," 1965, 18, HPLHR, HUES.

¹²⁸ Mike Hollis, "The Persistence of a Poison: Effects of Chemical Plant Still Plague Ala. Town," *Washington Post*, June 15, 1980, A2.

it as part of the agency's far reaching malaria control program on the Tennessee River.¹²⁹ Public perception of the toxin began to turn in the 1960s, however, after Rachel Carson called attention to the environmental consequences of its overuse in her book *Silent Spring*.¹³⁰ When introduced into a riverine ecosystem through spraying or spillage, the compound typically settled in the sediment of a stream where it was consumed by a variety of aquatic organisms, including fish. DDT did not breakdown readily, and once ingested, it lodged itself in the fatty tissue of its host, becoming increasingly concentrated as it moved up the food chain. While researchers initially observed the toxin's deleterious influence on the reproductive cycle of birds, studies also linked the chemical with increased incidents of liver cancer in animals, raising concerns that it would have similar carcinogenic effects in humans.¹³¹

The DDT found in the creeks and rivers southwest of Huntsville originated in the Calabama Chemical Company, a private manufacturer that operated a plant on the Redstone Arsenal. Calabama had leased an unused building from the Army in 1947, taking advantage of cheap TVA electricity. Seven years later the Olin Corporation purchased Calabama, continuing to make the insecticide until 1970 when it shut down the factory at the request of the Army. According to court documents filed years later, Calabama and Olin manufactured between one and two million pounds of DDT every month during the twenty-three years that their plant was in operation.¹³² Containment issues at the facility arose almost immediately. In 1948, Benton Wilcoxin, a part owner of Calabama who stayed on as site manager under Olin, observed DDT in

¹²⁹ The TVA made use of DDT in its anti-Malaria program; see TVA, *Annual Report, 1944* (Washington, D.C.: Government Printing Office, 1944), 39-41; TVA, *Annual Report, 1945*, 3 and 54-5; and TVA, *Annual Report, 1946*, 19-20. On DDT's use in World War II and subsequent problems in Egypt, see Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002), 46-50.

¹³⁰ Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1962).

¹³¹ Carl Crawford, "Where the Water Isn't Clean Anymore," *Tennessee Valley Perspective* 9(Spring 1979): 22.

¹³² Mike Hollis, "The Persistence of a Poison: Effects of Chemical Plant Still Plague Ala. Town," *Washington Post*, June 15, 1980, A2; and EPA, "Olin Agrees to Clean Up DDT in Triana, Alabama Area," press release, April 21, 1983, accessed March 6, 2014, <http://www2.epa.gov/aboutepa/olin-agrees-clean-ddt-triana-alabama-area>. Olin Corporation v. Insurance Company of North America, et al. 762 F.Supp. 548 (1991), 550-1.

the wastewater drainage ditches that traveled from the factory to an acid-neutralization pit before discharging into the Huntsville Spring Branch.¹³³ Later tests revealed that groundwater from the arsenal also flowed to the south and west before entering Indian Creek and the Tennessee River.¹³⁴

Throughout the next three decades evidence of the DDT problem around Redstone mounted. Two engineers that Olin hired in 1955 confirmed that trace amounts of the toxin were emanating from the plant along with other effluents, although they argued that this was consistent with normal operations at the facility. More disturbingly, Dr. Jimmie Reid, an Army chemist, found DDT deposits both in Olin's drainage ditch and in a delta shaped buildup at the point where the company's wastewater system emptied into the Huntsville Spring Branch. Reid studied the area for several years, noting sizeable accumulations on the lower bank of the creek and at locations several hundred feet downstream. At his suggestion, the United States Public Health Service (USPHS) conducted its own investigation in 1963. It traced DDT discovered in the Tennessee River to discharges from the Calabama and Olin plant and argued the resulting pollution was responsible for several fish kills. The TVA made its own studies in 1965 and again in 1978, finding extensive the damage to the environment around the arsenal.¹³⁵ Bass and catfish taken in the area had concentrations of DDT in their tissue as high as 260 and 411 parts per million respectively, well above the five parts per million that the United States Food and Drug Administration suggested was the maximum level safe for human consumption.¹³⁶ Local bird populations suffered as well. In the Wheeler Wildlife Refuge, a nature preserve that

¹³³ Olin Corporation v. Insurance Company of North America, et al. 762 F.Supp. 548 (1991), 551-2.

¹³⁴ Curry, *The People Who Lived on the Land*, 123.

¹³⁵ Olin Corporation v. Insurance Company of North America, et al. 762 F.Supp. 548 (1991), 551-5; Mike Hollis, "The Persistence of a Poison: Effects of Chemical Plant Still Plague Ala. Town," *Washington Post*, June 15, 1980, A2; and Thomas Noland, "Triana Fish Story," *Southern Changes* 1(1979): 14-6.

¹³⁶ Noland, "Triana Fish Story," 16.

functioned as a stopover for many migratory waterfowl, officials from the United States Fish and Wildlife Service reported a ninety-seven percent decrease in the number of double-crested cormorants between 1948 and 1959. Red-shouldered hawks had declined by ninety percent by 1963.¹³⁷ The danger to wildlife was unlikely to dissipate soon. The TVA estimated that approximately 4,000 tons of DDT remained in the Huntsville Spring Branch in the late 1970s.¹³⁸

The DDT that Calabama and Olin released also posed a serious threat to the town of Triana, Alabama. With roughly 1,000 residents, the predominantly African American community was located below the confluence of the Huntsville Spring Branch and Indian Creek, near the point where the latter spilled into the Tennessee River. Triana's inhabitants were relatively poor, and they relied on what they caught in the Tennessee and its tributaries to supplement their diets. As one resident noted to a reporter covering the area's pollution problems, "Fish is the cheapest meat you can get."¹³⁹ No one, however, informed the townspeople of the potential risks of consuming DDT tainted fish until the TVA released its investigation confirming the pollutant's presence in the Huntsville Spring Branch and Indian Creek in 1978.¹⁴⁰ The results of a subsequent study that the United States Center for Disease Control (CDC) conducted were staggering. Individuals from the community had average DDT levels that were ten times greater than those in other parts of the country. Astoundingly, one eighty-five year old retired farmer named Felix Wynn recorded a concentration of DDT in his bloodstream of 3,300 parts per billion, the highest ever recorded in a human.¹⁴¹

¹³⁷ Robert M. Press, "'Love Canal South': Alabama DDT Residue Will Cost Millions to Clean Up," *Christian Science Monitor*, June 12, 1981.

¹³⁸ Mike Hollis, "The Persistence of a Poison: Effects of Chemical Plant Still Plague Ala. Town," *Washington Post*, June 15, 1980, A2; and Thomas Noland, "Triana Fish Story," *Southern Changes* 1(1979): 14-6.

¹³⁹ Quoted in Press, "'Love Canal South.'"

¹⁴⁰ Noland, "Triana Fish Story," 15-6; and Mike Hollis, "The Persistence of a Poison: Effects of Chemical Plant Still Plague Ala. Town," *Washington Post*, June 15, 1980, A2.

¹⁴¹ Mike Hollis, "The Persistence of a Poison: Effects of Chemical Plant Still Plague Ala. Town," *Washington Post*, June 15, 1980, A2. The national average was 16.7 parts per billion.

The implications for Triana itself were devastating. Residents had few affordable alternatives for replacing the protein lost from their diets.¹⁴² Furthermore, the area's inhabitants were left to wonder about how the DDT in their bodies would affect their future health or whether they had unwittingly exposed their families to dangerous toxins and had irreparably harmed their own children.¹⁴³ The problems at Triana made national headlines. While the *Washington Post* published a piece entitled "The Persistence of Poison," the *Christian Science Monitor* captured the extent of the damage to local communities and the environment, labeling the town "Love Canal South."¹⁴⁴ Ultimately, there was little anyone could do to reverse the damage done to Triana and its residents.¹⁴⁵

Industrialization altered patterns of resource consumption in the Huntsville-Decatur corridor in ways that benefited white, middle-class professionals to the detriment of predominantly African American, agricultural communities. The history of pollution at Triana, however, was hardly unique either in the South or the United States as a whole in the twentieth century. Scholars have repeatedly demonstrated that the poor and minorities have borne the environmental consequences of the chemical industry's growth.¹⁴⁶ As Bruce Schulman has noted, the expansion of manufacturing and aerospace research did little to improve existing

¹⁴² Mike Hollis, "The Persistence of a Poison: Effects of Chemical Plant Still Plague Ala. Town," *Washington Post*, June 15, 1980, A2; and Crawford, "Where the Water Isn't Clean Anymore," 18-22. Furthermore, commercial fisherman in the area immediately found themselves out of a lucrative business that had paid upwards of \$700 per week in the 1970s.

¹⁴³ Press, "'Love Canal South,'" and Mike Hollis, "The Persistence of a Poison: Effects of Chemical Plant Still Plague Ala. Town," *Washington Post*, June 15, 1980, A2.

¹⁴⁴ Mike Hollis, "The Persistence of a Poison: Effects of Chemical Plant Still Plague Ala. Town," *Washington Post*, June 15, 1980, A2; and Press, "'Love Canal South.'"

¹⁴⁵ Crawford, "Where the Water Isn't Clean Anymore," 22; also see Press, "'Love Canal South'"; Noland, "Triana Fish Story," 15-6; and Mike Hollis, "The Persistence of a Poison: Effects of Chemical Plant Still Plague Ala. Town," *Washington Post*, June 15, 1980, A2.

¹⁴⁶ For examples, see Robert D. Bullard, *Dumping in Dixie: Race, Class, and Environmental Quality* (Boulder: Westview Press, 1990); Andrew Hurley, *Environmental Inequalities: Race, Class, and Industrial Pollution in Gary, Indiana, 1945-1980* (Chapel Hill: University of North Carolina Press, 1995); and Steve Lerner, *Diamond: A Struggle for Environmental Justice in Louisiana's Chemical Corridor* (Cambridge: MIT Press, 2005).

economic disparities in the Sunbelt, especially between black and white residents.¹⁴⁷ Many of the best paying jobs went to outsiders who possessed the skills and training necessary to fill the new positions that accompanied the rise of industry.¹⁴⁸ The energy-intensive economy that the TVA and local leaders promoted as a solution to the Huntsville-Decatur corridor's overreliance on cotton and textiles devalued and displaced agricultural communities in the name of progress.

Conclusion

The TVA's consumption-centric energy regime shaped economic growth and the use of natural resources in the Tennessee Valley Region. Access to an abundant supply of inexpensive electricity made communities like Huntsville and Decatur attractive locations for specific military installations, laboratories, and industrial processes. The Authority and its distributors also supported the work of local elites in recruiting new defense projects and private investment to the area after 1940. While the TVA provided advice on promotional strategies, the agency's distributors improved electrical grids and often served as the sole source of funding for development organizations. The successful implementation of the Authority's consumption-centric regime relied on the significant overlap between the TVA's vision for the region and that of civic leaders. Both favored industrialization and the growth of firms that specialized in applied research as means for improving standards of living in the Huntsville-Decatur corridor. An energy-intensive economy represented modernity and the creation of a New South, one that made more efficient use of its natural resources. According to the Huntsville Electric Service,

¹⁴⁷ Schulman, *From Cotton Belt to Sunbelt*, viii and 174-205.

¹⁴⁸ Myers, "Planning for Impact," 96-101. In fact, the percentage of Huntsville's population that was black dropped between 1950 and 1965, reflecting the massive in-migration of predominantly white scientists and engineers. The actual number of African Americans living in the area remained constant.

electricity was both “the tool which makes possible the development of highly complicated missiles” and “the tool that man uses to make himself master of his environment.”¹⁴⁹

Similar patterns of economic growth occurred in other communities in the Tennessee Valley Region. In 1950, the Atomic Energy Commission (AEC) chose Paducah, Kentucky, as the site for its new uranium enrichment plant in part because of the availability of cheap TVA electricity.¹⁵⁰ The AEC’s facilities at Paducah and Oak Ridge consumed more than half of the electric power that the Authority produced in the 1955-1956 fiscal year.¹⁵¹ Calvert City, Kentucky, a hamlet thirty miles south of Paducah on the Tennessee River, also benefited from access to TVA electricity, becoming a booming center for electrochemical manufacturing in the 1950s. Electric power often accounted for up to twenty-five percent of the operating costs of chemical and metallurgical companies. Inexpensive kilowatts, combined with the efforts of local businessmen and the assistance of the Paducah Chamber of Commerce, helped lure giants like the Pennsylvania Salt Manufacturing Company, the Air Reduction Corporation’s National Carbide Division, and B.F. Goodrich to the small Kentucky town in the post-World War II era.¹⁵² Overall, industry expanded throughout the Authority’s service area; while manufacturers provided jobs for only twelve percent of the region’s workforce in the early 1930s, well below the national average, they employed almost thirty percent by the 1960s, equivalent to the rates observed throughout the United States.¹⁵³ Private capital invested \$1.3 billion in 133 plant sites along the Tennessee River between 1933 and 1965 with almost all of the growth occurring after

¹⁴⁹ Huntsville Electric Service, “Years of Transition: 25th Anniversary – Electric System – Huntsville Utilities,” 1965, 12, HPLHR, HUES.

¹⁵⁰ TVA, “TVA, AEC, and EEInc,” informational report, August 19, 1953, 3, UTK: Hodges, TVA PC, Box 4, Folder 8.

¹⁵¹ TVA, *Annual Report, 1956* (Washington D.C.: Government Printing Office, 1956), 1.

¹⁵² On the expansion of Calvert City, see Agricultural and Industrial Development Board of Kentucky, “The Chemical Century Comes to Calvert City,” 1953, NARA-SE, RG 142, GMAF, Box 748. On the operating costs of chemical and metallurgical manufacturers, see Otte, *Industrial Opportunity*, 60.

¹⁵³ TVA Government Relations and Economics Staff, “Manufacturing Structure and Change in the Tennessee Valley Region, 1959-1963,” informational pamphlet, November 1964, 5, UTK: Hodges, TVA PC, Box 4.

1945. Chemicals, primary metals, and pulp production accounted for ninety-one percent of private investment and sixty-eight percent of employment on the waterfront.¹⁵⁴ Furthermore, the number of military installations in the region increased as a result of the TVA's power program, with two-thirds of the nation's federal defense spending in the 1950s occurring in twenty-two rural counties.¹⁵⁵ Although incomes continued to lag, an energy-intensive economy blossomed in the Tennessee Valley Region after World War II.¹⁵⁶

As Bruce Schulman has argued, the South benefited from the development of the national security state and the efforts of civic leaders and boosters who encouraged the creation of a robust manufacturing sector in the 1950s and 1960s. More broadly, the industrialization of the TVA's service area occurred during a period when many expected the state to play an active role in promoting economic growth. The specific defense projects and private companies that moved to the Tennessee Valley Region in the postwar era demonstrated the extent to which the Authority's consumption-centric energy regime influenced industrial expansion through the construction of an extensive electrical infrastructure and the support of local development organizations. Many scholars who have studied the South have not acknowledged the importance of energy and public power to the region's economy, yet, as this chapter has shown, the TVA's consumption-centric regime helped bring to fruition a vision of the modern South in which an American standard of living was attainable through the more efficient use of the natural resources.¹⁵⁷

¹⁵⁴ TVA, "Navigation and Economic Growth: Tennessee River Experience," informational pamphlet, September 1966, 8 and 11, UTK: Hodges, TVA PC, Box 4.

¹⁵⁵ Schulman, *From Cotton Belt to Sunbelt*, 94 and 158.

¹⁵⁶ On incomes, see TVA Government Relations and Economics Staff, "Manufacturing Structure and Change in the Tennessee Valley Region, 1959-1963," informational pamphlet, November 1964, 5, UTK: Hodges, TVA PC, Box 4.

¹⁵⁷ For Schulman's analysis, see Schulman, *From Cotton Belt to Sunbelt*, vii-xi, 1-38, and 206-21. For discussions of the state's role in promoting growth in the post-New Deal period throughout the United States, see Robert M. Collins, *More: The Politics of Economic Growth in Postwar America* (Oxford: Oxford University Press, 2000); Godfrey Hodgson, *America in Our Time: From World War II to Nixon – What Happened and Why* (Princeton:

At the same time, the TVA's regime and the energy-intensive economy that the agency promoted resulted in patterns of resource use that benefited white, middle- and upper-class professionals.¹⁵⁸ Business elites in Huntsville and Decatur positioned themselves to take advantage of the Authority's power program by courting defense projects and private companies in the postwar period. Their efforts resulted in the growth of a high-wage, high-skill economy that reinforced white privilege in these communities. Salaries and standards of living in Huntsville increased, and the city became a symbol of success in the New South. But the rewards of the aerospace sector did not fall to the Huntsville-Decatur corridor's rural poor, especially its black residents who were easily denied access to the best paying jobs. The environmental consequences of creating a modern, energy-intensive economy also fell most heavily on the poor and minorities.¹⁵⁹ As will be discussed in the following chapters, the TVA's regime sacrificed environments in remote areas for the benefit of affluent urban and suburban communities.

Princeton University Press, 2005 [1976]); and Alan Brinkley, "The New Deal and the Idea of the State," in *The Rise and Fall of the New Deal Order, 1930-1980*, eds. Steve Fraser and Gary Gerstle (Princeton: Princeton University Press, 1989), 85-121. For the origins of this vision in the Progressive Era and the interwar period, see Ellis W. Hawley, *The Great War and the Search for a Modern Order: A History of the American People and Their Institutions, 1917-1933* (New York: St. Martin's Press, 1979). For a broader discussion of the history of electricity in the United States economy, see Sam H. Schurr, Calvin C. Burwell, Warren D. Devine, Jr., and Sidney Sonenblum, *Electricity in the American Economy: Agent of Technological Progress* (New York: Greenwood Press, 1990); Schurr et al. notes the importance of electricity for certain chemical manufacturing processes as well as the link between the use of electric power and the extent to which technological factors affected economic growth and output in the twentieth century.

¹⁵⁸ In his study of the South, Schulman also notes that the federal policies that helped create the Sunbelt benefited white residents, creating what some scholars describe as "Herrenvolk development." See Schulman, *From Cotton Belt to Sunbelt*, viii and 174-205. For other scholarship on the relationship between race, class, and economic development in the United States, see Bullard, *Dumping in Dixie*; Hurley, *Environmental Inequalities*; and Lerner, *Diamond*.

¹⁵⁹ Also see Bullard, *Dumping in Dixie*; Hurley, *Environmental Inequalities*; and Lerner, *Diamond*.

Chapter 5

The Balance of Power: Low Rates, Public Health, and Air Pollution in the 1950s

*None of those environmental facilities make you a penny. You can't sell anything. You can't sell cleaner air, purer water. You just have to add the price on to the electricity and sell it to the electricity user.*¹

– Gabriel O. Wessenauer, TVA, Power Manager, Oral History Interview, May 22-23, 1990.

*We were just overwhelmed by the prospects of the tons of SO₂ that were going to be emitted from that plant when they got all six units, and later planned four more, in operation.*²

– Dr. Francis E. Gartrell, TVA, Division of Health and Safety, Oral History Interview, April 26, 1983

In the summer of 1973, the Tennessee Valley Authority published an article in *Tennessee Valley Perspective* entitled, “Electric Power and Clean Air – Can We Have Both?”³ Although the question of electricity’s compatibility with air quality functioned mostly as a rhetorical device within the TVA’s essay, it had been of central importance to the Authority for 25 years. On December 8, 1948, John Ferris, the Authority’s manager of reservoir and community relations, sent a memorandum to the agency’s chief engineer about the Johnsonville Steam Plant that began with a simple question: “Is consideration being given to the possibility of keeping flyash[sic] from the proposed new steam plant to a minimum?”⁴ In his memo, Ferris went on to

¹ Mary Jane Lowe, “Oral History Interview with G. O. Wessenauer,” part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, May 22-23, 1990, 70, National Archives and Records Administration Southeast Branch, Morrow, GA, Record Group 142, Oral History Records, Box 10.

² Mark Winter, “Oral History Interview with Dr. Francis E. Gartrell,” part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, April 26, 1983, 50, National Archives and Records Administration Southeast Branch, Morrow, GA, Record Group 142, Oral History Records, Box 3.

³ “Electric Power and Clean Air – Can We Have Both?” *Tennessee Valley Perspective* 3 (Summer 1973): 18-22. *Tennessee Valley Perspective* was a magazine published by the TVA in the 1970s.

⁴ Memorandum, John P. Ferris to C. E. Blee, “Fly Ash at New Johnsonville Steam Plant,” December 8, 1948, quoted in F. E. Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” December 1978,

note that the area surrounding the proposed plant site had great potential as a resource for recreation as well as a location for future residential developments and industrial growth “provided fly ash or fumes are not a serious factor.”⁵ Optimistically, he added that “demonstration of air pollution control, besides protecting near-by areas from unpleasant conditions, might jog public interest in smoke reduction in such metropolitan centers as Nashville and Knoxville.”⁶ From the beginning of the agency’s transition to coal-fired power, employees like Ferris expressed their concerns about the effect that the Authority’s new facilities would have on the environment and their desire that the TVA play a positive role in promoting air quality in the Tennessee Valley Region.

Most of the scholarship on air pollution and the Authority’s power program after World War II has emphasized the agency’s legal battles with states, activists, and the Environmental Protection Agency in the 1970s.⁷ In doing so, historians and critics have obscured the environmental history of the TVA and its transition to coal-fired power in the 1950s, a history that was both longer and more complex than the traditional narrative has suggested.⁸ While the

vol. I, part I, 9, Tennessee Valley Authority Research Library, Chattanooga, Tennessee [hereafter: TVA-RL]. At the time, the TVA was in the initial stages of its transition to coal-fired power, and it was in the process of winning Congressional approval for the Johnsonville facility. For more information on the importance of the political battle for funding for the Johnsonville Steam Plant, see Chapter Two of this dissertation.

⁵ Memorandum, John P. Ferris to C. E. Blee, “Fly Ash at New Johnsonville Steam Plant,” December 8, 1948, quoted in Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” vol. I, part I, 9, TVA-RL.

⁶ Memorandum, John P. Ferris to C. E. Blee, “Fly Ash at New Johnsonville Steam Plant,” December 8, 1948, quoted in Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” vol. I, part I, 9, TVA-RL.

⁷ For examples see, William U. Chandler, *The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-1983* (Cambridge: Ballinger Publishing Company, 1984); Robert F. Durant, *When Government Regulates Itself: EPA, TVA, and Pollution Control in the 1970s* (Knoxville: University of Tennessee Press, 1985); Dean Hill Rivkin, “TVA, the Courts, and the Public Interest,” in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 194-229; and Richard A. Couto, “New Seeds at the Grass Roots: The Politics of the TVA Power Program since World War II,” in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 230-60.

⁸ Two exceptions that provide more background on the period between 1948 and 1969 are Erwin C. Hargrove, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1980*, second edition (Knoxville: University of Tennessee Press, 2001), 155-94; and Marc J. Roberts and Jeremy S. Bluhm, *The Choices of Power: Utilities Face the Environmental Challenge* (Cambridge: Harvard University Press, 1981), 78-118. Roberts and Bluhm explain the agency’s environmental decisions as a function of its organizational structure, while Hargrove

Authority did become one of the nation's largest polluters in the decades following World War II and while it did resist the implementation of state and federal regulations in the 1970s, the agency also pioneered methods for studying the effects of coal-fired power plants on the environment. Furthermore, internal documents and the reflections of former employees suggest that there were many within the TVA who questioned whether or not the agency was doing enough to protect the natural resources of its service area.

The first four chapters of this dissertation have focused on the consumption-centric energy philosophy of the public power movement and the Tennessee Valley Authority's power program, the role that this philosophy played in the development of the TVA's generating infrastructure, and its effect on residential and commercial customers and their communities. This chapter analyzes the Authority's initial responses to the environmental degradation that resulted from the operation of its coal-fired power plants in the 1950s. It shows how a group of scientists and engineers in the TVA's Division of Health and Safety won a significant if limited victory when they convinced the agency's board of directors to adopt several pollution control measures at the Kingston Steam Plant against protests from the Authority's Office of Power. Environmental science became an important tool that helped these scientists and engineers question the TVA's energy regime and its focus on cheap power.

Throughout the post-World War II period, the Authority struggled with the consequences of its transition to coal-fired power. The agency studied, developed, adopted, and rejected various solutions to the pollution problems associated with the operation of its steam plants, including the construction of taller smokestacks, the strategic use of low-sulfur coal, the

attaches more importance to the agency's desire to remain free from external regulation and its commitment to providing cheap power. My chapter advances these narratives by suggesting that the TVA's air pollution control program was part of a long term conflict over the responsibilities and limits of the concept of public power and the Authority as a public agency.

installation of electrostatic precipitators and sulfur dioxide recovery systems, and the placement of its facilities in rural areas. This process exposed fractures within the Authority regarding the responsibilities of its power program and its role as a public agency tasked with the conservation of natural resources. In particular, the Office of Power remained skeptical of any policy that threatened the TVA's commitment to the consumption-centric energy regime of low rates and abundant supply that had helped drive the agency's expansion, while scientists and engineers in the Authority's Division of Health and Safety worked to enlarge the power program's environmental obligations, focusing on the public health risks associated with coal-fired emissions. In this way, internal conflicts that revolved around competing understandings of the limits and goals of public power shaped the design decisions, operational protocols, and engineering devices that the TVA used to minimize the deleterious effects of the pollutants that its steam plants produced. The choices that the Authority began making in the 1950s with the construction of some of its earliest coal-fired facilities foreshadowed its response to emissions during the 1960s and 1970s.

For the Dwellers of Industrial Cities: Electricity and Clean Air

Coal releases a variety of noxious byproducts when burned. Particularly in urban areas, residents and officials have long sought to reduce the impact of coal-fired emissions on densely populated neighborhoods. As early as the thirteenth century, smoke and fumes from residential chimneys and commercial furnaces so polluted London's air that Edward I banned the use of coal in the city, punishing those who defied his ruling with death.⁹ In the first decades of the twentieth century, Pittsburgh and St. Louis were among the first municipalities in the United

⁹ Edward I's ban on coal is mentioned in a variety of sources that discuss the history of pollution and coal. For example see, David Urbinato, "London's Historic 'Pea-Soupers,'" reposted from *EPA Journal* (summer 1994), accessed May 2, 2013, <http://www2.epa.gov/aboutepa/londons-historic-pea-soupers>.

States to enact local ordinances that regulated coal-fired emissions. In both cities, the early efforts at smoke abatement involved cooperation between local officials, residents, and business owners, including industrialists. The Progressive era interest in air pollution control also had an international element. For example, Berlin developed its own plans for combatting the negative consequences of using coal as a primary source of energy.¹⁰ At the time, most reformers focused on air quality in urban areas. The public power movement was no different.

In the 1920s, Gifford Pinchot and Morris Cooke argued that their Giant Power proposal would ease pollution in Pennsylvania's cities because it would allow residents and businesses to replace their coal-fired furnaces with those that utilized electricity. Giant Power, however, did not abandon coal as a fuel source. To do so would have been impractical given the paucity of viable hydroelectric sites in Pennsylvania. Instead, Pinchot and Cooke called for the construction of several large coal-fired power plants in the state's mining region. High voltage transmission lines would ferry the electricity to population centers, thereby demonstrating one of its major advantages as a source of energy.¹¹ As Pinchot put it, "To the dwellers in industrial cities it [large volumes of electric power produced at a distant location] means freedom from the smoke nuisance and ash nuisance."¹² He believed that his plan to supply the state with electricity would improve air quality in places like Pittsburgh and Philadelphia while ensuring that residents and factories retained access to a large supply of inexpensive energy.¹³ At a time when social

¹⁰ Frank Uekoetter, *The Age of Smoke: Environmental Policy in Germany and the United States, 1880-1970* (Pittsburgh: Pittsburgh University Press, 2009), 20-112.

¹¹ See, Gifford Pinchot, "Governor Pinchot's Message of Transmittal," in *Report of the Giant Power Survey Board to the General Assembly of the Commonwealth of Pennsylvania*, eds. Morris Llewellyn Cooke and Judson C. Dickson (Harrisburg: The Telegraph Printing Co., 1925), v-vi and xii-xiii; and Morris Llewellyn Cooke, "General Report of Director to Board," in *Report of the Giant Power Survey Board to the General Assembly of the Commonwealth of Pennsylvania*, eds. Morris Llewellyn Cooke and Judson C. Dickson (Harrisburg: The Telegraph Printing Co., 1925), 18-19 and 29-30.

¹² Pinchot, "Governor Pinchot's Message of Transmittal," v.

¹³ It is worth noting that most scholars have analyzed Gifford Pinchot's and Morris Cooke's Giant Power proposal as an economic and political document; see, Christopher F. Jones, "Energy Landscapes: Coal Canals, Oil Pipelines,

reformers were attacking aesthetic nuisances and threats to public health in the nation's cities, the promotion of electric power as a source of clean energy was an appealing option.¹⁴ Because it allowed one to separate the consequences of energy production from the site of consumption, electricity buttressed the impulse toward managed development that formed the major thrust of the larger conservation movement.¹⁵

Similarly, the TVA's Office of Power and its Board of Directors initially treated air pollution as an urban phenomenon for which electricity represented a convenient solution. As discussed in Chapters One and Two, the ideals of the public power movement shaped the Authority's energy policies and the agency's transition to coal-fired power in the 1950s and 1960s.¹⁶ Between 1945 and 1973, the TVA improved its generating capacity from a little more than 2.5 million kilowatts to almost twenty-two million kilowatts, making it the largest wholesale distributor of electricity in the United States.¹⁷ Although the agency produced 80 percent of its energy from hydroelectric sources in the immediate aftermath of World War II, it

Electricity Transmission Wires in the Mid-Atlantic, 1820-1930" (PhD diss., University of Pennsylvania, 2009), 261-365; Phillips, *This Land*, 25-9; Philip J. Funigiello, *Toward a National Power Policy: The New Deal and the Electric Utility Industry, 1933-1941* (Pittsburgh: University of Pittsburgh Press, 1973), 126-8; and Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983), 297-313. I believe that it is worth reexamining Giant Power as a policy with clear environmental intentions.

¹⁴ For a discussion of social reform in urban areas in the pre-New Deal era, see Daniel T. Rodgers, *Atlantic Crossings: Social Politics in a Progressive Age* (Cambridge: Belknap Press of Harvard University Press, 1998); Michael E. McGerr, *A Fierce Discontent: The Rise and Fall of the Progressive Movement in America, 1870-1920* (New York: Free Press, 2003); and Uekoetter, *The Age of Smoke*.

¹⁵ Theoretically, at least, electricity made it possible to improve the lives of individuals and communities by encouraging greater energy use without forcing consumers to endure the consequences of burning large volumes of coal at close proximity to their residences and businesses. One could argue, then, that electric power produced at a distant location was the first green energy. Although the use of the word "green" is anachronistic in this sentence, the sentiment that electricity was a form of energy that could be used in abundance without causing pollution problems is apt.

¹⁶ See Chapter One and Chapter Two of this dissertation.

¹⁷ The total for at the end of 1945 was 2,538,900 kilowatts. This had ballooned to 21,892,480 kilowatts by the end of the 1973 fiscal year; see, TVA, *Annual Report, 1973* (Government Printing Office: Washington, DC, 1973), 4-5; and TVA, *Annual Report, 1946* (Government Printing Office: Washington, DC, 1946), 9.

generated more than half of its electricity at coal-fired facilities by 1954.¹⁸ In 1970, coal plants accounted for eighty percent of the TVA's overall capacity, and in any given year they produced close to ninety percent of the agency's electric power.¹⁹ Including a smaller facility that it erected during World War II, the Authority designed and built a total of eleven coal-fired steam plants prior to 1973, absorbing several others into its power network as well.²⁰

¹⁸ Erwin C. Hargrove, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990* (Princeton: Princeton University Press, 1994), 126; and TVA, *Annual Report, 1954* (Government Printing Office: Washington, DC, 1954), 1.

¹⁹ TVA, *Annual Report, 1970* (Government Printing Office: Washington, DC, 1970), 2; and Hargrove, *Prisoners of Myth*, 126.

²⁰ In order of their construction starts: Watts Bar, 1940 (near Spring City, TN, since closed); Johnsonville, 1949 (former site of Johnsonville, TN); Widows Creek, 1950 (near Bridgeport, AL); Shawnee, 1951 (near Paducah, KY); Kingston, 1951 (near Kingston, TN); Colbert, 1951 (near Wilson Dam, AL); John Sevier, 1952 (near Rogersville, TN); Gallatin, 1953 (near Gallatin, TN); Paradise, 1959 (near former town of Paradise, KY); Bull Run, 1962 (near Oak Ridge, TN); Cumberland, 1968 (near Cumberland City, TN). In addition to several smaller coal-fired plants throughout the years, the TVA absorbed one major facility, the Allen Steam Plant, from the city of Memphis in 1965. The facilities that the TVA constructed were routinely among the largest in the world. For example, the agency projected that its first postwar plant, the Johnsonville Steam Plant, would have the second highest generating capacity of any known coal-fired plant in 1950. In the subsequent decades, the Authority's Kingston, Paradise, and Cumberland facilities all set records for overall capacity at the time of their respective completions. See, H. J. Petersen, "Johnsonville Steam Plant of the TVA," reprinted from *Combustion*, December 1950, 2, National Archives and Records Administration Southeast Branch, Morrow, GA [hereafter: NARA-SE], Record Group 142 [hereafter: RG 142], Office of Engineering Design and Construction, Project Histories and Reports [hereafter: OEDC], Box 578. Kingston Steam Plant was the largest in the world from 1955 until 1963 see, TVA, *The Kingston Steam Plant: A Report on the Planning, Design, Construction, Costs, and First Power Operations*, Technical Report No. 34 (Knoxville: TVA, 1965), 1; and "Celebration is Slated for Completion of T.V.A. Plant," *New York Times*, November 12, 1955, 25. Regarding Paradise Steam Plant and Cumberland Steam Plant see, TVA, *The Paradise Steam Plant Unit 3: The Planning, Design, Construction, Costs, and First Power Operations of the One-Unit Addition*, Technical Report No. 39 (TVA: Knoxville, 1979), 8. Additionally, although it was not among the largest plants in terms of overall capacity, the TVA's Bull Run facility possessed the biggest single generating unit ever designed and built for a coal-fired power plant when it was finished in 1967. The Authority's steam plants also set records for their efficiency. As the individual generating units increased in size, they were able to use less coal to produce the same amount of electric power. Although the agency's initial facility at Watts Bar required approximately one pound of coal per kilowatt-hour of electricity, Bull Run used less than 12 ounces of coal per kilowatt-hour. In 1969, the Federal Power Commission noted that the TVA had the most efficient multi-plant steam-generating system in the United States. On Bull Run see, TVA, *Annual Report, 1954*, 16-7; TVA, *Annual Report, 1960* (Washington, D.C.: Government Printing Office, 1960), 8 and 10; "Expansion Plans Outlined by T.V.A.," *New York Times*, July 19, 1964, F22; and "New T.V.A. Generating Unit is Termed Largest in World," *New York Times*, November 21, 1965, F11. On gains in efficiency see, TVA, *The Kingston Steam Plant*, Technical Report No. 34, 8-9; TVA, *Annual Report, 1954*, 16-7; and Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part III, 6, TVA-RL. On the Federal Power Commission see, TVA, *Annual Report, 1971* (Washington, D.C.: Government Printing Office, 1971), 30-1; for other comparisons regarding efficiency see, TVA, *Annual Report, 1954*, 36; TVA, *Annual Report, 1955* (Washington, D.C.: Government Printing Office, 1955), 29; TVA, *Annual Report, 1956* (Washington, D.C.: Government Printing Office, 1956), 5; and TVA, *Annual Report, 1957* (Washington, D.C.: Government Printing Office, 1957), 32. The Authority's decision to design and construct a system of the largest, most efficient coal-fired power plants in the decades following World War II demonstrated the agency's commitment to the consumption-centric energy policies that had their roots in the public power wing of the conservation movement of the early twentieth century. The belief that access to an abundant supply of inexpensive

At the time of the TVA's transition to coal-fired power, three of the area's largest municipalities suffered from poor air quality as a result of their reliance on coal as a primary fuel source. Thousands of individual furnaces in homes and businesses bathed Knoxville, Chattanooga, and Nashville in soot and fumes. The problem was particularly bad in the winter when residents relied on coal to heat their houses. The region's topography did not help. High ridges surrounded Chattanooga, leaving the city subject to frequent temperature inversions that prevented the dilution of smoke through atmospheric mixing, trapping noxious emissions at ground level. Both Knoxville and Nashville also suffered from periods of atmospheric stagnation that hindered the dissipation of airborne pollutants. TVA employees who spent time in these cities recalled that smoke billowing from the chimneys of homes and factories soiled clothing and interior decorations. At times, the clouds became so thick that it was difficult to see across the street, and urban residents who worked outside often had to cover their faces to seek relief from the dust and fumes. Describing the problem in an interview many years later, W. C. Whisenant commented wryly, "You could see a layer [of haze] and couldn't see Chattanooga."²¹

electricity would encourage higher levels of energy use, raising standards of living by promoting industrial growth and the proliferation of in-home appliances, formed the foundation of the expansion of the TVA's power program in the 1950s and 1960s. In addition to this consumption-centric philosophy, the burgeoning needs of the military industrial complex in the early Cold War period helped the Authority garner national support for its new coal-fired facilities. Finally, the physical size of the plants and the fact that the TVA designed them as tourist attractions to exhibit the latest advances in engineering and technology represented a continuation of the agency's policy of using its facilities to link the Authority symbolically with progress. Together, the TVA's focus on increasing consumption, its connection with the Cold War state, and its emphasis on technological displays formed the technopolitical regime that shaped the Authority's expansion into coal-fired power. For a more detailed discussion of technopolitics and the TVA's transition to coal-fired power see, Chapter Two.

²¹ No Author, "Conversation with W. C. Whisenant on Employee Orientation Program," May 26, 1982, 9-10 (quote from 10), NARA-SE, RG 142, Oral History Records [hereafter: OHR], Box 1; "TVA is Seeking to Give Lead in Air Pollution Control," *New York Times*, February 1, 1970, F15; Aubrey J. Wagner, "TVA's Role and Its Effect on the Environment," remarks before the Tennessee Group, Sierra Club, Nashville, Tennessee, November 12, 1971, 6, NARA-SE, RG 142, Power Manager's File [hereafter: PMF], Box 138; Mary Jane Lowe, "Oral History Interview with Joseph Swidler," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, June 18, 1991, no pagination, NARA-SE, RG 142, OHR, Box 8; "Electric Power and Clean Air – Can We Have Both?" *Tennessee Valley Perspective*, Summer 1973, 3(4), 19-20; TVA, *Annual Report, 1967* (Government Printing Office: Washington, DC, 1967), 6; and TVA, *Annual Report, 1968* (Government Printing Office: Washington, DC, 1968), 12.

As it had for Pinchot and Cooke in Pennsylvania, the TVA's decision to build its massive, coal-fired facilities in rural locations seemingly represented a solution to the problem of urban air quality.²² Although the Authority's engineers and the Office of Power considered a variety of factors when siting its new steam plants, including land prices, access to a steady water supply, the availability of cheap labor, and the cost of transporting coal, they tried to ensure that the operation of the agency's facilities would neither create aesthetic nuisances nor threaten the health of the residents in major urban areas.²³ As noted in Chapter Three, the TVA rejected Bordeaux, Tennessee, as a location for a coal-fired facility in 1941 because its proximity to downtown Nashville would exacerbate the city's pollution problems and reflect poorly on the cleanliness of TVA electricity and the agency's power program.²⁴

The Authority was successful in its effort to isolate its facilities. The TVA did not locate any of its coal-fired power plants within fifteen miles of an urban area. The Paradise Steam Plant was among the agency's most remote. Situated almost 100 miles from the nearest city, Nashville, the five mile radius around Paradise was home to 1,700 residents as of 1978, with only 16,800 people living less than ten miles from the facility. In contrast, when the city of

²² In the tradition of the conservation movement, the TVA's leadership and staff understood much of the agency's mission to include the improvement of the environment of the Tennessee Valley. For secondary literature see, Phillips, *This Land*, 1-106; David E. Lilienthal, *TVA: Democracy on the March* (New York: Harper & Row, 1944); Gordon Clapp, *The TVA: An Approach to the Development of a Region* (Chicago: Chicago University Press, 1955); Wilmon Henry Droze, *High Dams and Slack Waters: TVA Rebuilds a River* (Baton Rouge: Louisiana State University Press, 1965); and Judson King, *The Conservation Fight: From Theodore Roosevelt to the Tennessee Valley Authority* (Washington, DC: Public Affairs Press, 1959).

²³ This is not to say that environmental concerns always outweighed economic ones in the siting process. Structural and operational costs, especially the estimated cost of procuring coal, made up the bulk of site assessments; see, TVA, *The Johnsonville Steam Plant: A Comprehensive Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Six-Unit Plant*, Technical Report No. 31 (TVA: Knoxville, 1958), 1-29, copy in NARA-SE, RG 142, OEDC, Box 586; TVA, *The Paradise Steam Plant: A Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Two-Unit Plant*, Technical Report No. 37 (Knoxville, TN: TVA, 1964), 1-24, copy in NARA-SE, RG 142, OEDC, Box 636; Memorandum, G.P. Palo to A.J. Wagner, "Northwestern Area Steam Plant," October 1, 1959, NARA-SE, RG 142, OEDC, Box 628; and TVA, *The Paradise Steam Plant Unit 3*, Technical Report No. 39, 1-26. On the TVA's use of cost-benefit analysis see, 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).

²⁴ S. H. Woodward and W. H. Chambers, "Preliminary Report: Additional Power Generation Capacity in Steam Plants," internal report, June 20, 1941, 3, NARA-SE, RG 142, OEDC, Box 95.

Memphis constructed the Allen Steam Plant approximately nine miles from its downtown, the facility sat within five miles of 37,000 city residents and within ten miles of 323,000 people.²⁵

The decision to place its power plants in relatively rural locations also helped the agency to reduce expenses related to pollution control that might have otherwise required the TVA to raise its rates. The Authority benefited from the lower land values and construction costs that prevailed outside of the Tennessee Valley Region's cities. More importantly, TVA engineers and the Office of Power learned that they could limit the effect of emissions on urban communities and invest in less expensive plant designs by building the agency's facilities far from pollution centers.²⁶

Throughout the 1950s, the Office of Power used the isolation of the agency's steam plants to justify a minimalist approach to regulating emissions. By the end of World War II, several different devices existed for limiting the release of fly ash that coal-fired facilities produced as a byproduct of normal operations. Comprised of the tiny remnants of incinerated coal, fly ash easily became airborne, and in large quantities, it could become an aesthetic nuisance.²⁷ In many cities, utilities used electrically charged plates called electrostatic precipitators to remove fly ash from flue gases before it would be released into the atmosphere. The Authority, however, chose to outfit its power plants with cheaper, less efficient mechanical

²⁵ All population data current as of 1978; see, Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part III, 7, TVA-RL. In terms of distance, Bull Run and Allen are located closer to metropolitan areas than any of the other coal-fired facilities in the Authority's system. Bull Run is 15 miles from Knoxville while Allen sits less than 10 miles from Memphis, although it was not designed or built by the Authority. The next closest plant, the Gallatin Steam Plant is approximately 30 miles from Nashville but the prevailing winds around the plant do not blow toward the city.

²⁶ The TVA used this argument when rejecting Bordeaux; see S. H. Woodward and W. H. Chambers, "Preliminary Report: Additional Power Generation Capacity in Steam Plants," internal report, June 20, 1941, 3, NARA-SE, RG 142, OEDC, Box 95. Also see Chapter Three.

²⁷ The particulates also posed a health risk, although this was not understood fully at the time. For a survey of coal smoke and urban pollution see, Uekoetter, *The Age of Smoke*. In particular, it was difficult to remove fly ash from surfaces on which it settled, and it was responsible for the dust problems that plagued industrial cities. The difficulty of cleaning fly ash will be discussed in the next chapter; also see, Memorandum, John G. Holmes, Jr., to A. T. Secor, "Complaints by Residents of Paradise Village on Ash Fallout – Paradise Steam Plant," March 24, 1965, NARA-SE, RG 142, PMF, Box 802.

collectors. Notwithstanding internal concerns over the actual effectiveness of these collectors relative to the capabilities of the more efficient precipitators, the Office of Power convinced the Board of Directors that the less expensive collectors would suffice outside urban areas.²⁸ For other pollutants, the agency initially planned to do even less, relying solely on its power plants' remote location and the wind to dilute smoke and fumes and spare local residents of their harmful effects.²⁹

The Office of Power's preference for inexpensive pollution controls reflected its commitment to the TVA's consumption-centric energy regime. Gabriel O. Wessenauer, the manager of the Office of Power from 1944 until 1970, was a devotee of David Lilienthal, who believed strongly in the role that cheap electricity could play in improving life in the Tennessee Valley Region.³⁰ Born in Pennsylvania in 1906, Wessenauer graduated from Carnegie Institute of Technology with a degree in civil engineering. He worked for several years at the West Virginia Power and Transmission Company and the West Penn Power Company before joining the TVA in 1935. By 1941, he was the assistant manager of the Office of Power, becoming manager three years later.³¹ According to Wessenauer, electric power was a transformative force for public good, promoting industrialization and economic growth as well as national strength.³²

²⁸ TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 2-3, 7-9, 54-5 and 110-2, NARA-SE, RG 142, OEDC, Box 131. Also see, Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part II, 10-1, TVA-RL.

²⁹ According to TVA employees, accepted industry practices required the installation of mechanical collectors and smokestacks just tall enough to get emissions out of the building for rural power plants; see, Mark Winter, "Oral History Interview with Dr. Francis E. Gartrell," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, April 26, 1983, 52, NARA-SE, RG 142, OHR, Box 3.

³⁰ Wessenauer's affinity for Lilienthal's policies for and understanding of electricity is rather clear in his interviews and speeches. It is also worth noting that TVA staff noted his devotion as well; see, Lowe, "Oral History Interview with Joseph Swidler," no pagination, NARA-SE, RG 142, OHR, Box 8.

³¹ On Wessenauer's background, see Roland A. Kampmeier, "Gabriel Otto Wessenauer, 1906-1990," in *Memorial Tributes: National Academy of Engineering*, vol. 6, ed. National Academy of Engineering of the United States of America (Washington, D.C.: National Academy Press, 1993), 251.

³² Mark Winter, "Oral History Interview with G. O. Wessenauer," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, June 29, 1983, 33-7 and 43-4, NARA-SE, RG 142, OHR, Box 9; Mary Jane

Electricity's greatest benefit, he believed, accrued in the home, where it allowed rural residents to gain the advantages of urban living, including running water and access to a safe, reliable source of light.³³ Furthermore, electric power reduced the burden of daily chores, helping farmers improve their production while theoretically freeing women for more fulfilling pursuits.³⁴ Electricity meant better living, and in Wessenauer's opinion, it was the TVA's duty "to make the power available at the lowest possible cost for the benefit of the consumer."³⁵

Wessenauer's passion for inexpensive electricity was well known to his friends and foes throughout the TVA. When he left the agency, rumors circulated that he had retired rather than assent to a rate increase.³⁶ While to some he was a smart man of strong convictions who cared deeply about the well-being of the people in the Authority's service area, to others he was a single-minded dictator who took advantage of his close relationship with the TVA's leadership to ensure the success of his preferred policies.³⁷ Wessenauer struck both his supporters and detractors as a man with a forceful personality who molded the both Office of Power and

Lowe, "Oral History Interview with G. O. Wessenauer," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, May 22-23, 1990, 13-4 and 46, NARA-SE, RG 142, OHR, Box 10; and G. O. Wessenauer, "TVA and Rural Electrification," speech before the annual meeting of members of the Tennessee Rural Electric Cooperative Association, Nashville, TN, January 8, 1946, 13 University of Tennessee at Knoxville, John C. Hodges Library, Special Collections [hereafter: UTK: Hodges], TVA Pamphlet Collection 1934-1960 [hereafter: TVA PC], Box 4, Folder 8.

³³ Winter, "Oral History Interview with G. O. Wessenauer," 44, NARA-SE, RG 142, OHR, Box 9; Lowe, "Oral History Interview with G. O. Wessenauer," 51, NARA-SE, RG 142, OHR, Box 10; and G. O. Wessenauer, "TVA and Rural Electrification," 4-5, UTK: Hodges, TVA PC, Box 4, Folder 8.

³⁴ Winter, "Oral History Interview with G. O. Wessenauer," 32-3, NARA-SE, RG 142, OHR, Box 9; Lowe, "Oral History Interview with G. O. Wessenauer," 51-2, NARA-SE, RG 142, OHR, Box 10; and G. O. Wessenauer, "TVA and Rural Electrification," 4, UTK: Hodges, TVA PC, Box 4, Folder 8.

³⁵ The emphasis is as it is in the original transcript. For quote see, Lowe, "Oral History Interview with G. O. Wessenauer," 47, NARA-SE, RG 142, OHR, Box 10. For similar sentiments on what electricity "meant" see, Winter, "Oral History Interview with G. O. Wessenauer," 44, NARA-SE, RG 142, OHR, Box 9.

³⁶ Mary Jane Lowe, "Oral History Interview with A. A. Foster," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, March 7, 1991, 32, NARA-SE, RG 142, OHR, Box 3.

³⁷ For favorable descriptions of Wessenauer; see, Mary Jane Lowe, "Oral History Interview with Robert Marquis," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, April 19, 1991, no pagination, NARA-SE, RG 142, OHR, Box 6. and No Author, "Conversation with Jim Ward on Employee Orientation Program," May 26, 1982, 27-9, NARA-SE, RG 142, OHR, Box 1. For a hostile description; see, Lowe, "Oral History Interview with A. A. Foster," 15-6, 9, and 32, NARA-SE, RG 142, OHR, Box 3. Although less disgusted by Wessenauer's influence, Joseph Swidler also suggested that the Power Manager benefited from his close relationship with agency leaders like Aubrey Wagner; see, Lowe, "Oral History Interview with Joseph Swidler," no pagination, NARA-SE, RG 142, OHR, Box 8.

agency-wide policy relating to the power program.³⁸ As Roberts and Bluhm have noted, the Authority possessed a diffuse bureaucratic structure that concentrated decision-making at the division level. Although the TVA's general manager was nominally responsible for resolving disagreements between offices and implementing the board of directors' preferred policies, he lacked the staff or resources to adjudicate any except the most important of conflicts. This institutional weakness rewarded division heads like Wessenauer who had "strong personalities" and "well-defined goals."³⁹ For the duration of his tenure at the Authority, a career that spanned four different chairmen, Wessenauer and the Office of Power routinely resisted the implementation of regulations, procedures, or technologies that threatened its consumption-centric ethos. In particular, it opposed pollution control strategies that seemed likely to raise the cost of producing electric power, preferring those options that were least intrusive to the operation of its steam plants. As Wessenauer put it, "None of those environmental facilities make you a penny. You can't sell anything. You can't sell cleaner air, purer water. You just have to add the price on to the electricity and sell it to the electricity user."⁴⁰

The decision to isolate the Authority's facilities from the cities of Tennessee Valley Region reinforced the energy regime that the TVA first adopted under the leadership of David Lilienthal and Gordon Clapp. One of electricity's primary advantages was that it was transmittable over long distances, allowing the Authority to separate consumers from the byproducts of production. Many within the agency, including Wessenauer, believed that the power program's primary responsibility was to provide its service area with a plentiful supply of

³⁸ This has also been suggested by Marc Roberts and Jeremy Bluhm, who note that Wessenauer's second in command of the Office of Power, R. H. Kampmeier was similarly intimidating; see, Roberts and Bluhm, *The Choices of Power*, 78-95.

³⁹ Roberts and Bluhm, *The Choices of Power*, 78-95 (quoted text from 83).

⁴⁰ Lowe, "Oral History Interview with G. O. Wessenauer," 70, NARA-SE, RG 142, OHR, Box 10.

cheap kilowatts. Air pollution represented an urban phenomenon that the TVA could eliminate without increasing rates.

Overwhelmed with Concern: Project Authorization 594

Throughout its transition to coal-fired power, however, voices within the Authority questioned whether or not the agency was doing enough to control its facilities' emissions. During the post-World War II era, a group that included many scientists worked to create an expanded role for the TVA in the fight against air pollution. As early December 1948, agency staff began expressing concern about the risks that the Authority's proposed facility at Johnsonville, Tennessee, posed to the environment. For example, John Ferris, the TVA's manager of reservoir and community relations sent a memorandum to the agency's chief engineer asking if the Authority had considered installing devices to limit the emission of fly ash.⁴¹ Ferris feared that the airborne particulates would constitute a nuisance at Johnsonville if left unregulated, sullyng areas around the power plant that had the potential to become locations for residential and commercial developments as well as sites for outdoor recreation.⁴² In a memorandum dated April 20, 1949, the TVA's Director of Health, Dr. E. L. Bishop, expressed a similar concern, urging his colleagues to analyze "the potentiality of air contamination of the environment by sulfur compounds."⁴³ Focusing on the public health threat that Johnsonville posed, Bishop argued that the TVA ought to determine the amount of sulfur dioxide that its coal-

⁴¹ Memorandum, John P. Ferris to C. E. Blee, "Fly Ash at New Johnsonville Steam Plant," December 8, 1948, quoted in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part I, 9, TVA-RL.

⁴² Memorandum, John P. Ferris to C. E. Blee, "Fly Ash at New Johnsonville Steam Plant," December 8, 1948, quoted in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part I, 9, TVA-RL.

⁴³ Memorandum, Dr. E. L. Bishop to R. N. Clark, "New Johnsonville Steam Plant – Fly Ash Problem," April 20, 1949, quoted in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part I, 11, TVA-RL.

fired facilities were releasing into the atmosphere. Furthermore, he suggested that it was incumbent upon the agency to seek information regarding the concentrations at which sulfur dioxide became toxic to humans, plants, and animals.⁴⁴

Ferris' and Bishop's memoranda reflected their apprehension that the expansion of the power program would adversely affect the Authority's mission regarding conservation. Francis E. Gartrell, a scientist who worked in the TVA's Division of Health and Safety, recalled that he and his colleagues became alarmed when they learned how big the Authority's new power plant at Johnsonville was going to be and what environmental consequences future plants were likely to have.⁴⁵ From an investigation by R. N. Clark and Fred Thomas, two engineers whose job it was to study sanitation, Gartrell and his coworkers discovered that the agency planned to burn coal with a relatively high sulfur content at Johnsonville. As Gartrell put it, "We were just overwhelmed by the prospects of the tons of SO₂ that were going to be emitted from that plant when they got all six units, and later planned four more, in operation."⁴⁶ To make matters worse, a survey of the area around the agency's Watts Bar facility, a steam plant that was considerably smaller than those that the TVA was planning to build, revealed significant damage to vegetation that had gone unreported or unrecognized by the power plant's staff. When coupled with a deadly incident involving sulfur dioxide exposure in Pennsylvania in the fall of 1948, the problems exhibited at Watts Bar heightened internal fears that the Authority's massive power plants posed a threat to the general public.⁴⁷

⁴⁴ Memorandum, Dr. E. L. Bishop to R. N. Clark, "New Johnsonville Steam Plant – Fly Ash Problem," April 20, 1949, quoted in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part I, 11, TVA-RL.

⁴⁵ Winter, "Oral History Interview with Dr. Francis E. Gartrell," 50-3, NARA-SE, RG 142, OHR, Box 3.

⁴⁶ Winter, "Oral History Interview with Dr. Francis E. Gartrell," 50, NARA-SE, RG 142, OHR, Box 3.

⁴⁷ Winter, "Oral History Interview with Dr. Francis E. Gartrell," 50-3, NARA-SE, RG 142, OHR, Box 3.

Several events in the years after World War II had focused international attention on the health hazards associated with coal smoke. Between October 27 and October 31, 1948, dust and fumes inundated the town of Donora, Pennsylvania, killing at least twenty people and perhaps hastening the deaths of fifty more. Donora was located on a bend in the Monongahela River thirty miles from Pittsburgh. Situated in a valley with numerous factories and heavy industries and flanked by steep ridges that were approximately 400 feet tall, the community was susceptible to prolonged periods of poor air quality especially when adverse meteorological conditions prevented the dispersion of pollutants. During the five-day incident, residents reported that a dense fog covered their town, making it difficult to see. Studies confirmed that a period of atmospheric inversion had trapped emissions in the valley, and they traced the source of most of the pollution to a zinc factory near the community that burned coal as part of its smelting operation, releasing large amounts of sulfur dioxide, a respiratory irritant that can lead to lung infections such as pneumonia and bronchitis and in extreme cases can cause pulmonary arrest.⁴⁸ In another highly publicized disaster four years later, smog claimed the lives of over 4,000 London residents. Acute exposure to sulfur dioxide was again the primary cause of death.⁴⁹ Both of these events received a great deal of coverage from the press, and they led to a

⁴⁸ Uekoetter, *The Age of Smoke*, 118 and 302n13; Lynn Page Snyder, “‘The Death-Dealing Smog over Donora, Pennsylvania’: Industrial Air Pollution, Public Health, and Federal Policy, 1915-1963” (PhD diss., University of Pennsylvania, 1994); and Lynn Page Snyder, “Revisiting Donora, Pennsylvania’s 1948 Air Pollution Disaster,” in *Devastation and Renewal: An Environmental History of Pittsburgh and Its Region*, ed. Joel A. Tarr (Pittsburgh: University of Pittsburgh Press, 2003), 126-44. The incident received national news coverage for several years; see, “Survivors of Smog Flee to High Land,” *New York Times*, November 1, 1948, 12; “Monongahela Valley Air to be Checked,” *Washington Post*, November 5, 1948, 25; “Clear Factory Linked to Fog that Killed 19,” *Chicago Daily Tribune*, November 6, 1948, 13; “Federal Experts will Study Smog,” *New York Times*, November 19, 1948, 55; Dr. Theodore R. Van Dellen “How to Keep Well: The Donora Catastrophe,” *Chicago Daily Tribune*, April 6, 1949, 24. The event also sparked panics in several towns that experienced smaller events; see, “Town Gets Gas Scare,” *Washington Post*, November 25, 1948, 13; and “Smog Tension Grips 2-State Area; Scores Ill,” *Washington Post*, December 4, 1948, 9.

⁴⁹ Uekoetter, *The Age of Smoke*, 118 and 302n13; TVA Division of Health and Safety, “Project Authorization Serial No. 594: Air Pollution Studies Johnsonville Steam Plant Report of Progress Calendar Year 1955,” (TVA: Wilson Dam, AL, 1956), 12, NARA-SE, RG 142, OEDC, Box153; and Michelle L. Bell, Devra L. Davis, and Tony

growing unease over the use of coal and its relationship with environmental quality and public health.⁵⁰ As the TVA began its expansion in the 1950s, internal documents referenced the two disasters as examples of the potential consequences that could result from the agency's decision to build large, coal-fired power plants. The incident at Donora proved to be particularly relevant to the Authority because of the similarities between the topography of western Pennsylvania and parts of the TVA's service area.⁵¹

In the southeastern corner of Tennessee, the history of Great Copper Basin also demonstrated the long-term environmental damage that could result from concentrated sulfur emissions. Prospectors first found copper ore in the region in the 1800s, and a thriving smelting industry had developed by the Civil War. During the late nineteenth and early twentieth centuries, two companies built and operated large open-furnaces to extract metal from the ore, making the Basin the largest copper producer in the southeast. The smelting process devastated the surrounding hillsides, releasing copious amounts of sulfur dioxide gas that destroyed trees and shrubs. When the TVA first surveyed the region in the 1930s, the land looked like a moonscape, while locals referred to the site as the great copper desert. All of the vegetation had died years earlier, leaving the hills to erode, choking streams, and leaching all of the nutrients from what little soil remained. The clouds of concentrated sulfur emissions from the smelters

Fletcher, "A Retrospective Assessment of Mortality from the London Smog Episode of 1952: The Role of Influenza and Pollution," *Environmental Health Perspectives* 112 (January 2004): 6-8.

⁵⁰ Uekoetter, *The Age of Smoke*, 118 and 302n13; and TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies Johnsonville Steam Plant Report of Progress Calendar Year 1955," (TVA: Wilson Dam, AL, 1956), 12, NARA-SE, RG 142, OEDC, Box153. Interestingly, several British politicians requested copies of the final analysis of the pollution event at Donora to help them design similar studies of London; see, "Donora Report to Aid Britain in Smog Fight," *New York Times*, December 29, 1952, 6.

⁵¹ On Donora and London disasters within TVA documents see, TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 71, NARA-SE, RG 142, OEDC, Box 131; TVA Division of Health and Safety, "Project Authorization No. 594: Air Pollution Studies TVA Steam Plants Calendar Year 1954," (TVA: Wilson Dam, AL, 1955), 4-5, NARA-SE, RG 142, OEDC, Box153; TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies Johnsonville Steam Plant Report of Progress Calendar Year 1955," (TVA: Wilson Dam, AL, 1956), 12, NARA-SE, RG 142, OEDC, Box153; Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part V, 7, TVA-RL.

had poisoned the area.⁵² Power plants also produced large amounts of sulfur dioxide depending on the chemical composition of the coal that they burned, and the Authority expected to procure most of its coal from fields that had high sulfur content.⁵³

The potential for similar public health incidents and growing evidence of environmental degradation compelled the TVA's board of directors to authorize a comprehensive study of pollution at the agency's power plants.⁵⁴ Known as Project Authorization Number 594 (PA 594), the study assessed the effect of different factors, including atmospheric conditions and smokestack height, on the dispersion of sulfur dioxide and, to a lesser extent, fly ash. In

⁵² On the Great Copper Basin; see, Murray Wyche, "The Great Copper Desert Will Bloom Once More: TVA and Mining Company Aid in Nature's Fight," unassigned newspaper article, NARA-SE, RG 142, OEDC, Box 89; Robert Sparks Walker, "Land of Naked Dreams as Naturalist Sees It: Walker Views Copper Basin," unassigned newspaper article, NARA-SE, RG 142, OEDC, Box 89; and Melissa E. Morris, "Ducktown/Copper Basin Oral History Interview Series Proposal," internal report, August 3, 1993, NARA-SE, RG 142, OHR, Box 12. It should be noted that the furnaces used wood rather than coal. The sulfur damage in the Great Copper Basin resulted from the sulfur dioxide released by the smelted copper ore.

⁵³ The TVA expected to procure most of its coal from fields in eastern Tennessee, Kentucky, southern Illinois, and southern Indiana. The coalfields that ran underneath Illinois, Indiana, and western Kentucky, in particular, produced coal that had high sulfur content; see, Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part VI, 42, TVA-RL. In fact, the Authority studied several incidents involving smelters, including one in British Columbia, Canada, in which sulfur dioxide emissions became trapped in the Columbia River Gorge, damaging plants and causing health problems for local communities. See, Memorandum, A. V. Slack and L. B. Hein to Office of Chemical Engineering Files, "Recovery of Sulfur Dioxide from Power Plant Stack Gas: Visits to Consolidated Mining and Smelting Company, Crown-Zellenbach Corporation, Union Oil Company, Monsanto Chemical Company, and E. P. Fleming, Consultant," February 10, 1953, 1-21, NARA-SE, RG 142, OEDC, Box 70; Official Meeting Summary, A. V. Slack, "Conference on Recovery of Sulfur Dioxide from Steam Plant Gases," November 3, 1952, 2, NARA-SE, RG 142, OEDC, Box 70; and TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 7, NARA-SE, RG 142, OEDC, Box 131.

⁵⁴ Although the TVA's leadership was aware of the Donora incident, the Great Copper Basin, and the worry regarding air pollution that was percolating through various departments within the agency, the Board of Directors chose not to force significant changes to the design of the Johnsonville Steam Plant. Winter, "Oral History Interview with Dr. Francis E. Gartrell," 51-2, NARA-SE, RG 142, OHR, Box 3. Several offices within the Authority initiated scientific studies in the late 1940s and early 1950s. By 1952, the number of departments that had a compelling interest in the results of this research had grown so great that the Board of Directors decided to collect the separate investigations under a single umbrella program, voting in favor of the comprehensive project "to evaluate and to recommend necessary control measures for existing and potential air pollution problems associated with TVA steam plants." Reflecting the initial uncertainty of TVA scientists regarding the effect that the Authority's facilities might have on the flora and fauna of the Tennessee Valley Region, the project's authorization statement had warned, "Atmospheric pollution from coal-fired steam plants in large enough quantities and under certain conditions may cause injurious effects on plants, soil, and man. Expected emissions of polluting gases from TVA steam plants now under construction are large." For quoted material in note, see "Air Pollution Studies and Control at TVA Steam Plants," Project Authorization, Serial No. 594, April 18, 1952, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part I, Appendix 2 (also quoted on 12), TVA-RL. Also see, Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part I, 11-2, TVA-RL.

addition, scientists conducted vegetation and soil surveys around the agency's facilities looking for signs of damage, while analyzing the toxicity of emissions and determining the amount of pollutants that each power plant released.⁵⁵

The initial results of PA 594 confirmed that the Authority's new facilities represented an environmental hazard. The first 125,000-kilowatt generating unit at Johnsonville began commercial operations on October 27, 1951. After the outbreak of the Korean War, the Authority compressed the original construction schedule for the facility, completing five more boilers by February 22, 1953.⁵⁶ The power plant stood on the eastern shore of Kentucky Reservoir in Humphreys County, Tennessee, surrounded by a landscape of sloping hills and high ridges. Much of the land on either side of the reservoir remained rural, and a matrix of low woodlands interspersed with open fields marked the local environment.⁵⁷ A healthy assortment of vegetation existed throughout the area, and the county contained stands of deciduous hardwoods, including red oak, elm, white oak, chestnut, sycamore, hickory, and white and American ash as well as a few conifers such as the shortleaf and loblolly pine.⁵⁸ A similar level of diversity existed in Benton County on the western shore of the reservoir. In both counties,

⁵⁵ Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part I, 11-3, TVA-RL; also see "Air Pollution Studies and Control at TVA Steam Plants," Project Authorization, Serial No. 594, April 18, 1952, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part I, Appendix 2, TVA-RL.

⁵⁶ TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 1 and 14, copy in NARA-SE, RG 142, OEDC, Box 586; the other units went into service on November 28, 1951, February 6, 1952, April 8, 1952, November 10, 1952, and February 22, 1953.

⁵⁷ See aerial photographs: TVA, *The Johnsonville Steam Plant*, Technical Report No. 31, 16, 20, and 30. Also see TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 29-33, NARA-SE, RG 142, OEDC, Box 131.

⁵⁸ See, TVA Division of Health and Safety, "Air Pollution Studies Johnsonville Steam Plant Report of Progress – Calendar Year 1953," (TVA: Wilson Dam, AL, 1954), Appendix A, NARA-SE, RG142, OEDC, Box 579; John C. Allen, "Report on Timber Damage Survey – Fall 1954, Johnsonville Steam Plant Area," (TVA: 1955), Table 2, NARA-SE, RG 142, OEDC, Box 579; and TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 29-33, NARA-SE, RG 142, OEDC, Box 131.

forestry served as the dominant form of land use for economic purposes, and the local forest products industry was relatively lucrative.⁵⁹

As early as May 1952, observers noticed damage to trees and shrubs in the wooded areas less than one mile southeast of the Johnsonville facility. Spotters had reported smoke and fumes from the power plant lingering at ground level. The leaves on the trees in the affected area looked as if they had suffered a chemical burn, and the markings were consistent with over-exposure to sulfur dioxide. Within a few weeks, the trees had completely dropped their foliage. Throughout the course of the summer, similar defoliations occurred around the power plant with the most severe instances located in a northeasterly direction within a mile of the facility. Although most of the trees recovered enough to sprout new leaves before the end of the growing season, the fact that the plant caused serious foliar injuries while operating at less than full capacity troubled TVA scientists.⁶⁰

The Authority's Division of Health and Safety delivered its report on the initial findings of PA 594 in February 1953, arguing that the data that it had collected demonstrated the need for future study and suggesting that "it appears reasonable to expect a serious air pollution problem...if additional control measures are not applied."⁶¹ The report focused on sulfur dioxide emissions, contending that they posed a greater threat to human health than fly ash.⁶² By way of comparison, the Division of Health and Safety analyzed the largest known coal-fired facilities in

⁵⁹ TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 29-33, NARA-SE, RG 142, OEDC, Box 131.

⁶⁰ TVA Division of Health and Safety, "Air Pollution Studies Johnsonville Steam Plant, July 1, 1951 – December 31, 1952," (TVA: Wilson Dam, AL, 1953), 53-9, NARA-SE, RG 142, OEDC, Box 579.

⁶¹ TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 11, NARA-SE, RG 142, OEDC, Box 131. Also quoted in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part II, 34, TVA-RL.

⁶² TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 2-3 and 7, NARA-SE, RG 142, OEDC, Box 131. At the time, fly ash was thought to be a simple nuisance, albeit one that frequently created aesthetic problems at steam plants. Later, fly ash was found to be a primary respiratory irritant.

the United States, finding that the Fisk and Crawford plants in Chicago and the Hudson Gold plant in New York emitted approximately 500 tons of sulfur dioxide every day when operating at full capacity and that these facilities had not caused any documentable damage to their surroundings. The Fisk, Crawford, and Hudson Gold plants, however, benefitted from favorable atmospheric conditions and topographical features that facilitated the dispersion of pollutants, something that could not be said of those that the Authority planned to build.⁶³ Additionally, when developed to their full capacity, each of the TVA's power plants would produce more sulfur dioxide than the facilities in either Chicago or New York, with some emitting over 1,600 tons per day. The Division of Health and Safety predicted that at least four of the agency's new steam plants, Kingston, Widows Creek, Johnsonville, and Shawnee, would each emit between two and four times the predicted maximum amount of sulfur dioxide that they could release safely on a daily basis. Because of "the enormous quantities of combustion products to be discharged" from the Authority's facilities, the agency's power network presented "a potential air pollution problem without precedent."⁶⁴ In this way, the Division of Health and Safety used PA 594 and its resulting report to argue that expanding the role of environmental research and public health in the agency's power program was necessary.

In response to the February release of the report on PA 594, the TVA established the Air Pollution Committee (APC) on May 12, 1953, "to assist in the coordination of our approach to

⁶³ TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 6-7, NARA-SE, RG 142, OEDC, Box 131. Smelters located in the Columbia River Valley (British Columbia, Canada) had caused considerable harm to local vegetation while releasing similar amounts of sulfur dioxide.

⁶⁴ TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 1-18 (see 2 for "enormous quantities" and 7 for "without precedent"), NARA-SE, RG 142, OEDC, Box 131. Indeed, the TVA was well aware that its plans to construct coal-fired power plants with capacities above 500,000 kilowatts were unprecedented; see, TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 146, NARA-SE, RG 142, OEDC, Box 131.

air pollution problems at steam plants.”⁶⁵ With representatives from the Division of Health and Safety, the Office of Power, the Office of Engineering, and the Office of Chemical Engineering, the APC functioned as a vehicle for sharing and discussing the results of research at TVA facilities, a clearinghouse for future studies, and an advisory body that recommended pollution control policies to the Board of Directors. As one of its first official tasks, the Committee debated the extension of PA 594.⁶⁶

Fractures quickly emerged within the APC, however. W. E. Dean, Jr., of the Office of Power and A. V. Slack of the Office of Chemical Engineering expressed concerns that the agency’s current study was too expensive, suggesting that the Authority ought to focus only on those projects that were absolutely essential. Both the Office of Power and the Office of Chemical Engineering were responsible for the operation of facilities that released potentially hazardous substances into the atmosphere, and they viewed the expansion of the agency’s research program as a possible threat to their missions. At Dean’s urging, the Committee agreed to assess the benefits of PA 594 and its associated costs.⁶⁷

Representing the Division of Health and Safety, Francis Gartrell argued that the results of the TVA’s initial survey underscored the necessity of continuing research at Johnsonville and establishing similar studies at all of the agency’s power plants, especially the Kingston Steam

⁶⁵ Memorandum, John Oliver to O. M. Derryberry, C. E. Blee, G. O. Wessenauer, and C. N. Young, “Air Pollution Committee,” May 12, 1953, quoted in F. E. Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” December 1978, vol. II, part VII, 1, TVA-RL.

⁶⁶ Official Summary, F. E. Gartrell, “Air Pollution Committee Meeting, June 5, 1953 – Report No. 1,” undated, in Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” vol. II, part VII, Appendix, TVA-RL; Official Summary, F. E. Gartrell, “Air Pollution Committee Meeting, June 19, 1953 – Report No. 2,” July 7, 1953, in Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” vol. II, part VII, Appendix, TVA-RL; and for an overview, Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” vol. II, part VII, 1-3, TVA-RL.

⁶⁷ Official Summary, F. E. Gartrell, “Air Pollution Committee Meeting, June 5, 1953 – Report No. 1,” undated, in Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” vol. II, part VII, Appendix, TVA-RL; Official Summary, F. E. Gartrell, “Air Pollution Committee Meeting, June 19, 1953 – Report No. 2,” July 7, 1953, in Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” vol. II, part VII, Appendix, TVA-RL.

Plant. Gartrell had graduated from Mississippi State University in 1933 with a degree in electrical engineering. He had become interested in the field of public health and earned a fellowship to study sanitary engineering at Harvard, eventually completing a PhD at Johns Hopkins. Prior to joining the TVA, Gartrell worked on a malaria control project for the Mississippi Board of Health, conducting similar research after joining the Authority.⁶⁸ He had also been among the first TVA scientists to question the agency's lax approach to pollution control at its coal-fired power plants. Gartrell acknowledged that PA594 was costly but not excessively so, noting that the complexity of the work involved and the knowledge that the Authority would gain from completing the various studies outweighed any financial concerns. According to Gartrell, the data gained from an extension of PA 594 would help the TVA devise pollution control strategies that could forestall a serious public health problem, avoid expensive litigation, and guide the agency's plans to expand its power network in the future. R. A. Monroe of the Office of Engineering agreed with Gartrell, stating that by continuing the agency's air pollution research program, the TVA would be able to determine the maximum generating capacity that it could develop at each of its plant sites.⁶⁹ As far as Monroe and Gartrell were concerned, the reauthorization of PA 594 represented "the minimum program under which we [the TVA] could reasonably expect to meet the objectives of the studies."⁷⁰

Gartrell and his colleagues also enlisted the help of several outside experts, including Raymond C. Wanta and Morris Katz, to bolster their case for expanding the Authority's role in air pollution research and control. Wanta worked as a scientist for the United States Weather

⁶⁸ Winter, "Oral History Interview with Dr. Francis E. Gartrell," 3-5, NARA-SE, RG 142, OHR, Box 3.

⁶⁹ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, June 5, 1953 – Report No. 1," undated, 2-3, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

⁷⁰ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, June 5, 1953 – Report No. 1," undated, 2-3, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

Bureau, and he had participated in the Authority's initial survey of the area around Johnsonville, making several recommendations that influenced the Division of Health and Safety's report.

Born in 1921, Wanta had earned a B.S. in the physical sciences from the University of Chicago and a Masters in meteorology from New York University, and he had served as a consultant on air pollution problems in Japan following World War II.⁷¹ At the time, he was one of the preeminent scholars of atmospheric dispersion and the behavior of airborne particulates. In his presentation before the APC on August 7, 1953, Wanta emphasized the importance of conducting meteorological studies at the agency's massive power plants. For example, he noted that the ridges surrounding Kingston posed a serious problem for air pollution control, urging the Committee to "plan for trouble" at the facility.⁷² Another consultant, Morris Katz, met with the APC on September 23, six weeks after Wanta. Katz had earned his PhD in organic and biochemistry from McGill University in 1929, and he also became known as a leader in environmental research.⁷³ Katz reiterated Wanta's concerns about the likely pollution problem at the Kingston Steam Plant, calling the situation "dangerous" and stating that the facility was at risk for a "Donora episode."⁷⁴ Like Wanta, he recommended that the TVA continue monitoring the conditions around all of its power plants.⁷⁵

⁷¹ "Raymond Wanta Obituary" *The Concord Journal*, Concord, MA, February 2, 2012.

⁷² Official Summary, Dr. O. M. Derryberry, "Air Pollution Committee Meeting, August 7, 1953 – Report No. 3," October 20, 1953, 1-3 ("plan for trouble" is on page 2), in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

⁷³ "Morris Katz: A Pioneer in Air Pollution Research in North America," *Journal of Air Pollution Control Association* 37(November 1987): 1354.

⁷⁴ Official Summary, Dr. O. M. Derryberry, "Air Pollution Committee Meeting, September 23, 1953 – Report No. 4," December 16, 1953, 1-4 ("dangerous" and "Donora" are on page 3), in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

⁷⁵ Official Summary, Dr. O. M. Derryberry, "Air Pollution Committee Meeting, September 23, 1953 – Report No. 4," December 16, 1953, 1-4, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL. Furthermore, Katz argued that increasing the height of the smokestacks at the agency's facilities was the best way to improve the dispersion of pollutants and reduce the risk that coal-fired emissions posed to public health, although he cautioned that other measures, including the removal of sulfur dioxide from flue gases, might become necessary.

The Division of Health and Safety won this early skirmish. The Board of Directors agreed to extend PA 594 in September 1953.⁷⁶ The Authority's scientists had succeeded in making environmental research in the interest of public health a component of the TVA's air pollution control program. The agency's initial survey of the Johnsonville area became a model for future data collection for the next three decades.

Sulfur Dioxide and Environmental Science

On June 26, 1952, the TVA convened an interdivisional taskforce on the issue of sulfur dioxide that revealed a growing concern across the agency about the damage that the Authority was doing to the environment.⁷⁷ In his summary of the meeting, Francis Gartrell observed that the central problem facing the TVA arose “from the concentration of generating capacity and relatively high sulfur coals used which will result in mass emissions of SO₂ in quantities which may exceed the capacities of the local ‘airstreams’ to disperse them without the occurrence of hazardous and damaging ground concentrations.”⁷⁸ Although no one had successfully applied the available methods for recovering sulfur dioxide to coal-fired power plants, the participants

⁷⁶ Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” vol. II, part VII, 3, TVA-RL.

⁷⁷ TVA Division of Health and Safety, “Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952,” (TVA: Wilson Dam, AL, 1953), 10 and 152-3, NARA-SE, RG 142, OEDC, Box 131. As noted above, scientists and engineers in the Division of Health and Safety became concerned in the late 1940s and early 1950s when they realized that the TVA was likely to burn high-sulfur coal at several of the massive power plants that it was in the process of building. The deadly 1948 incident at Donora, Pennsylvania, had focused international attention on the potentially serious threat that sulfur compounds posed to humans when concentrated at ground level, and the history of the Great Copper Basin in southeast Tennessee remained a stark reminder of the destruction that the pollutant could cause. Furthermore, the Division of Health and Safety had focused on matters related to public health in the past, designing methods for preventing the proliferation of malaria around the Authority's reservoirs. On Malaria studies see, Winter, “Oral History Interview with Dr. Francis E. Gartrell,” 4-23, NARA-SE, RG 142, OHR, Box 3; and F. E. Gartrell, Joseph C. Cooney, George P. Chambers, and Ralph H. Brooks, “TVA Mosquito Control 1934-1980 – Experience and Current Program Trends and Developments,” reprinted from *Mosquito News*, 41(2), June 1981, 302-22, NARA-SE, RG 142, OHR, Box 4. On the Division of Health and Safety's long term focus on public health matters related to the TVA; see, Roberts and Bluhm, *Choices of Power*, 95.

⁷⁸ Official Meeting Summary, F. E. Gartrell, “Discussion of SO₂ Recovery from Flue Gas – TVA Steam Plants – June 26, 1952,” July 2, 1952, 1, NARA-SE, RG 142, OEDC, Box 70.

agreed that the Authority was in a favorable position to develop such a process in large part because of its ability to conduct large-scale studies in chemical engineering.⁷⁹

By October 1952, a consensus formed within the TVA favoring research into methods of sulfur recapture. The Division of Health and Safety had convinced many that the agency's power plants would emit dangerous amounts of the toxin when they reached full capacity, a prediction supported by the Authority's initial survey of vegetation around the Johnsonville Steam Plant.⁸⁰ At the same time, the TVA dismissed other potential solutions, noting that operational controls had "definite limitations" to their effectiveness and that reducing the size of its facilities was not practical.⁸¹ Although there was agreement within the Authority to raise the height of the smokestacks at its power plants to improve atmospheric dispersion, outside consultants working with the Division of Health and Safety warned that high stacks alone might not solve the TVA's sulfur problem.⁸²

The Authority's decision to reject capacity limits at its power plants demonstrated the extent to which the agency's preferred pollution control strategies represented the ongoing

⁷⁹ Official Meeting Summary, F. E. Gartrell, "Discussion of SO₂ Recovery from Flue Gas – TVA Steam Plants – June 26, 1952," 3-4, NARA-SE, RG 142, OEDC, Box 70. Smelting companies had developed a process for recovering sulfur dioxide, but because their facilities were significantly smaller than the TVA's, the amount of sulfur that they released was considerably less. Furthermore, due to the nature of the smelting process, flue gases at these plants were cooler than at the Authority's facilities. In the 1950s, it was not at all clear if the process could be modified and scaled up to function for coal-fired power plants of the size that the TVA planned to build. See, TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 10 and 151-3, NARA-SE, RG 142, OEDC, Box 131. Also see, Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part II, 33, TVA-RL.

⁸⁰ On consensus and role of Department of Health and Safety see, Official Meeting Summary, A. V. Slack, "Conference on Recovery of Sulfur Dioxide from Steam Plant Gases," November 3, 1952, 1-3, NARA-SE, RG 142, OEDC, Box 70. On the initial survey of vegetation see, TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 13-7 and 135-9, NARA-SE, RG 142, OEDC, Box 131.

⁸¹ Official Meeting Summary, A. V. Slack, "Conference on Recovery of Sulfur Dioxide from Steam Plant Gases," November 3, 1952, 1-3, NARA-SE, RG 142, OEDC, Box 70.

⁸² Official Summary, Dr. O. M. Derryberry, "Air Pollution Committee Meeting, September 23, 1953 – Report No. 4," December 16, 1953, 4, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; and TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 146-51, NARA-SE, RG 142, OEDC, Box 131.

negotiation between those who were most concerned with public health and those who were committed to providing consumers with access to an abundant supply of inexpensive electricity. At the June 26, 1952, meeting of the Authority's interdivisional taskforce on sulfur emissions, the participants pointed out that important economies of scale existed with respect to the agency's facilities.⁸³ Larger plants generated electric power more efficiently, allowing the TVA to reduce rates both by burning less coal and by minimizing infrastructural costs per kilowatt-hour produced. Even the Division of Health and Safety acknowledged in its 1953 report that placing a limit on the capacity of the Authority's facilities was only "a rather drastic means of [pollution] control."⁸⁴ Building support for a sulfur recovery program, especially within the Office of Power, required more than its presumed benefits for public health.

Sulfur's economic value provided the impetus that the TVA's environmentalists needed. The fact that sulfur was a "vital material in short supply," an observation made at meetings and in documents, rendered its recovery attractive.⁸⁵ Sulfuric acid was an input in many industrial processes, and it was necessary for the production of the phosphate fertilizers. The availability of a large volume of sulfur compounds at the Authority's power plants might attract related

⁸³ Official Meeting Summary, F. E. Gartrell, "Discussion of SO₂ Recovery from Flue Gas – TVA Steam Plants – June 26, 1952," 1-2, NARA-SE, RG 142, OEDC, Box 70.

⁸⁴ TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 145, NARA-SE, RG 142, OEDC, Box 131.

⁸⁵ For this quote see, Official Meeting Summary, F. E. Gartrell, "Discussion of SO₂ Recovery from Flue Gas – TVA Steam Plants – June 26, 1952," 2, NARA-SE, RG 142, OEDC, Box 70; and TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 152, NARA-SE, RG 142, OEDC, Box 131. Much of the internal support for a recapture process was based on the assumption that the Authority would be able sell the sulfur byproducts that it created, allowing the TVA, at the very least, to break even on its investment in the regulation of emissions; see TVA, "Supplementary Material for Project on Recovery of Sulfur Dioxide from Power Plant Gases," no date, 1, NARA-SE, RG 142, OEDC, Box 70. As a public agency charged with conservation, many within the TVA also believed that it had an obligation to salvage as much sulfur as possible from its facilities, preventing the commodity from going to waste. See sources above as well as Memorandum A. V. Slack to Office of Chemical Engineering Files, "Recovery of Sulfur Dioxide from Power Plant Stack Gas: Interim Review," September 4, 1952, 1, NARA-SE, RG 142, OEDC, Box 70; and Official Meeting Summary, A. V. Slack, "Conference on Recovery of Sulfur Dioxide from Steam Plant Gases," November 3, 1952, 1, NARA-SE, RG 142, OEDC, Box 70.

chemical manufacturers to the Tennessee Valley Region while providing important raw materials for the Authority's production of fertilizer.⁸⁶ According to an internal review of the potential program conducted in the fall of 1952, "The most desirable approach to this problem [the agency's sulfur dioxide emissions], as a matter of economy and conservation, [was] to recover the sulfur in a useful form[.]"⁸⁷

The market forces that augured well for sulfur removal also led the TVA to abandon its research. Although the agency tested at least four different salvage processes, only two yielded a saleable product, and one of those relied on manganese ore which was not plentiful in the Authority's service area.⁸⁸ While the use of ammonia as a scrubbing agent appeared promising given the prices for the compounds it created, mounting evidence suggested that the quantity of sulfur produced at Kingston alone would glut international markets.⁸⁹ Ultimately, the Authority discontinued the study because of a worldwide drop in sulfur's value after 1955.⁹⁰ Much like the agency's refusal to consider building smaller power plants, the demise of the TVA's sulfur recovery program illustrated how the consumption-centric energy philosophy that animated the Authority's transition to coal-fired power precluded certain options for limiting the release of sulfur dioxide. For the Office of Power in particular, the maintenance of low rates was paramount, and anything that threatened the status quo was suspect. Sulfur dioxide recapture was only acceptable to the extent that it was profitable.

⁸⁶ Memorandum A. V. Slack to Office of Chemical Engineering Files, "Recovery of Sulfur Dioxide from Power Plant Stack Gas: Interim Review," September 4, 1952, 4, NARA-SE, RG 142, OEDC, Box 70.

⁸⁷ Memorandum A. V. Slack to Office of Chemical Engineering Files, "Recovery of Sulfur Dioxide from Power Plant Stack Gas: Interim Review," September 4, 1952, 1, NARA-SE, RG 142, OEDC, Box 70.

⁸⁸ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, January 12, 1955 – Report No. 8," no date, 3-5, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; and Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, March 10, 1955 – Report No. 9," April 15, 1955, 6-8, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

⁸⁹ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, March 10, 1955 – Report No. 9," April 15, 1955, 7, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

⁹⁰ Roberts and Bluhm, *Choices of Power*, 98.

Pollution Control in Practice: The Kingston Steam Plant and Public Health

The competing policy preferences of the Division of Health and Safety and the Office of Power also influenced the actual operational strategies and devices that the TVA used to control pollution at its facilities. Between 1951 and 1953, Congress approved funding for nine coal-fired generating units at Kingston, Tennessee. Construction on the plant began on April 30, 1951, and the last unit went into operation on December 2, 1955. With a total capacity of 1.6 million kilowatts, the Kingston Steam Plant was the largest coal-fired facility in the world at the time of its completion, a rank it held until 1963.⁹¹ Its condensers used more water than New York City, and it burned 500 tons of coal per hour.⁹² The confluence of the Clinch and Emory Rivers just above the plant site provided the generating station with access to a steady supply of water. The ridges that separated the Kingston facility and its emissions from the city of Knoxville also hindered the dispersion of airborne pollutants. The hills that surrounded the plant rose between 400 and 1,000 feet above the valley floor. As a result, the area suffered from periods of atmospheric stagnation that trapped emissions at ground level, channeling fumes and particulate matter into valleys and along ridgelines. After the release of the initial report on PA 594, the TVA raised Kingston's smokestacks in an effort to preclude problems at the facility. Although the newly installed stacks were taller than those at Johnsonville, ranging from 250 to 300 feet in height, they did not reach above the neighboring hilltops.⁹³

⁹¹ TVA, *The Kingston Steam Plant*, Technical Report No. 34, 1; "Celebration is Slated for Completion of T.V.A. Plant," *New York Times*, November 12, 1955, 25; and TVA, *The Paradise Steam Plant Unit 3*, Technical Report No. 39, 8.

⁹² TVA, *Annual Report, 1956*, 1.

⁹³ Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part V, 7, TVA-RL; and TVA, *The Kingston Steam Plant*, Technical Report No. 34, 1-12. In some instances gases remained trapped in valleys while in others they tracked along the ridge line; see, TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1956," (TVA: Wilson Dam, AL, 1957), I-Kingston Steam Plant, 33-4, NARA-SE, RG 142, OEDC, Box 170.

The Authority began receiving complaints about emissions from the Kingston Steam Plant in the spring of 1954, less than three months after the facility's first generators began operating. Ironically, some of the first reports of problems came from TVA employees living in the area. For example, on April 13, 1954, E. G. Wisehuegel, who worked in the Forestry, Fisheries, and Wildlife Division, recounted smelling sulfur dioxide fumes at his residence 15 miles from Kingston on four occasions in the previous ten weeks. Wisehuegel was adamant that the odor came from the power plant.⁹⁴ In other instances, local residents brought their grievances to the TVA. While in some cases, individuals simply reported a strange odor that they attributed to the Authority's operations, at least one woman suggested that fumes from the steam plant had become so excessive that she had difficulty breathing.⁹⁵ A Kingston real estate agent even told a story of a client turning down a home after the facility's emissions inundated the property during a showing.⁹⁶ The complaints at Kingston confirmed the predictions of experts, including Morris Katz and Ray Wanta, who had warned the TVA that the facility's size and location made pollution episodes around the plant a likely occurrence.⁹⁷ In response, the Authority began working with Wanta and his colleague at the United States Weather Bureau,

⁹⁴ Letter, E. G. Wisehuegel to Dr. O. M. Derryberry, April 13, 1954, NARA-SE, PMF, Box 801.

⁹⁵ Memorandum, Richard Kilbourne to F. E. Gartrell, "SO₂ Gas Odor," July 28, 1954, NARA-SE, PMF, Box 801; and Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "Air Pollution Complaints – Kingston Area," August 18, 1954, NARA-SE, PMF, Box 801.

⁹⁶ Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "Air Pollution Complaints – Kingston Area," September 21, 1954, NARA-SE, PMF, Box 801.

⁹⁷ The fact that Kingston sat in a valley surrounded by a series of high ridges that was subjected to prolonged periods of atmospheric stagnation drew obvious comparisons to Donora, Pennsylvania. Official Summary, Dr. O. M. Derryberry, "Air Pollution Committee Meeting, August 7, 1953 – Report No. 3," October 20, 1953, 1-3, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; and Official Summary, Dr. O. M. Derryberry, "Air Pollution Committee Meeting, September 23, 1953 – Report No. 4," December 16, 1953, 1-4, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

Theodore W. Kleinsasser, on a solution to the sulfur-induced public health problems at Kingston.⁹⁸

As a scientist with the Weather Bureau, Ray Wanta had collaborated with the TVA's Division of Health and Safety on its initial survey of the Johnsonville area, and he had helped convince the Authority's leadership to extend PA 594 in the fall of 1953.⁹⁹ He continued to work with the TVA on issues related to public health and the dispersion of pollutants. With Wanta's guidance, the Authority opened atmospheric studies at each of its new power plants, collecting valuable data on local wind patterns and air quality both before and after the facilities began operating.¹⁰⁰ T. W. Kleinsasser worked at the Weather Bureau's office in Knoxville, Tennessee, and he was familiar with the prevailing meteorological conditions in the region as well as the factors that contributed to periods of stagnation.¹⁰¹

The research that the Division of Health and Safety carried out with Wanta produced important innovations. Scientists still did not understand completely the process of dispersion as it applied to large coal-fired power plants, and they wanted to determine how a variety of factors, such as the height of a facility's smokestacks, its rate of emissions, and wind speed, combined to affect the concentration of pollutants reaching ground level. Throughout the 1950s, Wanta worked with Francis Gartrell and Fred Thomas to collect and analyze a wealth of data on the behavior of airborne emissions. In part, the studies that Wanta and the Division of Health and

⁹⁸ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, September 2, 1954 – Report No. 6," September 16, 1954, 1-5, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

⁹⁹ TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies and Control at TVA Steam Plants Report of Progress through December 31, 1952," (TVA: Wilson Dam, AL, 1953), 6-10 and 146-51, NARA-SE, RG 142, OEDC, Box 131; and Official Summary, Dr. O. M. Derryberry, "Air Pollution Committee Meeting, August 7, 1953 – Report No. 3," October 20, 1953, 1-3, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

¹⁰⁰ For pre and post operational studies see, Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part V, 1-2, TVA-RL.

¹⁰¹ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, September 2, 1954 – Report No. 6," September 16, 1954, 2, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

Safety conducted relied on the network of recording equipment that they established at each power plant. These networks included devices that monitored the level of pollutants present in the air at ground level. While the Authority gleaned a significant amount of information from this equipment, the fact that the devices were stationary limited their usefulness. To improve the quality of the data that they were collecting, Wanta and Gartrell pioneered new methods of mobile sampling, mounting recording devices on cars and trucks and developing a technique for using a helicopter to measure the concentration of pollutants while aloft.¹⁰²

With Wanta's help, the Division of Health and Safety used the data that it collected to develop mathematical equations that described the process of atmospheric dispersion occurring at the Authority's facilities. At Kingston, for example, the Division of Health and Safety created four different templates for dispersion that illustrated how the plant's current operations and design led to the accumulation of pollutants at ground level at various locations depending on the prevailing winds.¹⁰³ Although other researchers had developed formulas for explaining the behavior of airborne particulates and gases, Ray Wanta and the TVA's engineers had found that they did not scale well to power plants of the size that the Authority was building.¹⁰⁴ The Division of Health and Safety hoped that the new equations would help prove the theoretical effectiveness of constructing taller smokestacks.¹⁰⁵

¹⁰² Winter, "Oral History Interview with Dr. Francis E. Gartrell," 54-9, NARA-SE, RG 142, OHR, Box 3. Gartrell completed a doctoral thesis on the process of using a titrolog mounted on a helicopter to collect data on smoke plumes at coal-fired power plants.

¹⁰³ TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1956," (TVA: Wilson Dam, AL, 1957), I-Kingston Steam Plant, 33-39 and Figure 7, NARA-SE, RG 142, OEDC, Box 170.

¹⁰⁴ Memorandum, Fred W. Thomas to Division of Health and Safety Files, "Notes on Conference with R. C. Wanta, Knoxville, August 6-7, 1953," August 11, 1953, 2-4, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; and Winter, "Oral History Interview with Dr. Francis E. Gartrell," 54-5, NARA-SE, RG 142, OHR, Box 3.

¹⁰⁵ Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part V, 5, TVA-RL; Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, January 12, 1955 – Report No. 8," no date, 2, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies TVA Steam Plants Calendar Year 1955," (TVA: Wilson Dam, AL, 1956), IV, 49-58, NARA-SE, RG 142,

Along with Fred Thomas, an engineer with the Division of Health and Safety who had made some of the earliest calculations demonstrating that the Authority was likely to face problems at its coal-fired power plants, Wanta and Kleinsasser also designed a set of operational procedures specifically for Kingston to combat the buildup of sulfur dioxide around the facility when winds were slight.¹⁰⁶ Modeled on a plan that MIT scientists developed for Donora, Pennsylvania, the proposal called for the Weather Bureau's Knoxville Office to issue preliminary alerts to the Authority if conditions in the Kingston area were likely to produce a stagnation event. In addition to twice weekly statements regarding a pre-established stagnation index, these alerts formed the basis of an advisory system that the TVA could use to alter operations at the Kingston Steam Plant to suit prevailing conditions by switching the furnaces to low-sulfur coal.¹⁰⁷ Although members of the Air Pollution Committee raised questions about the cost associated with coal-switching, they approved the proposal on a trial basis, suggesting that it could become permanent provided that the "expected frequency of such [alert] conditions [was] not too great."¹⁰⁸

Within eight weeks, the operational protocol that Wanta, Kleinsasser, and Thomas had developed passed its first test. Between October 23 and October 26, 1954, the area around Kingston suffered from a prolonged period of atmospheric stagnation. Winds near the facility

OEDC, Box 153; and TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1956," (TVA: Wilson Dam, AL, 1957), Summary, 13, NARA-SE, RG 142, OEDC, Box 170.

¹⁰⁶ Thomas, like Gartrell had studied at Harvard; see Winter, "Oral History Interview with Dr. Francis E. Gartrell," 12, NARA-SE, RG 142, OHR, Box 312.

¹⁰⁷ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, September 2, 1954 – Report No. 6," September 16, 1954, 2-3, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

¹⁰⁸ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, September 2, 1954 – Report No. 6," September 16, 1954, 3, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

were slight, and the plant's smoke plume dispersed in "an umbrella-like fashion."¹⁰⁹ While engineers at the plant quickly began transitioning to low-sulfur coal after receiving the Weather Bureau's alert on October 23, they did not complete the process until the next day, in part, because the fuel bunkers had recently been filled. In the intervening hours, pollutants accumulated to the point that they became visible in neighboring valleys. After the switch to low-sulfur coal, however, conditions eased, and tests demonstrated that the power plant's sulfur dioxide emissions dropped between fifty and sixty percent despite the facility maintaining its normal output of electricity.¹¹⁰ As a result, the Air Pollution Committee recommended the continuation of the Kingston Stagnation Alert Program.¹¹¹ Throughout the 1950s and 1960s, the TVA partnered with the Weather Bureau to obtain local and regional forecasts, successfully preventing the occurrence of any deadly fumigations at Kingston.¹¹²

At the same time, the protocol that Wanta, Kleinsasser, and Thomas developed only applied to very specific atmospheric conditions that occurred relatively infrequently. Historical data that Kleinsasser compiled revealed that stagnation events in the greater Knoxville area, including Kingston, had occurred a mere nineteen times in the four decades between 1899 and 1939 and that most of these incidents took place in the months of September, October, and November. The Weather Bureau did issue two alerts in the fall of 1954, but there were none in

¹⁰⁹ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, October 29, 1954 – Report No. 7," November 18, 1954, 1-2 and 7-8 ("umbrella-like" is on 8), in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

¹¹⁰ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, October 29, 1954 – Report No. 7," November 18, 1954, 1-2 and 7-8, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

¹¹¹ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, October 29, 1954 – Report No. 7," November 18, 1954, 9, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; Roberts and Bluhm, *The Choices of Power*, 98; and Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part V, 7-8, TVA-RL.

¹¹² Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part V, 7-8, TVA-RL; also see, T. W. Kleinsasser and R. C. Wanta, "The Development of a Forecasting Service for Use in Air Pollution Control," *AMA Archives of Industrial Health*, vol. 14, October 1956, 307-18; and F. E. Gartrell, "Monitoring of SO₂ in the Vicinity of Coal-Fired Power Plants – TVA Experience," *Proceedings of the American Power Conference*, vol. 27, 1965.

1955 and 1956.¹¹³ The Kingston Stagnation Alert Program did not address the environmental effects of coal-fired emissions that occurred as part of normal operations.

Francis Gartrell, in particular, was not satisfied with the level of pollution control provided by the alert program, suggesting that the agency should consider additional measures. Representatives from the TVA's legal department shared Gartrell's misgivings, noting that, as a public agency, the Authority operated under greater scrutiny than private utilities and that the inability to address air pollution at facilities like Kingston could tarnish its reputation.¹¹⁴ TVA employees who lived and worked near the power plant expressed similar concerns, citing complaints from local residents.¹¹⁵ Nevertheless, the Authority did not implement immediate changes at the Kingston Steam Plant beyond the stagnation alert program. W. E. Dean and Gabriel Wessenauer in the Office of Power delayed further action, arguing that the agency's scientists and engineers ought to demonstrate the value of supplementary pollution controls before asking the TVA to commit resources to the construction of higher smokestacks, the addition of new devices, or the adoption of more stringent operational protocols.¹¹⁶

The Division of Health and Safety's leadership was well aware that it would be counterproductive to support costly solutions. In 1954 and 1955, Francis Gartrell rejected a

¹¹³ TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1956," (TVA: Wilson Dam, AL, 1957), I-Kingston Steam Plant, 25-27, NARA-SE, RG 142, OEDC, Box 170.

¹¹⁴ For the misgivings of Gartrell and representatives from the Division of Law see, Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, October 29, 1954 – Report No. 7," November 18, 1954, 9, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL. The representative from the Division of Law was particularly cognizant of the fact that the TVA operated in a "goldfish bowl" because of its status as a public agency.

¹¹⁵ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, September 2, 1954 – Report No. 6," September 16, 1954, 4, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

¹¹⁶ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, September 2, 1954 – Report No. 6," September 16, 1954, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, October 29, 1954 – Report No. 7," November 18, 1954, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; and Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, January 12, 1955 – Report No. 8," no date, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

complete switch to low-sulfur coal at Kingston despite the success of the stagnation alert program, noting that the fuel procurement staff in the Office of Power had already warned that supplying the facility with such a large volume of low-sulfur coal was not economical. While Gartrell admitted that a permanent shift would almost certainly reduce the threat that the Kingston Steam Plant posed to the surrounding communities, he was unwilling to challenge the Office of Power's recommendation.¹¹⁷ Instead, the Division of Health and Safety and the Office of Power agreed to the study of a modified plan that would increase coal-switching at times when sulfur emissions were most likely to become problematic.¹¹⁸ In addition, many within the agency still hoped that the construction of taller smokestacks would improve dispersion to the point that other controls were unnecessary.¹¹⁹

Compounding the complexity of the issues at Kingston, the Authority faced external pressure from residents living in the vicinity of the steam plant. Although some reports of fumigation and foul, sulfurous odor came from as far away as thirty miles, most of the grievances originated in two neighborhoods, Woodhaven and Laddie Village, located

¹¹⁷ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, October 29, 1954 – Report No. 7," November 18, 1954, 9, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; and Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, January 12, 1955 – Report No. 8," no date, 6, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL. Also see the Office of Power's undated report, "Cost of Using Low Sulfur Coal at Kingston," 1-3, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

¹¹⁸ In this selective firing approach, the TVA would use low-sulfur coal during daylight hours with the exception of the two hours after sunrise and the hour before sunset. There was some suggestion that the plan could be modified further to burn low-sulfur all day during the growing season (April, May, and June) to reduce any likelihood of damage to vegetation. Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, January 12, 1955 – Report No. 8," no date, 5-8, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; and Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, March 10, 1955 – Report No. 9," April 15, 1955, 2-3, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

¹¹⁹ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, January 12, 1955 – Report No. 8," no date, 2, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; and Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, March 10, 1955 – Report No. 9," April 15, 1955, 4-6, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

approximately one mile southeast of the plant across Watts Bar Reservoir.¹²⁰ As early as 1954, the TVA began receiving official complaints from both communities detailing the negative impact of the steam plant on the local environment. Deposits of ash from the facility's smokestacks covered homes and vehicles, corroding paint and creating an aesthetic nuisance. Similarly, particulate matter and sulfur dioxide emissions injured trees, shrubs, and flowers, angering homeowners.¹²¹ Residents described the sulfurous air as having a metallic smell and taste or even as having an odor similar to burned toast.¹²² More importantly, locals reported that sulfur dioxide fumigations induced respiratory distress in the form of sneezing and coughing fits.¹²³ Throughout the decade, the Kingston Planning Commission made several inquiries about the danger that the steam plant posed to the town, questioning the Authority on its progress in developing a solution to the problem of coal-fired emissions.¹²⁴

¹²⁰ In the TVA holdings, I have found complaints attributed to the Kingston Steam Plant from as far away as Norris, which is approximately 30 miles from the facility. See, Letter, E. G. Wisehuegel to Dr. O. M. Derryberry, April 13, 1954, NARA-SE, PMF, Box 801; Memorandum, Richard Kilbourne to F. E. Gartrell, "SO₂ Gas Odor," July 28, 1954, NARA-SE, PMF, Box 801; Informal Memorandum, E. G. Wisehuegel to Dr. O. M. Derryberry, March 11, 1955, NARA-SE, PMF, Box 801. The vast majority of the complaints originate in Woodhaven and Laddie Village, approximately one mile from the steam plant.

¹²¹ Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "Air Pollution Complaints – Kingston Area," August 13, 1954, NARA-SE, RG 142, PMF, Box 801; Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "SO₂ Fumigation Complaint – Kingston Steam Plant," November 17, 1954, NARA-SE, RG 142, PMF, Box 801; Memorandum, Dr. O. M. Derryberry, to G. O. Wessenauer, "Air Pollution Complaint – Kingston Steam Plant," April 4, 1956, NARA-SE, RG 142, PMF, Box 801; Letter, J. Croy to Tennessee Valley Authority, September 27, 1957, NARA-SE, RG 142, PMF, Box 801; Memorandum, C. H. Waugaman to E. E. Robinson, "Kingston Steam Plant – Complaints Regarding Pollution of Woodhaven Area," May 12, 1958, NARA-SE, RG 142, PMF, Box 801; Memorandum, G. A. Cole and T. F. Hall to Fred W. Thomas, "Fumigation of May 6-7 at Kingston – Inspection May 13-14," May 22, 1958, NARA-SE, RG 142, PMF, Box 801; and Memorandum, Van S. Pickel to E. E. Robinson, "Report on Injured Foliage Associated with Smoke Concentration from the Kingston Steam Plant by Residents Requesting Inspections," May 23, 1958, NARA-SE, RG 142, PMF, Box 801.

¹²² Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "SO₂ and Fly Ash Reports – Kingston," October 22, 1954, NARA-SE, RG 142, PMF, Box 801; and Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "SO₂ Fumigation Complaint – Kingston Steam Plant," November 17, 1954, NARA-SE, RG 142, PMF, Box 801.

¹²³ Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "SO₂ and Fly Ash Reports – Kingston," October 22, 1954, NARA-SE, RG 142, PMF, Box 801; and Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "SO₂ Fumigation Complaint – Kingston Steam Plant," November 17, 1954, NARA-SE, RG 142, PMF, Box 801.

¹²⁴ Although it appears that the tone of the TVA's meetings with the Kingston Planning Commission was not hostile, the KPC was concerned about the pollution risks associated with the plant, with some members explicitly referencing the Copperhill, Tennessee (i.e. the Great Copper Basin). See, Memorandum, M. A. DeVoe to Files, "Air Pollution – Kingston Steam Plant," December 8, 1954, NARA-SE, RG 142, PMF, Box 801; Memorandum, J. Ed Campbell, "Air Pollution – Kingston Steam Plant," November 17, 1954, NARA-SE, RG 142, PMF, Box 801;

Scientists from Oak Ridge National Laboratory became some of the TVA's greatest critics in the Kingston area. Originally built during World War II, Oak Ridge lured numerous researchers to eastern Tennessee in the 1950s, and a large number of them settled in the communities near the steam plant. Many of the scientists who came to Oak Ridge did so, in part, because of the region's environmental resources. The wooded ridges of the Cumberland Plateau and the Appalachian foothills combined with the placid waters of Watts Bar Reservoir provided ample opportunity for outdoor recreation.¹²⁵ This image of life in eastern Tennessee, one in which it was possible to conduct high-end research at an internationally recognized laboratory while living in proximity to, and enjoying the benefits of, the great outdoors, was an important draw for Oak Ridge in attracting top scientific talent.¹²⁶ The reality of living in the shadow of the Kingston Steam Plant was something far different.

By November 1954, deteriorating conditions led several Oak Ridge scientists to make their own calculations regarding the power plant, its operations and emissions, and their presumed environmental effects. The results were not flattering to the TVA, and they suggested that the Authority had vastly underestimated the potential for air pollution problems in the Kingston area. The Oak Ridgers observed that the issues at the facility would only worsen once it began operating at its full capacity.¹²⁷ Releasing their findings to the media, the scientists shaped the public discourse about the steam plant, circulating their criticisms in editorials

Memorandum, Aelred J. Gray to Edward A. Ackerman, "Air Pollution – Community Relations in Kingston, Tennessee, Area," November 10, 1954, NARA-SE, RG 142, PMF, Box 801; and Informal Memorandum, G. P. Palo to A. J. Wagner, "Meeting with Kingston Planning Committee on Plans for Precipitators at Kingston Steam Plant," January 28, 1959, NARA-SE, RG 142, PMF, Box 801.

¹²⁵ Report, M. A. DeVoe, "Air Pollution – Kingston Steam Plant," December 8, 1954, NARA-SE, RG 142, PMF, Box 801.

¹²⁶ Report, M. A. DeVoe, "Air Pollution – Kingston Steam Plant," December 8, 1954, NARA-SE, RG 142, PMF, Box 801.

¹²⁷ Report, M. A. DeVoe, "Air Pollution – Kingston Steam Plant," December 8, 1954, NARA-SE, RG 142, PMF, Box 801.

published by local newspapers and through conversations with their neighbors while stoking concerns about the threat that the facility's emissions posed to the area.¹²⁸

As the decade progressed, the problems at Kingston became more difficult to ignore. By the end of 1955, white pine on the Cumberland Plateau showed signs of injury as far as twenty miles away from steam plant while those located in valleys exhibited discoloration to a distance of at least twelve miles.¹²⁹ In response to pressure from local landowners and timber operators, for whom the trees represented a lucrative source of income, the Authority initiated a study of the region's white pine, receiving help from the United States Forest Service. While the TVA's scientists could not pinpoint the exact cause of the problem, their work suggested that atmospheric factors played a role in the disease afflicting pine in the area.¹³⁰ Looming in the distance, the Kingston Steam Plant emitted an average of seven hundred tons of sulfur dioxide per day when operating all nine of its generating units, approximately twice as much as what a medium-sized city ordinarily generated.¹³¹

¹²⁸ See, Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "Air Pollution Complaint – Kingston Steam Plant," January 6, 1956, NARA-SE, RG 142, PMF, Box 801; and Report, M. A. DeVoe, "Air Pollution – Kingston Steam Plant," December 8, 1954, NARA-SE, RG 142, PMF, Box 801. Eventually, the complaints garnered attention from one of Tennessee's United States Senators, Estes Kefauver. In 1955, Kefauver presented a bill "to provide for the adoption by the Tennessee Valley Authority of measures designed to eliminate the air pollution problem in Kingston, Tennessee, occasioned by the operation of steam plants by such authority," after receiving a letter from two Oak Ridge researchers. Although the TVA was able to diffuse the situation, arguing that it was already in the process of finding a solution to the problem and that "the necessity for installation of particular air pollution control devices" was "a matter appropriate to administrative determination on the basis of the factual situation" at Kingston, Kefauver's bill demonstrated the agency's difficulties in managing public relations and coal-fired emissions around its facility. For quotes see, Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part VI, 22-3, TVA-RL.

¹²⁹ TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1956," (TVA: Wilson Dam, AL, 1957), 5, NARA-SE, RG 142, OEDC, Box 170; and TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1959," (TVA: Wilson Dam, AL, 1960), 4, NARA-SE, RG 142, OEDC, Box 197.

¹³⁰ TVA Division of Forestry Development, Office of Power, and Division of Health and Safety, "Report on Study of a Disease of White Pine in East Tennessee," (TVA: 1969), 68-72, NARA-SE, RG 142, PMF, Box 827; and Letter, Aubrey J. Wagner to Robert J. Herford, January 29, 1968, NARA-SE, RG 142, PMF, Box 801.

¹³¹ TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1956," (TVA: Wilson Dam, AL, 1957), Summary 4, NARA-SE, RG 142, OEDC, Box 170. These figures are taken from 1956, and the maximum value for one day was 1,218 tons. In its report for the 1955 calendar year the TVA expected Kingston to emit around 800 tons of sulfur dioxide per day when operating at full capacity with all nine units; see

Public pressure on the agency continued to mount as the health risks of coal-fired emissions became more obvious. Sulfur dioxide exacerbated existing conditions, including asthma and silicosis.¹³² Children tended to be the most susceptible to the effects of emissions.¹³³ In some cases, exposure was life threatening.

On May 4, 1957, the five year old son of Mr. and Mrs. John Ellis spent the day playing in his family's yard in Kingston. Throughout the course of the morning, a noticeable sulfurous odor enveloped the neighborhood. Mrs. Ellis remembered the fumes being worse than at any previous time. The young boy, who had asthma, developed a cough during the afternoon that persisted into the evening. As her son began complaining of breathing difficulties, Mrs. Ellis initially contacted the family's physician before taking the boy to the hospital in Harriman, fearing that he might be close to death. The child's health continued to deteriorate, and five days later he had to be rushed to the Fort Sanders Hospital in Knoxville. Only then did doctors stabilize his condition and determine that the likely cause of his asthmatic episode was exposure to sulfur dioxide emissions from the Kingston Steam Plant.¹³⁴ Shortly thereafter, local residents

TVA Division of Health and Safety, "Project Authorization Serial No. 594: Air Pollution Studies TVA Steam Plants Calendar Year 1955," (TVA: Wilson Dam, AL, 1956), Summary 4, NARA-SE, RG 142, OEDC, Box 153. In comparison, the industries and other energy users in the city of Louisville produced an aggregate of 380 tons of sulfur dioxide every day in 1954; see, Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, October 29, 1954 – Report No. 7," November 18, 1954, Fig. 1, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

¹³² Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "SO₂ and Fly Ash Reports – Kingston," October 22, 1954, NARA-SE, RG 142, PMF, Box 801; and Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "SO₂ Fumigation Complaint – Kingston Steam Plant," November 17, 1954, NARA-SE, RG 142, PMF, Box 801.

¹³³ Memorandum, Dr. O. M. Derryberry to G. O. Wessenauer, "SO₂ Fumigation Complaint – Kingston Steam Plant," November 17, 1954, NARA-SE, RG 142, PMF, Box 801; and Memorandum Karr to Wessenauer, "Complaints About TVA Steam Plant Operations," May 13, 1957, NARA-SE, RG 142, PMF, Box 801.

¹³⁴ Memorandum from Karr to G. O. Wessenauer, "Complaints About TVA Steam Plant Operations," May 13, 1957, NARA-SE, RG 142, PMF, Box 801. Other parents had to make the difficult decision either to break up their families, sending their children away for health reasons, or to subject their sons and daughters to the health risks associated with living near the steam plant. One mother reported sending her daughter to school in Florida to protect her health. See, Memorandum, C. A. Cole and T. F. Hall to Fred W. Thomas, "Fumigation of May 6-7 at Kingston – Inspection May 13-14," May 22, 1958, NARA-SE, RG 142, PMF, Box 801. Similar situations occurred at the TVA's other plants. For example, in Drakesboro, Kentucky, David Barker's children all suffered severe respiratory ailments as a result of the emissions from the TVA's Paradise facility. Barker, however, could not afford to leave his job in the Muhlenberg County coal mines. He had to choose between his family's economic well-being

sent a signed petition to the Authority complaining about the health effects of the fumes from the facility.¹³⁵

Following the incident involving the Ellis' child, scientists in the Division of Health and Safety took an increased interest in the relationship between fly ash, sulfur dioxide, and public health. Initially, the TVA had considered the particles of incinerated coal dust that its power plants emitted to be inert. Accordingly, the Authority had not treated fly ash as a threat to the people living in the vicinity of its facilities, although the agency did recognize that the soiling effects of the particulates themselves represented a nuisance. While Francis Gartrell was already calling for more research on the extent to which fly ash exacerbated the toxic effects of sulfur dioxide by 1954, suggesting that anecdotal evidence for the synergistic relationship was mounting, the TVA conducted few detailed studies on the issue before 1957.¹³⁶ In its report on air pollution for the 1956 calendar year, the Division of Health and Safety mentioned the potential problem once, noting only that there was a possibility that dust might exacerbate respiratory discomfort in the presence of sulfur emissions.¹³⁷ The fallout from the Ellis' ordeal led to renewed interest from the Authority's scientists, who confessed that they had difficulty

and his children's physical health. Pediatricians in Muhlenberg County noticed an increase in diagnoses of childhood asthma after the power plant began operations, and families that moved to the county reported their children developing chronic conditions only after being exposed to local coal-fired emissions. See, Letter, David Barker to TVA, February 28, 1966, NARA-SE, RG 142, PMF, Box 802. Paradise will be discussed in depth in the following chapter.

¹³⁵ Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part VI, 23, TVA-RL.

¹³⁶ Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, October 29, 1954 – Report No. 7," November 18, 1954, 6-7, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL; and Official Summary, F. E. Gartrell, "Air Pollution Committee Meeting, January 12, 1955 – Report No. 8," no date, 2-3, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL. In fact, Gartrell was not the only regular attendee of the Air Pollution Committee who argued that sulfur dioxide became more deadly when paired with other pollutants. Ivan Zwenig of the Office of Power made similar claims, although he seems to have been more interested in undermining support for the agency's study of sulfur emissions than improving its understanding of how particulates and other toxins combined to threaten public health. See, Official Summary, Dr. O. M. Derryberry, "Air Pollution Committee Meeting, May 4, 1954 – Report No. 5," July 12, 1954, 2, in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. II, part VII, Appendix, TVA-RL.

¹³⁷ TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1956," (TVA: Wilson Dam, AL, 1957), I-Kingston Steam Plant, 20-21, NARA-SE, RG 142, OEDC, Box 170.

explaining the reports of injury and death occurring during fumigations that were “inconsistent with the known toxicity of individual pollutants.”¹³⁸

In 1957, the Division of Health and Safety issued a new report suggesting that fly ash particulates might exacerbate the effect of sulfur emissions in multiple ways.¹³⁹ For example, fly ash could serve as a “catalytic material” that encouraged the oxidation of sulfur dioxide into more dangerous substances such as sulfur trioxide and sulfuric acid.¹⁴⁰ In other instances, the Division of Health and Safety hypothesized that the ash encouraged the formation of condensation that, again, facilitated the conversion of sulfur dioxide to sulfuric acid. The report speculated that because of their size particulates could ferry absorbed sulfur compounds deep into the human body, and it suggested that fly ash itself might be a primary irritant of lung tissue.¹⁴¹ The Authority’s scientists found a “marked relationship” between the two pollutants such that high levels of sulfur dioxide often occurred in tandem with increased atmospheric dust loading.¹⁴² More importantly, the study revealed that all of the health incidents that communities near the facility reported between 1955 and 1957 coincided with periods when large concentrations of particulates and sulfur compounds were both present at ground level.¹⁴³

¹³⁸ Quoted in TVA Division of Health and Safety, “Air Pollution Studies TVA Steam Plants Calendar Year 1957,” (TVA: Wilson Dam, AL, 1958), I-Kingston Steam Plant, 15, NARA-SE, RG 142, OEDC, Box 162. Also see, Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” vol. I, part VI, 24, TVA-RL.

¹³⁹ The Division of Health and Safety based the conclusions in its report on a review of existing literature on the relationship between sulfur compounds and particulates. In addition, the report’s findings resulted from the assessment of almost two years of data and local complaints from the area around the Kingston Steam Plant.

¹⁴⁰ Quote from TVA Division of Health and Safety, “Air Pollution Studies TVA Steam Plants Calendar Year 1957,” (TVA: Wilson Dam, AL, 1958), I-Kingston Steam Plant, 15, NARA-SE, RG 142, OEDC, Box 162.

¹⁴¹ TVA Division of Health and Safety, “Air Pollution Studies TVA Steam Plants Calendar Year 1957,” (TVA: Wilson Dam, AL, 1958), I-Kingston Steam Plant, 15, NARA-SE, RG 142, OEDC, Box 162. For more on oxidation see, TVA Division of Health and Safety, “Air Pollution Studies TVA Steam Plants Calendar Year 1958,” (TVA: Wilson Dam, AL, 1960), Summary, 6-7, NARA-SE, RG 142, OEDC, Box 191. The TVA corresponded with researchers from Harvard University’s school of public health; see, Winter, “Oral History Interview with Dr. Francis E. Gartrell,” 61, NARA-SE, RG 142, OHR, Box 3.

¹⁴² Quote from TVA Division of Health and Safety, “Air Pollution Studies TVA Steam Plants Calendar Year 1957,” (TVA: Wilson Dam, AL, 1958), I-Kingston Steam Plant, 14, NARA-SE, RG 142, OEDC, Box 162.

¹⁴³ TVA Division of Health and Safety, “Air Pollution Studies TVA Steam Plants Calendar Year 1957,” (TVA: Wilson Dam, AL, 1958), I-Kingston Steam Plant, 14, NARA-SE, RG 142, OEDC, Box 162; and Gartrell, “History of TVA Air Pollution Control Program for Coal-Fired Power Plants,” vol. I, part VI, 25, TVA-RL.

Within a year, wind tunnel tests conducted with the help of engineers from New York University further demonstrated the need for action at Kingston though they did not specifically address the relationship between sulfur dioxide and fly ash. Carried out in early 1958 using a scale model that included the steam plant and its surrounding topographical features, the NYU tests confirmed that the smokestacks that the TVA had originally built at the facility were not tall enough to provide for the adequate dispersion of pollutants. If no other controls were added to reduce the quantity of fly ash or sulfur dioxide emanating from the power plant, the report concluded that the Authority would have to increase the height of the smokestacks at Kingston to a minimum of 500 feet.¹⁴⁴

In multiple ways, then, the Division of Health and Safety gathered evidence that the existing pollution controls at the Kingston Steam Plant were deficient and that further action was required to prevent the facility's emissions from posing a threat to public health. Initially, scientists had focused almost exclusively on sulfur dioxide, but by 1958, they had concluded that the combination of various sulfur compounds and particulates, working in tandem, represented the greatest risk to the residents living near the plant. As a result of its numerous studies and an analysis of the available solutions, the Division of Health and Safety recommended the installation of electrostatic precipitators at Kingston, arguing that the synergistic effects of sulfur dioxide and fly ash would be "most effectively disrupted by removing the fly ash components."¹⁴⁵ Wessenauer and the Office of Power continued to oppose the installation of the precipitators, claiming that they were unnecessary, but the evidence that the Division of Health and Safety had produced was persuasive. The Board of Directors authorized precipitators for

¹⁴⁴ TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1958," (TVA: Wilson Dam, AL, 1960), I-Kingston Steam Plant, 4-5, NARA-SE, RG 142, OEDC, Box 191.

¹⁴⁵ Quoted on TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1958," (TVA: Wilson Dam, AL, 1960), I-Kingston Steam Plant, 6, NARA-SE, RG 142, OEDC, Box 191.

five of the nine units at Kingston on October 28, 1958, agreeing to add the devices to the facility's remaining generators on June 25, 1959.¹⁴⁶

Conclusion

Air pollution became an important and divisive issue for the TVA well before the 1970s. Almost as soon as the Authority began its transition to coal-fired power, a group of scientists and engineers within the agency expressed their concerns about the size of the TVA's new facilities, noting that the massive plants posed a risk to public health and the environment. In the 1950s, these scientists and engineers, many of whom worked in the Division of Health and Safety, tried to expand the environmental responsibilities of the Authority and its power program. In response to their challenges and questions, the TVA conducted a variety of scientific studies on the behavior and toxicity of coal-fired emissions as well as the effectiveness of different control measures, including the construction of taller smokestacks, coal-switching, sulfur dioxide recovery systems, and electrostatic precipitators.

The scientists and engineers in the Division of Health and Safety had their greatest success at the Kingston Steam Plant where they were able to convince the TVA's board of directors to install precipitators, reduce the use of high sulfur coal, and, later, raise the facility's smokestacks against the wishes of the Office of Power. The Authority's work on air quality also helped the TVA cultivate partnerships with other agencies and institutions that had an interest in

¹⁴⁶ TVA Division of Health and Safety, "Air Pollution Studies TVA Steam Plants Calendar Year 1958," (TVA: Wilson Dam, AL, 1960), I-Kingston Steam Plant, 6, NARA-SE, RG 142, OEDC, Box 191. The Board of Directors was always more concerned about the aesthetic nuisance that fly ash represented than its risk to public health. It is likely that the Board favored precipitators as a lone solution to the problem at Kingston because it also satisfied their desire to render the agency's emissions less visible to local residents. Also see Roberts and Bluhm, *The Choices of Power*, 103 and 414n85; citing interviews with Aubrey Wagner, the TVA's chairman at the time, and Fred Thomas, Roberts and Bluhm suggest that a presentation by O. M. Derryberry in which he displayed a picture of a lung blackened by exposure to coal smoke helped turn the board of directors in favor of precipitators. I have been unable to confirm this story in other sources.

the environment, including the Weather Bureau and the United States Public Health Service. These connections often produced ground breaking research. In addition to the advances that the Authority made in the field of atmospheric dispersion, the TVA's joint project with the Alabama Polytechnic Institute culminated in 1963 with the publication of the first scientific paper recognizing the phenomenon that became popularly known as acid rain.¹⁴⁷

At the same time, the Division of Health and Safety's ability to influence the Authority was limited. Gabriel Wessenauer and his staff in the Office of Power remained vocal critics of any solution that threatened to undermine the agency's rate structure. The TVA did not begin installing precipitators on all of its coal-fired facilities until the 1970s. Although the agency's leaders recognized the danger of sulfur dioxide and authorized experiments on recovery systems, the TVA abandoned the project when the international market for sulfur declined. The promising program was no longer advantageous to the Office of Power, which preferred to rely on atmospheric dispersion and the rural location of the Authority's facilities to reduce the effect of the TVA's emissions on the region and, in particular, its city residents.

Environmental science, then served as an important if only partial check on the TVA's energy regime in the early years of the agency's transition to coal-fired power. The results of the Division of Health and Safety's research lent credibility to its arguments and helped it weaken the Office of Power's influence over the Authority's board of directors. Although it did not lead to immediate system-wide changes, the work of scientists and engineers, including Francis

¹⁴⁷ F. E. Gartrell, F. W. Thomas, and S. B. Carpenter, "Atmospheric Oxidation and the Role of Particulates in Air Pollution," *American Industrial Hygiene Journal*, vol. 24, no. 2, 1963, 113-20; and Winter, "Oral History Interview with Dr. Francis E. Gartrell," 75-6, NARA-SE, RG 142, OHR, Box 3.

Gartrell, Fred Thomas, and Ray Wanta, was the first salvo against the consumption-centric philosophy that animated the TVA's power program.¹⁴⁸

The internal conflict between groups like the Office of Power and the Division of Health and Safety exposed a growing problem for the Authority that only worsened as the agency continued to construct its massive steam plants in the decades following World War II. The shift to coal-fired power that began in the 1950s threatened to sever the connection between the TVA's power program and the agency's original mission of multipurpose resource development. While the operation of most of the Authority's plants still relied on its ability to manage the Tennessee River and its tributaries to provide the facilities with a consistent supply of water, the expansion of the TVA's power program raised important questions about the concept of public power, its purpose, and its limits. Although the Authority's leadership continued to define conservation as "the use of the earth for the good of man," disagreements over what public power was and what it meant for the environment, or rather, what the TVA's obligations were as a public agency that generated and distributed electricity animated an ongoing debate within the Authority that ultimately spilled over into the towns and villages of the Tennessee Valley Region.¹⁴⁹ As the tensions with Oak Ridge scientists and other residents at Kingston revealed,

¹⁴⁸ In other instances the TVA's studies functioned less as the impartial arbiters of best practice than as a convenient means to obfuscate the role of politics in the agency's decision making process. Thus, when Senator Kefauver introduced his bill to force the Authority to address emissions at the Kingston Steam Plant in response to the complaints from Oak Ridge in 1955, the TVA's chairman, Herbert Vogel, responded that, "since we believe the necessity for installation of particular air pollution control devices is a matter *appropriate to administrative determination on the basis of the factual situation as it develops*, we do not believe enactment of the bill would be desirable." In many ways reminiscent of the Authority's earlier claim that engineering constraints and the exigencies of the free market had necessitated the transition to coal-fired power, the deferential appeal to science as a means to delay action and preserve autonomy at the agency's facilities represented the invocation of a technocratic narrative that allowed the TVA to argue that its approach to regulating emissions was apolitical. The quote can be found in Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part VI, 22-3, TVA-RL; emphasis my own. Erwin Hargrove, Marc Roberts, and Jeremy Bluhm also suggest that the TVA's use of science to justify its decision making was more rhetorical than real. It remained important for the Authority to appear apolitical. See Hargrove, *Prisoners of Myth*; and Roberts and Bluhm, *The Choices of Power*, 63-118.

¹⁴⁹ Quoted in TVA, *Annual Report, 1953* (Washington, D.C.: Government Printing Office, 1953), 52; and Hargrove, *Prisoners of Myth*, 181. This phrase is originally from Gifford Pinchot, who used it to articulate his understanding

outside groups began to develop and vocalize their own understandings of the TVA's responsibilities. Chapter Six analyzes how the individual communities involved in the production of electricity struggled with the promise and reality of the Authority's consumption-centric energy regime. In the 1960s, the environmental limitations of the TVA's power program became evident at the agency's Paradise Steam Plant in western Kentucky.

of the concept of conservation. The TVA quoted it directly in its 1953 annual report, and, demonstrating the sentiment's staying power, Wagner used it in a 1972 speech to the Sierra Club that is quoted in Hargrove.

Chapter 6

Where Paradise Lay: Coal-Fired Power in Muhlenberg County, Kentucky

*Where the little river town once stood in the shade of its trees by the river bank there is now a blackened desert.*¹

– Wendell Berry, 1972

*If cigarette smoking causes lung cancer, what will this stuff do? ... At least you have a choice about smoking.*²

– Sharolet Lyons, 1967

In 1971, songwriter John Prine released a track titled “Paradise” as part of his eponymous debut album. The song lamented the destruction of a small village of the same name in the coalfields of Muhlenberg County, Kentucky, at the hands of the Peabody Coal Company, and it became an anthem for opponents of strip mining throughout the United States in the 1970s and 1980s. Although Prine’s “Paradise” captured the consequences of generating large volumes of inexpensive electricity from coal for the communities involved in production, it elided important details of the town’s demise. It was true that Paradise had been a village in Muhlenberg County, and it was true that the last residents had moved away as a result of deteriorating conditions. Peabody, however, was not directly to blame; the company had not mined the land adjacent to the hamlet.³ Although various stripping operations had devastated the fields surrounding

¹ Quoted in “‘Paradise’ Returning to Muhlenberg,” *The Kentucky New Era*, Hopkinsville, Kentucky, September 1, 1992, 7A.

² Letter, Sharolet Lyons to Frank A. Stubblefield, January 9, 1967, National Archives and Records Administration Southeast Branch, Morrow, GA, Record Group 142, Power Manager’s File, Box 802.

³ In fact, the Pittsburgh and Midway Company, a subsidiary of Gulf Oil, had stripped the land adjacent to the village. Peabody vigorously denied Prine’s accusations and printed pamphlets called “Facts vs. Prine” that decried Prine’s song and its factual inaccuracy, demonstrating just how damaging “Paradise” was to the company’s flagging reputation in the 1970s and 1980s. Peabody’s vociferous defense also hints at a company that was not used to having its authority successfully questioned in a national forum after years of dominating the communities in which it operated. A sense of Peabody’s power in Muhlenberg County can be gathered from the fact the company was able to ban Prine’s “Paradise” from local radio stations. For a mention of the pamphlet, see Frank Martin, “John Prine

Paradise, the emissions from the massive coal-fired power plant that the TVA built less than 1,000 feet from the tiny community had ultimately rendered the town uninhabitable.⁴

Furthermore, the agency's coal-buying policies in the post-World War II period had encouraged the very surface mining that had disfigured Muhlenberg County. While the village vanished, the Authority's facility and the scarred landscape remained.

At the same time, the Paradise Steam Plant served as a fitting monument to the TVA's consumption-centric energy regime when its two initial units began producing electricity in 1963.⁵ It was one of the largest, most efficient coal-fired generating stations in the world. Located on the rural periphery of the Tennessee Valley Region, the facility provided cheap kilowatts to residential and industrial customers in cities like Nashville while helping to eliminate the sources of pollution that plagued urban areas prior to World War II. Additionally, the plant had the backing of local development organizations and the state's congressional delegation, which believed that it would stabilize the mining industry and attract new

Goes Back to What's Left of Paradise," no publication provided, undated, Muhlenberg County Genealogy and History Annex, Greenville, Kentucky [hereafter: MCGHA], Folder Paradise-Muhlenberg County. For information on the radio ban, see Julie Paxton, "What *Really* Happened to Paradise," *Kentucky Monthly* 2 (August 1981): 38, copy in MCGHA, Folder Paradise-Muhlenberg County. On Pittsburgh and Midway, see "Paradise Reclaimed?" *Lexington Herald-Leader Business Monday*, August 24, 1992, 1 and 8, copy in MCGHA, Folder Paradise-Muhlenberg County; and Dave McBride, "Only 3 Families Left in Paradise," *Messenger-Times-Argus*, Central City, Kentucky, December 28, 1967, 7.

⁴ Joe Creason, "There's Trouble in Paradise Caused by TVA Plant," *Messenger-Times-Argus*, Central City, Kentucky, August 18, 1966, National Archives and Records Administration Southeast Branch, Morrow, GA [hereafter: NARA-SE], Record Group 142 [hereafter: RG 142], Power Manager's File [hereafter: PMF]; 802; and Memorandum, Dr. O. M. Derryberry to L. J. Van Mol, "Fly Ash Fallout – Paradise Steam Plant and Village of Paradise, Kentucky," March 2, 1964, NARA-SE, RG 142, PMF, Box 802. Other reports suggest that the coal storage area abutted the backyards of Paradise residents; see, Memorandum, C. H. Waugaman to T. Graham Wells, Jr., "Activities Related to Coal Dust and Fly Ash in the Paradise Area," September 1, 1966, NARA-SE, RG 142, PMF, Box 802.

⁵ The TVA initially designed Paradise as a two-unit plant with a capacity of 1,300,000 kilowatts. The Authority added a massive third unit in 1969, bringing the facility's total capacity to 2,450,000 kilowatts. These numbers should be viewed as approximate; in the late 1960s and 1970s, the TVA adjusted the nameplate rating for all of its boilers. Under the new system, Paradise's capacity was initially 1,408,000 kilowatts and its final capacity was 2,558,200 kilowatts). See TVA, *The Paradise Steam Plant: A Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Two-Unit Plant*, Technical Report No. 37 (Knoxville, TN: TVA, 1964), 1, copy in NARA-SE, RG 142, Office of Engineering, Design, and Construction Project Histories and Reports [hereafter: OEDC], Box 636; and TVA, *The Paradise Steam Plant Unit 3: The Planning, Design, Construction, Costs, and First Power Operations of the One-Unit Addition*, Technical Report No. 39 (TVA: Knoxville, 1979), 8-9.

manufacturers to the western Kentucky coal basin. Throughout the 1950s, these boosters had lobbied for improvements on the Green River and its tributaries that would allow the watershed to support a modern generating station. Without their assistance, the Authority would never have built a coal-fired facility in Muhlenberg County.

The relationship that developed between the TVA's power program and the communities involved in production demonstrated both the promise and the consequences of the agency's energy regime in the post-World War II period. The political economy of mass-consumption and cheap electricity initially appeared to be a pathway to progress for the region's coal towns and the rural villages that hosted the Authority's steam plants. Nevertheless, the agency's regime relied on the continued exploitation of natural resources in these communities while its economic benefits accrued elsewhere. In particular, the environmental damage that the TVA caused belied the egalitarian rhetoric of public power and undermined support for the agency's power program.

Few scholars have studied the operation of the Authority's steam plants or its coal-buying policies at the local level.⁶ This chapter analyzes TVA's power program by focusing on Muhlenberg County, Kentucky, and the Paradise Steam Plant. Significant local support for the construction of massive coal-fired generating stations helped lure the Authority to the Green River Valley in 1959. Although scientists and engineers in the TVA's Division of Health and

⁶ Many scholars have broadly discussed the role of the TVA's coal-fired power network in damaging the environment of the agency's service area; however, they have not chosen to emphasize individual communities, focusing instead on broad treatments of strip mining and aerial emissions. Paradise receives mention in several of these texts, but only to note that the Authority destroyed the town and that the Peabody Coal Company operated the world's largest stripping shovel in its vicinity. For examples, see Walter L. Creese, *TVA's Public Planning: The Vision, the Reality* (Knoxville: The University of Tennessee Press, 1990), 121-3; and Bruce Daniel Rogers, "Public Policy and Pollution Abatement: TVA and Strip Mining" (PhD Diss., Indiana University, 1973), 58-60, 90-1, 109-10, and 129-45. With two brief exceptions, the existing literature has ignored the welcome that the TVA's facilities initially received and the crucial role that private citizens and politicians played in influencing the agency's decision to build its generating stations in certain areas; see Marc J. Roberts and Jeremy S. Bluhm, *The Choices of Power: Utilities Face the Environmental Challenge* (Cambridge: Harvard University Press, 1981), 72-4; and Erwin C. Hargrove, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990* (Princeton: Princeton University Press, 1994), 183.

Safety had recently convinced the board of directors to implement new pollution control measures at the agency's Kingston Steam Plant, the Authority built Paradise without precipitators and planned to burn high sulfur coal at the facility because of its isolation. Over time, the agency's power plant and its coal-buying policies ravaged the environment, despoiling the village of Paradise and contributing to the considerable harm that strip mining caused in Muhlenberg County. As the damage mounted, those who lived in close proximity to the TVA's facility and those who opposed strip mining began to pressure the Authority to act, questioning the agency's its commitment to resource conservation and its environmental obligations as a public provider of electricity. While many in western Kentucky viewed the TVA's power program as an excellent complement to the region's extractive economy, the shortcomings of the agency's consumption-centric energy regime manifested themselves in Muhlenberg County.

Paradise and Muhlenberg County

Jacob and Henry Stom built the settlement that would become Paradise on the banks of the Green River—a tributary of the Ohio River—in Muhlenberg County in 1798. [Fig. 6.1] During the nineteenth century, Stom's Landing, as the town was originally known, served as a port for neighboring communities, including Drakesboro and Greenville, as well as a stopping point between Bowling Green, Kentucky, and the Ohio River. The village developed into a commercial hub connecting county residents to the outside world. The steamships that plied the waters of the Green off-loaded merchandise in Paradise before taking tobacco and other farm products to distant markets.⁷

⁷ C. W. Mayes, "Reflections on Paradise," June 1, 1982, 5-8, MCGHA, Folder Paradise-Muhlenberg County; Dave McBride, "Progress Closing the Gates to Paradise," *Messenger & Inquirer*, Owensboro, Kentucky, December 3, 1967, copy in MCGHA, Folder Paradise-Muhlenberg County; and Agnes S. Harralson, "Paradise in Kentucky," *Ohio County News*, Hartford, Kentucky, October 10, 1974, accessed January 12, 2012,

Muhlenberg County comprised a 175 square mile expanse of low, rolling hills and farms dotted with towns and interspersed with pockets of hardwoods all resting atop rich seams of coal. According to Otto A. Rothert, a local historian, William D. McLean opened the first commercial mining operation in the county around 1820. Within a decade, barges routinely transported coal from the county downriver to serve the needs of cities on the Ohio like Evansville, Indiana, and Owensboro, Kentucky. Few other industries found success, including an ill-fated ironworks that folded within five years during the 1850s. Aside from a sawmill that operated at Paradise, tobacco and coal formed the foundation of county's extractive economy.⁸

<http://muhlenberg.genealogie.net/places/paradise2.htm>[no longer active]; and Otto A. Rothert, *A History of Muhlenberg County* (Louisville: John P. Morton & Company, 1913) 8-28 and 380-403.

⁸ Rothert, *A History of Muhlenberg County*, 8-28 and 380-403; C. W. Mayes, "Reflections on Paradise," June 1, 1982, 5-8, MCGHA, Folder Paradise-Muhlenberg County; Dave McBride, "Progress Closing the Gates to Paradise," *Messenger & Inquirer*, Owensboro, Kentucky, December 3, 1967, copy in MCGHA, Folder Paradise-Muhlenberg County; Memorandum, James H. Barton, William G. Grieve, and Robert D. Nelson to Kenneth J. Seigworth, "Strip Mining – Western Kentucky," September 26, 1960, NARA-SE, RG 142, PMF, Box 405; and Agnes S. Harralson, "Paradise in Kentucky," *Ohio County News*, Hartford, Kentucky, October 10, 1974, accessed January 12, 2012, <http://muhlenberg.genealogie.net/places/paradise2.htm>[no longer active].

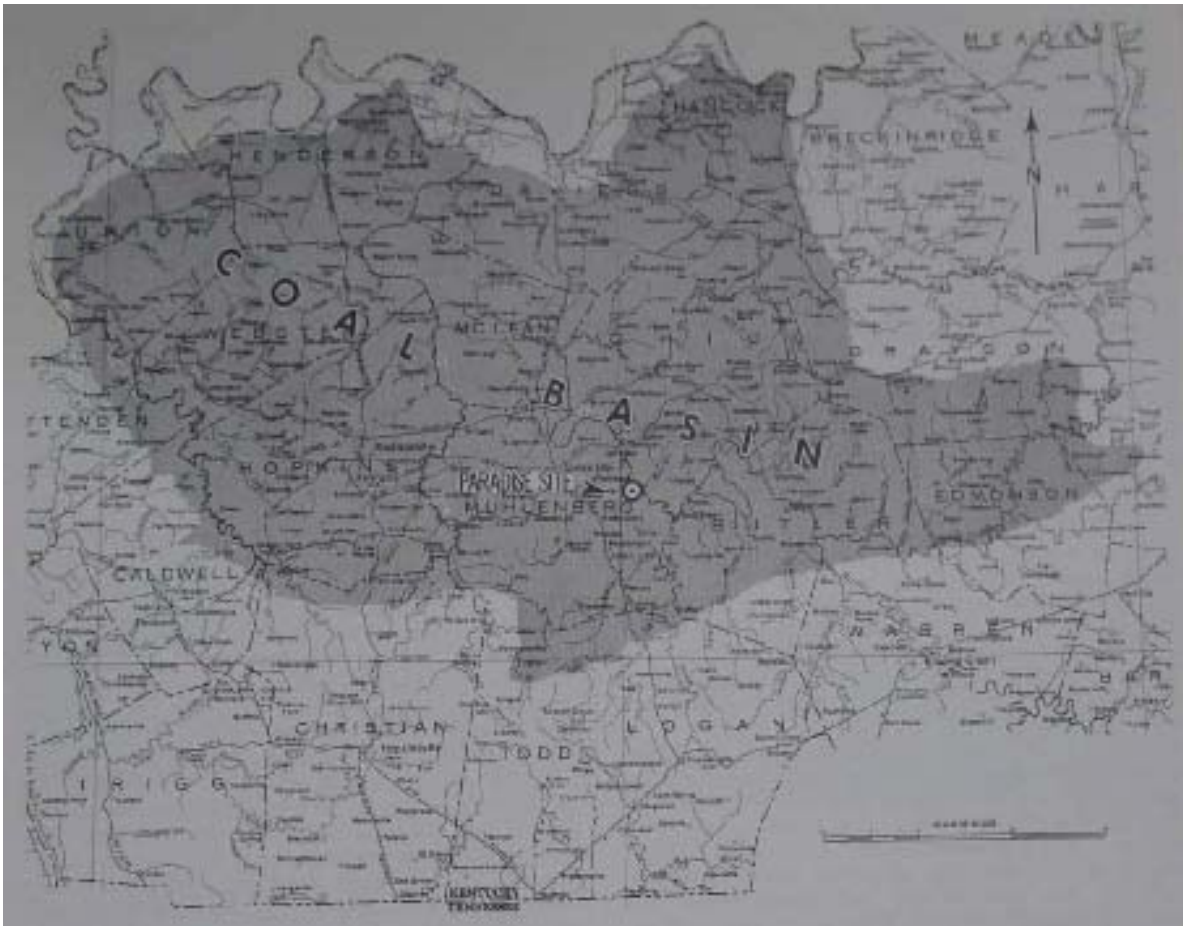


Figure 6.1: Western Kentucky Coal Basin – Paradise, Muhlenberg County, and the western Kentucky coal basin. Source: TVA, The Paradise Steam Plant: A Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Two-Unit Plant, Technical Report No. 37 (Knoxville, TN: TVA, 1964), 14, copy in NARA-SE, RG 142, OEDC, Box 636.

During the late nineteenth and early twentieth centuries, Paradise and Muhlenberg County prospered. The coal industry boomed, and production increased from less than 100,000 tons per year in the decades immediately following the Civil War to more than 6,000,000 tons in 1927.⁹ Paradise itself counted more than 800 residents in the late 1800s, and two steamships used the community as their home port. The county as a whole became one of the largest coal

⁹ “County’s Coal Production Since 1890,” no publication provided, undated, photocopy in *Coal In Western Kentucky*, book 1, scrapbook by Agnes S. Harralson, ed. David Orrahood, MCGHA.

producers in the state with a population that grew from less than 11,000 in 1860 to almost 40,000 by the 1930s.¹⁰



Figure 6.2: KY-176 – A view of KY-176 looking toward the Green River in Paradise, circa 1967. Source: “Paradise Homes” Greenville Leader, Greenville, Kentucky, undated, clipping in MCGHA, Folder Tennessee Valley Authority-TVA.

The collapse of the market for coal during the Great Depression and its tepid recovery after the war left most of the western Kentucky basin mired in an economic slump.¹¹ [Fig. 6.1] By the early 1950s, Paradise’s population dwindled to less than one hundred. Similarly,

¹⁰ C. W. Mayes, “Reflections on Paradise,” June 1, 1982, 6, MCGHA, Folder Paradise-Muhlenberg County; and Edward Manley, “809 Persons Lived in Paradise Precinct in 1870 Census, Including 203 Blacks,” *Messenger-Times-Argus*, Central City, Kentucky, October 29, 1959, copy in MCGHA, Folder Paradise-Muhlenberg County.

¹¹ James Branscombe, “Paradise Lost,” *Southern Exposure* 1 (Summer 1973): 29-41; C. W. Mayes, “Reflections on Paradise,” June 1, 1982, 7-9, MCGHA, Folder Paradise-Muhlenberg County; “Plant to Hike Area’s Economy,” *The Kentucky New Era*, Hopkinsville, Kentucky, October 2, 1959, 1; “Paradise Not Lost: Life Returning to Ghost Town,” *The Kentucky New Era*, Hopkinsville, Kentucky, October 2, 1959, 7; Dave McBride, “Progress Closing the Gates to Paradise,” *Messenger & Inquirer*, Owensboro, Kentucky, December 3, 1967, copy in MCGHA, Folder Paradise-Muhlenberg County; Memorandum, E.F. Thomas to G.O. Wessenauer, “Paradise Steam Plant – Paradise Village Air Pollution Complaints,” March 1, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum and report, Fred W. Thomas to F.E. Gartrell, “Fly Ash Fallout – Paradise Steam Plant and Village of Paradise, Kentucky,” February 10, 1964, NARA-SE, RG 142, PMF, Box 802.

Muhlenberg County lost between six and eight thousand residents to outmigration between 1950 and 1959 as a result of the coal industry's downturn, consigning the region to poverty.¹²

Newspaper and TVA accounts depicted Paradise as a declining relic of a bygone age, a cluster of homes and tree-lined streets nestled among the low knolls that abutted the Green River. [Fig. 6.2] Although undulating farmland had enclosed the hamlet for much of its existence, the Pittsburgh and Midway Company, a coal operator, began purchasing surrounding properties in the early 1950s, further isolating the small village. With only a single church and two stores, one of which doubled as the post office, the town was comprised mostly of widows and pensioners with few children or young adults. Despite the lingering industrywide depression, those residents who were still of working age sought employment in the mines that dotted Muhlenberg County. While they were not affluent, many owned their homes and remained hopeful that prosperity would return. Nevertheless, few opportunities for growth existed in the immediate post-World

¹² Muhlenberg County was known as one of the poorest in Kentucky. A variety of publications reported several different population figures for Paradise in the 1950s ranging from a few dozen families to approximately 100 people. It has also been suggested that when Pittsburgh and Midway began purchasing farms in 1952 it roughly halved the village's population, reducing it from fifty families to only sixty people. For various estimates on population at Paradise as well as Muhlenberg County's designation as one of the poorest in the state, see C. W. Mayes, "Reflections on Paradise," June 1, 1982, 5 and 7, MCGHA, Folder Paradise-Muhlenberg County; Nate Basham, "Paradise – Hamlet of 35 Families – Stirs with Excitement Over New Plant," *Messenger & Inquirer*, Owensboro, Kentucky, October 2, 1959, photocopy in MCGHA, Folder Paradise-Muhlenberg County; Julie Paxton, "What Really Happened to Paradise," *Kentucky Monthly* 2 (August 1981): 35, copy in MCGHA, Folder Paradise-Muhlenberg County; "Real Paradise, Like One in the Song, Is Gone," *Louisville Courier Journal*, September 21, 1987, B3; Dave McBride, "Progress Closing the Gates to Paradise," *Messenger & Inquirer*, Owensboro, Kentucky, December 3, 1967, copy in MCGHA, Folder Paradise-Muhlenberg County; Agnes S. Harralson, "Paradise in Kentucky," *Ohio County News*, Hartford, Kentucky, October 10, 1974, accessed January 12, 2012, <http://muhlenberg.genealogy.net/places/paradise2.htm>[no longer active]; Joe Creason, "There's Trouble in Paradise Caused by TVA Plant," *Messenger-Times-Argus*, Central City, Kentucky, August 18, 1966, NARA-SE, RG 142, PMF, Box 802; "Plant to Hike Area's Economy," *The Kentucky New Era*, Hopkinsville, Kentucky, October 2, 1959, 1; "Paradise Not Lost: Life Returning to Ghost Town," *The Kentucky New Era*, Hopkinsville, Kentucky, October 2, 1959, 7; Memorandum, E.F. Thomas to G.O. Wessenauer, "Paradise Steam Plant – Paradise Village Air Pollution Complaints," March 1, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum and report, Fred W. Thomas to F.E. Gartrell, "Fly Ash Fallout – Paradise Steam Plant and Village of Paradise, Kentucky," February 10, 1964, NARA-SE, RG 142, PMF, Box 802.

War II period.¹³ Although the region possessed rich coal deposits, it had been unable to attract other industries.¹⁴

The Green River Valley Citizens League: Building the Environment for Public Power

Local leaders took stock of the Green River Valley's plight after World War II, searching for ways to improve the economic prospects of small communities like Paradise. In 1951 a group of businessmen and civic leaders that included newspaper publishers, insurance salesmen, store owners, coal operators, and public officials joined together to form the Green River Valley Citizens League (GRVCL). The men hailed from communities throughout Muhlenberg and the surrounding counties though none lived in Paradise itself. As an organization committed to

¹³ According to one article, mail had only recently stopped arriving at Paradise on horseback and telephone service in the hamlet still went through an operator; see George Kerler, "Paradise, A Speck of Geography, Found by Giant TVA," *Messenger & Inquirer*, Owensboro, Kentucky, October 11, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA. For examples of other newspaper and TVA accounts that include descriptions of residents, the importance of mining, and discussions of the town's setting and the surrounding landscape see Nate Basham, "Paradise – Hamlet of 35 Families – Stirs with Excitement Over New Plant," *Messenger & Inquirer*, Owensboro, Kentucky, October 2, 1959, photocopy in MCGHA, Folder Paradise-Muhlenberg County; Dave McBride, "Progress Closing the Gates to Paradise," *Messenger & Inquirer*, Owensboro, Kentucky, December 3, 1967, copy in MCGHA, Folder Paradise-Muhlenberg County; Agnes S. Harralson, "Paradise in Kentucky," *Ohio County News*, Hartford, Kentucky, October 10, 1974, accessed January 12, 2012,

<http://muhlenberg.genealogenie.net/places/paradise2.htm>[no longer active]; Joe Creason, "There's Trouble in Paradise Caused by TVA Plant," *Messenger-Times-Argus*, Central City, Kentucky, August 18, 1966, NARA-SE, RG 142, PMF, Box 802; "Plant to Hike Area's Economy," *The Kentucky New Era*, Hopkinsville, Kentucky, October 2, 1959, 1; "Paradise Not Lost: Life Returning to Ghost Town," *The Kentucky New Era*, Hopkinsville, Kentucky, October 2, 1959, 7; Memorandum, E.F. Thomas to G.O. Wessenauer, "Paradise Steam Plant – Paradise Village Air Pollution Complaints," March 1, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum and report, Fred W. Thomas to F.E. Gartrell, "Fly Ash Fallout – Paradise Steam Plant and Village of Paradise, Kentucky," February 10, 1964, NARA-SE, RG 142, PMF, Box 802. On Pittsburgh and Midway Julie Paxton, "What Really Happened to Paradise," *Kentucky Monthly* 2 (August 1981): 35, copy in MCGHA, Folder Paradise-Muhlenberg County; and "Real Paradise, Like One in the Song, Is Gone," *Louisville Courier Journal*, September 21, 1987, B3.

¹⁴ James Branscombe, "Paradise Lost," *Southern Exposure* 1 (Summer 1973): 29-41; C. W. Mayes, "Reflections on Paradise," June 1, 1982, 7-9, MCGHA, Folder Paradise-Muhlenberg County; "Plant to Hike Area's Economy," *The Kentucky New Era*, Hopkinsville, Kentucky, October 2, 1959, 1; "Paradise Not Lost: Life Returning to Ghost Town," *The Kentucky New Era*, Hopkinsville, Kentucky, October 2, 1959, 7; Dave McBride, "Progress Closing the Gates to Paradise," *Messenger & Inquirer*, Owensboro, Kentucky, December 3, 1967, copy in MCGHA, Folder Paradise-Muhlenberg County; Memorandum, E.F. Thomas to G.O. Wessenauer, "Paradise Steam Plant – Paradise Village Air Pollution Complaints," March 1, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum and report, Fred W. Thomas to F.E. Gartrell, "Fly Ash Fallout – Paradise Steam Plant and Village of Paradise, Kentucky," February 10, 1964, NARA-SE, RG 142, PMF, Box 802.

development, the GRVCL found much about which to be optimistic.¹⁵ The region still possessed massive coal reserves, making the western Kentucky basin one of the most advantageous areas in the world to produce low-cost electricity.¹⁶ If the GRVCL could convince utilities to build new coal-fired power plants in the area, the Green River Valley would become an attractive destination for industry. Much like the TVA and its distributors, the Citizens League maintained that access to an abundant supply of energy, in particular electricity, could drive economic growth. Members argued that the Green River Valley had lost prospective manufacturers because the supply of electric power in western Kentucky lagged behind other areas of the southeast, citing the Reynolds Aluminum Company's decision to locate a plant in Lister Hill, Alabama, rather than Bowling Green, Kentucky, as evidence.¹⁷ The construction of new coal-fired power plants would also help to stabilize the region's mines by providing a market for coal,

¹⁵ Green River Valley Citizens League, Inc., "Resolutions Adopted April 25, 1952 at Meeting of Green River Valley Citizens League, Inc.," undated, Breckinridge Research Room, King Building, University of Kentucky Special Collections Library, Lexington, Kentucky [hereafter: UKSCL], John Sherman Cooper Papers, 1927-1979, 80M1 [hereafter: JSC], Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1955-1956.

¹⁶ This claim was first made in the Hopkinsville *New Era*, see Green River Valley Citizens League, "Green River Valley Citizens League, Inc.," newsletter, July 2, 1954, 3, UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session. For repeated mentions of claim, see "Kentucky Has Potential for Far Greater Development than Ever Known – Ward," no publication provided, November 1953, copy in UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session; Letter, James R. Hines, A. P. Harding, and C. A. Reis to T. Millet Hand, II, July 8, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session; Letter, James R. Hines, A. P. Harding, and C. A. Reis to Lewis L. Strauss, Chairman, Atomic Energy Commission, July 13, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session; Letter, James R. Hines, A. P. Harding, and C. A. Reis to Raymond R. Paty and Harry A. Curtis, TVA, July 13, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session; Letter, James R. Hines, A. P. Harding, and C. A. Reis to Major General Samuel D. Sturgis, Jr., Army Corps of Engineers, July 14, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session; Letter, James R. Hines, A. P. Harding, and C. A. Reis to Rowland R. Hughes, Director, Bureau of the Budget, July 15, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session; and Letter, C. A. Reis to Senator E. C. Clements, Senator J. S. Cooper, Representative N. J. Gregory, and Representative W. H. Natcher, June 11, 1954, UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session.

¹⁷ Bobby Anderson, "Most Citizens of Muhlenberg are Acting as if They Already Had Found Paradise," *Louisville Courier-Journal*, October 2, 1959, 1, clipping in TVA Paradise," scrapbook, no editor provided, MCGHA; also see C. A. Reis and Green River Valley Citizens League, "The Railroads and the Green River Valley Program," newsletter, undated, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 1st Session, 1953; and W. Arch Moore, Amos E. Stone, and C. A. Reis, "Green River Valley Citizens League, Inc.," newsletter, February 13, 1956, 1-2, UKSCL, JSC, Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1955-1956.

and the steam plants themselves would offer opportunities for employment. Obtaining a TVA facility in the Green River Valley became the Citizen League's primary goal.

In the early 1950s, however, there remained one impediment preventing the construction of the type coal-fired power plants that the GRVCL desired: water.¹⁸ The massive facilities that the TVA built following World War II relied on adjacent rivers and reservoirs to cool and condense the steam that they used to create electricity. The agency's power plants required stream flows in excess of 1,200 to 1,500 cubic feet per second to operate efficiently. With a minimum flow of only 250 cubic feet per second, the Green River and its tributaries simply could not support a facility of the size that the TVA would build.¹⁹ Although the state of Kentucky had constructed a series of six locks and dams on the Green in the nineteenth century, the structures did little to regulate the stream and had fallen into disrepair by the 1950s.²⁰ Periods of low flow had already forced a smaller coal-fired facility that the private Kentucky Utilities owned to operate at less than full capacity during the summers of 1952 and 1953.²¹ Unsurprisingly, then, the Citizens League committed itself to improving the Green, adopting a

¹⁸ As Herbert Vogel, the TVA's chairman from 1954-1962, pointed out in a letter to the League's executive vice president, Amos Stone, "I am aware of the coal deposits present in the Green River Valley and of the favorable aspects of locating a steam-electric generating station in the area. However...a major obstacle at present to locating a large steam plant on the Green River or its tributaries is the inadequate water supply." Letter, Herbert D. Vogel to Amos E. Stone, August 10, 1956, UKSCL, JSC, Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1955-1956, underlining in original.

¹⁹ The Authority informed representatives from the Citizens League of this fact on multiple occasions. Letter, W. A. Moore, James R. Hines, C. A. Reis, and A. P. Harding to William H. Natcher, August 3, 1954, UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session; Letter, Herbert D. Vogel to Amos E. Stone, August 10, 1956, UKSCL, JSC, Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1955-1956.

²⁰ The locks were built to aid the navigation of steam ships and coal barges; see U. S. Army Corps of Engineers, "Locks and Dams Nos. 1 and 2, Green River, Kentucky," July 29, 1953, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River, Locks and Dams Nos. 1 and 2, 1953.

²¹ C. A. Reis and A. P. Harding, "Rebuttal to 12-Page Statement Filed by Illinois Central Railroad Company and Louisville and Nashville Railroad Company A. M. of March 5, 1854 Before the Army Civil Functions Sub-Committee of the U. S. Senate Committee on Appropriations Respecting Recommendation of Board of Engineers for Rivers and Harbors for Reconstruction of Locks Nos. 1 and 2 of Green River in Kentucky," March 5, 1954, UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session.

resolution that called for the federal government to build new reservoirs on the upper river and its tributaries.²²

The GRVCL lobbied the Army Corps of Engineers and Kentucky's congressional delegation to develop the Green River throughout the 1950s. It also placed full page advertisements in local newspapers and received editorial support from the *Louisville Courier Journal*, the largest paper in the state.²³ As early as 1952, the GRVCL sent a missive to Colonel Paschal N. Strong of the Corps of Engineers outlining the importance of constructing all of the proposed dams on the Green and its tributaries to meet the needs of a large coal-fired power plant that might attract other industries.²⁴ The organization also corresponded with Senator John Sherman Cooper and Representative William H. Natcher on a regular basis. As they had with the Army Corps of Engineers, the GRVCL's letters to Kentucky's congressmen focused on the necessity of projects like the Nolin, Barren, and Green Reservoirs, emphasizing riverine improvement as a pathway to progress for the region that would permit the Tennessee Valley Authority to take advantage of the western Kentucky basin's vast coal reserves. Making the production of coal-fired power feasible in the Green River Valley would benefit area residents

²² Located on the Nolin, Barren, and upper Green Rivers, the Citizens League argued that these projects were necessary to prevent flooding and maintain adequate flow throughout the watershed; see Green River Valley Citizens League, Inc., "Resolutions Adopted April 25, 1952 at Meeting of Green River Valley Citizens League, Inc.," undated, UKSCL, JSC, Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1955-1956; Letter, James R. Hines to John Sherman Cooper, May 25, 1957, UKSCL, JSC, Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1957; and Joe Creason, "Crash Program Started to Get Funds for Work on Green, Barren Rivers," *Louisville Courier-Journal*, January 17, 1960, clipping in UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Locks and Dams, 3 and 4, 1959-1960.

²³ For full page advertisement, see "Kentucky Has Potential for Far Greater Development than Ever Known – Ward," no publication provided, November 1953, copy in UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session. For editorial support, see "West Kentucky, A Logical Site For T.V.A. Plant," *Louisville Courier Journal*, August 28, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA.

²⁴ Letter, C. A. Reis to Col. Paschal N. Strong, November 11, 1952, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 1st Session, 1953.

and the nation as a whole by increasing the local supply of inexpensive electricity and reducing the cost of energy for federal agencies like the Atomic Energy Commission.²⁵

John Sherman Cooper, in particular, championed the GRVCL's cause in Congress. The organization had first contacted Cooper on March 20, 1953. A month later, the senator cosponsored a bill that authorized improvements on the Green River.²⁶ Cooper was a staunch supporter of public power and the expansion of the TVA's power program, and he believed that the goal of obtaining a new steam plant for the region "was a good one."²⁷ Other members of the state's congressional delegation backed the GRVCL's proposals as well. Senator Earle Clements aided Cooper in shepherding legislation through the Committee on Public Works, while William Natcher and Noble J. Gregory sponsored bills in the House of Representatives.²⁸

²⁵ As C. A. Reis argued, "It would be just too bad if TVA is allowed to build another giant power plant where costs would be much higher than in the Green River Valley." See Letter, C. A. Reis to Senator E. C. Clements, Senator J. S. Cooper, Representative N. J. Gregory, and Representative W. H. Natcher, June 11, 1954, UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session. For other examples, see Letter, W. A. Moore, James R. Hines, C. A. Reis, and A. P. Harding to William H. Natcher, August 3, 1954, UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session; Letter, James R. Hines to John Sherman Cooper, April 18, 1953, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 1st Session, 1953; Telegram, James R. Hines, A. P. Harding, and C. A. Reis to John Sherman Cooper, July 19, 1954, UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session; and Telegram, W. A. Moore and J. E. Wood to John Sherman Cooper, February 24, 1958, UKSCL, JSC, Box 88, Folder Army Corps of Engineers, Nolin Reservoir, 1958-1960.

²⁶ Letter, James R. Hines to John Sherman Cooper, April 18, 1953, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 1st Session, 1953; and "S. 1728 – A Bill Authorizing the Project for Improvement of Green and Barren Rivers, Kentucky," April 22, 1953, 83rd Congress, 1st Session, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 1st Session, 1953.

²⁷ Quoted in J. Ray Gaines, "In Time, T.V.A. to Need 600,000 Kilowatt[sic] Coal-Steam Generator at Bowling Green," in "Green River Valley Celebration Special," various newspapers, July 8, 1954, 2, copy in UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session. In fact, Senator Cooper helped lead the fight for the Bond Revenue Act later in the 1950s, the legislation that allowed the TVA to raise funds for new power plants outside of the normal appropriations process, and he lobbied the Authority to locate additional coal-fired facilities in eastern Kentucky as part of a program to alleviate poverty in Appalachia. On Cooper's role in sponsoring the Bond Revenue Act, see John Sherman Cooper, "Remarks of Senator John Sherman Cooper Before the Annual Meeting of the National Rural Electric Cooperative Association," February 5, 1958, UKSCL, JSC, Box 896, Folder Achievements and Problems of T.V.A and R.E.A.; and John Sherman Cooper, "Article for Nashville Tennessean Senator John Sherman Cooper," undated, UKSCL, JSC, Box 911, Folder T.V.A. Nashville Tennessean. For his plans for eastern Kentucky, see Untitled Press Release, March 8, 1961, UKSCL, Anne and Harry M. Caudill Collection, 1854-1996, 91M2 [hereafter: AHCC], Box 10, Folder 1. For his general support for developing public power, see Letter, John Sherman Cooper to Harry M. Caudill, October 1, 1963, UKSCL, AHCC, Box 10, Folder 3.

²⁸ In explaining his support for the Citizens League, Clements noted, "I have long thought that if any more steam plants are built by the TVA they should be located at the source of the fuel. The electric power can be transmitted much more cheaply than the fuel can be transported." Quoted in J. Ray Gaines, "In Time, T.V.A. to Need 600,000

Opposition to the GRVCL's program of development focused on the environmental consequences of the Green River's canalization. Area farmers and agricultural interests complained that new dams would flood the rich bottom lands that were the most productive in the valley.²⁹ Sportsmen's clubs also argued that turning the Green's tributaries into slack water reservoirs would make the watershed less hospitable to certain species of fish and that other game animals would find their habitats reduced.³⁰ Nevertheless, the GRVCL benefited from the support of local residents who viewed the construction of dams as a potential source of employment for a depressed region.³¹

Congress quickly approved plans to renovate the first two sets of locks and dams on the lower Green River in 1953, but it took several more years before the Senate and the House of Representatives funded the construction of reservoirs on the upper Green and its tributaries.³²

Kilowat[sic] Coal-Steam Generator at Bowling Green," in "Green River Valley Celebration Special," various newspapers, July 8, 1954, 2, copy in UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session. Similarly, Representative Noble J. Gregory observed in the same article that "The construction of steam plants would help in more ways than one and would go a long way toward a solution of our coal problem." Also see "S. 1728 – A Bill Authorizing the Project for Improvement of Green and Barren Rivers, Kentucky," April 22, 1953, 83rd Congress, 1st Session, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 1st Session, 1953; "Joint Answer of Senator Clements, Senator Cooper, Representative Natcher, and Representative Gregory, To Statements Opposing the Reconstruction of Locks and Dams Nos. 1 and 2 on the Green River, Kentucky," undated, UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session; and Letter John Sherman Cooper to Central City Chamber of Commerce July 6, 1954 (see attached resolution), UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session.

²⁹ U. S. Army Corps of Engineers, "Locks and Dams Nos. 1 and 2, Green River, Kentucky," July 29, 1953, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River, Locks and Dams Nos. 1 and 2, 1953.

³⁰ Letter, Gilbert F. Morton, Nelson County Sportsmen's Club, Inc. to John Sherman Cooper, December 8, 1956, UKSCL, JSC, Box 88, Folder Army Corps of Engineers, Nolin Reservoir, 1956-1957.

³¹ Letter, T. H. Demunbrun to John Sherman Cooper, June 5, 1957, UKSCL, JSC, Box 88, Folder Army Corps of Engineers, Nolin Reservoir, 1956-1957.

³² As for the first two lock and dam combinations, the Army Corps of Engineers argued that refurbishing the existing structures rather than building a single high dam would flood the minimum amount of land necessary to permit year-round navigation for modern coal barges. In July 1953, both the Senate and the House Committees on Public Works ruled that the River and Harbor Act of 1909 had already authorized modernization of the existing structures on the Green River, meaning that Congress did not need to pass a specific appropriation for the project. Work could begin immediately. U. S. Army Corps of Engineers, "Locks and Dams Nos. 1 and 2, Green River, Kentucky," July 29, 1953, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River, Locks and Dams Nos. 1 and 2, 1953; Letter Edward Martin to Major General Samuel D. Sturgis, Jr., July 16, 1953, UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 1st Session, 1953; and Letter, John Sherman Cooper to James R. Hines, July 25, 1953, UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 1st Session, 1953. Regarding the approval of construction on the upper river, the Flood Control Act of 1938 had included plans for

[Fig. 6.3] At various points in the 1950s, the Eisenhower administration recommended that domestic development programs be postponed unless they had a direct connection to national defense.³³ The GRVCL continued to lobby for the completion of additional projects on the upper river. On July 8, 1954, the organization sent a form letter to members of Congress, reiterating that “some Federal agencies are not generating coal-steam-electricity where that can be done at the lowest cost possible in the whole wide world.”³⁴ Additionally, the Citizens League partnered with twelve different local newspapers in the Green River Valley to print an eight page special edition on July 8 and 9, 1954 devoted entirely to the improvement of the Green and its tributaries.³⁵

impoundments on the Nolin and Barren Rivers as well as another dam on the Green, but Congress still had to fund their construction; see Letter, Colonel C. C. Noble to John Sherman Cooper, January 11, 1960, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River, Locks and Dams Nos. 1 and 2, 1959-1960; and Letter, C. H. Chorpening to John Sherman Cooper, May 19, 1953 (see attached table), UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 1st Session, 1953.

³³ Letter, John Sherman Cooper to W. A. Moore, February 28, 1958, UKSCL, JSC, Box 88, Folder Army Corps of Engineers, Nolin River Reservoir, 1958-1960.

³⁴ Letter, James R. Hines, A. P. Harding, and C. A. Reis to T. Millet Hand, II, July 8, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session (includes a list of congressmen to which the letter was sent). The Citizens League mailed duplicate copies to a variety of federal agencies in the coming weeks, including the Atomic Energy Commission, the TVA, the Army Corps of Engineers, and the Bureau of the Budget. Letter, James R. Hines, A. P. Harding, and C. A. Reis to Lewis L. Strauss, Chairman, Atomic Energy Commission, July 13, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session; Letter, James R. Hines, A. P. Harding, and C. A. Reis to Raymond R. Paty and Harry A. Curtis, TVA, July 13, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session; Letter, James R. Hines, A. P. Harding, and C. A. Reis to Major General Samuel D. Sturgis, Jr., Army Corps of Engineers, July 14, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session; and Letter, James R. Hines, A. P. Harding, and C. A. Reis to Rowland R. Hughes, Director, Bureau of the Budget, July 15, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session.

³⁵ Memorandum, C. A. Reis to League Members, July 14, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session. A copy of the July 8, 1954 issue can also be found in UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session. The newspapers involved were the *Owensboro Messenger* (KY), *Owensboro Inquirer* (KY), *McLean County News* (Calhoun, KY), *Messenger* (Central City, KY), *Times-Argus* (Central City, KY), *Greenville Leader* (Greenville, KY), *Green River Republican* (Morgantown, KY), *Park City Daily News* (Bowling Green, KY), *Henderson Gleaner & Journal* (KY), *Ohio County Messenger* (Beaver Dam, KY), *Ohio County News* (Hartford, KY), and *Sebree Banner* (KY). Articles in the special edition claimed that the valley had already lost power plants to other areas where stream flow was more conducive to coal-fired production and that the supply of coal in the Green River Valley was “Tremendous.” In particular, Virgil Stewart, a League member from Beaver Dam, Kentucky, suggested that the private utility conglomerate that constructed a facility to supply part of the electric load for the Atomic Energy Commission’s complex in Paducah, Kentucky, had acknowledged that it had bypassed the Green River because it could not support a modern steam plant. Virgil Stewart, “Need for Green River Reservoirs is Outlined,”



Figure 6.3: The Green River Watershed – A map of the Green River and its tributaries, including dams and locks, completed and planned, circa 1960. Source: Barren River Development League, “Report Urging Reconstruction of Locks and Dams Nos. 3 and 4, Green River, and Extension of 9-Foot Navigation Channel to Bowling Green, Kentucky,” in “Green and Barren Rivers Navigation Improvements,” March 15, 1960, 14, UKSCL, JSC, Box 40, Folder Army Corps of Engineers, Barren River Reservoir, 1956-1964.

in “Green River Valley Celebration Special,” various newspapers, July 8, 1954, 2 and 3, copy in UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session; for “Tremendous,” see C. A. Reis, “Tremendous Coal Supply in the Valley,” in “Green River Valley Celebration Special,” various newspapers, July 8, 1954, 6, copy in UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session. Reis repeated the GRVCL’s argument that a power plant located in the western Kentucky basin would be able to generate coal-fired electricity cheaper than any other facility in the world. Also see C. A. Reis, “It Might Have Been Better to Put New Atomic Plant on Green River Rather Than in Ohio,” in “Green River Valley Celebration Special,” various newspapers, July 8, 1954, 1, copy in UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session; C. A. Reis, “Valley Seen as Source of Coal, Power at Lowest Cost in World,” in “Green River Valley Celebration Special,” various newspapers, July 8, 1954, 1 and 5, copy in UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session; and J. Ray Gaines, “In Time, T.V.A. to Need 600,000 Kilowatt[sic] Coal-Steam Generator at Bowling Green,” in “Green River Valley Celebration Special,” various newspapers, July 8, 1954, 2, copy in UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session. As a statement of the GRVCL’s position, the special edition was thorough if repetitive, and it received positive editorial comment from numerous newspapers in western Kentucky; see Memorandum, C. A. Reis to League Members, July 14, 1954, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Project, 83rd Congress, 2nd Session.

The Army Corps of Engineers completed the first two lock and dam combinations on the lower Green in 1956, creating a nine-foot deep navigation channel from the river's mouth to mile 103, just beyond Paradise.³⁶ The proposed impoundments on the upper river, however, remained in various stages of planning throughout 1957 and 1958.³⁷ The Corps of Engineers finally broke ground on the Nolin Reservoir in April 1959 and prepared to commence work on the Barren Reservoir as well.³⁸ On October 1, 1959, the TVA revealed that it would build its next coal-fired facility on the Green River at Paradise, Kentucky, in Muhlenberg County.³⁹

The Paradise Steam Plant

Consistent with the agency's consumption-centric regime, the Authority had searched for a site that would allow it to generate and transmit large volumes of electricity at the lowest possible cost while separating production from residential and commercial customers. By October 1959, the area near the village of Paradise met all of the Authority's criteria. The location possessed adequate access to cooling water, an ample supply of coal, and it was distant from the major population centers of the TVA's service area.

³⁶ Letter, Colonel C. C. Noble to John Sherman Cooper, January 11, 1960, UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Locks and Dams, 3 and 4, 1959-1960; and Amos E. Stone, "Review and Current Status of the Overall Green River Valley Development Program," newsletter, December 27, 1956, UKSCL, JSC, Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1957.

³⁷ Amos E. Stone, "Review and Current Status of the Overall Green River Valley Development Program," newsletter, December 27, 1956, UKSCL, JSC, Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1957; Telegram, John Sherman Cooper to Amos E. Stone, July 9, 1957, UKSCL, JSC, Box 88, Folder Army Corps of Engineers, Nolin Reservoir, 1956-1957; and Letter, John Sherman Cooper to Amos E. Stone, May 14, 1958, UKSCL, JSC, Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1958-1959.

³⁸ "Nolin River Reservoir Ceremonies Saturday," *Ohio County Messenger*, Beaver Dam, Kentucky, April 3, 1959, 1; "All Eyes Focused on Valley," *Greenville Leader*, Greenville, Kentucky, October 8, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; other sources suggest that construction began by early 1960, see Barren River Development League, "Report Urging Reconstruction of Locks and Dams Nos. 3 and 4, Green River, and Extension of 9-Foot Navigation Channel to Bowling Green, Kentucky," in "Green and Barren Rivers Navigation Improvements," March 15, 1960, 13, UKSCL, JSC, Box 40, Folder Army Corps of Engineers, Barren River Reservoir, 1956-1964.

³⁹ "TVA to Build One Hundred Million Dollar Electric Plant at Paradise on Green River," *Messenger-Times-Argus*, Central City, Kentucky, October 1, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA.

The recent improvement of the Green River had influenced the Authority's decision. The TVA had built all of its earlier coal-fired facilities on the Tennessee River and its tributaries in part to take advantage of the large, consistent stream flow that the managed watershed provided for cooling purposes. The Authority's plans for its new plant called for two massive generating units that together would consume approximately 450,000 gallons of water per minute, as much as New York City or Los Angeles.⁴⁰ The new reservoirs on the Green River and its tributaries had made Paradise a viable location for a power plant.⁴¹ Although other sites that the TVA surveyed possessed better access to cooling water, two additional factors weighed heavily in the community's favor.⁴²

⁴⁰ David McBride, "New Paradise Steam Plant Taking Shape," *Messenger & Inquirer*, Owensboro, Kentucky, undated, clipping in MCGHA, Folder Tennessee Valley Authority-TVA; and "A Giant in Paradise," no publication provided, November 24, 1961, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA.

⁴¹ Agency staff had assessed the Green River and its tributaries in February 1959. The TVA's official site selection report noted that construction had started on the Nolin River dam and that Congress' Public Works Appropriation Act for the upcoming fiscal year had authorized the Barren River project as well. The completion of these impoundments would yield conditions "favorable" to the operation of a steam plant of the size that the Authority proposed. The TVA's board of directors also made it clear to Senator Cooper that the agency had considered the progress that had been made on the Nolin and Barren reservoirs when selecting Paradise. "TVA Officials Inspect Coal Mines, Lock and Dams on Green and Barren," *Messenger-Times-Argus*, Central City, Kentucky, February 5, 1959, 5; Tennessee Valley Authority Division of Water Control Planning Project Planning Branch, "Summary Report of Site Selection Studies Northwestern Area Steam Plant," October 1959, 1-4 and 7-8 (quote from 7), NARA-SE, RG 142, OEDC, Box 628; Memorandum, G. P. Palo to A. J. Wagner, "Northwestern Area Steam Plant," October 1, 1959, in Tennessee Valley Authority Division of Water Control Planning Project Planning Branch, "Summary Report of Site Selection Studies Northwestern Area Steam Plant," October 1959, NARA-SE, RG 142, OEDC, Box 628; Letter A. R. Jones to John Sherman Cooper, March 1, 1960, UKSCL, JSC, Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1960. The Authority's pronouncements only verified what many in western Kentucky already assumed. According to Joe Creason, a columnist at the *Louisville Courier-Journal*, "It is an accepted fact that if the Green had not been navigable, and if the tributary reservoirs had not been under way, the Tennessee Valley Authority would not have decided to build the world's largest single-generator steam electric plant at Paradise, a village 3 miles below the head of present navigation." Quoted in Joe Creason, "Crash Program Started to Get Funds for Work on Green, Barren Rivers," *Louisville Courier-Journal*, January 17, 1960, clipping in UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Locks and Dams, 3 and 4, 1959-1960. I believe it is also likely that John Sherman Cooper's role in sponsoring and passing the Bond Revenue Act in 1959 influenced the Authority's decision to build its first plant using bonds rather than Congressional appropriations in western Kentucky; however, I have been unable to corroborate this in the archives.

⁴² In fact, the TVA's initial calculations suggested that constructing its facility near Kentucky Dam on a massive reservoir that the agency had built on the Tennessee River would provide the plant with a greater capacity for condensing steam, making future expansion easier. Adding a third or fourth unit on the Green River, in contrast, would require expensive cooling towers. The TVA was also concerned about the cost of construction labor at Paradise relative to Kentucky Dam, but this did not prevent the Authority from choosing the former for its plant site; see Tennessee Valley Authority Division of Water Control Planning Project Planning Branch, "Summary Report of Site Selection Studies Northwestern Area Steam Plant," October 1959, 7-12, NARA-SE, RG 142, OEDC, Box 628;

First, Paradise was located in the middle of the western Kentucky coalfield, and several mines backed up to the proposed plant site. The procurement of fuel accounted for the largest operational cost at the Authority's steam facilities, and building a generating station on the Green River in Muhlenberg County, Kentucky, allowed the agency to minimize its expenses related to the transportation of coal.⁴³ For the TVA, the construction of a mine-mouth power plant symbolized efficiency, epitomizing the agency's consumption-centric approach to producing electricity.⁴⁴ The Authority estimated that fuel costs at Paradise would be almost one dollar per ton less than at another site under consideration near Kentucky Dam, a savings of approximately twenty-five percent.⁴⁵ Given the quantity and quality of coal in Muhlenberg County and the western Kentucky basin, Paradise represented an ideal location to produce steam generated electric power.⁴⁶

and Memorandum, G.P. Palo to A.J. Wagner, "Northwestern Area Steam Plant," October 1, 1959, NARA-SE, RG 142, OEDC, Box 628.

⁴³ The Authority would not hesitate to choose a location that had higher infrastructural costs if it could demonstrate that access to cheap coal would reduce long term operational expenses. For examples of the siting process that emphasize costs, see TVA, *The Johnsonville Steam Plant: A Comprehensive Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Six-Unit Plant*, Technical Report No. 31 (TVA: Knoxville, 1958), 1-29, NARA-SE, RG 142, OEDC, Box 586; TVA, *The Paradise Steam Plant*, Technical Report No. 37, 1-24, copy in NARA-SE, RG 142, OEDC, Box 636; Memorandum, G.P. Palo to A.J. Wagner, "Northwestern Area Steam Plant," October 1, 1959, NARA-SE, RG 142, OEDC, Box 628; and TVA, *The Paradise Steam Plant Unit 3*, Technical Report No. 39, 1-26.

⁴⁴ Many of the local leaders and politicians who encouraged the Authority to choose the Green River Valley for its new facility noted that it was much cheaper to transmit electricity to distant communities than barge or truck coal to a generating station. As James E. Wood, a GRVCL member and insurance salesman from Greenville, noted in a speech before the Public Works Subcommittees of the United States Senate and House of Representatives, [emphasis original] "*It is high time to stop hauling the coal to the water and let the water run to the coal.*" See J. E. Wood, "Statement Urging Completion of Flood Control-Water Storage in the Green River Watershed of Western Kentucky," speech before the Public Works Subcommittees of the Appropriations Committees of the United States Senate and House of Representatives in Washington, D. C., May 5, 1955, 10, UKSCL, JSC, Box 71, Folder Army Corps of Engineers, Green River Reservoir, 1955-1956. Also see J. Ray Gaines, "In Time, T.V.A. to Need 600,000 Kilowatt[sic] Coal-Steam Generator at Bowling Green," in "Green River Valley Celebration Special," various newspapers, July 8, 1954, 2, copy in UKSCL, JSC, Box 70, Folder Green River Project, 83rd Congress – 2nd Session.

⁴⁵ "The prime cost advantage of the Paradise site is the lower cost of fuel which results from its location in the western Kentucky coal field." See Memorandum, G. P. Palo to A. J. Wagner, "Northwestern Area Steam Plant," October 1, 1959, NARA-SE, RG 142, OEDC, Box 628.

⁴⁶ Tennessee Valley Authority Division of Water Control Planning Project Planning Branch, "Summary Report of Site Selection Studies Northwestern Area Steam Plant," October 1959, 9-10 and 14, NARA-SE, RG 142, OEDC, Box 628; and Memorandum, G.P. Palo to A.J. Wagner, "Northwestern Area Steam Plant," October 1, 1959, NARA-SE, RG 142, OEDC, Box 628.

Second, Muhlenberg County remained far removed from the population centers of the Tennessee Valley Region as well as valuable sites for outdoor recreation. Nashville, Tennessee, the closest major city, was almost ninety miles away.⁴⁷ Furthermore, the Authority did not distribute electric power in Muhlenberg County, and none of the agency's customers lived in the vicinity of the proposed plant. Memos from the TVA's chief engineer, G. P. Palo, the official site selection report, and the agency's final report on the construction of the Paradise facility also observed that a plant near Kentucky Dam posed a much greater risk from an environmental perspective. Emissions from a generating station on that site would sully an area that was home to many vacation cabins on one of the Authority's scenic reservoirs.⁴⁸ The lakes that the TVA created on the Tennessee River served as oases for the urban residents of the valley and for vacationers from around the eastern United States, and the Authority touted its reservoirs as being situated within a day's drive of one third of the country's population.⁴⁹ Paradise, the official site selection report noted, was located "in a rural area, portions of which have been badly cut up as a result of strip mining operations. It is unlikely that construction of a steam plant would be objectionable, or result in claims for damage to surrounding property."⁵⁰ Massive

⁴⁷ In fact, The TVA expected to transmit much of the electricity generated from its new facility to Nashville, building a high-voltage line from Paradise to Davidson County; see "\$100 Million To Be Spent at Paradise," *Tennessean*, October 2, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; and "New Transmission Line from Paradise to Nashville to Cost \$7.7 Million," no publication provided, undated, clipping in MCGHA, Folder Tennessee Valley Authority-TVA.

⁴⁸ Tennessee Valley Authority Division of Water Control Planning Project Planning Branch, "Summary Report of Site Selection Studies Northwestern Area Steam Plant," October 1959, 5, NARA-SE, RG 142, OEDC, Box 628; Memorandum, G.P. Palo to A.J. Wagner, "Northwestern Area Steam Plant," October 1, 1959, NARA-SE, RG 142, OEDC, Box 628; and TVA, *The Paradise Steam Plant*, Technical Report No. 37, 11-15, copy in NARA-SE, RG 142, OEDC, Box 636.

⁴⁹ See, Warner Ogden, "TVA Has Year-Round Plans at Land Between the Lakes," *New York Times*, March 31, 1968, 15.

⁵⁰ For this quote see Tennessee Valley Authority Division of Water Control Planning Project Planning Branch, "Summary Report of Site Selection Studies Northwestern Area Steam Plant," October 1959, 5, NARA-SE, RG 142, OEDC, Box 628. Also see, Memorandum, G.P. Palo to A.J. Wagner, "Northwestern Area Steam Plant," October 1, 1959, NARA-SE, RG 142, OEDC, Box 628; and TVA, *The Paradise Steam Plant*, Technical Report No. 37, 11-15, copy in NARA-SE, RG 142, OEDC, Box 636.

strip mines flanked both sides of KY-176, the only road into and out of the village.⁵¹ TVA employees who visited the Paradise remarked that its residents already lived in deteriorating homes, the implication being that even if the community's inhabitants did notice the steam plant's effect on their environs, they would have neither the resources nor the clout to force a confrontation with the Authority.⁵² Building on the Green River in Muhlenberg County allowed the TVA to separate consumers and valuable recreation destinations from the byproducts of coal-fired production.



Figure 6.4a: Paradise Steam Plant – A ground level view of Paradise Steam Plant circa 1964. Source: TVA, The Paradise Steam Plant: A Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Two-Unit Plant, Technical Report No. 37 (Knoxville, TN: TVA, 1964), frontispiece, copy in NARA-SE, RG 142, OEDC, Box 636.

⁵¹ George Kerler, "Paradise, A Speck of Geography, Found by Giant TVA," *Messenger & Inquirer*, Owensboro, Kentucky, October 11, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA.

⁵² Memorandum and report, Fred W. Thomas to F.E. Gartrell, "Fly Ash Fallout – Paradise Steam Plant and Village of Paradise, Kentucky," February 10, 1964, NARA-SE, RG 142, PMF, Box 802.

If choosing the village of Paradise embodied the TVA's consumption-centric approach to designing its power network so did the Paradise Steam Plant itself. The facility was physically imposing. [Fig. 6.4a and Fig. 6.4b] The size of a twenty-two-story building, the structure towered over the low knolls along the banks of the Green River. At 600 feet in height, the Paradise's smokestacks were taller than the Washington Monument, reaching higher than any of the stacks at the Authority's other plants.⁵³ According to the TVA, the massive facility, with its twin 650,000 kilowatt units, was scheduled to be the largest in the world in terms of overall capacity at the time of its completion in 1963.⁵⁴ Individually, the generators also surpassed any that the Authority had ever constructed, more than quadrupling the power output of those that the agency had commissioned for its first postwar steam plant at Johnsonville, Tennessee, in 1948.⁵⁵ Even the engineering of the new facility's furnaces represented a technological advance for the TVA as the agency claimed that the plant's cyclone-fired boilers, a reference to the pattern of air flow and the movement of coal particles through the furnace, allowed the Authority to capture fly ash more completely, eliminating the need for other pollution controls.⁵⁶ The Paradise Steam Plant represented the crown jewel of the TVA's power network.

⁵³ William R. Heffren, "Bonanza for Western Kentucky," *L&N Magazine*, 26(11), November 1960, 10-11 and 21, found in NARA-SE, RG 142, OEDC, Box 629; "Work Continues on Big TVA Steam Plant at Paradise," *The Park City Daily News*, Bowling Green, Kentucky, September 4, 1960, 14; and TVA Division of Engineering Design, "Paradise Steam Plant: Final Design Report," Report No. 40-200, May 1964, 24, NARA-SE, RG 142, OEDC, Box 631.

⁵⁴ "Paradise TVA Plant to be World's Largest Producer," *Messenger-Times-Argus*, Central City, Kentucky, October 22, 1959, 1. William R. Heffren, "Bonanza for Western Kentucky," *L&N Magazine*, 26(11), November 1960, 10-11 and 21, found in NARA-SE, RG 142, OEDC, Box 629; "Work Continues on Big TVA Steam Plant at Paradise," *The Park City Daily News*, Bowling Green, Kentucky, September 4, 1960, 14; and TVA Division of Engineering Design, "Paradise Steam Plant: Final Design Report," Report No. 40-200, May 1964, 24, NARA-SE, RG 142, OEDC, Box 631.

⁵⁵ See, TVA, *Annual Report, 1954* (Washington, D.C.: Government Printing Office, 1954), 16-7; TVA, *Annual Report, 1960* (Washington, D.C.: Government Printing Office, 1960), 8 and 10; TVA, *The Paradise Steam Plant Unit 3*, Technical Report No. 39, 8; "Expansion Plans Outlined by T.V.A.," *New York Times*, July 19, 1964, F22; and "New T.V.A. Generating Unit is Termed Largest in World," *New York Times*, November 21, 1965, F11.

⁵⁶ TVA, *The Paradise Steam Plant*, Technical Report No. 37, 25 and 62, copy in NARA-SE, RG 142, OEDC, Box 636. Although the cyclone furnace design was not new when the TVA adopted it, the agency had previously used more conventional boilers.



Figure 6.4b: Paradise Steam Plant (aerial) – An aerial photograph of Paradise Steam Plant circa 1964. Source: TVA, The Paradise Steam Plant: A Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Two-Unit Plant, Technical Report No. 37 (Knoxville, TN: TVA, 1964), 26, copy in NARA-SE, RG 142, OEDC, Box 636.

A Bonanza for Western Kentucky

Although the local advocates of private power criticized the announcement of the Authority's decision, broad support for the agency and its new generating facility existed in western Kentucky. Opposition to the Paradise Steam Plant focused mostly on the threat that the TVA posed to free enterprise, suggesting that the agency was a socialist experiment that was an affront to the United States' capitalist traditions. For many of the area's conservatives, the new

facility at Paradise was simply the latest in a long line of the Authority's transgressions against the region and the nation.⁵⁷

The TVA's proponents countered these critics with praise for the Authority's power plant. Headlines in local newspapers and trade magazines referred to the facility as a "Bonanza for Western Kentucky," while declaring, "Sun Shines on Depressed Area Again."⁵⁸ Articles called attention to the jobs that the Paradise Steam Plant created, the stable market that it provided for coal, and the facility's presumed role in attracting heavy industries that would boost the local economy.⁵⁹ The arrival of the Authority's power plant meant that the possibilities for

⁵⁷ For examples of opposition, see "Kentucky May Be Battleline[sic] of Free Enterprise Versus Public Ownership," no publication provided, November 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; "Someone Will Have to Pay the Taxes if TVA Eliminates KU – Willis Says," no publication provided, undated, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; Arthur T. Iler, "Iler Hopes TVA Paradise Plant Cost is Not More than We Can Afford," no publication provided, November 5, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; Marvin Wachs, "Citizens for Low Cost Power Really 'Citizens for BELOW Cost Power,'" *Messenger-Times-Argus*, Central City, Kentucky, August 27, 1959, 1; and "Lexington Leader Declares TVA Plant Is Another Move to Ruin Private Power," no publication provided, November 11, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA. Interestingly, the *Messenger-Times-Argus* of Central City, Kentucky, in Muhlenberg County was one of the TVA's largest critics despite the fact that one of the paper's editors, Amos E. Stone, was a member of the Green River Valley Citizens League; see "Mr. Khrushchev, You'll Feel Right at Home Visiting TVA," *Messenger-Times-Argus*, Central City, Kentucky, September 3, 1959, 1; and "Stone Asks Doctor Seeking Socialized Utilities to Back Socialized Medicine," *Messenger-Times-Argus*, Central City, Kentucky, August 27, 1959. The conservative stance of the *Messenger-Times-Argus* on the TVA and its power program makes sense within the context of the agency's beginnings as a producer of hydroelectricity, something that did not endear the Authority to mining communities in the Tennessee Valley Region. For more information on the political fight between private and public power, see Chapter Two.

⁵⁸ For quotes see the headlines of following articles, William R. Heffren, "Bonanza for Western Kentucky," *L&N Magazine*, 26(11), November 1960, 10-11 and 21, NARA-SE, RG 142, OEDC, Box 629; and "Sun Shines On Depressed Area Again," *Middlesboro Daily News*, Middlesboro, Kentucky, October 2, 1959, 1-2.

⁵⁹ For examples, see "Most Citizens of Muhlenberg are Acting as if They Already Had Found Paradise," *Louisville Courier-Journal*, October 2, 1959, 1; George H. Kerler, "Paradise, a Speck of Geography, Found by TVA Giant," *Messenger & Inquirer*, Owensboro, Kentucky, October 11, 1959, 1-4; "Madisonville Messenger Sees Unlimited Possibilities in TVA Plant on Green," no publication provided, November 12, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; "Era of Prosperity Looms Ahead for Green River Valley Region," no publication provided, November 12, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; "Courier-Journal Calls Green River Valley Natural Site for TVA Power," no publication provided, undated, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; Frank Stubblefield, "Young People Will Get More Job Chances at Home, Stubblefield Says," no publication provided, October 22, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; "Construction Payroll at TVA Plant Will Be \$40 Million; 1500 Needed At Peak of Project," *Greenville Leader*, October 9, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; "Green River Valley Gest Some Doubly Welcome News," no publication provided, October 3, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; and Bobby Anderson, "Most Citizens of Muhlenberg are Acting as if They Already Had Found Paradise," *Louisville Courier-Journal*, October 2, 1959, 1, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA. It was common for residents in areas where

the Green River watershed were “unlimited,” with some predicting that the area would become the “Ruhr Valley of America.”⁶⁰ In Muhlenberg County, Greenville’s mayor, William Sparks, also assessed the Paradise facility favorably, labelling it “the greatest economic asset [the county] has ever had.”⁶¹ Overall, supporters argued that the agency’s generating station symbolized a new beginning for the communities in the western coal basin, “providing reason for new hope among residents of this chronically depressed section of Kentucky.”⁶²

The generating station represented a victory for the GRVCL and the organization’s program of development. George Kerler of the Owensboro *Messenger & Inquirer* described the Paradise plant as the climax of the Citizens League’s effort to modernize the Green and its tributaries.⁶³ Other newspapers also credited the GRVCL and the state’s congressional delegation for helping the area attract a major coal-fired power plant.⁶⁴ Unsurprisingly, members of the Citizens League concurred. James E. Wood, an insurance broker from Greenville and a vice president of the GRVCL, noted that it would not have been possible to locate a facility at Paradise without the work of men like Amos Stone and Albert Harding. According to Wood, “Without the efforts of those who fought for the impoundment of water in the upper Green River

the TVA built its facilities to welcome the new coal-fired plant as an economic boon; see, Roberts and Bluhm, *The Choices of Power*, 72-4; also Hargrove, *Prisoners of Myth*, 183.

⁶⁰ Both quotes are from a reprint of an editorial in the *Madisonville Messenger*, see “Madisonville Messenger Sees Unlimited Possibilities in TVA Plant on Green,” no publication provided, November 12, 1959, clipping in “TVA Paradise,” scrapbook, no editor provided, MCGHA.

⁶¹ William Sparks, “Plans Should be Started to Cope with Coming Industry – Sparks,” no publication provided, undated, clipping in “TVA Paradise,” scrapbook, no editor provided, MCGHA.

⁶² Quoted from reprinted article that notes original editorial was from *Park City Daily News*, “Paradise Plant Providing New Hope for Valley,” no publication provided, November 12, 1959, clipping in “TVA Paradise,” scrapbook, no editor provided, MCGHA.

⁶³ George Kerler, “Green River Program Climaxes in TVA Plant,” *Messenger & Inquirer*, Owensboro, Kentucky, undated, clipping in “TVA Paradise,” scrapbook, no editor provided, MCGHA.

⁶⁴ “Sometimes Seemingly Thankless Efforts are Now Bearing Fruit, Daily News Says,” no publication provided, undated, clipping in “TVA Paradise,” scrapbook, no editor provided, MCGHA; Joe Creason, “Crash Program Started to Get Funds for Work on Green, Barren Rivers,” *Louisville Courier-Journal*, January 17, 1960, clipping in UKSCL, JSC, Box 70, Folder Army Corps of Engineers, Green River Locks and Dams, 3 and 4, 1959-1960; and Bobby Anderson, “Most Citizens of Muhlenberg are Acting as if They Already Had Found Paradise,” *Louisville Courier-Journal*, October 2, 1959, 1, clipping in TVA Paradise,” scrapbook, no editor provided, MCGHA.

Valley watershed, and on the Rough, Nolin, and Barren rivers, there simply would not have been enough water for a plant such as this.”⁶⁵ The new generating station at Paradise signified a commitment not just to power but to mining. Shortly after making the location of its new facility public, the Authority announced that it had signed a \$191,750,000 contract with the Peabody Coal Company to provide the agency with 65,000,000 tons of coal over the next seventeen years.⁶⁶ Ultimately, the Authority’s steam plant stabilized the mining industry in Muhlenberg, leading to several decades of growth as the county became the largest coal producer by tonnage in the United States.⁶⁷

Few scholars have acknowledged either the extent to which communities celebrated being chosen as a site for one of the TVA’s generating stations or the role of local leaders in altering regional watersheds to make their towns more attractive for the Authority. Considerable overlap existed between the agency’s energy regime and the goals of the civic boosters in the western Kentucky coalfields. At least for the TVA and its supporters, the Paradise Steam Plant represented both the product and the promise of their commitment to using natural resources more efficiently in the pursuit of public power and regional prosperity.

⁶⁵ Quoted in Bobby Anderson, “Most Citizens of Muhlenberg are Acting as if They Already Had Found Paradise,” *Louisville Courier-Journal*, October 2, 1959, 1, clipping in TVA Paradise,” scrapbook, no editor provided, MCGHA. For his part, Albert Harding attributed the Citizens League’s success to C. A. Reis, a local coal operator and a man of “foresight and determination” whose vision fully captured the valley’s potential for progress; see Albert P. Harding, “Albert P. Harding Says Thanks to Mr. C. A. Reis for Vision,” no publication provided, undated, clipping in “TVA Paradise,” scrapbook, no editor provided, MCGHA.

⁶⁶ “Peabody Gets \$191,000,000 Contract for 65 Million Tons of Coal to New TVA Plant,” *Messenger-Times-Argus*, Central City, Kentucky, October 8, 1959, 1.

⁶⁷ “Muhlenberg Most in ’64, #1 Coal Producing County in Nation,” no publication provided, September 5, 1965, photocopy in *Coal In Western Kentucky*, book 1, scrapbook by Agnes S. Harralson, ed. David Orrahood, MCGHA; “County’s Coal Production Since 1890,” no publication provided, undated, photocopy in *Coal In Western Kentucky*, book 1, scrapbook by Agnes S. Harralson, ed. David Orrahood, MCGHA; and Bryce Williams, “The Land is Raped for Coal: Sun Team Visits Kentucky Strip Mine,” *The Vancouver Sun*, January 25, 1969, 1 and 14.

Paradise Lost

The village of Paradise also welcomed the TVA's decision to locate a facility on the Green in Muhlenberg County. Newspapers argued that the community stood to gain from the Authority's power plant, with one headline proclaiming, "Paradise Not Lost: Life Returning to Ghost Town."⁶⁸ Residents of the small hamlet agreed. When asked his opinion of the new TVA facility, John H. Buchanan, the local postmaster and the owner of one of the two stores left in the village, responded, "I feel great about it. We need something to boost us up."⁶⁹ C. D. Cavanaugh, who operated the other store in Paradise, concurred suggesting that the plant meant he could expand his grocery.⁷⁰ Like many of the Authority's supporters throughout western Kentucky, the townspeople believed that the new facility would boost the local economy. Numerous villagers, including John Buchanan's wife, Nellie, longtime residents W. W. Tabb and Mrs. S. A. Tunstill, and William H. Poole, a retired miner who had three sons living in Michigan, all conveyed their optimism that the TVA's generating station would save Paradise by propping up the coal industry and providing jobs that would stem the tide of outmigration.⁷¹

Nevertheless, the Paradise Steam Plant did little for the village that shared its name.

Although seventy-five percent of the workers who helped build the facility came from within

⁶⁸ "Paradise Not Lost: Life Returning to Ghost Town," *The Kentucky New Era*, Hopkinsville, Kentucky, October 2, 1959, 7; Nate Basham, "Paradise – Hamlet of 35 Families – Stirs with Excitement Over New Plant," *Messenger & Inquirer*, Owensboro, Kentucky, October 2, 1959, photocopy in MCGHA, Folder Paradise-Muhlenberg County; and Dan Coleman, "Hamlet Agog Over New Plant," *Nashville Tennessean*, October 2, 1959.

⁶⁹ Quoted in Nat Basham, "Paradise – Hamlet of 35 Families – Stirs with Excitement Over New Plant," *Messenger & Inquirer*, Owensboro, Kentucky, October 2, 1959, photocopy in MCGHA, Folder Paradise-Muhlenberg County.

⁷⁰ Nat Basham, "Paradise – Hamlet of 35 Families – Stirs with Excitement Over New Plant," *Messenger & Inquirer*, Owensboro, Kentucky, October 2, 1959, photocopy in MCGHA, Folder Paradise-Muhlenberg County.

⁷¹ "Paradise Not Lost: Life Returning to Ghost Town," *The Kentucky New Era*, Hopkinsville, Kentucky, October 2, 1959, 7; Jean Howerton, "Paradise Residents Just Couldn't Believe News of \$1,000,000 Plant," *Louisville Courier-Journal*, undated, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA. Nate Basham, "Paradise – Hamlet of 35 Families – Stirs with Excitement Over New Plant," *Messenger & Inquirer*, Owensboro, Kentucky, October 2, 1959; Dan Coleman, "Hamlet Agog Over New Plant," *Nashville Tennessean*, October 2, 1959; "Sun Shines On Depressed Area Again," *Middlesboro Daily News*, Middlesboro, Kentucky, October 2, 1959, 1-2; and William R. Heffren, "Bonanza for Western Kentucky," *L&N Magazine*, 26(11), November 1960, 10-11 and 21, NARA-SE, RG 142, OEDC, Box 629.

sixty miles of the plant site, few settled in Paradise itself, and three out of four employees lived outside of Muhlenberg County in 1960.⁷² Those who did move to Muhlenberg bypassed Paradise in favor of the county's three largest towns: Greenville, Central City, and Drakesboro.⁷³ While the TVA facility required several hundred permanent staff and led to an increase of approximately 800 jobs at the Peabody Coal Company's mines, the boom that many villagers expected never materialized.⁷⁴

Instead, the Paradise Steam Plant altered the local environment in ways that were detrimental both to those who resided in the vicinity of the facility and to those who used the area for outdoor pursuits. The annual hickory nut harvest in the Shellwood Bottoms south of the village along the Green River became the first casualty of the plant's construction. For many who lived in Muhlenberg County, the first frost in late October or early November signaled the traditional start of hickory gathering season. It was common to see a dozen or more families, and often three generations within the same family, scouring the woods and overgrown brush for nuts. The TVA's decision to locate its facility at Paradise meant that the 1959 hunt was the last. The agency built on top of the former harvesting grounds.⁷⁵

While the loss of Shellwood Bottoms received only a brief lamentation in a local newspaper, the Paradise Steam Plant caused environmental problems that elicited vociferous

⁷² Letter, Herbert D. Vogel to John Sherman Cooper, January 24, 1961, UKSCL, JSC, Box 212, Folder Jobs, Tennessee Valley Authority, 1961; and "3 Out of 4 Workers at Paradise TVA Plant Live Outside Muhlenberg," *Messenger-Times-Argus*, Central City, Kentucky, December 22, 1960, 1.

⁷³ Joe Creason, "There's Trouble in Paradise Caused by TVA Plant," *Messenger-Times-Argus*, Central City, Kentucky, August 18, 1966, clipping in NARA-SE, RG 142, PMF, Box 802; and Agnes S. Harralson, "Paradise in Kentucky," *Ohio County News*, Hartford, Kentucky, October 10, 1974, accessed January 12, 2012, <http://muhlenberg.genealogenie.net/places/paradise2.htm>[no longer active].

⁷⁴ Some put jobs estimates for the plant at 400; see "TVA Plant to have 400 Permanent Employees," *Messenger-Times-Argus*, Central City, Kentucky, October 15, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA. For the effect on area coal mines, see "Sun Shines On Depressed Area Again," *Middlesboro Daily News*, Middlesboro, Kentucky, October 2, 1959, 1-2; and William R. Heffren, "Bonanza for Western Kentucky," *L&N Magazine*, 26(11), November 1960, p. 10-11 and 21, NARA-SE, RG 142, OEDC, Box 629.

⁷⁵ Bobby Anderson, "Paradise Nutting Grounds will be Gone Forever After This Season," no publication provided, October 29, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA.

complaints from residents as soon as the generating station became operational on September 9, 1963. The massive amount of water that the Authority's facility required overwhelmed the capacity of the Green River despite the improvements that the Army Corps of Engineers had made. Temperature readings in the river near the facility exceeded ninety-five degrees Fahrenheit for several days, hot enough to generate fog and overheat outboard boat motors and well above the normal high of eighty degrees in the late summer and fall in the stretch that passed through Muhlenberg County. In the following weeks, TVA staff reported a massive fish kill, including 182 dead fish in close proximity to the plant on September 26 alone. Studies revealed that a twenty mile stretch below the Paradise Steam Plant was devoid of any zooplankton, a vital component of the food chain on other parts of the Green. Subsequently, multiple residents accused the agency of ruining fishing on the river.⁷⁶

Nothing, however, demonstrated the deleterious effect of coal-fired production more than the declining air quality of Paradise. Although scientists and engineers in the Division of Health and Safety had convinced the board of directors to install precipitators at the TVA's Kingston Steam Plant in 1958, the agency chose not to include them in the design of its Paradise facility. The Office of Power argued that new cyclone-fired furnaces would trap enough fly ash to prevent pollution from becoming a problem in the sparsely populated area around the plant and that the use of precipitators was both costly and unnecessary. Without detailed studies to support their position, there was little the Division of Health and Safety could do to convince the

⁷⁶ For the TVA's problems regarding overheated water and its ecological effects on the Green River; see Tennessee Valley Authority Division of Water Control Planning Engineering Laboratory, "Paradise Steam Plant River and Plant Conditions for Periods of Elevated River Temperatures September and October 1963," Report No. 40-20, March 1964, NARA-SE, RG 142, OEDC, Box 629. For reports of complaints, see Memorandum, John G. Holmes, Jr., to A. T. Secor, "Complaints by Residents of Paradise Village on Ash Fallout – Paradise Steam Plant," March 24, 1965, NARA-SE, RG 142, PMF, Box 802.

directors that the cyclone-fired furnaces would be ineffective. Cheap power still took precedence over environmental quality.⁷⁷

Almost as soon as Paradise began producing electricity, the fly ash and coal dust that lofted over the town from the Authority's facility became a daily nuisance and a health hazard. Particulate matter inundated the community. The pollution was at its worst whenever a south wind prevailed, directing the plant's smoke plume over the village while kicking up dust clouds from the stockpiles of coal that sat within 1,000 feet of some residents' backyards.⁷⁸ [Fig. 6.5]

⁷⁷ TVA, *The Paradise Steam Plant*, Technical Report No. 37, 25 and 62, copy in NARA-SE, RG 142, OEDC, Box 636.

⁷⁸ The particulate matter affecting Paradise was mostly fly ash and coal dust. The difference between fly ash and coal dust is the source. Fly ash refers to particulates that are released from the smokestacks of a steam plant. They are essentially the remnants of burned coal. Coal dust on the other hand refers to the particulate matter that blew off of the TVA's stockpiles at Paradise. There was some suggestion that coal dust was harder to clean. It was certainly more difficult for the TVA to control; see, Joe Creason, "There's Trouble in Paradise Caused by TVA Plant," *Messenger-Times-Argus*, Central City, Kentucky, August 18, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum, G. O. Wessenauer to L. J. Van Mol, "Ash Fallout and Coal Dust Problem – Paradise Steam Plant," September 7, 1966, NARA-SE, RG 142, PMF, Box 802. Other reports suggest that the coal storage area abutted the backyards of Paradise residents; see, Memorandum, C. H. Waugaman to T. Graham Wells, Jr., "Activities Related to Coal Dust and Fly Ash in the Paradise Area," NARA-SE, RG 142, PMF, Box 802. Sulfur dioxide was not a problem at Paradise Village; see, Memorandum, Dr. O. M. Derryberry to L. J. Van Mol, "Fly Ash Fallout – Paradise Steam Plant and Village of Paradise, Kentucky," March 2, 1964, NARA-SE, RG 142, PMF, Box 802; and Fred W. Thomas, "Fly Ash and Coal Dust Nuisance Paradise Steam Plant," September 10, 1964, NARA-SE, RG 142, PMF, Box 802.

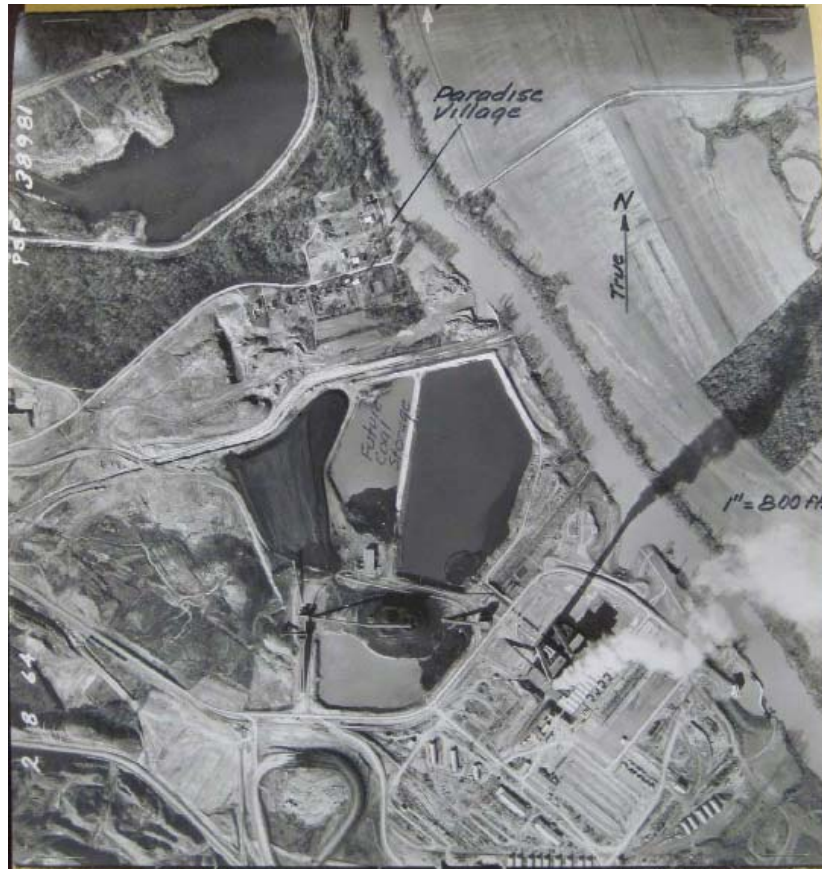


Figure 6.5: Paradise Steam Plant and Village – An aerial photograph of the Paradise Steam Plant and the village of Paradise (current image is not to scale noted in picture). Source: Untitled photograph, undated, found in NARA-SE, RG 142, PMF, Box 404.

At first, the townspeople treated the Paradise Steam Plant as a simple inconvenience. The TVA received its first official complaint regarding the facility’s emissions on November 20, 1963, less than three months after the plant became fully operational, when Kathryn Tabb reported that fly ash had soiled clothing that she had left outside to dry. Kathryn’s husband, James Tabb, also showed his car to the two TVA employees sent to investigate the claim, who observed a “considerable amount of fly ash” covering the vehicle.⁷⁹ Prior to 1965, the villagers’ complaints typically focused on similar aesthetic nuisances caused by the power plant’s

⁷⁹ Memorandum John G. Holmes, Jr., to A. T. Secor, “Complaint on Fly Ash Fallout by J. H. Tabb of Paradise, Kentucky – Paradise Steam Plant,” November 22, 1963, NARA-SE, RG 142, PMF, Box 802; and Memorandum, E. F. Thomas to G. O. Wessenauer, “Paradise Steam Plant – Paradise Village Air Pollution Complaints,” March 1, 1966, NARA-SE, RG 142, PMF, Box 802.

emissions.⁸⁰ During this period, the Tabbs often voiced their displeasure with the facility and the TVA's limited reaction to the problem, hinting that their neighbors shared their opinion.⁸¹ The Authority responded by offering residents free car washes and by promising to study the issue further.⁸² Francis Gartrell, Fred Thomas, and their colleagues in the Division of Health and Safety set up monitoring equipment around the plant. Like at Kingston, the scientists would have to prove the facility's negative effect on air quality before precipitators could be installed.⁸³

The TVA's relationship with the townspeople rapidly deteriorated as conditions continued to worsen. The Authority became aware of the breadth of the problem at a meeting with two dozen villagers on March 24, 1965. Although residents again cited the usual issues associated with ash fallout, namely, accumulation on any and all outdoor surfaces, they also complained that the particulates were soiling the interiors of their homes, making it difficult, if not impossible, to maintain a clean household. More importantly, the residents claimed that the power plant's emissions were infiltrating their food and water supply.⁸⁴ They were incensed that the Authority had not been able to solve the pollution issue stemming from the Paradise facility, and several of them threatened to picket the plant. In particular, the residents could not understand why the TVA had yet to respond to their request to furnish the village with a supply

⁸⁰ Memorandum, E. F. Thomas to G. O. Wessenauer, "Paradise Steam Plant – Paradise Village Air Pollution Complaints," March 1, 1966, NARA-SE, RG 142, PMF, Box 802.

⁸¹ Memorandum, E. F. Thomas to G. O. Wessenauer, "Paradise Steam Plant – Paradise Village Air Pollution Complaints," March 1, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, John G. Holmes, Jr., to A. T. Secor, "Complaint by James Tabb of Paradise Village Regarding Ash Fallout – Paradise Steam Plant," June 8, 1964, NARA-SE, RG 142, PMF, Box 802.

⁸² On car washes see the interview conducted with the Smith family in Ross Spears, "The Electric Valley," James Agee Film Project, 1983. On promise for action see, Memorandum, John G. Holmes, Jr., to A. T. Secor, "Complaint by James Tabb of Paradise Village Regarding Ash Fallout – Paradise Steam Plant," June 8, 1964, NARA-SE, RG 142, PMF, Box 802.

⁸³ Memorandum, Dr. O. M. Derryberry to L. J. Van Mol, "Fly Ash Fallout – Paradise Steam Plant and Village of Paradise, Kentucky," March 2, 1964, NARA-SE, RG 142, PMF, Box 802. On Kingston, see Chapter Five.

⁸⁴ On the meeting see, Memorandum, John G. Holmes, Jr., to A. T. Secor, "Complaints by Residents of Paradise Village on Ash Fallout – Paradise Steam Plant," March 24, 1965, NARA-SE, RG 142, PMF, Box 802.

of freshwater.⁸⁵ These new grievances suggested that the power plant had become more than a simple nuisance and that the townspeople had begun to think that it was poisoning their community. This shift bespoke a larger problem at Paradise that demonstrated how issues of class exacerbated the effect of pollution on the village's residents.⁸⁶

As a small, relatively poor, rural hamlet, Paradise depended on its local environment for potable water and food. Gardens were ubiquitous in the town. Neighbors with adjoining plots often combined parts of their property into a commons in which they cultivated corn and other fresh vegetables. The gardens could be rather large, and in some instances they took up almost half of the residents' backyards. The citizens of Paradise relied on the produce that they grew to supplement their families' diets.⁸⁷ Furthermore, residents of the rural community did not have access to freshwater except from wells and cisterns. Any additional water that the townspeople needed had to be purchased and transported to their homes. Most could not afford to buy enough purified water to cover their daily needs.⁸⁸

During the summer of 1965, the inhabitants of Paradise became increasingly alarmed at the deposition of particulate matter on the fruits and vegetables in their gardens. For example, on

⁸⁵ Memorandum, John G. Holmes, Jr., to A. T. Secor, "Complaints by Residents of Paradise Village on Ash Fallout – Paradise Steam Plant," March 24, 1965, NARA-SE, RG 142, PMF, Box 802; and Memorandum, E. F. Thomas to J. E. Watson, March 26, 1965, NARA-SE, RG 142, PMF, Box 802.

⁸⁶ Paradise's population was almost entirely white by the 1960s.

⁸⁷ Memorandum, Auburn E. Owen, Jr. to J. M. Leavitt, "Investigation of Complaint of Damage to Garden Vegetables By Fly Ash Fallout from the Paradise Steam Plant – July 13 and 14, 1965," July 15, 1965, NARA-SE, RG 142, PMF, Box 802; and Memorandum, John G. Holmes, Jr. to A. T. Secor, "Complaint of Damage to Garden Vegetables By Ash Fallout – Paradise Steam Plant," July 13, 1965, NARA-SE, RG 142, Power Manger's File, Box 802.

⁸⁸ Memorandum, John G. Holmes, Jr. to A. T. Secor, "Complaints by Residents of Paradise Village on Ash Fallout – Paradise Steam Plant," March 24, 1965, NARA-SE, RG 142, PMF, Box 802; Letter, Kathryn Tabb to Ed Cabaniss, January 9, 1967, NARA-SE, RG 142, PMF, Box 802; Letter, Sharolet Lyons to Frank A. Stubblefield, January 9, 1967, NARA-SE, RG 142, PMF, Box 802; Joe Creason, "There's Trouble in Paradise Caused by TVA Plant," *Messenger-Times-Argus*, Central City, Kentucky, August 18, 1966, copy in NARA-SE, RG 142, PMF, Box 802; Memorandum, John G. Holmes, Jr., to A. T. Secor, "Telephone Complaint by James H. Tabb on Ash Fallout – Paradise Steam Plant," June 14, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum, John G. Holmes, Jr., to E. F. Thomas, "Necessity of Action on Complaints of Coal Dust and Fly Ash Damage – Paradise Steam Plant," December, 1966, NARA-SE, RG 142, PMF, Box 802.

July 12, 1965, Elizabeth Foster noticed that, once again, fallout from the Paradise facility had left a sandy coating on the backyard plot that she shared with her brother, his family, and their neighbors. Dust and ash clumped in visible spots on heads of cabbage and corn cobs in the garden. Due to their acidic nature, the particulates had also begun to eat away at the vegetables, causing pitting to occur on corn kernels. Worried by the thought of her family consuming the tainted produce, Foster contacted the Muhlenberg County Health Office to determine the toxicity of fly ash and coal dust. The director promptly told her to refrain from eating the damaged plants until further notice. Foster reported the matter to the TVA.⁸⁹

In response to Foster's complaint, John Holmes, the superintendent of the Paradise Steam Plant, and Auburn Owen of the Industrial and Air Hygiene Branch informed residents that the garden vegetables would be safe to consume as long as they had been washed. Ingesting the particulates themselves was ill-advised, but they would have no lingering effects on the edibility of food items once they had been eliminated.⁹⁰ Although Holmes and Owen presumably rendered their advice in good faith, their recommendations contained an implicit assumption that it was even possible to remove the offending particulates. Given the state of air quality in Paradise Village, however, anything left on a countertop for an extended period of time, whether wet or dry, would attract a new coating of dust in short order.⁹¹ Furthermore, the steam plant's

⁸⁹ Memorandum, Auburn E. Owen, Jr. to J. M. Leavitt, "Investigation of Complaint of Damage to Garden Vegetables By Fly Ash Fallout from the Paradise Steam Plant – July 13 and 14, 1965," July 15, 1965, NARA-SE, RG 142, PMF, Box 802; Memorandum, John G. Holmes, Jr. to A. T. Secor, "Complaint of Damage to Garden Vegetables By Ash Fallout – Paradise Steam Plant," July 13, 1965, NARA-SE, RG 142, Power Manger's File, Box 802; and Memorandum, E. F. Thomas to G. O. Wessenauer, "Paradise Steam Plant – Paradise Village Air Pollution Complaints," March 1, 1966, NARA-SE, RG 142, PMF, Box 802.

⁹⁰ Memorandum, Auburn E. Owen, Jr. to J. M. Leavitt, "Investigation of Complaint of Damage to Garden Vegetables By Fly Ash Fallout from the Paradise Steam Plant – July 13 and 14, 1965," July 15, 1965, NARA-SE, RG 142, PMF, Box 802; and Memorandum, John G. Holmes, Jr. to A. T. Secor, "Complaint of Damage to Garden Vegetables By Ash Fallout – Paradise Steam Plant," July 13, 1965, NARA-SE, RG 142, Power Manger's File, Box 802.

⁹¹ Residents continuously complained about ash contaminating their food between 1965 and 1967; see, Memorandum, E. F. Thomas to G. O. Wessenauer, "Paradise Steam Plant – Paradise Village Air Pollution Complaints," March 1, 1966, NARA-SE, RG 142, PMF, Box 802.

particulate emissions had effectively rendered the town's water supply useless for purposes of cleaning and consumption. Fly ash and coal dust easily found their way into cisterns and wells, forming large, floating clumps of grit. To make matters worse, the TVA ultimately denied the community's request to furnish the village with a supply of potable water, saying only that the project was not cost effective.⁹²

For those still living in Paradise, the Authority's tone-deaf response to Foster's complaint as well as the agency's position on supplying the town with a new source of freshwater symbolized the depth of the TVA's intransigence. By the spring of 1966, residents had taken matters into their own hands in an effort to force the agency to act. From the Authority's perspective, the first sign of trouble came during a meeting with James and Kathryn Tabb on February 10, 1966. After discussing the latest deposition of particulate matter on his property, James Tabb informed TVA investigators that he had been in contact with lawyers who were encouraging him and his neighbors to sue. The Tabbs also suggested a possible solution that would appease the town's residents. They proposed that it would be cheaper for the TVA to buy them out than continue its efforts at pollution control, claiming that they had discussed the matter with their fellow villagers and that most seemed interested in selling.⁹³

⁹² Memorandum, John G. Holmes, Jr. to A. T. Secor, "Complaints by Residents of Paradise Village on Ash Fallout – Paradise Steam Plant," March 24, 1965, NARA-SE, RG 142, PMF, Box 802; Letter, Kathryn Tabb to Ed Cabaniss, January 9, 1967, NARA-SE, RG 142, PMF, Box 802; Letter, Sharolet Lyons to Frank A. Stubblefield, January 9, 1967, NARA-SE, RG 142, PMF, Box 802; Joe Creason, "There's Trouble in Paradise Caused by TVA Plant," *Messenger-Times-Argus*, Central City, Kentucky, August 18, 1966, copy in NARA-SE, RG 142, PMF, Box 802; and Memorandum, John G. Holmes, Jr., to E. F. Thomas, "Necessity of Action on Complaints of Coal Dust and Fly Ash Damage – Paradise Steam Plant," December, 1966, NARA-SE, RG 142, Power Manager's Correspondence File, Box 802.

⁹³ Memorandum, E. F. Thomas to G. O. Wessenauer, "Paradise Steam Plant – Paradise Village Air Pollution Complaints," March 1, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum, John G. Holmes, Jr., to A. T. Secor, "Complaint by J. H. Tabb on Coal Dust from Plant – Paradise Steam Plant," February 11, 1966, NARA-SE, RG 142, PMF, Box 802. Other villagers repeated the claim that it would be cheaper for the Authority to buy them out in later meetings with TVA personnel also mentioning that they had spoken to lawyers; see, Memorandum, John G. Holmes, Jr., to A. T. Secor, "Complaint by C. W. Helsley of Paradise Village on Ash Fallout Damage – Paradise Steam Plant," March 15, 1966, NARA-SE, RG 142, PMF, Box 802.

The second sign of trouble occurred on the afternoon of April 27, 1966, when Joe Creason, a reporter for the *Louisville Courier-Journal*, called the TVA to inquire about its response to the pollution problems at Paradise. At the time, Creason was one of the best-known columnists in the state of Kentucky, and local newspapers often reprinted his articles from the *Courier-Journal*. Creason mentioned that his call had been prompted by five letters that he had received from residents of the village alerting him to their plight.⁹⁴

Pressure mounted throughout 1966. Creason published his article under the title, “There’s Trouble in Paradise Caused by TVA Plant,” observing that the facility’s emissions had rendered the village virtually uninhabitable while noting that the Authority had refused to supply community with water.⁹⁵ The agency continued to receive a steady stream of grievances from the remaining townspeople, and several residents asked the agency to reconsider its decision regarding Paradise’s water supply.⁹⁶ In May, James Tabb complained that with summer approaching he faced the prospect of keeping his windows and doors shut tight to slow the flow of dust into his house. The thought of sitting in a sweltering home throughout the hottest months of the year made him irate, and he demanded to know how the TVA expected him to put up with

⁹⁴ Memorandum, G. S. Meyers to [illegible], “Fly-Ash Fallout Complaints to Louisville Courier-Journal from Paradise Village Residents,” April 29, 1966, NARA-SE, RG 142, PMF, Box 802; and Telephone Message from Joe Creason to John G. Holmes, Jr., “Letters to *Courier-Journal* from Villagers at Paradise,” April 27, 1966, NARA-SE, RG 142, PMF, Box 802.

⁹⁵ Joe Creason, “There’s Trouble in Paradise Caused by TVA Plant,” *Messenger-Times-Argus*, Central City, Kentucky, August 18, 1966, copy in NARA-SE, RG 142, PMF, Box 802.

⁹⁶ Memorandum, John G. Holmes, Jr., to A. T. Secor, “Telephone Complaint by James H. Tabb – Paradise Steam Plant,” June 14, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, E. E. Cabaniss to A. T. Secor, “Complaint by J. H. Tabb on Coal Dust from Plant – Paradise Plant,” October 17, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum, E. E. Cabaniss to John G. Holmes, Jr., “Complaint by Jack L. Lyons on Ash Fallout from this Plant,” November 22, 1966, NARA-SE, RG 142, PMF, Box 802.

the worsening conditions.⁹⁷ Dissatisfied with the response he received, Tabb and his wife began sending itemized bills to the Authority for damage to their vehicles and property.⁹⁸

Internally, the TVA debated the best course of action. The Division of Health and Safety's studies revealed that the operation of the steam plant had increased deposited particulate matter in Paradise threefold and that dust levels in the village were three hundred percent greater than normal for a residential area.⁹⁹ Although the Authority's scientists and engineers were confident that the installation of electrostatic precipitators could eliminate the problem caused by ash emitted from the facility's smokestacks, they conceded that little could be done to prevent dust blowing over the town from the plant's stockpiles of coal.¹⁰⁰ The Division of Health and Safety lacked an economical solution that had been scientifically tested, limiting its ability to convince the board of directors to act. As complaints mounted, the TVA fretted over the

⁹⁷ Letter, James H. Tabb to A. T. Secor, May 25, 1966, NARA-SE, RG 142, PMF, Box 802.

⁹⁸ For examples of handwritten bills see, Letter, James H. Tabb to TVA, October 19, 1966, NARA-SE, RG 142, PMF, Box 802; Letter, James H. Tabb to TVA, December 21, 1966, NARA-SE, RG 142, PMF, Box 802; and Letter, Kathryn Tabb to TVA, January 9, 1967, NARA-SE, RG 142, PMF, Box 802.

⁹⁹ TVA Air Pollution Control Staff, Industrial and Air Hygiene Branch, Division of Health and Safety, "Fly Ash and Coal Dust Studies: Paradise Steam Plant," September 12, 1966, no pagination, NARA-SE, RG 142, PMF, Box 802; and Memorandum, E. F. Thomas to T. Graham Wells, Jr., "Ash Fallout and Coal Dust Problem – Paradise Steam Plant," August 31, 1966, NARA-SE, RG 142, PMF, Box 802.

¹⁰⁰ Memorandum, E. F. Thomas to T. Graham Wells, Jr., "Ash Fallout and Coal Dust Problem – Paradise Steam Plant," August 31, 1966, NARA-SE, RG 142, PMF, Box 802; TVA Air Pollution Control Staff, Industrial and Air Hygiene Branch, Division of Health and Safety, "Fly Ash and Coal Dust Studies: Paradise Steam Plant," September 12, 1966, no pagination, NARA-SE, RG 142, PMF, Box 802; Memorandum, E. F. Thomas to G. O. Wessenauer, "Paradise Steam Plant – Paradise Village Air Pollution Complaints," March 1, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, E. F. Thomas to J. E. Watson, "Complaint by J. H. Tabb on Coal Dust from Plant – Paradise Steam Plant," February 17, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, G. O. Wessenauer to L. J. Van Mol, "Ash Fallout and Coal Dust Problem – Paradise Steam Plant," September 7, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, C. H. Waugaman to T. Graham Wells, Jr., "Activities Related to Coal Dust and Fly Ash in the Paradise Area," September 1, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, E. E. Cabaniss to A. T. Secor, "Complaint by J. H. Tabb on Coal Dust from Plant – Paradise Plant," October 17, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum, E. F. Thomas, "Conversation with Duane Dunlap, Division of Law, with Reference to June 13, 1966, Complaint of James H. Tabb – Air Pollution – Paradise Steam Plant," June 28, 1966, NARA-SE, RG 142, PMF, Box 802.

negative publicity that might result from the situation at Paradise.¹⁰¹ Increasingly, intra-agency memoranda suggested that purchasing the town represented the best solution.¹⁰²

Finally, on January 9, 1967, Sharolet Lyons sent a petition to the TVA signed by twenty-five other residents, requesting help while again detailing the extent of the problems at Paradise. Lyons noted that the Authority had refused to pay for damage to the villagers' gardens, that the agency had declined to provide the community with freshwater, that it was impossible to keep her home clean, that the dust and ash stripped the paint off of buildings and cars, that going to church meant looking like one had spent an entire day in a coal mine, and that her daughter could no longer play outside. Remarking on the possible health hazards posed by the plant's emissions, Lyons observed, "If cigarette smoking causes lung cancer, what will this stuff do? We breath[sic] it 24 hours a day and it couldn't be very healthy. At least you have a choice about smoking."¹⁰³ Lyons implied in her petition that the townspeople saw only one viable solution to their plight, a buyout from the Authority. The community was "covered with black

¹⁰¹ Memorandum, John G. Holmes, Jr., to A. T. Secor, "Telephone Complaint by James H. Tabb on Ash Fallout – Paradise Steam Plant," June 14, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, E. E. Cabaniss to A. T. Secor, "Complaint by J. H. Tabb on Coal Dust from Plant – Paradise Plant," October 17, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, C. J. Powell to C. H. Waugaman, "Comments on John Holmes' Memorandum to a Complaint by Tabb on Coal Dust," March 3, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum, John G. Holmes, Jr., to E. F. Thomas, "Necessity of Action on Complaints of Coal Dust and Fly Ash Damage – Paradise Steam Plant," December, 1966, NARA-SE, RG 142, PMF, Box 802.

¹⁰² Memorandum, John G. Holmes, Jr., to E. F. Thomas, "Necessity of Action on Complaints of Coal Dust and Fly Ash Damage – Paradise Steam Plant," December, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, John G. Holmes, Jr., to A. T. Secor, "Complaint by J. H. Tabb on Coal Dust from Plant – Paradise Steam Plant," February 11, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, C. J. Powell to C. H. Waugaman, "Comments on John Holmes' Memorandum to a Complaint by Tabb on Coal Dust," March 3, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, G. O. Wessenauer to L. J. Van Mol, "Ash Fallout and Coal Dust Problem – Paradise Steam Plant," September 7, 1966, NARA-SE, RG 142, PMF, Box 802; Memorandum, E. F. Thomas to T. Graham Wells, Jr., "Ash Fallout and Coal Dust Problem – Paradise Steam Plant," August 31, 1966, NARA-SE, RG 142, PMF, Box 802; and Memorandum, E. F. Thomas, "Conversation with Duane Dunlap, Division of Law, with Reference to June 13, 1966, Complaint of James H. Tabb – Air Pollution – Paradise Steam Plant," June 28, 1966, NARA-SE, RG 142, PMF, Box 802. As early as 1964, some within the TVA suggested that a buyout might become necessary; see, Memorandum, Dr. O. M. Derryberry to E. F. Thomas, "Fly Ash and Coal Dust Nuisance – Paradise Village," September 21, 1964, NARA-SE, RG 142, PMF, Box 802; and Fred W. Thomas, "Fly Ash and Coal Dust Nuisance: Paradise Steam Plant," September 10, 1964, NARA-SE, RG 142, PMF, Box 802.

¹⁰³ Letter, Sharolet Lyons to TVA, January 9, 1967, NARA-SE, RG 142, PMF, Box 802. Identical copies sent to Frank A. Stubblefield and John Sherman Cooper. It is likely that one was sent to Joe Creason as well, although I cannot confirm this.

smoke and cinders from the stacks of the T.V.A. Steam Plant” and “dust from their[the Authority’s] huge coal pile.”¹⁰⁴ Residents could no longer garden; the food was not fit to eat, “so full of this black mess” that it could not be washed.¹⁰⁵ The water, of course, had grit in it anyway. According to Lyons, the villagers could not simply sell their houses for they lacked any value on the open market. No one wanted to move to Paradise.¹⁰⁶

In addition to the copy that she mailed to the TVA, Lyons sent her petition to her U.S. Representative, Frank A. Stubblefield, and Senator John Sherman Cooper.¹⁰⁷ Within one week Stubblefield contacted the TVA’s chairman, Aubrey Wagner, inquiring about a solution to the problem at Paradise.¹⁰⁸ On January 26, 1967, Wagner wrote Stubblefield to say that the Authority would purchase the town, and on February 9, one month to the day after Lyons mailed her initial petition, the TVA informed her of its decision.¹⁰⁹ The last remaining families left Paradise on December 30, 1967.¹¹⁰ The Authority’s official explanation of its decision, however, did not mention fly ash or coal dust. Instead, the agency used its 1965 decision to

¹⁰⁴ Both quotes from Letter, Sharolet Lyons to TVA, January 9, 1967, NARA-SE, RG 142, PMF, Box 802.

¹⁰⁵ Letter, Sharolet Lyons to TVA, January 9, 1967, NARA-SE, RG 142, PMF, Box 802.

¹⁰⁶ Letter, Sharolet Lyons to TVA, January 9, 1967, NARA-SE, RG 142, PMF, Box 802. The question of whether or not the TVA was the only potential buyer for Paradise is an interesting one that the documents in the archives that I have visited do not fully address. Presumably, Lyons was correct that no one, or at least very few people, wanted to move to Paradise in 1967. Nevertheless, it seems likely that the town sat above the same rich coal reserves that underlay the rest of Muhlenberg County, and in fact, the area next to the Paradise Steam Plant had already been mined extensively. Coal companies had purchased properties around the village throughout the 1950s, and probably would have purchased the remaining town if given the chance—they may have even already owned the mineral rights to any coal under Paradise. My hypothesis, reading between the lines of several documents, is that the townspeople turned to the TVA not just because of the damage that the power plant had caused but also because it was a public conservation agency with a record of buying out communities and because it represented an alternative to the coal companies. Despite the fact that previous TVA buyouts had resulted in claims that the Authority did not value homes properly, the residents deeply distrusted the coal companies even as they remained economically reliant on the mines. As a public agency, or at least a separate entity, the Authority was presumably susceptible to public pressure in a way that the coal companies had never been in western Kentucky. In short, the TVA represented the best chance for receiving anything close to a fair price.

¹⁰⁷ Letter, Sharolet Lyons to Frank A. Stubblefield, January 9, 1967, NARA-SE, RG 142, PMF, Box 802; and Joe Creason, “Trouble in Paradise: Smoke in Its Skies,” *Louisville Courier-Journal*, January 29, 1967, copy in NARA-SE, RG 142, PMF, Box 802.

¹⁰⁸ Letter, Frank A. Stubblefield to Aubrey J. Wagner, January 16, 1967, NARA-SE, RG 142, PMF, Box 802.

¹⁰⁹ Letter, Aubrey J. Wagner to Frank A. Stubblefield, January 26, 1967, NARA-SE, RG 142, PMF, Box 802; and Letter, O. M. Derryberry to Sharolet Lyons, February 9, 1967, NARA-SE, RG 142, PMF, Box 802.

¹¹⁰ Judy Prusnek, “Paradise is Closing Down for Good Saturday,” *The Portsmouth Times*, Portsmouth, OH, December 29, 1967, 1.

expand the Paradise Steam Plant to justify buying out the community by arguing that the land had become necessary for the construction of a third massive generating unit.¹¹¹

The TVA's inability to control the airborne particulates emanating from its facility had rendered the village of Paradise uninhabitable. Newspapers covering the town's demise invariably emphasized the damage that fly ash and coal dust had wrought on the local environment.¹¹² The articles' descriptions of the inhospitable conditions reflected the harsh reality of living in the shadow of a coal-fired generating station. The Authority had also received complaints regarding the Paradise Steam Plant's release of sulfur dioxide from other communities in Muhlenberg County, with pediatricians suggesting that they had witnessed a dramatic increase in the number of cases of childhood asthma after the facility began operations.¹¹³ When combined with the elimination of outdoor recreational areas and the decline of aquatic life in the superheated waters of the Green River, the problems that the TVA's aerial emissions caused demonstrated the Authority's difficulty in developing viable solutions to the destruction that resulted from its consumption-centric regime. The pressure that the TVA received from local residents and the threat of a broader public relations crisis helped bolster the Division of Health and Safety's case for pollution controls. In 1967, the board of directors agreed to install precipitators at Paradise and authorized the use of low sulfur coal during periods

¹¹¹ Harry Bolser, "TVA Taking Over: Time is Running Out for Paradise – Ky." *Louisville Courier-Journal*, March 16, 1967, photocopy in MCGHA, Folder Paradise-Muhlenberg County. Internal memoranda suggested that the TVA did not want to be seen to be purchasing the community for environmental reasons. The construction of a third generating unit represented a convenient, if somewhat accurate excuse. The third unit certainly made purchasing the town necessary; see Memorandum, John G. Holmes, Jr., to E. F. Thomas, "Necessity for Action on Complaints of Coal Dust and Fly-Ash Damage – Paradise Steam Plant," date illegible, c. 1966 by placement in archive, NARA-SE, RG 142, PMF, Box 802.

¹¹² Joe Creason, "There's Trouble in Paradise Caused by TVA Plant," *Messenger-Times-Argus*, Central City, Kentucky, August 18, 1966, copy in NARA-SE, RG 142, PMF, Box 802; Dave McBride, "Progress Closing the Gates to Paradise," *Messenger & Inquirer*, Owensboro, Kentucky, December 3, 1967, copy in MCGHA, Folder Paradise-Muhlenberg County; Bill Lyon, "2 Stories Vary on How Paradise Got Its Name, Buchanan Declares," *Evansville Courier & Press*, January 4, 1968, photocopy in MCGHA, Folder Paradise-Muhlenberg County; and Harry Bolser, "TVA Taking Over: Time is Running Out for Paradise – Ky." *Louisville Courier-Journal*, March 16, 1967, photocopy in MCGHA, Folder Paradise-Muhlenberg County.

¹¹³ Letter, David Barker to TVA, February 28, 1966, NARA-SE, RG 142, PMF, Box 802.

of atmospheric stagnation, though neither of these measures solved the immediate problems of the village that shared the plant's name.¹¹⁴ In Muhlenberg County, the effects of strip mining became another symbol of the consequences of the Authority's approach to generating low-cost electricity that sparked public criticism of the TVA's energy regime.

The Blackened Desert

Although the Authority did not operate its own mines in western Kentucky, the agency's coal-buying policies encouraged the use of extractive practices that were particularly detrimental to the environment. As noted above, the procurement of fuel represented the largest single operational expense for the TVA's power program.¹¹⁵ The agency sought a variety of ways to reduce the cost of obtaining coal. Minimizing transportation from mine to plant represented one strategy employed to great effect at Paradise. Additionally, the Authority preferred to sign long-term contracts with mining companies to provide fixed volumes of coal for specific facilities.¹¹⁶ These contracts allowed the TVA to insulate itself from fluctuations in the coal market. The Authority became the largest single coal buyer in the United States in 1955, a title it retained into the 1970s, and the agency's contracts represented lucrative opportunities for mine operators to obtain a stable customer.¹¹⁷ As a result, the TVA had an outsized effect on the coal industry, especially in the Tennessee Valley Region. In particular, the Authority contracted with

¹¹⁴ F. E. Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," December 1978, vol. I, part III, 5, 15-16, and 39-41, Tennessee Valley Authority Research Library, Chattanooga, Tennessee [hereafter: TVA-RL]; and Gartrell, "History of TVA Air Pollution Control Program for Coal-Fired Power Plants," vol. I, part V, 12-4, TVA-RL.

¹¹⁵ Coal accounted for forty percent of the TVA's operating cost for its power program; see TVA, *Annual Report, 1962* (Government Printing Office: Washington, DC, 1962), 48-50.

¹¹⁶ In 1955, for example, the TVA received eighty percent of its coal from long-term contracts purchasing the rest on the spot market; see TVA, *Annual Report, 1955* (Government Printing Office: Washington, DC, 1955), 30-1.

¹¹⁷ TVA, *Annual Report, 1955*, 30; TVA, *Annual Report, 1956* (Government Printing Office: Washington, DC, 1956), 3; TVA, *Annual Report, 1966* (Government Printing Office: Washington, DC, 1966), 80-2; and James Branscombe, "Paradise Lost," *Southern Exposure* 1 (Summer 1973): 30. On the contracts' importance to coal operators, see TVA, *Annual Report, 1952* (Government Printing Office: Washington, DC, 1952), 24-5.

companies to employ specific extraction techniques to assure “an adequate, low-cost fuel supply.”¹¹⁸ Mechanized strip mines became a preferred way of extracting fuel for the TVA, accounting for approximately half of the coal that the agency purchased by the end of the 1960s while highlighting the gains in efficiency that could be made through the application of technology.¹¹⁹

In the western Kentucky coal basin, strip mining predated the TVA by more than one hundred years. Some of the first mines in the Muhlenberg County were surface operations.¹²⁰ The rich coal seams that underlay the county were relatively shallow and easily accessible.¹²¹ Nevertheless, the type of mechanized, large-scale mining that typified later stripping operations did not fully develop until World War II.¹²² In the late 1940s and 1950s, coal companies invested in massive earth moving equipment to facilitate the rapid removal of coal from the ground. Draglines—gigantic scooping shovels attached to rotating booms—became commonplace in the western Kentucky basin. [Fig. 6.6] These behemoths could excavate over 100 tons of coal in a single swoop, significantly more than the most efficient men in

¹¹⁸ For quote and an example of the TVA contracting with a company to use a specific technique, see TVA, *Annual Report, 1958* (Government Printing Office: Washington, DC, 1958), 54. As early as 1952, the TVA noted that it had designed its purchasing program to encourage investment and expansion on the part of the mining industry; see TVA, *Annual Report, 1952*, 24-5. On the effect of labor on the cost of coal; see TVA, *Annual Report, 1957* (Government Printing Office: Washington, DC, 1957), 2; TVA, *Annual Report, 1959* (Government Printing Office: Washington, DC, 1959), 38; and TVA, *Annual Report, 1967* (Government Printing Office: Washington, DC, 1967), 2-3. On the pressure that the TVA’s contracts put on mine operators in western Kentucky, see Rogers, “Public Policy and Pollution Abatement: TVA and Strip Mining”; and Marc Karnis Landy, *The Politics of Environmental Reform: Controlling Kentucky Strip Mining* (Washington, D.C.: Resources for the Future, 1976), 34-7. On the relationship between mechanization, economics, and labor in the mining industry in general, see Richard H. K. Vietor, *Environmental Politics and the Coal Coalition* (College Station: Texas A&M University Press, 1980), 63; Rogers, “Public Policy and Pollution Abatement: TVA and Strip Mining”; and Landy, *The Politics of Environmental Reform*, 31.

¹¹⁹ TVA, *Annual Report, 1972* (Government Printing Office: Washington, DC, 1972), 64. On efficiency and cost effectiveness of stripping according to the TVA; see TVA, *Annual Report, 1968* (Government Printing Office: Washington, DC, 1968), 13.

¹²⁰ Julie Paxton, “What *Really* Happened to Paradise,” *Kentucky Monthly* 2 (August 1981): 33, copy in MCGHA, Folder Paradise-Muhlenberg County.

¹²¹ “Paradise Reclaimed?” *Lexington Herald-Leader Business Monday*, August 24, 1992, 1 and 8, copy in MCGHA, Folder Paradise-Muhlenberg County.

¹²² “Strip Mining Ought to be Regulated,” *Louisville Courier Journal*, January 25, 1948, copy in UKSCL, Joe Creason Papers, 1941-1974, 97MS123 [hereafter: JCP], Box 76, Folder Strip Mining C.

underground mines produced in one day.¹²³ In Muhlenberg County, the Peabody Coal Company, the Amax Corporation, and the Pittsburgh and Midway Company all owned surface mines, and stripping increased rapidly after 1954.¹²⁴ The growth of surface mining formed an excellent complement to the Authority's consumption-centric energy regime.¹²⁵



Figure 6.6: Peabody's Big Hog – A picture of Big Hog, the massive dragline that Bucyrus-Eerie built for Peabody's Sinclair Mine (for a sense of scale, see man in foreground, center). Source: TVA, The Paradise Steam Plant: A Report on the Planning, Design, Construction, Costs, and First Power Operations of the Initial Two-Unit Plant, Technical Report No. 37 (Knoxville, TN: TVA, 1964), 19, copy in NARA-SE, RG 142, OEDC, Box 636.

¹²³ The amount of coal that the average miner could produce varied from field to field. In the 1950s some reports suggested that miners in western Kentucky could produce twenty tons per day while those in southern Tennessee only produced ten; see Letter R. A. Kampmeier to Estes Kefauver, March 29, 1957, NARA-SE, RG 142, PMF, Box 343.

¹²⁴ Pittsburgh and Midway, for example, had begun purchasing the farmland that surrounded the village of Paradise in 1952 opening a surface mine that stripped the rolling knolls adjacent to the community; see Julie Paxton, "What Really Happened to Paradise," *Kentucky Monthly* 2 (August 1981): 35, copy in MCGHA, Folder Paradise-Muhlenberg County; "Real Paradise, Like One in the Song, is Gone," *Louisville Courier Journal*, September 21, 1987, B3; "Paradise Reclaimed?" *Lexington Herald-Leader Business Monday*, August 24, 1992, 1 and 8, copy in MCGHA, Folder Paradise-Muhlenberg County; and "11,189 Acres Stripped in County," *Messenger-Times-Argus*, January 30, 1964, copy in NARA-SE, RG 142, PMF, Box 405; 9,320 of the 11,189 acres had been stripped after 1954.

¹²⁵ The TVA purchased more than half its coal from western Kentucky for the first time in the fiscal year ending in 1964. In previous years, western Kentucky accounted for just under half of the agency's coal receipts. For data from 1960s, see TVA, *Annual Report, 1964* (Government Printing Office: Washington, DC, 1964), 33-5; TVA, *Annual Report, 1963* (Government Printing Office: Washington, DC, 1963), 37; TVA, *Annual Report, 1962*, 48-50; TVA, *Annual Report, 1961* (Government Printing Office: Washington, DC, 1961), 44-5; TVA, *Annual Report, 1960*, 40-1; TVA, *Annual Report, 1959*, 39; TVA, *Annual Report, 1965* (Government Printing Office: Washington, DC, 1965), 41-2; TVA, *Annual Report, 1966*, 43-5; TVA, *Annual Report, 1967*, 87-9; TVA, *Annual Report, 1968*, 46-7; and TVA, *Annual Report, 1969* (Government Printing Office: Washington, DC, 1969), 44.

After signing its seventeen year \$191,000,000 contract to supply the Paradise Steam Plant, the Peabody Coal Company opened one of the largest strip mines in the world. Known as the Sinclair Mine, the massive facility yielded four million tons of coal per year, supplanting Peabody's River Queen Mine, also in Muhlenberg County, as the biggest in Kentucky with more than double River Queen's capacity.¹²⁶ The equipment that Peabody used to excavate its 6,000 acre colliery was similarly gargantuan. In 1962, the company unveiled the Big Hog, the largest land machine in the world. [Fig. 6.6] Constructed by the Bucyrus-Eerie Corporation, the gigantic dragline was capable of removing 173 tons of earth in a single scoop. It stood 220 feet or approximately twenty stories tall at the top of its boom with a reach of 460 feet. Estimates suggested that the shovel could uncover 14,000 tons of coal per day.¹²⁷ With their size and production capacity, the Big Hog and Peabody's Sinclair Mine mirrored the TVA's Paradise facility. The largest dragline ever built stripped coal from the world's largest surface mine to supply the largest, most efficient coal-fired power plant then in existence.¹²⁸ In short, Peabody's

¹²⁶ "Peabody Mine, TVA Paradise Plant to Contain Three World's Firsts," no publication provided, November 19, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; "New TVA Plant Brings Mammoth Mine with It," *Messenger & Inquirer*, Owensboro, Kentucky, October 2, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; and "New Mine will Supply T.V.A. Plant," no publication provided, undated, photocopy in *Coal In Western Kentucky*, book 1, scrapbook by Agnes S. Harralson, ed. David Orrahood, MCGHA.

¹²⁷ Tom Duncan, "Earth-Gulping Shovel Takes 173 Tons in Just One Bite," *Louisville Courier Journal*, August 29, 1962, loose clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA.

¹²⁸ In addition, Peabody's contract with the TVA was the largest ever signed, Paradise generated electricity at the lowest possible cost, and the Authority was the United States' largest public utility. "Paradise TVA Plant to be World's Largest Producer," *Messenger-Times-Argus*, Central City, Kentucky, October 22, 1959, 1. William R. Heffren, "Bonanza for Western Kentucky," *L&N Magazine*, 26(11), November 1960, 10-11 and 21, found in NARA-SE, RG 142, OEDC, Box 629; "Work Continues on Big TVA Steam Plant at Paradise," *The Park City Daily News*, Bowling Green, Kentucky, September 4, 1960, 14; TVA Division of Engineering Design, "Paradise Steam Plant: Final Design Report," Report No. 40-200, May 1964, 24, NARA-SE, RG 142, OEDC, Box 631; Tom Duncan, "Earth-Gulping Shovel Takes 173 Tons in Just One Bite," *Louisville Courier Journal*, August 29, 1962, loose clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; "Peabody Mine, TVA Paradise Plant to Contain Three World's Firsts," no publication provided, November 19, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; "New TVA Plant Brings Mammoth Mine with It," *Messenger & Inquirer*, Owensboro, Kentucky, October 2, 1959, clipping in "TVA Paradise," scrapbook, no editor provided, MCGHA; and "New Mine will Supply T.V.A. Plant," no publication provided, undated, photocopy in *Coal In Western Kentucky*, book 1, scrapbook by Agnes S. Harralson, ed. David Orrahood, MCGHA. For memo noting the size of the Sinclair

stripping operation served as an integral component of the production process that helped make the Paradise Steam Plant the epitome of the TVA's consumption-centric energy regime.

In the gently sloping fields of western Kentucky, most coal companies relied on a process known as area stripping.¹²⁹ [Fig. 6.7] The first step involved clear cutting all the trees and other plants covering the land. Second, the mine operator used explosives to loosen the remaining overburden, a term that referred to the flora, soil, and rocks covering the uppermost seam of coal. Third, miners used draglines to excavate the overburden, exposing the coal seam and piling the dislodged dirt, now known as spoil, in a ridge running parallel to the cut that they had made in the ground. This left a level workspace of unprotected coal called a bench. Next, the company removed all of the coal from the bench repeating steps two through four until it had mined all of the seams that underlay the initial cut. In Muhlenberg County, for instance, there were three seams of coal that could be mined from the surface. Finally, the company began the process again, making a cut parallel to the first while dumping the overburden from the new cut into the previous one until it had mined the entire property. Coal operators often left the last cut open, allowing it to fill with water.¹³⁰ Visual images of area stripping in western Kentucky from the 1960s were particularly arresting. Rows of black and brown ridges, devoid of life, had turned the once verdant terrain into a veritable moonscape. [Fig. 6.8] As noted poet and social critic

Mine, see Memorandum, Charles Young to Natie Allen, Jr., "Meeting Concerning Sinclair Mine," October 30, 1972, NARA-SE, RG 142, PMF, Box 404.

¹²⁹ Area stripping contrasts with contour stripping often used in the hills of Appalachia. In contour stripping the stripping bench is cut into the side of the mountain at the height of the desired coal seam. The overburden is then stacked on the outside (slope side) of the bench. Once the coal is removed the overburden is either pushed back to fill the bench or allowed to slide down the side of the mountain. As a result, contour stripping leads to serious erosion problems in the Appalachians not least because it removes trees holding the soil in place but also because the overburden often clogs streams leading to flooding. Contour stripping like area stripping also exposes highly acidic mine wastes that renders soil inhospitable to future growth. In the mountains, re-grading to original contour is also almost impossible.

¹³⁰ On the steps associated with area mining, see Tennessee Valley Authority, "An Appraisal of Coal Strip Mining," 1963, 5, NARA-SE, RG 142, OEDC, Box 191; and United States Department of the Interior, "A Study of Strip and Surface Mining in Appalachia: An Interim Report to the Appalachian Regional Commission," 1966, 43, copy in NARA-SE, RG 142, PMF, Box 406.

Wendell Berry wrote in 1972 after flying over the coalfields of Muhlenberg County, “[T]he strip miners have harrowed Paradise, as they would harrow heaven itself were they to find coal there. Where the little river town once stood in the shade of its trees by the river bank there is now a blackened desert.”¹³¹

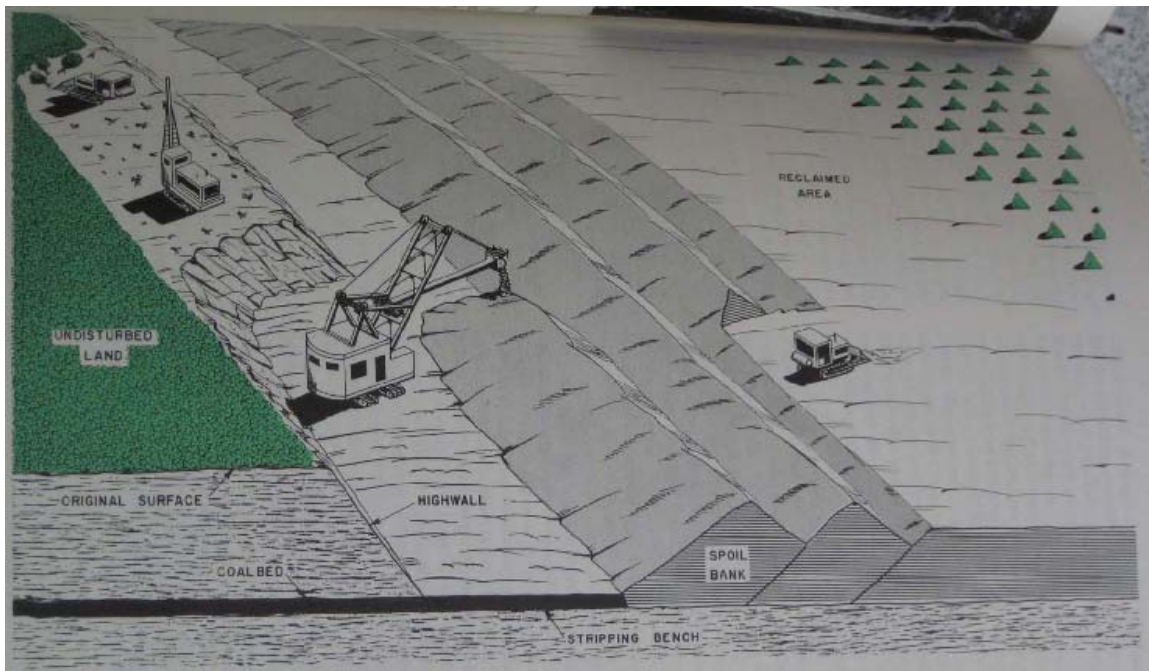


Figure 6.7: Diagram of Area Stripping – Note the dragline in the foreground, piling spoil and exposing a coal seam. A bulldozer clears trees in the background, and other workers set dynamite. On the right, an example of reclamation is provided as land is regraded and replanted. Source: United States Department of the Interior, “A Study of Strip and Surface Mining in Appalachia: An Interim Report to the Appalachian Regional Commission,” 1966, 43, copy in NARA-SE, RG 142, PMF, Box 406.

Strip mining resulted in severe ecological damage. Removing all of the trees and ground cover facilitated erosion that choked streams with silt and debris. The spoil banks that the coal companies created formed steep ridges, upwards of 200 feet tall, that made plowing the land for

¹³¹ Quoted in “Paradise Reclaimed?” *Lexington Herald-Leader Business Monday*, August 24, 1992, 8, copy in MCGHA, Folder Paradise-Muhlenberg County; also see “‘Paradise’ Returning to Muhlenberg,” *The Kentucky New Era*, Hopkinsville, Kentucky, September 1, 1992, 7A.

agricultural purposes impossible.¹³² Furthermore, the mining process brought deposits of heavy metals like selenium and mercury to the surface. These mine tailings rendered the spoil banks highly acidic and toxic to most plant species, preventing rapid revegetation or cultivation. The poisonous spoils contaminated local creeks and rivers as well, killing fish and other aquatic life while leaving the streams a “garish red” or “mustard, gray and copper” color.¹³³ The heavy metals from the acidic spoils also created salt marshes in low lying areas that provided the ideal breeding grounds for the mosquitos that plagued the western Kentucky coalfields throughout the post-World War II period.¹³⁴ As the images taken of Muhlenberg County in the 1960s made clear, the land that companies like Peabody and Pittsburgh and Midway stripped supported very little life without proper reclamation, creating a landscape of destruction that mirrored the ecological damage that mining had caused.

¹³² Harry M. Caudill, “Paradise Is Stripped,” *New York Times*, March 13, 1966, 27. The TVA suggested that the average height was between 30 and 100 feet for spoil ridges; see Tennessee Valley Authority, “An Appraisal of Coal Strip Mining,” 1963, 5, NARA-SE, RG 142, OEDC, Box 191.

¹³³ Quoted in “Kentucky’s Ravaged Land, Its People... And Its Hope,” *Louisville Courier Journal*, January 5, 1964, 4 and 11, copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining.

¹³⁴ Joe Creason, “Water Coming Clean?” *Louisville Courier Journal*, March 3, 1963, 3; and Joe Creason, “Joe Creason’s Kentucky,” *Louisville Courier Journal*, August 22, 1964, 7.

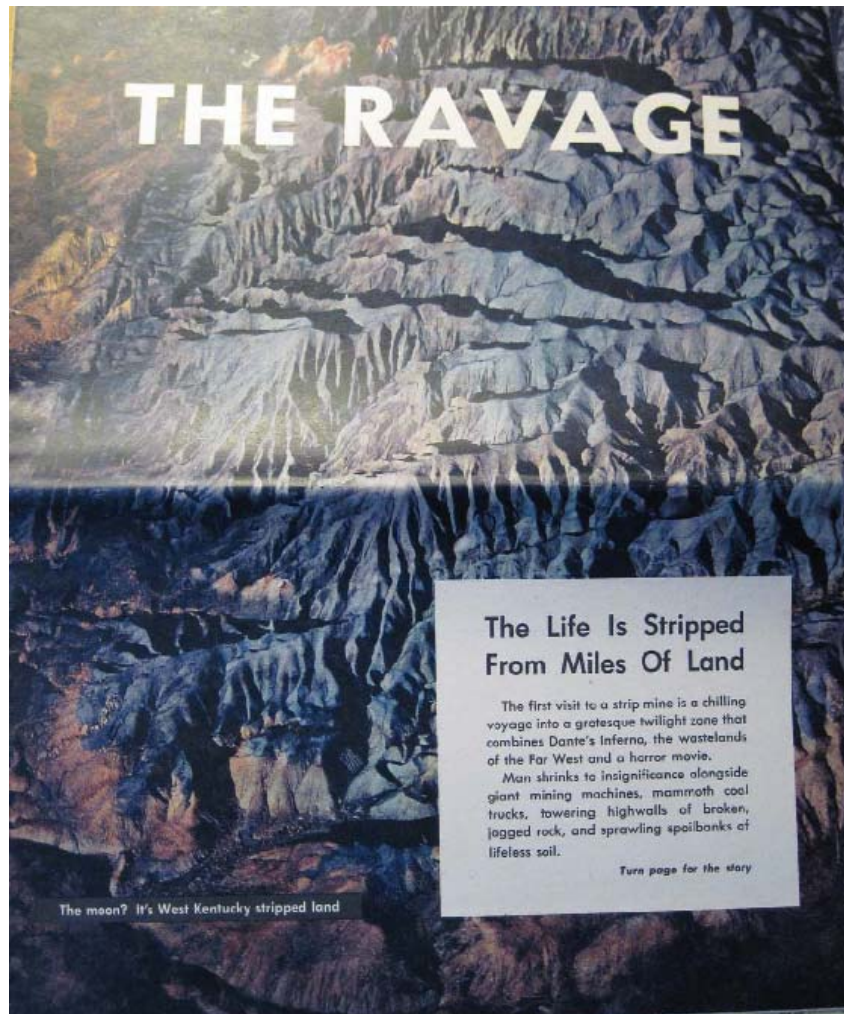


Figure 6.8: *The Ravage* – A photograph of strip mining in western Kentucky circa 1964. Source: “Kentucky’s Ravaged Land, Its People... And Its Hope,” *Louisville Courier Journal*, January 5, 1964, 3, copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining.

As early as 1948, surface mining had become a divisive statewide issue in Kentucky.

The *Louisville Courier Journal* published articles and editorials on the environmental consequences of stripping in both western and eastern Kentucky, receiving praise and condemnation from local residents.¹³⁵ By the 1960s, the *Courier Journal* noted that the state had

¹³⁵ The first editorial from the *Louisville Courier Journal* that I have found is dated January 25, 1948; see “Strip Mining Ought to be Regulated,” *Louisville Courier Journal*, January 25, 1948, copy in UKSCL, JCP, Box 76, Folder 9 Strip Mining C. For letter to the *Louisville Courier Journal* thanking it for help on the issue so stripping; see Letter, G. Baxter Ramsey to Editor *Louisville Courier Journal*, January 25, 1948, UKSCL, JCP, Box 76, Folder 9 Strip Mining C. For letter condemning the newspaper’s editorial, see Letter Thomas C. Cheasley to Editor *Louisville Courier Journal*, January 29, 1948, UKSCL, JCP, Box 76, Folder 9 Strip Mining C.

failed to protect the environment in the Green River Valley.¹³⁶ The newspaper and its columnists focused primarily on the visual and ecological devastation that the coal companies left in their wake.¹³⁷ On January 5, 1964, the *Courier Journal* ran a fifteen-page special report entitled “Kentucky’s Ravaged Land: Its People... And Its Hope.”¹³⁸ The report detailed the destructive nature of strip mining, emphasizing the barren spoil banks, poisoned streams, and “the stench of sulphur[sic]” that emanated from the brackish swamps that dotted the countryside.¹³⁹ The color photographs printed as part of “Kentucky’s Ravaged Land” depicted the horrors of stripping for the *Louisville Courier Journal*’s readers in stark relief, providing images of jagged blackened ridges devoid of any greenery.¹⁴⁰ [Fig. 6.8] The report attributed two of its pictures to active mines in Muhlenberg County, portraying a massive dragline in a warren of spoil banks within plain site of the Western Kentucky Parkway and Peabody’s Big Hog laboring in the area around Paradise.¹⁴¹ [Fig. 6.9 and Fig. 6.10] Life, according to the *Courier Journal*, had been “Stripped

¹³⁶ “You are Paying the Final Costs of Strip Mines,” *Louisville Courier Journal*, August 8, 1963, copy in NARA-SE, RG 142, PMF, Box 405. Other newspapers had begun calling for an outright ban on strip mining in the mountainous region of Appalachia. “Ban Strip Mining in the Mountains,” *Sun Democrat*, Paducah, Kentucky, April 3, 1963, copy in NARA-SE, RG 142, PMF, Box 405.

¹³⁷ According to Creason and the *Louisville Courier Journal*, the mosquitos were so thick at times that farmers could not risk putting livestock out to pasture. “You are Paying the Final Costs of Strip Mines,” *Louisville Courier Journal*, August 8, 1963, copy in NARA-SE, RG 142, PMF, Box 405; “Kentucky’s Ravaged Land, Its People... And Its Hope,” *Louisville Courier Journal*, January 5, 1964, 5 and 12, copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining; Joe Creason, “Water Coming Clean?” *Louisville Courier Journal*, March 3, 1963, 3; Joe Creason, “Joe Creason’s Kentucky,” *Louisville Courier Journal*, August 22, 1964, 7; Joe Creason, “Joe Creason’s Kentucky,” *Louisville Courier Journal*, June 12, 1965, 5; Joe Creason, “Joe Creason’s Kentucky,” *Louisville Courier Journal*, February 13, 1966, copy in UKSCL, JCP, Box 7, Folder Articles Series, February 1966; Joe Creason, “Joe Creason’s Kentucky,” *Louisville Courier Journal*, April 14, 1967, A9.

¹³⁸ For a copy, see “Kentucky’s Ravaged Land, Its People... And Its Hope,” *Louisville Courier Journal*, January 5, 1964, copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining

¹³⁹ “Kentucky’s Ravaged Land, Its People... And Its Hope,” *Louisville Courier Journal*, January 5, 1964, quote from 11, copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining.

¹⁴⁰ “Kentucky’s Ravaged Land, Its People... And Its Hope,” *Louisville Courier Journal*, January 5, 1964, 3, copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining.

¹⁴¹ “Kentucky’s Ravaged Land, Its People... And Its Hope,” *Louisville Courier Journal*, January 5, 1964, 6 (for Paradise) and 8-9 (for Western Kentucky Parkway), copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining.

From Miles Of Land.”¹⁴² Throughout the 1960s, the newspaper continued to call attention to environmental consequences of surface mining.¹⁴³

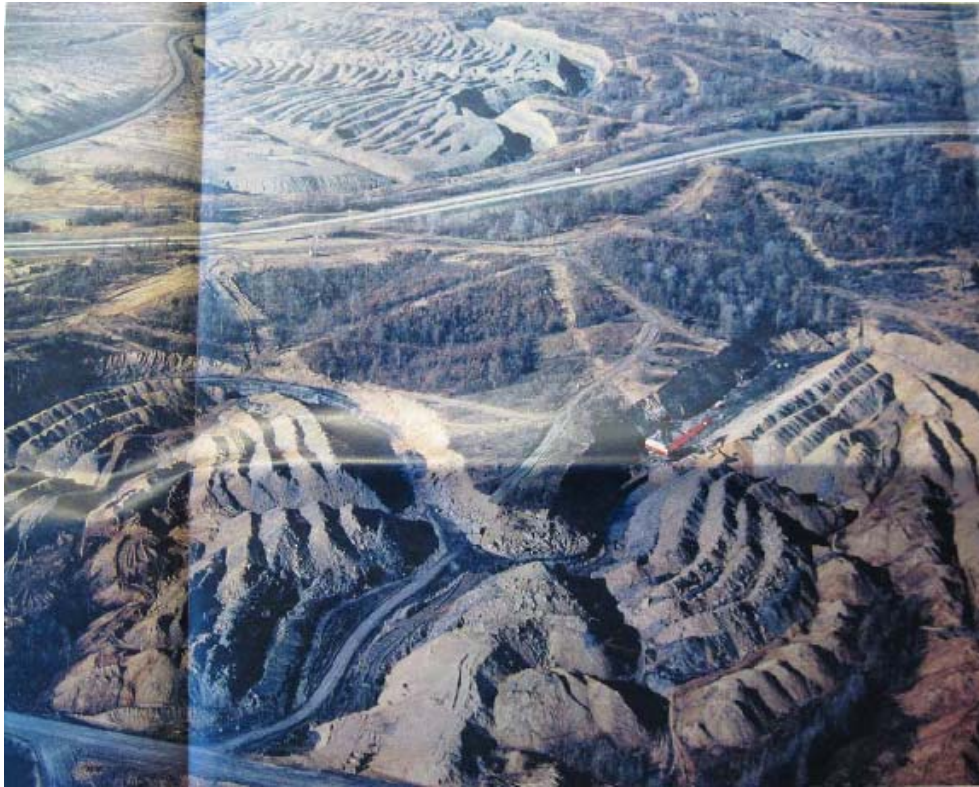


Figure 6.9: Strip Mining in Western Kentucky – Mines encroaching on the Western Kentucky Parkway in Muhlenberg County circa 1964. Source: “Kentucky’s Ravaged Land, Its People... And Its Hope,” Louisville Courier Journal, January 5, 1964, 8-9, copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining.

¹⁴² “Kentucky’s Ravaged Land, Its People... And Its Hope,” *Louisville Courier Journal*, January 5, 1964, 3, copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining.

¹⁴³ The *Louisville Courier Journal* became a mouthpiece for the anti-strip mining lobby in Kentucky. The paper expressed outrage over the damage to the environment as well as the weak response from state officials and the TVA. In particular, the paper argued that reclamation provisions in coal contracts requiring companies to re-grade and re-vegetate the land were rarely enforced; for several examples, see “Strip-Mine Action Hit by Caudill,” *Louisville Courier Journal*, July 20, 1963, copy in NARA-SE, RG 142, PMF, Box 405; “The Way to Save Kentucky’s Assets,” *Louisville Courier Journal*, January 27, 1964, copy in NARA-SE, RG 142, PMF, Box 405; David Ross Stevens, “Reclamation Not a Panacea Or an Ogre,” *Louisville Courier Journal*, August 31, 1969, copy in NARA-SE, RG 142, PMF, Box 405; David Ross Stevens, “Strip-Mine Reclamation Good in Spots, Inferior in Others,” *Louisville Courier Journal*, September 1, 1969, copy in NARA-SE, RG 142, PMF, Box 405; Livingston Taylor, “State Permits Huge Shovel to Dig Despite Delays in Reclamation,” *Louisville Courier Journal*, October 8, 1969, copy in NARA-SE, RG 142, PMF, Box 405; “Is Peabody Immune to State Strip-Mine Controls?” *Louisville Courier Journal*, October 10, 1969, copy in NARA-SE, RG 142, PMF, Box 405; and “A Good Move to Control Strip Mines,” *Louisville Courier Journal*, December 7, 1969, copy in NARA-SE, RG 142, PMF, Box 405.

In Muhlenberg County, strip mines remained omnipresent reminders of the relationship between cheap energy and the region's changing landscape. Residents lamented the coal companies' destruction of the environment, with one woman comparing Peabody's record setting Big Hog to a grotesque mythical beast, a Scylla carving its prey from the rolling countryside.¹⁴⁴ As several newspaper articles covering the demise of Paradise noted, the wind carried the "deep rumbling sounds" of draglines "gouging coal out of the nearby hills," and the fields shook "when the world's largest strip mining shovel [took] a mammoth bite out of the soil."¹⁴⁵ According to Dave McBride, a syndicated columnist from Owensboro, "Early inhabitants of Paradise would never recognize the once beautiful rolling countryside. The ground and everything above it is darkened with coal dust and the earth, a victim of its own riches, is scarred by deep pits."¹⁴⁶

¹⁴⁴ The comparison to Scylla is a reference to Homer's *Odyssey*. It is from a poem composed by a local resident named Hope Neathemer; see Hope Neathemer, "Scylla '69," quoted in C. W. Mayes, "Reflections on Paradise," June 1, 1982, 2, MCGHA, Folder Paradise-Muhlenberg County. The poem is as follows:

If Odysseus ever wakes to wander
Wandering through the hills along the Green River,
Even he, the wily Trojan warrior, will shudder
As their looms before his unbelieving eyes
A monstrous land locked Scylla,
Grotesque against bereaved Kentucky skies.

Stretching her hideous neck this way and that,
Probing for the gleaming ebon prey,
Her massive jaws gnash, gnash, gnash
All the living beauty from the land,
Two hundred tons of earth at one great gulp.

A solitary bite of leafy hill remains
After her unsated gorging –
A lonely little graveyard at the tiptop point.
Its tombstones stand like decaying molars
In the dusty gaping skull of a skeleton hill.

Just beyond this ravage
lies a ghost town
named Paradise.

¹⁴⁵ For "rumbling" and "gouging," see Bill Lyon, "2 Stories Vary on How Paradise Got Its Name, Buchanan Declares," *Evansville Courier & Press*, January 4, 1968, photocopy in MCGHA, Folder Paradise-Muhlenberg County. For "mammoth bite," see Dave McBride, "Progress Closing the Gates to Paradise," *Messenger & Inquirer*, Owensboro, Kentucky, December 3, 1967, copy in MCGHA, Folder Paradise-Muhlenberg County.

¹⁴⁶ Dave McBride, "Only 3 Families Left in Paradise," *Messenger-Times-Argus*, Central City, Kentucky, December 28, 1967, 7.

The coal companies and their advocates argued that the economic benefits of surface mining outweighed its environmental costs.¹⁴⁷ In Muhlenberg County, the *Messenger-Times-Argus* reported that stripping operations had employed 1,142 residents in 1963 and paid out almost \$11,000,000 in wages.¹⁴⁸ Coal companies, including Peabody, denounced journalists for printing sensationalized images of spoil banks at active mines without reporting on revegetation, ignoring “the fields of golden grain, producing above average yields, and the hundreds of thousands of young trees growing on the reclaimed hills.”¹⁴⁹ Most of strip mining’s proponents, including the TVA, focused on its economic importance and the extent to which the land could be put to future use.¹⁵⁰

Other residents of Muhlenberg County played an active role in shielding strip mine operators from regulation. For example, Bill Paxton of Central City served in the Kentucky General Assembly during the late 1960s and 1970s, becoming both the Speaker pro temp of the lower house and interim chairman of the Agriculture and Natural Resources Committee. Paxton also played golf with Peabody executives, and he used his leadership position to block several anti-stripping bills.¹⁵¹ State officials, meanwhile, noted that several Muhlenberg County judges were known for their friendly rulings toward Peabody, suggesting that the company had bribed the magistrates.¹⁵²

¹⁴⁷ In response to the *Courier Journal’s* special report, one local newspaper argued that strip mining produced more than \$30,000 per acre in wages and tax revenue; see “Land ‘Ravage’ Produces \$30,886 Per Acre,” no publication provided, January 31, 1964, copy in NARA-SE, RG 142, PMF, Box 405.

¹⁴⁸ “6 Muhlenberg Strip Mines Pay \$121,065.82 in Taxes,” *Messenger-Times-Argus*, Central City, Kentucky, January 30, 1964, copy in NARA-SE, RG 142, PMF, Box 405.

¹⁴⁹ Agnes S. Harralson, “Paradise in Kentucky,” *Power for Progress* 3 (August, 1973): 9, publication of the Peabody Coal Company, copy in MCGHA, Folder Paradise-Muhlenberg County.

¹⁵⁰ The TVA’s leadership observed that the average per acre value of agricultural products in western Kentucky was eighteen dollars in 1963 whereas coal yielded \$18,000 per acre. Letter, Aubrey J. Wagner to Lee C. White, September 3, 1963, NARA-SE, RG 142, PMF, Box 405.

¹⁵¹ Paxton had also helped the company obtain legal representation in a dispute over Peabody’s construction of a non-permitted coal-road. James Branscombe, “Paradise Lost,” *Southern Exposure* 1 (Summer 1973): 41.

¹⁵² James Branscombe, “Paradise Lost,” *Southern Exposure* 1 (Summer 1973): 36.



Figure 6.10: Big Hog in Sinclair Mine – Peabody's Big Hog at work at the Sinclair Mine in Muhlenberg County circa 1964. Source: "Kentucky's Ravaged Land, Its People... And Its Hope," Louisville Courier Journal, January 5, 1964, 6, copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining.

The Authority's role as the largest coal buyer in the area and its practice of encouraging mechanization placed the agency and its energy regime in the middle of the political fights over surface mining. TVA scientists had studied stripping operations and their effect on the environment since the 1940s—before it began building its coal-fired power plants.¹⁵³ By the late 1950s, however, banning the purchase of stripped coal would have crippled the power program.¹⁵⁴ Instead, the scientists argued that the Authority should require coal operators to restore stripped land for future use. Reclamation became the TVA's preferred strategy for bringing its energy regime in line with its conservation mandate. The TVA's leadership was well aware of the damage surrounding its Paradise facility, recognizing it as a potential public

¹⁵³ TVA, *Annual Report, 1962*, 73-4.

¹⁵⁴ Only a decade later, the TVA claimed that approximately half of its coal came from strip mines; see TVA, *Annual Report, 1971* (Government Printing Office: Washington, DC, 1971), 75.

relations disaster as early as 1960.¹⁵⁵ A. A. Foster, who worked for the agency's Forestry, Fisheries, and Wildlife Development Division, recalled that the barren land in Muhlenberg County reminded him and his colleagues more of the American southwest than Kentucky.¹⁵⁶ TVA staff visited many of the mines in the county, observing that Peabody had reclaimed very few of its properties and appeared to have the worst record in the area while Pittsburgh and Midway had done little to revegetate the land adjacent to the Paradise Steam Plant.¹⁵⁷ Beginning in the fall of 1961, Authority partnered with the Kentucky Department of Conservation and Peabody on a demonstration reclamation project at the latter's Sinclair Mine, reporting that it had successfully replanted the entire test area four years later.¹⁵⁸ In 1965, the agency also began inserting provisions in its coal contracts that required mining companies to reclaim the land that they disturbed or risk termination of its business relationship with the TVA.¹⁵⁹

Nevertheless, reclamation had political and ecological limitations. Although Kentucky passed its first law requiring coal companies to regrade mined land to its original contour and revegetate the spoils in 1954, state officials rarely enforced the regulations. The Kentucky Division of Reclamation lacked the funding and the manpower to carry out its mission. The administration of state laws also suffered from corruption as the coal companies often provided

¹⁵⁵ While serving as the TVA's chairman in 1961, Aubrey Wagner personally toured the area, hiking up spoil banks and surveying the county's mines from an airplane. Mary Jane Lowe, "Oral History Interview with A. A. Foster," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, March 7, 1991, 13-20, NARA-SE, RG 142, Oral History Records [hereafter: OHR], Box 3.

¹⁵⁶ Lowe, "Oral History Interview with A. A. Foster," 14, NARA-SE, RG 142, OHR, Box 3.

¹⁵⁷ As a memorandum from Clark Grover of the Office of Power noted, "It very definitely appears that Peabody is more interested in producing maximum tonnage than in establishing natural resources for future use." Quoted in Memorandum, C. E. Grover to E. P. Ericson, "Strip Mining – Western Kentucky," September 23, 1960, NARA-SE, RG 142, PMF, Box 405. TVA staff argued that Pittsburgh and Midway represented "a more immediate public relations problem than the Peabody operation" at the new Sinclair Mine which had yet to break ground. For quote, see Memorandum, James H. Barton, William G. Grieve, and Robert D. Nelson to Kenneth J. Seigworth, "Strip Mining – Western Kentucky," September 26, 1960, NARA-SE, RG 142, PMF, Box 405.

¹⁵⁸ TVA, *Annual Report, 1962*, 73-4; and TVA, *Annual Report, 1965*, 74.

¹⁵⁹ TVA, *Annual Report, 1966*, 3. It should be noted that the TVA only once canceled a contract for lack of reclamation.

gifts and meals for inspectors.¹⁶⁰ TVA employees charged with administering the agency's reclamation provisions claimed that it could be difficult even to locate a specific mine let alone compel an operator to comply.¹⁶¹ Furthermore, the reality of regraded and revegetated spoil banks left much to be desired. Rather than the hardwoods that predominated before stripping, various types of pine represented the only tree species that grew readily. Although the conifers represented an improvement over barren ridges, they still seemed out of place to local residents.¹⁶² Reclamation also failed to address the poisoning of streams and groundwater that resulted from surface mining, and the artificial lakes that coal companies created in the cuts that they could not refill often remained sterile.¹⁶³ Writing about Paradise in 1982, C. W. Mayes observed that "as one stands on the crest of a nearby hill, the sprawling expanse of the power plant, the scarred landscape, the grey-brown of the once blue sky, and the sting in the nostrils provide vivid reminders of the changes which have taken place."¹⁶⁴ It took decades for the land to restore itself after being stripped and reclaimed.¹⁶⁵

By the mid-1960s, the Authority found itself increasingly assailed from the left.¹⁶⁶ Harry Caudill, a lawyer from Whitesburg in eastern Kentucky and a former state representative,

¹⁶⁰ James Branscombe, "Paradise Lost," *Southern Exposure* 1 (Summer 1973): 39.

¹⁶¹ Mary Jane Lowe, "Oral History Interview with Arthur Wardner," part of Tennessee Valley Authority Oral History Collection: TVA Employee Series, March 27, 1991, 12-4, NARA-SE, RG 142, OHR, Box 9. The Authority continually had trouble convincing Peabody to remain involved in the agency's test demonstration at Paradise; see Letter, Aubrey Wagner to Lee C. White, September 3, 1963, NARA-SE, RG 142, PMF, Box 405.

¹⁶² Memorandum, James H. Barton, William G. Grieve, and Robert D. Nelson to Kenneth J. Seigworth, "Strip Mining – Western Kentucky," September 26, 1960, NARA-SE, RG 142, PMF, Box 405; Julie Paxton, "What Really Happened to Paradise," *Kentucky Monthly* 2 (August 1981): 33, copy in MCGHA, Folder Paradise-Muhlenberg County; and "Kentucky's Ravaged Land, Its People... And Its Hope," *Louisville Courier Journal*, January 5, 1964, 14, copy in UKSCL, JCP, Box 77, Folder 1 Strip Mining.

¹⁶³ "A Good Move to Control Strip Mines," *Louisville Courier Journal*, December 7, 1969, copy in NARA-SE, RG 142, PMF, Box 405.

¹⁶⁴ C. W. Mayes, "Reflections on Paradise," June 1, 1982, 10, MCGHA, Folder Paradise-Muhlenberg County.

¹⁶⁵ "Paradise Reclaimed?" *Lexington Herald-Leader Business Monday*, August 24, 1992, 1 and 8, copy in MCGHA, Folder Paradise-Muhlenberg County.

¹⁶⁶ Traditionally, the literature on environmental history and activism in the United States has focused on the 1960s as a time of increasing environmental consciousness among a broad swath of the middle class. The passage of federal legislation like the National Environmental Protection Act and the creation of the Environmental Protection Agency in 1970 certainly support this periodization; see Samuel P. Hays, *Beauty, Health, and Permanence:*

became the face of the movement against strip mining after publishing his 1962 book, *Night Comes to the Cumberlands*. In 1966, he wrote an exposé on the area around Paradise for the *New York Times* that criticized the TVA for its complicity in the destruction of Muhlenberg County. Caudill observed that the small village lay “isolated and shrunken, huddled in an appalling waste.”¹⁶⁷ Surrounding the community, “acres of earth are piled high into ghastly ridges, sometimes black with coal, sometimes brown with sulphur[sic]. The streams that wind through this dead landscape are devoid of life.”¹⁶⁸ Against this bleak backdrop, Caudill noted that Peabody’s massive dragline drew thousands of visitors who came to see the behemoth “devastate the American land.”¹⁶⁹ In the distance, the Paradise Steam Plant “towers above a desolation created by its insatiable appetite for fuel.”¹⁷⁰ According to Caudill, the TVA’s insistence on reducing the cost of coal created a tension between the Authority’s power program and its obligations as a conservation agency. This contradiction, the destruction of the land at the behest of the TVA, represented “the tragedy of Paradise.”¹⁷¹

Conclusion

The political economy of mass-consumption and cheap energy sacrificed environmental quality in rural areas to benefit urban and suburban consumers. As William Cronon argues in his study of Chicago, this exploitative relationship between periphery and core has defined patterns

Environmental Politics in the United States, 1955-1985 (Cambridge: Cambridge University Press, 1987); and Adam Rome, *The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism* (Cambridge: Cambridge University Press, 2001). Recently, scholars have been trying to demonstrate the important connections between the New Deal and the later environmental movement; see Sarah T. Phillips, *This Land, This Nation: Conservation, Rural America, and the New Deal* (Cambridge: Cambridge University Press, 2007); and Neil M. Maher, *Nature’s New Deal: The Civilian Conservation Corps and the Roots of the American Environmental Movement* (Oxford: Oxford University Press, 2008).

¹⁶⁷ Harry M. Caudill, “Paradise Is Stripped,” *New York Times*, March 13, 1966, 26.

¹⁶⁸ Harry M. Caudill, “Paradise Is Stripped,” *New York Times*, March 13, 1966, 26-7.

¹⁶⁹ Harry M. Caudill, “Paradise Is Stripped,” *New York Times*, March 13, 1966, 27.

¹⁷⁰ Harry M. Caudill, “Paradise Is Stripped,” *New York Times*, March 13, 1966, 81.

¹⁷¹ Harry M. Caudill, “Paradise Is Stripped,” *New York Times*, March 13, 1966, 81.

of resource use and abuse in the modern United States. Middle- and upper-class white communities have remained insulated from the negative effect that both the rise of mass-production and the widespread adoption of energy-intensive lifestyles have had on the environment. In the Tennessee Valley Region, the TVA's regime institutionalized the political and economic dominance of relatively affluent cities and towns over the coalfields and steam plant communities that served them.

The environmental consequences of the Authority's energy regime belied the agency's commitment to sound resource management, exposing a central paradox of public power. To provide abundant, cheap electricity for consumers, the TVA relied on massive coal-fired power plants that concentrated pollutants in rural areas, and it adopted coal-buying policies that promoted strip mining. The Authority's residential and commercial customers and the region's coal operators reaped the benefits of this regime while shouldering few of its environmental costs. In contrast, coal-fired emissions inundated the communities that hosted the TVA's facilities, and surface mining denuded the land and poisoned streams.

The separation of consumers from the production of electricity was a major stratifying force in the Tennessee Valley region that undermined the egalitarian image of public power and popular support for the Authority's energy regime. The shortcomings of the TVA's power program manifested themselves both at the Paradise Steam Plant and in the coalfields of western Kentucky. The Authority's facility stabilized the coal industry in Muhlenberg County but did not raise wages for miners or diversify the local economy. Furthermore, the development of the region's electrical resources rendered entire towns uninhabitable, destroyed the local landscape, and resulted in the canalization of the Green and its tributaries. Despite the backing of local boosters and organizations like the GRVCL, the damage that the TVA's power plants and coal-

buying policies caused sparked conflicts between the Authority, individual communities, and anti-strip mining activists who argued that the TVA had an obligation as a public conservation agency to protect people from the harmful effects of its coal-fired emissions and to ensure that the mine operators reclaimed the land that they disturbed. Both the Authority's subsequent effort to have the Paradise Steam Plant serve as a test site for controlling coal-fired emissions and the reclamation demonstrations that it sponsored in the 1970s did little to alter its flagging reputation among a growing coterie of critics for whom the agency had become just another power company.¹⁷²

Outsiders ultimately forced the TVA to address the inconsistencies between its energy regime and its broader mission. The Authority could no longer plausibly claim that its power program supported the agency's mandate for resource conservation.¹⁷³ What began with the concerns of a group of scientists and engineers in the Division of Health and Safety developed into a full-fledged public relations crisis that focused on the TVA's changing environmental responsibilities. The Authority's consumption-centric regime had failed to fulfill the progressive promise of public power and the conservation movement.

¹⁷² On the TVA's Sulfur Dioxide Emission Limitation Program at Paradise, see TVA, *Annual Report, 1973* (Government Printing Office: Washington, DC, 1973), 40-3; and TVA, *Annual Report, 1975* (Government Printing Office: Washington, DC, 1975), 46. The TVA and coal operators like Peabody and Pittsburgh and Midway touted the efforts of the agency and mining companies in Muhlenberg County to little avail; see "Paradise Reclaimed?" *Lexington Herald-Leader Business Monday*, August 24, 1992, 1 and 8, copy in MCGHA, Folder Paradise-Muhlenberg County; "Peabody Reclamation Works... And Works... And Works... And Works," *Power for Progress* 3 (August, 1973): 4-5, publication of the Peabody Coal Company, copy in MCGHA, Folder Paradise-Muhlenberg County; Agnes S. Harralson, "Paradise in Kentucky," *Power for Progress* 3 (August, 1973): 9, publication of the Peabody Coal Company, copy in MCGHA, Folder Paradise-Muhlenberg County; TVA, *Annual Report, 1962*, 73-4; TVA, *Annual Report, 1963*, 71; TVA, *Annual Report, 1965*, 74; and TVA, *Annual Report, 1973*, 76.

¹⁷³ The term "conservation" underwent a shift in the 1960s and 1970s as environmental groups redefined it to mean something more akin to preservation than its original meaning of managed development; see Samuel P. Hays, *Conservation and the Gospel of Efficiency* (Cambridge: Harvard University Press, 1959); and Samuel P. Hays, *Beauty, Health, and Permanence*; Adam Rome, *The Bulldozer in the Countryside*; and Donald Worster, *Nature's Economy: A History of Ecological Ideas*, second edition (Cambridge: Cambridge University Press, 1994).

Conclusion: The Use of the Earth for the Good of Man¹

Nineteen-Sixty-Seven began a period of transition for the Tennessee Valley Authority and its energy regime. In August, less than one year after it decided to purchase Paradise Village, the TVA raised residential electricity rates in its service area for the first time. The agency had increased its industrial rates once before in 1951, but it had never raised the price of electric power for in-home use. Citing the cost of both coal and new construction as well as rising interest rates, the Authority claimed that the increase was necessary for the agency and its distributors to remain solvent. In 1967, the TVA also broke ground on its first nuclear power plant—Brown’s Ferry—near Athens, Alabama.² Over the next two decades, the Authority raised rates several more times, encouraged residents to insulate their homes and conserve energy, and started work on three additional nuclear facilities. In response to new federal regulations and growing criticism of its environmental practices, including several lawsuits, the TVA agreed to install precipitators and sulfur removal equipment on all of its coal-fired generating stations. Furthermore, the Authority initiated new research both on strip mine reclamation and on the effect of its power plants on aquatic life in the Tennessee River.³ Producing large volumes of

¹ Gifford Pinchot used this phrase to describe the environmental philosophy of public power and the conservation movement; see TVA, *Annual Report, 1953* (Washington, D.C.: Government Printing Office, 1953), 52; also see Erwin C. Hargrove, *Prisoners of Myth: The Leadership of the Tennessee Valley Authority, 1933-1990* (Knoxville: University of Tennessee Press, 1994), 181.

² TVA, “TVA Power, 1967,” informational pamphlet, May 1967, 22-3, National Archives and Records Administration Southeast Branch, Morrow, GA [hereafter: NARA-SE], Record Group 142 [hereafter: RG 142], Power Manager’s File [hereafter: PMF], Box 17; and TVA, *Annual Report, 1967* (Washington, D.C.: Government Printing Office, 1967), 2-3; and TVA, *Annual Report, 1951* (Washington, D.C.: Government Printing Office, 1951), 14.

³ For examples of rate increases, see TVA, *Annual Report, 1969* (Washington, D.C.: Government Printing Office, 1969), 39; TVA, *Annual Report, 1970* (Washington, D.C.: Government Printing Office, 1970), 35; TVA, *Annual Report, 1974* (Washington, D.C.: Government Printing Office, 1974), 42; and TVA, *Annual Report, 1981* (Washington, D.C.: Government Printing Office, 1981), 6. On the conservation of energy and home insulation, see TVA, *Annual Report, 1978* (Washington, D.C.: Government Printing Office, 1978), 15. On nuclear facilities, see TVA, *Annual Report, 1973* (Washington, D.C.: Government Printing Office, 1973), 37. On research, see TVA, *Annual Report, 1975* (Washington, D.C.: Government Printing Office, 1975), 5; and TVA, *Annual Report, 1969*, 16.

cheap electricity remained an important goal for the TVA, but the agency could no longer ignore the environmental consequences of coal-fired power both in the coal fields of the Tennessee Valley Region and in the communities that hosted its steam plants.

For three decades, the TVA's consumption-centric regime had reinforced federal energy policies predicated on the public power movement's philosophy of high use, low cost, and abundance. The implementation of these policies led to the creation of several other programs and laws that focused on making inexpensive electric power available throughout the United States. For example, the Rural Electrification Administration improved access to electricity across the country by providing low interest loans to communities and utilities to extend service to farms and other underserved areas. The Electric Home and Farm Authority helped finance the purchase of electric appliances. Meanwhile, the Public Utility Holding Company Act sought to reduce the cost of electricity by breaking up the large trusts that dominated the utility industry, making it easier for individual states to regulate electric companies and their rates.⁴

The ideals of the public power movement supported the state's effort to promote social welfare and national security. The postwar political economy of mass consumption, suburbanization, decentralized economic growth, and the United States' nuclear arsenal all depended on electricity—reliable, abundant and cheap. The single-family home replete with a plethora of electric appliances became a symbol of a quintessentially American standard of living, and the expansion of diffuse suburbs relied as much on electricity as on the automobile

On lawsuits and modifications to coal-fired power plants, see Robert F. Durant, *When Government Regulates Itself: EPA, TVA, and Pollution Control in the 1970s* (Knoxville: University of Tennessee Press, 1985).

⁴ On the Rural Electrification Administration, see David E. Nye, *Electrifying America: Social Meanings of a New Technology, 1880-1940* (Cambridge: MIT Press, 1990), 287-338. On the Electric Home and Farm Authority, see Electric Home and Farm Authority, "Electric Home and Farm Authority: Its Plan for Financing the Retail Purchase of Electrical Appliances, Circular No. 1," informational pamphlet, May 1936, NARA-SE, RG 142, PMF, Box 171. For more information on the Rural Electrification Administration and the Electric Home and Farm Authority as well as a discussion of the Public Utility Holding Company Act, see Philip J. Funigiello, *Toward a National Power Policy: The New Deal and the Electric Utility Industry, 1933-1941* (Pittsburgh: University of Pittsburgh Press, 1973).

and gasoline. The nation's economy required large volumes of inexpensive kilowatts to mass-produce affordable consumer goods and fuel research into the development of new technologies. Similarly, the military industrial complex's rapid expansion during the early 1950s would not have been possible were it not for the availability of low-cost electric power. In fact, the United States used more electricity than any other country in the world in the decades after World War II.⁵

The TVA was the largest experiment in public power in United States history. After he ousted Arthur Morgan in 1938, David Lilienthal instilled the ideals of the public power movement in the Authority, creating an energy regime dedicated to generating and distributing inexpensive kilowatts. The massive coal-fired power plants that the TVA built after World War II took advantage of efficiencies of scale to produce electric power more efficiently and in greater quantities than anywhere else in the world. The agency expanded its transmission infrastructure and reduced rates to encourage the consumption of electricity in its service area, an 80,000 square mile expanse that was home to approximately five million people by the late 1950s.⁶ The Authority and its distributors also engaged in extensive promotional campaigns that highlighted the benefits of electric power for residential and commercial use.⁷ The TVA treated electricity as a public good and a basic right, a tool of national defense and progressive social and economic change that could raise standards of living for all Americans.

The rapid growth of in-home electricity use in the Tennessee Valley Region was the greatest success of the TVA's regime. While fewer than three percent of farms had access to

⁵ NES, "The NES News," newsletter, vol. 9, no. 7, January-February 1969, 1, Nashville Public Library, Special Collections, Nashville, TN [hereafter: NPLSC], Nashville Electric Service Public Relations Records [hereafter: NESPRR], Box 1, Folder 1. Production of electricity in the United States was more than double that of the next highest country in the late 1960s, the USSR; see, TVA, "TVA Power, 1970," informational pamphlet, April 1970, 2, NARA-SE, RG142, PMF, Box 17.

⁶ See Chapter Two.

⁷ See Chapter Three.

electric power in 1933, almost all of them did by 1960. Overall, the TVA's customers increased from less than 300,000 in 1933 to more than two million in 1970. By the 1970s, the average household in the TVA's service area consumed nearly 14,000 kilowatt-hours per year compared to only 1,903 kilowatt-hours in 1946. Almost one third of the region's homes used electricity for all of their energy needs in 1970, consuming about 24,000 kilowatt-hours each per year. Only twenty years earlier, less than two percent of residences in the Authority's service area had been all-electric.⁸ The TVA's regime had facilitated the widespread adoption of energy-intensive ways of life.

Inexpensive electricity helped transform the region's economy by attracting private capital and defense spending. Industries that relied on energy-intensive processes opened new manufacturing plants in communities like Decatur, Alabama, and Calvert City, Kentucky. Between 1933 and 1965, the chemical, primary metals, and pulp industries—all of which required large volumes of cheap electric power—accounted for more than ninety percent of private investment along the Tennessee River and more than two out of every three new jobs. Overall, manufactures employed approximately half of all workers in the region by the late-1960s compared to only twelve percent three decades earlier.⁹ The military also located several projects, including its rocket and guided missile program, in the Tennessee Valley Region because of the Authority's abundant supply of cheap kilowatts. The atomic research laboratories and uranium processing centers at Oak Ridge, Tennessee, and Paducah, Kentucky, consumed massive amounts of electricity. Defense installations attracted private contractors to the region

⁸ For statistics on coverage and use, see TVA, "TVA Power, 1970," informational pamphlet, April 1970, 12-3, NARA-SE, RG 142, PMF, Box 17; TVA, "TVA Power, 1946," informational pamphlet, 1946, 11, NARA-SE, RG 142, PMF, Box 17; and TVA, "TVA Power, 1959-1960," informational pamphlet, January, 1960, 14, University of Tennessee at Knoxville, John C. Hodges Library, Special Collections [hereafter: UTK: Hodges], TVA Pamphlet Collection 1934-1960 [hereafter: TVA PC], Box 4, Folder 8.

⁹ TVA, "Navigation and Economic Growth: Tennessee River Experience," informational pamphlet, September 1966, 8 and 11, UTK: Hodges, TVA PC, Box 4; and TVA, "TVA Power, 1970," informational pamphlet, April 1970, 6, NARA-SE, RG142, PMF, Box 17.

as well. In particular, the Army's rocket program lured numerous aerospace firms to Huntsville, Alabama.¹⁰

Despite its success in promoting electricity use and economic growth, the TVA's energy regime never realized the egalitarian rhetoric of the public power movement. Instead, it reinforced a political economy of white privilege that favored middle- and upper-class, suburban homeowners and white-collar professionals over minorities and the poor. Ironically, perhaps, the largest experiment in the socialization of an industry in United States history did little to undermine existing socioeconomic and racial hierarchies in the Tennessee Valley Region.

The shortcomings of the TVA's energy regime exposed the broader biases of the federal government's consumption-centric social and economic policies. Although it did raise standards of living, increasing the purchasing power of individuals did not reduce inequality. Instead, by linking social citizenship with consumption, New Deal era policies further divided Americans. Programs like unemployment insurance and old age insurance and legislation like the Fair Labor Standards Act and, later, the G.I. Bill favored the white middle class. Meanwhile, policies that promoted suburbanization facilitated mass movement to socioeconomically and racially segregated communities. The archetypal citizen consumer was the suburban, white male breadwinner and his family.¹¹

¹⁰ See Chapter Four.

¹¹ There is a growing literature on the New Deal and the postwar state that highlights the ways in which federal policy, though nominally race, gender, and class neutral, favored white, heterosexual, middle- and upper-class Americans. For examples, see Suzanne Mettler, *Dividing Citizens: Gender and Federalism in New Deal Policy* (Ithaca: Cornell University Press, 1998); Meg Jacobs, *Pocketbook Politics: Economic Citizenship in Twentieth Century America* (Princeton: Princeton University Press, 2007); Lizabeth Cohen, *A Consumer's Republic: The Politics of Mass Consumption in Postwar America* (New York: Alfred A. Knopf, 2003); Ira Katznelson, *When Affirmative Action was White: An Untold Story of Racial Inequality in Twentieth Century America* (New York: W. W. Norton & Company, 2005); Kathleen J. Frydl, *The GI Bill* (Cambridge: Cambridge University Press, 2009); David K. Johnson, *The Lavender Scare: The Cold War Persecution of Gays and Lesbians in the Federal Government* (Chicago: University of Chicago Press, 2004); Kenneth T. Jackson, *The Crabgrass Frontier: The Suburbanization of America* (Oxford: Oxford University Press, 1985); and Thomas Sugrue, *The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit* (Princeton: Princeton University Press, 2005).

Furthermore, the TVA's regime fostered environmental inequality. The Authority's pursuit of cheap kilowatts privileged patterns of resource use that benefited consumers while polluting the areas in which the agency generated its electricity. By concentrating the environmental consequences of its power program far from urban and suburban population centers, the TVA rendered the true costs of producing inexpensive coal-fired power invisible to most of its customers. The Authority's decision to build massive steam plants without pollution controls in rural areas removed ash and noxious gas from the cities like Nashville and Knoxville but provided no protection for the facilities' host communities. The agency's coal-buying policies promoted large-scale strip mining operations that destroyed the environment but remained mostly unnoticed outside of the coalfields until the late 1960s. In this way, the TVA's regime sacrificed environmental quality in outlying areas to improve standards of living for urban and suburban consumers.

The separation of consumption from the site of production has been a defining feature of modernity in the United States. Improvements in transportation have been paramount. The ability to move goods quickly and efficiently over long distances expanded regional and national markets and allowed production to occur in a single location. The railroads that connected nineteenth-century ranchers in Omaha with meat processors in Chicago and customers on the east coast were precursors to the high-voltage power lines that formed the sinew of the TVA's power network.¹² This separation has been both a blessing and curse. By insulating consumers from the full costs of production, it facilitated the era of mass consumption, raising standards of living by inflating the purchasing power of individuals while shielding them from the environmental implications of their actions. The exploitative relationships that have developed

¹² William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton & Co., 1991).

between consumers and the nation's natural resources have led to increased inequality between affluent suburbs and the hinterlands on which they depend.¹³

The environmental consequences of coal-fired power eventually undermined the TVA's regime. As early as the late 1940s, scientists and engineers within the Authority's Division of Health and Safety began questioning the agency's decision to build its massive steam plants without pollution controls. These scientists and engineers carried out numerous environmental studies around several of the TVA's facilities that demonstrated the breadth of the problem that the agency faced. In 1958, they convinced the board of directors to approve the use of low-sulfur coal during periods of atmospheric stagnation and install taller smokestacks and electrostatic precipitators at the Authority's Kingston Steam Plant. In addition to internal pressure on the agency's regime, external criticism mounted in the 1960s. In Muhlenberg County, Kentucky, the damage that the TVA's Paradise Steam Plant caused and the destructive effects of the strip mining led to a public relations crisis that resulted in the Authority purchasing the town of Paradise and fending off a growing opposition to its coal-buying policies. Increasingly, the TVA found itself outflanked on the left by those who doubted that the pursuit of cheap, coal-fired power represented the use of the earth for the good of man.¹⁴

The backlash against the TVA's regime occurred during a shift in the nation's environmental politics. The conservation movement of the 1920s and the advocates of public power had believed that the United States' natural resources could be managed to sustain

¹³ Robert D. Bullard, *Dumping in Dixie: Race, Class, and Environmental Quality* (Boulder: Westview Press, 1990); Andrew Hurley, *Environmental Inequalities: Race, Class, and Industrial Pollution in Gary, Indiana, 1945-1980* (Chapel Hill: University of North Carolina Press, 1995); and Steve Lerner, *Diamond: A Struggle for Environmental Justice in Louisiana's Chemical Corridor* (Cambridge: MIT Press, 2005).

¹⁴ See Chapter Five and Chapter Six. Also, see Durant, *When Government Regulates Itself*; William U. Chandler, *The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-1983* (Cambridge: Ballinger Publishing Company, 1984); and Dean Hill Rivkin, "TVA, the Courts, and the Public Interest," in *TVA: Fifty Years of Grass-Roots Bureaucracy*, eds. Erwin C. Hargrove and Paul K. Conkin (Urbana: University of Illinois Press, 1983), 194-229.

perpetual growth. Much of the social and economic legislation of the New Deal rested on similar assumptions about the nation's ability to develop its resources indefinitely. The environmental movement of the 1960s and 1970s, however, rejected the philosophy of limitless growth and sought to rein in past abuses. The TVA was ill-equipped to navigate this political shift. The Environmental Protection Act led to the creation of air and water quality standards that the Authority had great difficulty meeting. Lawsuits filed by states in which the TVA operated and public pressure from groups like the Sierra Club and the National Resources Defense Council ultimately forced the agency to implement stricter pollution controls at its power plants. Finally, the national movement against strip mining further undermined support for the Authority.¹⁵

The successes and failures of the TVA's energy regime raised important questions about the Authority's role as a public agency charged with the production of electric power and resource conservation. Indeed, what was public power, and what were the environmental responsibilities of the TVA's power program? Despite the antipathy of its early advocates to private utilities, public power was neither wholly public nor private. The Authority's regime relied on the partnerships that the TVA cultivated with local elites and private development groups as well as state and federal agencies. The associational character of the Authority's regime mirrored historical trends in American political development. The state has often been at its most effective when it has built cooperative relationships with non-state actors.¹⁶

¹⁵ On the shifting environmental politics of the postwar era, see Samuel P. Hays, *Beauty, Health, and Permanence: Environmental Politics in the United States, 1955-1985* (Cambridge: Cambridge University Press, 1987); Sarah T. Phillips, *This Land, This Nation: Conservation, Rural America, and the New Deal* (Cambridge: Cambridge University Press, 2007); Neil M. Maher, *Nature's New Deal: The Civilian Conservation Corps and the Roots of the American Environmental Movement* (Oxford: Oxford University Press, 2008); and Adam Rome, *The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism* (Cambridge: Cambridge University Press, 2001). For pressure on the TVA, including lawsuits, see Durant, *When Government Regulates Itself*.

¹⁶ Brian Balogh, *A Government Out of Sight* (Cambridge: Cambridge University Press, 2009); Ellis W. Hawley, *The Great War and the Search for a Modern Order: A History of the American People and their Institutions, 1917-1933*,

For many of the TVA's critics on the left, the agency's pursuit of cheap kilowatts represented an abdication of its environmental obligations that highlighted the deterioration of the public power ideal. They believed that the Authority's mission as a public power agency was to develop better methods for producing electricity to meet the needs of its varied constituents. The innovation that characterized the TVA's power program from the 1930s through the 1950s vanished as the Authority struggled to fulfill its responsibilities to customers in a period of rapidly changing environmental consciousness. In doing so, the TVA missed an opportunity to expand its role as a public power provider. Rather than become a leader in the production of cleaner energy, the Authority became a symbol of sclerotic bureaucracy, a cautionary tale of calcification that belied the agency's early history of experimentation. This paradox of the TVA's regime and public power—their inability to protect both the interests of consumers and the environment—is in many respects the story of the liberal state's decline. The federal government's pioneering responses to the Great Depression and the consumption-centric social policies of the postwar era failed to adapt to changing circumstances in the 1970s and 1980s. The subsequent repudiation of the public sector has had serious consequences for the state and its ability to serve as bulwark of progressive social change. The rise and fall of the TVA's regime, of cheap energy and the public power ideal, is the rise and fall of the state and liberal social and economic policy in the twentieth century.

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