



# On Mattering: A Coal Ash Flood and the Limits of Environmental Knowledge

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**ABSTRACT** This paper investigates the largest flood of coal ash in United States history as an event at once monumental and insignificant. It traces affective forces generative of both the ash, and its invisibility. In the moment of rupture, the ash flowed out of a large holding pond in a spill of layered sediments – each layer of particulate a temporary resting place for a forceful trajectory of matter spurned into motion elsewhere in space and time. This paper takes up the atemporal matter of this coal ash flood to ask: out of what movements and connections was the ash formed? How did this particular landscape change to accommodate its accumulation? What trajectories flowed into the pond, and what hidden memories sat buried in its mass? Drawing on ethnographic and archival research, this paper weaves together juxtaposed scenes that form (some of) the backstory of this event, and invites a reconsideration of the practices of knowledge that helped condition it.

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The water runs gray. Giant, craggy “ashbergs” float on the Emory River in East Tennessee. Cenospheres, the tiny glass beads that form in the extreme high heat of the coal burning power plant, pool miles away along the winter’s recessed shoreline.<sup>1</sup> The night temperature dropped to nine degrees Fahrenheit on December 22, 2008, the night of the largest coal ash flood in United States history.<sup>2</sup>

An electrician from the Steam Plant – the coal burning power plant that housed the ashy byproduct before its rupture – described how, upon leaving work after the night shift, one could not turn right onto the road.<sup>3</sup> It appeared to be blocked off by some kind of strange, gray wall. The worker turned left and went home.

A resident of the Swan Pond community, adjacent to the Kingston Steam Plant, saw news of the spill from the hospital, recognizing her neighbors’ homes as those moved from their foundation by the tsunami-like force of the flood. Boat docks shifted, relocated to homes

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<sup>1</sup> Shea Tuberty, interview by Susie Hatmaker, Appalachian State University (ASU), Boone, NC, 20 May, 2013. These particles are produced when coal burns at 1500-1750°C.

<sup>2</sup> Shaila Dewan, “At Plant in Coal Ash Spill, Toxic Deposits by the Ton,” *The New York Times*, 29 December, 2008, <http://www.nytimes.com/2008/12/30/us/30sludge.html>. Fahrenheit is used in this sentence to reflect the local, rather than international scientific unit of measure.

<sup>3</sup> Kingston Electrician, interview by Susie Hatmaker, Kingston, TN, 18 April, 2013.

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upstream. Far down the river, a young woman saw a curious sight as she left for work that morning: a pair of women's pumps floating, followed by furniture. That morning, the residents of Kingston, Tennessee, awoke to the reality that the central infrastructural element of the entire town, the Steam Plant, had spilled over 1.1 billion gallons of coal ash waste out of an earthen holding pond and into the river. The news media zeroed in on the human residents for interviews, while photographers attempted to capture a constantly moving, vastly messy, landscape of disaster. Neither interviews with people nor photographic images could ever fully capture this event. We only have little shards, framed views, memories, and raw feelings. The moment of the spill is one of movement, fluidity, and a kind of resistance. It happened late at night in the dark of a rural town when no one was looking. So much matter disappeared into the swift currents of a wide and constantly moving river, becoming new parts of a post-industrial ecosystem, evading human knowledge and representation forever.

I witnessed this scene on the national evening news, whose anchor stood on the lawn of a Swan Pond resident's now-former home. The camera panned the scene, and then filmed a woman's distress over her sudden loss. The news anchor narrated this woman's story with the practiced tone of voice that signals seriousness and grave drama, interpolating the woman into a familiar disaster victim narrative. When I arrived three years later with fieldwork funding, I gathered in interviews that those affected by the flood often felt that national news reporters came with a prefabricated story that they wanted to tell. Interlocutors told me that they were not asked to tell their story in its complexity, but to fill in the sound bites in a story written in advance. Before most would grant me an interview, I was asked, "What's your angle?" Those who could speak to the human experience of the flood failed to signify in ways legible to the cultural narratives of disaster. Without willing human victim stories or the spark of a grassroots activist fight against (literal) power, the flood quickly faded from visibility. It failed to mobilize the desire to reconsider choices, infrastructures of power, or actions. It flowed out in a monumental, geological event that again reshaped this landscape. Those who live here quickly point out and repeat the mantra that it was the largest disaster of its kind in US history. Yet it is not represented or representable by conventional epistemologies of politics, history, and knowledge that search for meaning in event. The movement of an ambiguous gray matter and its complex story of becoming a massive flood do not fit into the dominant modes of knowledge production, environmental or otherwise.

Watching the news with my family on that initial day after the flood, I could not place the event easily. Unlike a corporate oil spill or deaths at a factory producing goods for the consumer marketplace, I could not quickly categorize, classify, and critique. It took years of sitting with the flood for its mattering to slowly reveal itself to me. On the day I learned about the spill, my family no longer lived in Kingston, Tennessee, our hometown. We watched the forced attempts to extract a conventional disaster news story from a cozy couch in San Diego. Despite growing up and even swimming in the strangely warm waters beneath the towering smokestacks of the Steam Plant, I had no idea about the ash. Out of what movements and connections was the ash formed? How did this particular landscape change to accommodate its accumulation? What trajectories flowed into the pond, and what hidden memories sat buried in its mass?

During the five years since the spill it became clear that, despite its status as the largest coal ash spill in US history, this disaster lacks overt meaning and significance. As a national news story with a life span of only a few days, it does not rank among the well-known events with simple names that signify their historical relevance. Bhopal, Exxon-Valdez, BP, Love Canal, Chernobyl, and Fukushima, all call to mind the tenuous relationship among ideas about nature, technology, and progress. In her work on the Bhopal chemical plant disaster, Kim Fortun includes a chapter on Institute, West Virginia, where the same chemical company operating in Bhopal, Union Carbide, leaked toxic gas into the surrounding community. She notes that Bhopal, like the other “major” occurrences on an environmental historian’s list of “significant events,” is one of those that “catalyzed public concern about environmental risk.” But then she asks, what about those incidents that “fail to ever achieve the status of ‘events’”?<sup>4</sup> She notes that the problem is exacerbated by media coverage that isolates events in a localized place, and assigns them to a moment on a linear timeline. She writes about how many places are left out of this loop, places like Institute, where “the tensions between jobs and safety are high.” She concludes, “The contradiction is harsh: events matter, but events are events because they are encapsulated in space and time.”<sup>5</sup> The Kingston coal ash flood has yet to be assigned to overdetermined categories of meaning. There isn’t a clear-cut sense of how this should matter, or even of its status as an event. It is at once monumental and insignificant. The flood’s lack of clear meaning evidences the need for a mode of thought that can acknowledge it as an event in the first place.

Kathleen Stewart, in her book *Ordinary Affects*, provides a paradigm for thinking about events that moves away from meaning, structure, and ideology. She narrates an array of scenes she witnessed over the years, juxtaposing unexpected or curious life events. Scenes of ordinary affects in her book take place in restaurants, parking lots, at work, among friends, or while talking with loved ones. She writes that ordinary affects are an “animate circuit that conducts force ... they are a kind of contact zone where the overdeterminations of circulations, events, conditions, technologies, and flows of power literally take place.”<sup>6</sup> Ordinary affects, according to Stewart, build intensities that open onto possibilities. They are not directly meaningful, but charged with potentiality. They allow for a glimpse of certain modes of knowledge and the relationships that condition them, resonating through their presence. I take from this that Stewart suggests we approach events not as meaningful in themselves, but emergent from and opening onto ways of being that are in flux. The event is a pressure point, a culmination of trajectories in which flows of matter and affect coalesce.

Stewart instructs that the conditions of possibility for ordinary affects are not fixed, but are linked to events, banalities, and overlapping forces. These ordinary affects “literally move things —things that are in motion and that are defined by their capacity to affect and to be affected. They have to be mapped through different, coexisting forms of composition, habituation, and event.”<sup>7</sup> Thus, I analyze this event to understand how and in what ways it emerges from affects, values, and patterns of thought. My work illustrates forces that intersect

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<sup>4</sup> Kim Fortun, *Advocacy after Bhopal: Environmentalism, Disaster, New Global Orders* (Chicago: University of Chicago Press, 2001), 78.

<sup>5</sup> Fortun, *Advocacy after Bhopal*, 78.

<sup>6</sup> Kathleen Stewart, *Ordinary Affects* (Durham, NC: Duke University Press, 2007), 3.

<sup>7</sup> *Ibid.*, 4.

in the ash. The affects flowing through this matter emerge together with a changing landscape of material connections.

The landscape is a social force in rural East Tennessee. This is not just a cultural aspect of life, but a physical presence that exerts influence on the everyday. Tim Ingold points out that the landscape is not simply a backdrop to human life, but a dynamic space marked by those who lived in and shaped it.<sup>8</sup> He calls for a mode of research attuned to traces left in the landscape, such as those witnessed in the coal ash flood and its constitutive materiality. I adopt this perspective, and Stewart's definition of affect and event, to investigate how this landscape changed to accommodate the ash—a repository of buried connections. This focus on the affective conditions of possibility for the flood allows for a buffer between event and widespread significance. In this indeterminate zone, the ash is the unseen, never fully representable excess of the dreams and desires for advancement through scientific and technological development.

In the moment of rupture, the ash flowed out of its hiding place in a spill of layered sediments—each layer of particulate a temporary resting place for a forceful trajectory of matter spurned into motion elsewhere in space and time. In the years since the Kingston Steam Plant began operation, in 1955, these flows of ash mixed up in a gigantic hole in the ground, blurring any distinction between points on a timeline of linear history. In the layers of this specific yet unbounded body of once-contained, now widely dispersed coal ash, one can trace the birth of the atomic era, the spread of global developmentalism, the affects of American political cultures, the formation of the electric power “grid,” and the effects of environmental awareness. In the flood, a gray mesh of pasts spilled out: present.

Atemporal and lacking in significance, coal ash is a material remainder forgotten, kept perpetually out of sight. The vital, electric flows of which the ash is the forgotten byproduct power a future that comes after *this*. The desire for positive transformation and change, through planning and technology and science, hopes to create a better future while real change floods out all around us. Desire, an affect, “literally moves things,” because it wants what it lacks. What follows is an account of the ways an absence within desire, a forgetting, becomes matter.

Each of the following three sections traces a condition of possibility for the coal ash flood. Each is about the desires and performances of human agency that helped reconfigure this landscape, and the material conditions that shaped them. The first section examines the ideas and values surrounding the establishment of the Tennessee Valley Authority (TVA), the agency whose power plant spilled this waste. In the second section, I use a 1930's stage play titled *Power* to discuss the notion of backwardness used to render the people in the region outside of modernity, and thus moveable to make way for dam and power plant construction. Finally, I look at records revealing how coal ash waste became the major problem for electric utilities in the 1970s, and how the utilities worked to minimize the visibility of this problem. What connects these three juxtaposed scenes (aside from the basic fact that each forms the backstory of how the power plant and coal ash came into existence) is a focus on the presence of irrational forces that exceed control and shape desires. In each section, human actors *perform* an agency they *believe* they possess. I show these performances as intrinsically linked

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<sup>8</sup> Tim Ingold, “The Temporality of the Landscape,” *World Archaeology* 25, no. 2 (October 1, 1993): 152–174.

to material presences and forces indifferent to dreams and desires for modernization and progress over time.

Much recent theoretical work that foregrounds the agency of nonhuman things is pitched against what came before, the linguistic turn and discursive cultural studies.<sup>9</sup> In light of this, my focus on rhetorical speech acts, a stage performance, and the materiality and agency of the coal ash within the same study may appear incongruous. Yet, accounting for the forces generative of this disaster demands attention to all the ways that land, bodies, materials, and technologies were put into motion. I include language and performance within this framework as *material forces* that *physically move* people and things. Good rhetoric and art is that which effects a *movement*, a shift, an altering of thought or feeling. It corresponds to physical thrusts of affect and action. In the following sections, I describe processes integral to the transformation of this region into a landscape of power production, and a site where its detritus can accumulate outside of visibility.

### Groundwork

TVA formed in response to a problem of material excess. It emerged out of a reaction to unintentionally leftover matter. After WWI, a US government-owned nitrate production facility in Muscle Shoals, Alabama, previously used for bomb production, sat idle. The potential of the wartime residue, to go from idle waste to productive matter, determined what became possible.<sup>10</sup> Realizing the potential for nitrate to become fertilizer, Senator George Norris drafted a plan to expand government ownership of land in the rural South to create a new, tightly controlled landscape of planned agricultural development and power production for the security and betterment of the nation. Norris worked with Franklin D. Roosevelt to develop this plan. Roosevelt amended to the TVA Act a broader, more ideological vision that included social development to change rural life in the region.<sup>11</sup> Early TVA contained several branches – categorically divided, like academic departments—that used quantitative scientific methodology to study the terrain and the people, in order to advance plans for national social and economic improvement. Before this government intervention, communities farmed the land, maintaining a lifestyle characterized by handcraft, sharing, and physical outdoor labor. The aims of TVA rendered such lives outmoded. In the eyes of the nation, as embodied by early chairmen of TVA who were appointed by the president, the land that these people occupied, and were removed from, was incredibly rich in natural resources. The fact that locals had not harnessed nature to grow profits testified to their backwardness, lack of education, and need for an intervention.

To gain support for this substantial undertaking, TVA leveraged an intensive propaganda campaign to paint a story of the region's people as the embodiment of a national

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<sup>9</sup> Two prominent examples: Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham: Duke University Press, 2010); Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, Mass.: Harvard University Press, 1999).

<sup>10</sup> Brian Massumi, in *Parables for the Virtual: Movement, Affect, Sensation* (Durham, NC: Duke Univ. Press, 2002), writes: "Potential is the *immanence* of a thing to its still indeterminate value." And: "Possibility is back-formed from potential's unfolding," 9.

<sup>11</sup> Michael J. McDonald and John Muldowny, *TVA and the Dispossessed: The Resettlement of Population in the Norris Dam Area* (Knoxville: University of Tennessee Press, 2001), 9.

poverty problem, and the land as wild and lacking human control. Once identified as such, the population became one of many fixable problems that science and planning could solve, alongside the problems of flooding, controlling the pricing and flows of electrical power, and conserving nature for aesthetic enjoyment and managed recreation. The Authority defined flooding as an extremely wasteful, irrational force of human destruction. Depicting floods as wild, treacherous, and dreaded, positioned TVA as controlled, safe, and necessary for security. To promote the construction of several large dams, TVA argued for flood control as a universal social good, establishing a relationship of nation to river and power that, in the post-New Deal decades, spread globally as an ideal of rural development.<sup>12</sup>

TVA took to the news media to repeatedly advocate for this vision. Arthur E. Morgan, on behalf of the first directors of TVA (Morgan was one of three original chairmen), described the agency's view of flooding and waste in an address delivered over NBC stations on 21 May, 1934. Morgan begins the address with the story of a catastrophic flood in Dayton, Ohio, which "destroyed hundreds of millions of dollars of property."<sup>13</sup> He speaks of the flood prevention committee that convened afterward to "prevent such catastrophes in the future," to "secure" the river valley. He uses this example, and the painful memories of destruction and loss, to justify the use of public funds to prevent future disaster. He notes that Roosevelt "sees beyond emergencies ... to lift the country out of the terrible slough of despondency ..." Among these plans was the Tennessee Valley Authority, intended to "promote an orderly industrial and social development in that limited region."<sup>14</sup> Morgan notes that the Tennessee Valley is "peculiarly suitable" for use as an experimental testing ground for the idea of using government planning to control an entire region's natural resources and improve its human population. In the following statements, Morgan makes clear his view of the region as in need of authoritative

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<sup>12</sup> Various memos and reports, including "The Training of Foreign Students by the Tennessee Valley Authority" (20 July, 1950), and "TVA: A Symbol of Resource Development in Many Countries (compiled August 1950), Office of General Manager Files, Record Group 142: Records of the Tennessee Valley Authority 1918-2000 (RG 142), U.S. National Archives and Records Administration (NARA), Atlanta, GA. Reports detail the numbers of students coming to Tennessee to study for longer than two weeks, and notes a sharp increase in the late 1940s, particularly in students from India and China. The report on foreign students states, "The number of students from India is significant. Most of them are technical specialists, chiefly civil, electrical, and chemical engineers, and it is probable that many of them will be occupied on the Damodar Valley Corporation project or other development schemes being undertaken by the Indian Government" (4). The report "TVA: A Symbol of Resource Development," records the scope and magnitude of projects influenced by TVA. A total of 30 foreign development projects are included. Those said to closely mirror TVA are listed and mapped: "TVA on the Jordan," "India's TVA -- The DVC (Damodar Valley Corporation)," "Andean TVA -- The Santa Corporation of Peru," "TVA's Contemporary -- Niger River Development -- French West Africa," "Rione -- TVA's Counterpart on Uruguay's Rio Negro," "China's TVA -- The Proposed YVA on the Yangtze," "African TVA -- A Development Where the Nile Begins." Additional projects are noted in Australia, Chile, Mexico, Scotland, and Brazil. Bibliographic details point out the influence of TVA research on planners and engineers abroad, or in some cases, name which former TVA engineers were employed (at times as chief engineer) on these development projects.

<sup>13</sup> Arthur E. Morgan, "Text of Address Delivered by Directors of the TVA over NBC Stations on 21 May, 1934," University of Tennessee Special Collections Archive: TVA Pamphlet Collection.

<sup>14</sup> *Ibid.*

control, in a discursive move that reveals how planning emerges in response to the irrational presence of the uncontrolled river *and* people. He states, “the great river system of the Tennessee demands unified control to prevent enormous waste of its water power resources ... [in the region] ‘rugged individualism’ has stripped the country of its resources ... leaving behind a stranded population in poverty and despair. Many of the acute problems of the nation are here calling for solution.” These problems of the nation include, “unplanned agriculture,” which TVA cited as evidence that locals were “destroying” the region and turning the land barren, “unified river control,” through which “the Tennessee River can be made to yield millions of horsepower,” but without unified control will become “an enormous waste of power.”<sup>15</sup>

Waste, a repeated keyword, is defined as *not* developing the river by a vast, unprecedented government agency. Morgan argues, “Our nation must not suffer the waste which lack of planning of this great river system would cause.”<sup>16</sup> Morgan, in a position of literal Authority, invokes the Western dictate against waste to buttress the logical basis of these future dreams. The dreams emerge out of a reaction to a river with the force to destroy and a people whose way of life appeared indifferent to all that he, and the nation, hoped to become. Thus, the seemingly proactive stance of TVA to uplift the region is conditioned by the material remainders (nitrate), nonhuman forces (floods), and human presences (rural backwardness), that exist outside of the framework of authoritative knowledge and ordered productivity. Affective reactions to waste enable new material configurations of the landscape.

A profound alteration of life in the Tennessee River Valley began with the first TVA dam, the Norris Dam, which began generating power in 1936. The era leading to the construction of the dam saw thousands evicted from the most fertile riverfront land, with their properties assessed for very little.<sup>17</sup> The mass exodus included exhuming and reintering the dead from local cemeteries. The landscape of these former communities is now buried beneath a massive lake, controlled and policed by TVA, and available for boating, fishing, and swimming (with proper permits or within restricted areas), with an idyllic lush forested landscape of TVA-planted trees surrounding the manmade structure of the lake and large dam.<sup>18</sup> Within its first 20 years, TVA built over 20 more dams, creating a system of enormous lakes, along with several power plants, at first hydroelectric, then coal-fired, and later, nuclear.

In 1955, the TVA-owned and operated Kingston Steam Plant emerged as the largest coal burning power plant in the world, a scale commensurate with the magnitude of the ash spill. This status has little to do with power use by the region’s rural population. During WWII, the federal government again displaced thousands of farming families and acquired 59,000 acres of land to build a town devoted to the enrichment of Uranium 235 for the first atomic bomb.<sup>19</sup> Built very rapidly next door to Kingston, Oak Ridge began as a “secret city” of the Manhattan Project, flanked by armed guard towers and requiring passes for entry. The rural

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<sup>15</sup> Morgan, “Text of Address.”

<sup>16</sup> *Ibid.*

<sup>17</sup> McDonald and Muldowny, *TVA and the Dispossessed*.

<sup>18</sup> The TVA Pamphlet Collection at the University of Tennessee Special Collections Library contains several documents that chart the progress of this reforestation effort.

<sup>19</sup> Charles O. Jackson and Charles W. Johnson, “The Urbane Frontier: The Army and the Community of Oak Ridge, Tennessee, 1942-1947,” *Military Affairs* 41, no. 1 (February 1977): 9.

location was selected due to the isolation of the woods, and the availability of cheap electric power.<sup>20</sup> Oak Ridge, today the site of the largest science and energy labs in the United States, demands abundant energy. From the 1930s through the 1950s, a rural farming region in East Tennessee's river valleys transformed into a central infrastructure of American dominance, the US power grid, and the flow of knowledge about energy and development on a global scale.

In "The Temporality of the Landscape," Ingold instructs that the landscape *is* a story, "an enduring record of —and testimony to—the lives and works of past generations who have dwelt within it, and in so doing, have left there something of themselves."<sup>21</sup> While researching the landscape changes leading to the Kingston coal ash flood, I heard stories of glass jars of radioactive waste unearthed all around Oak Ridge. Many locals, including former Oak Ridge workers, told me about the sediment of radioactive cesium, plutonium, and mercury lining the riverbed that should not be disturbed. This is why dredging was limited in the wake of the coal ash flood, as Kingston is downriver from Oak Ridge. A seam of coal ash now lines the bottom of the river.<sup>22</sup> I heard about Oak Ridge cancer stories, and how all the treatments are fully paid for by the federal government for former workers.<sup>23</sup> There are stories of mid-twentieth century guards shooting barrels of radioactive waste to sink them in creeks. Across the street from the K-25 gaseous diffusion plant in Oak Ridge, I stumbled upon a recently uncovered "African Burial Ground" —a slave cemetery.<sup>24</sup> Buried under the lakes, former towns; buried in the riverbed, the accumulated waste of American economic and military power. With power flowing to Oak Ridge, to private homes, and to cities beyond the South, the landscape alterations that came with TVA realigned national value(s) and government power. As energy continues to flow into productive circuits, ash accumulates. Widely unacknowledged, it is another layer of sediment, buried by the logic of rational planning and the desire for perpetual advancement.

### Performing Power's Value

National development, power generation, rural electrification, resource management, and human improvement in a backward region defined the TVA vision for this landscape. Yet, just as the region emerged into national visibility, profitability, a new viability where the conditions of everyday life changed, it also remained a locus of a deep and perpetual forgetting. How to explain this paradoxical situation? What does it mean to become central to national progress and at the same time a place habitually forgotten?

<sup>20</sup> Jackson and Johnson, "The Urbane Frontier."

<sup>21</sup> Ingold, "The Temporality of the Landscape," 152.

<sup>22</sup> Ellen A. Cowan, Keith C. Seramur, and Steven J. Hageman, "Magnetic Susceptibility Measurements to Detect Coal Fly Ash from the Kingston Tennessee Spill in Watts Bar Reservoir," *Environmental Pollution* 174 (March 2013): 179–188.

<sup>23</sup> For a general overview of this program see: <http://www.dol.gov/owcp/energy/index.htm>. This Oak Ridge Press Release announces town hall meetings in February 2013 to notify Oak Ridge workers of the availability of funding to cover medical expenses, mostly for cancers: <http://www.dol.gov/owcp/energy/regs/compliance/pressreleases/esa20130205.htm>. The following charts over \$1 billion, paid to workers from one Oak Ridge facility (K-25) alone: [http://www.dol.gov/owcp/energy/regs/compliance/statistics/WebPages/OAK\\_RIDGE\(K-25\).htm](http://www.dol.gov/owcp/energy/regs/compliance/statistics/WebPages/OAK_RIDGE(K-25).htm).

<sup>24</sup> Fieldwork conducted in summer 2012 and spring and summer 2013.



The TVA narrative of a nation harnessing its natural resources to self-improve over time emerged as a modern origin myth. This mythology relies on a fictional character, cast in the role of victim. The “Appalachian” hillbilly took center stage, literally.<sup>25</sup> The play’s name: *Power*. In this play, and in the long archive of depictions of the region, a fictional Appalachia became highly visible, rendering the actual conditions of the East Tennessee landscape invisible. This is possible because Appalachia (like paper money) is a construct—an image or representation of a set of ideas and desires—while the East Tennessee landscape serves as a determinant of power’s value. The temporal condition of “backwardness”—a being outside of modern time—is a presence desired by, even necessary to, the modern subject.<sup>26</sup> This desire for backwardness is a *conjuring* of something in excess of modernity that enables reactions to it.<sup>27</sup>

The stage play, *Power*, first produced at the Ritz Theater in New York City on 23 February, 1937, cast the Appalachian hillbilly as the heart of the affective argument for TVA, while emphasizing the need for the agency to act as a “cost yardstick” in the regulation of energy prices. The New York performance of *Power* sold over 60,000 tickets before its opening night. From this success, it traveled to urban centers such as Minneapolis and San Francisco. *Power* is one of several “Living Newspaper” plays written and performed as part of the Works Progress Administration’s Federal Theater Project, a New Deal program to put people back to work to overcome the Great Depression. Theater workers wrote, produced, and staged a series of these plays depicting the biggest news stories of the day, international in scope and content. The play relies on newspapers and pamphlets for all the informational content, and many of its lines are direct quotes from governmental, legal, and media sources.<sup>28</sup>

*Power* is a performance of light overcoming darkness. The first scene is a portrayal of electricity’s interconnections throughout modern city life. The narrative moves on to explain the invention of the dynamo to harness energy, to the light bulb, to the early twentieth century power company monopolies that emerged as electricity became commodified and sold. This broad view of power eventually closes in on the conflict at the heart of the play—the legitimacy and role of the Tennessee Valley Authority. The play’s emotional climax comes with the fight to deliver power to the poor, and ends with the Supreme Court ruling that upholds the creation of the TVA.

The success of this play, like the overall success of TVA in reshaping the Tennessee landscape, hinges on the reinforcement of a narrative of progress over linear time. As Act One of *Power* draws to a close, films showing the Tennessee Valley fill a large screen. The “loudspeaker” characterizes the situation:

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<sup>25</sup> My use of “Appalachian” refers to a constructed group identity. It is not how people in the diverse regions it references self-identify. See: Allen Batteau, *The Invention of Appalachia* (Tucson, Ariz.: University of Arizona Press, 1990). Batteau’s ethnography details how for over a century, cultural images of the “Appalachian” fixed this identity, while allowing for natural resource exploitation in ways that parallel colonial encounters.

<sup>26</sup> Ann Laura Stoler, in *Carnal Knowledge and Imperial Power: Race and the Intimate in Colonial Rule* (Berkeley: University of California Press, 2010), similarly shows how racial definitions of pre-modern subjectivity were critical to the formation of Western dominance.

<sup>27</sup> Conjuring is a magical incantation. It also means to produce, to make materialize.

<sup>28</sup> Hallie Flanagan, “Introduction,” in *Triple-A Plowed Under / Power / Spirochete (Federal Theatre Plays)*, Arthur Arent, Arnold Sundgaard, and Staff, First Edition (New York: Random House, 1938), xi.

In the Tennessee Valley... Parts of seven States, 40,000 square miles, two million people. All living in a region blighted by the misuse of land, and by the wash of small streams carrying away the fertile topsoil. In these cabins, life has changed but little since some pioneer wagon broke down a century ago, and for them this became the promised land. Occupations – when they exist at all – are primitive, a throwback to an earlier America. Here stand the results of poor land, limited diet, insufficient schooling, inadequate medical care, no plumbing, industry, agriculture, or electrification!<sup>29</sup>

This announcement encapsulates TVA's origin myth for its own existence. The tenuous status of residents hinges on their temporal designation as outside, and behind, modern time. The sympathy made available to urban progressives relies on the racial logic that because they are Anglo-Saxon, they deserve help. This characterization of the population was not invented with TVA, but has a long literary and cultural history, through which the trope of Appalachia as a relic of pre-modern America emerged, and has ever since been maintained.<sup>30</sup> But why do moderns *need* this myth? Why can the people, even as impoverished, never share the temporal citizenship status as existing in present time? Why must the place be ancient, a reliquary for travelers to view and visit and reconnect to their ancestry and origin story? Despite much protestation to the contrary, moderns need their ghosts. Appalachia is an Anglo-Saxon ghost story that reveals modernity's inherent, little-acknowledged irrationality and dependency on that which exceeds its demands for objectivity, logic, rationality, and order.

After the above pronouncement on the status of the Tennessee Valley, the loudspeaker again makes a sweeping announcement, heralding the creation of TVA in 1933. The scene is one of heightened melodrama, with light and music used for affective response. A clerk of the Senate emerges on stage to declare the success of a numerically ordered set of achievements:

The Tennessee Valley Authority is created for the sole purpose of: one, flood control of the Tennessee River Basin; two, elimination of soil erosion, and three, the social and economic rehabilitation of the swampland and hill people of this district; four, *the generation and distribution of cheap electric power and the establishment of a cost yardstick*.<sup>31</sup>

The stage notes indicate that the orchestra begins to swell at the words "social and economic rehabilitation," and that with the words "cost yardstick" the lights fade from the clerk and a luminous film of water cascading over Norris Dam fills the projection screen, as the "TVA Song" begins to play. With this, the cast emerges to fill the stage, singing and carrying lanterns. The drama of the waterfall, warm light encircling the stage, the orchestra playing, and the cast singing about the noble government work that will bring good times to the Valley, all together depicts human agency and rationality as able to overcome multiple social problems.

This performance, *Power*, was not necessary for these landscape changes to take place, but as a conveyance of sentiment, it explicates the emotional tenor of the times and the desires that accompanied physical changes. The modernization of a rural landscape emerges out of an affective thrust of affirmation. The nation and the public mix together into a current of feelings:

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<sup>29</sup> Arent, *Power*, 1.15, 61.

<sup>30</sup> Batteau, *The Invention of Appalachia*.

<sup>31</sup> Arent, *Power*, 1.15-E, 68. Emphasis in original.

of care, hope, and desire for change. Bringing light to the poor —this triumph over darkness and the human achievement it conveys—elicits a response that scientific logic alone does not. It is no accident that in the play, light takes center stage as a character throughout. Illumination as metaphor and as physical flow of electric current combines to symbolically and physically move viewers, naturalizing the value of power in modern, well-lit lives.

This is the era, as part of the core affective argument for TVA, in which the concept emerges that electric power is a *basic need* for human life, akin to air and water. Before TVA, with private ownership and higher rates, electricity was a luxury. Thinking of the future, and the good of the nation, Congress passed the TVA Act to spread power exponentially, rapidly, and cheaply. As new consumers emerged and the electric grid as we know it was established across the US, the role of TVA as a “cost yardstick” became an integral though easily overlooked aspect of how this became possible. As TVA began operation it deeply undercut private power. The only way for the private energy companies to compete was to also drop their rates. This is how power became widely accessible, though still commodified. All illuminated, the national population entered into visibility, a glowing facet of modernization. At the beginning of *Power*, a small child asks how much power costs and why. Her father tells her about the kilowatt-hour as a measurement of power’s flow. But the child persists: who decides the value of this new, invisible thing?<sup>32</sup> An entire landscape was harnessed as central not only to energy production, but to power’s value, because of TVA’s “cost yardstick.” Electricity is now a commodity, but just barely for most who live in the Western world. It exceeds the description “commodity;” it is an integral life force in the worlds that have been built.

Electricity flows from power plants to illuminate life, but like value, it is an unseen force. Appalachia appears repeatedly in cultural history, available for sacrifice, the site of the authentic, a place of urban longings for the past, for bluegrass, for a simple life, for stories of canning and hunting and fishing and living self-sufficient off the land. It is the site of Lyndon Johnson’s War on Poverty, the home of Dolly Parton, and a place of moonshine, rural mythology and romanticization. It is desired. It is a living relic of pasts and legacies that give meaning to the modern. It attracts. But this image disguises how the landscape became the “cost yardstick” of electric power, an act that shaped power’s value. TVA is the reason electricity is so cheap that we can take it for granted in the US, perhaps more so than any other commodity. Flick a switch: lights come on. Our need for it runs deep, exceeds culture, is in fact foundational to it. The magic of the value of electricity has its home in the Tennessee Valley. This connection is obscured in layers of separation, enabled by the recurrence of the fictional trope of Appalachia—a myth of temporal dislocation that, in its heightened visibility, conceals the reality of everyday life in East Tennessee. The invisibility of this connection connects to the invisibility of the ash. In these stories Appalachia, like the ash, cannot be seen as present. This psychological burial of connection and the ashen detritus share an ontological foundation.

### What Coal Ash Isn’t

Coal ash is not one thing, chemically and physically speaking. It varies such that one could not form a recipe for the re-creation of coal ash in the laboratory and say, “here, this is what coal

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<sup>32</sup> Arent, *Power*, 1.8, 37.

ash is." During archival research into the documents of TVA's in-house scientists and managers, I gained a sense of this heterogeneity and ambiguity. Interviews with scientists at Appalachian State University, who worked independently in the wake of the Kingston spill, confirmed my thinking. A chemist explained that she could not create a sample of "standard ash" to use in laboratory study, because the chemical makeup of the ash varies so greatly among samples, even from the same pond.<sup>33</sup> A biologist discovered that coal ash, when completely dewatered, settles into an extremely hard solid, much harder and denser than concrete.<sup>34</sup> Coal ash at the microscopic level can be spherical, or non-spherical. It can be gray, black, white, orange, or red.<sup>35</sup> The more I talked with the scientists, the more I realized that this is unknown matter, in many ways. Unknown in that we've been generating it as humans for a short time, in that it's been mostly ignored in isolated holding ponds, and that relatively little attention is paid to what happens within a pond. I learned that the ash varies depending on the qualities of the coal burnt, the conditions of the burning, the reactions with air and land in specific places, the size of the pond, what the terrain is like underneath it, what the weather conditions are like as it ages, where it seeps and how it condenses, and what new coal waste is added to it. All of these things affect the pond and render the ash changeable, unstable, fluid, and volatile in its sheer mass.

In the wake of the Kingston spill, journalists needed numbers to speak authoritatively about its impact. But like the chemistry of coal ash, attempts at scientific measurement fail to produce meaningful results. The initial *New York Times* article reported:

The inventory, disclosed by the Tennessee Valley Authority on Monday at the request of The New York Times, showed that in just one year, the plant's byproducts included 45,000 pounds of arsenic, 49,000 pounds of lead, 1.4 million pounds of barium, 91,000 pounds of chromium and 140,000 pounds of manganese.<sup>36</sup>

But what do these numbers reveal about impacts and effects once those accumulated byproducts meet a powerful river current? What does measurement allow us to know? The same reporter notes the "competing" numbers pertaining to the volume of the spill, revealing the impossibility of measurement in an earthen, multi-acre waste holding pond:

Officials at the authority initially said that about 1.7 million cubic yards of wet coal ash had spilled when the earthen retaining wall of an ash pond at the Kingston Fossil Plant, about 40 miles west of Knoxville, gave way on Monday. But on Thursday they released the results of an aerial survey that showed the actual amount was 5.4 million cubic yards, or enough to flood more than 3,000 acres one foot deep. The amount now said to have been spilled is

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<sup>33</sup> Carol Babyak, interview by Susie Hatmaker, ASU, Boone, NC, 20 May, 2013.

<sup>34</sup> Tuberty, interview by Hatmaker.

<sup>35</sup> Cowan, Seramur, and Hageman, "Magnetic Susceptibility Measurements to Detect Coal Fly Ash from the Kingston Tennessee Spill in Watts Bar Reservoir."

<sup>36</sup> Dewan, "At Plant in Coal Ash Spill, Toxic Deposits by the Ton."

larger than the amount the authority initially said was in the pond, 2.6 million cubic yards.<sup>37</sup>

Billions of gallons, millions of cubic yards, or thousands of acres all indicate the vastness of this spill. So much matter moved, and suddenly. While the journalist aims to report an accurate story of disaster, this passage reveals how difficult it is to measure something like volume outside of the controlled environment of the laboratory. When was the coal ash pond last measured? Sitting outside in a big hole in the dirt, the ash in Kingston built up for over half a century, all the while leaching into the earth below, blowing into the wind, seeping as runoff with every heavy rain, transforming into solids, liquids, and air in imperceptible ways.

Coal ash is not federally classified as a toxic or hazardous substance. It is used to fill valleys where coal mining stripped mountains, and to level terrain for housing developments and shopping malls. It is recycled into cement, wallboard, bowling balls, shower stalls, and paint.<sup>38</sup> The lack of a designation of “toxic” or “hazardous” was a planned avoidance of dealing with the vastness of coal ash as a human problem, unintentionally generated out of the desires for power. In what follows, I trace efforts to avoid dealing with the ash—managerial performances of control and scientific authority that, despite the presumption of agency, reveal its limits.

In the archives, I discovered an incident from 6 and 7 May, 1958. The “smoke” from the original nine, low stacks at the Kingston Steam Plant destroyed gardens in the surrounding subdivisions. Flowers, trees, beets, greens, all “rendered inedible,” “burned.”<sup>39</sup> A doctor received many calls concerning inhalation of ash. Previously, in Oak Ridge, from 18 to 21 April, 1958, people could smell and taste the fumes and see a plume coming over the ridge. This incident was attributed to foggy weather conditions, which is why it only appeared for a few days. But the pollution caused by burning coal was visible and tangible in the early days of the Plant’s operation. The people living nearby could see, smell, taste, and touch the smoke and its effects. A ruined garden of inedible vegetables manifests a truth of harm. Two very tall smoke stacks were built soon after to disperse emissions higher into the atmosphere. These twin stacks stand, flanked by the original nine shorter stacks, as the town landmark of Kingston, the highest buildings for miles around in a verdant countryside of rolling hills. Today, a new, rotund stack pumps out a thick white plume. This is the scrubber, the most recent monument to changing emission control technology. It began operation in 2010, but the energy industry and TVA discussed scrubber technology as early as the 1970s, a time when the electric power industry began to face limits.

The 1970s began an era of Environmental Protection Agency (EPA) oversight of the industry. Talk of the “energy situation,” fuel shortages, sludge waste, sulfur dioxide emissions, in short, the “energy-environmental issue,” emerged as the main focus of TVA’s power manager throughout the 1970s, as reflected in a review of his archived files. These files contain

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<sup>37</sup> Shaila Dewan, “Tennessee Ash Flood Larger Than Initial Estimate,” *The New York Times*, 26 December, 2008, sec. US, <http://www.nytimes.com/2008/12/27/us/27sludge.html>.

<sup>38</sup> For more details on the EPA classification and noted uses see: <http://www.epa.gov/radiation/tenorm/coalandcoalash.html>.

<sup>39</sup> G. O. Wessenauer, Manager of Power, to O. M. Derryberry, Director of Health, Tennessee Valley Authority, 22 May, 1958, Office of Power Manager Files, RG 142, NARA, Atlanta, GA.

a lengthy request from the president of the Edison Electric Institute, based in New York, to participate in an industry-wide effort to use sponsored scientific research, legal aid, and consulting to get “out in front” of proposed new regulations, the Resource Conservation and Recovery Act, and the Toxic Substance Control Act, of 1976. As the memo notes, these two proposed regulations “will have serious adverse effects on the use and disposal of solid waste generated by electric utilities.”<sup>40</sup> Under these acts, the electric utilities feared, coal ash might be declared a hazardous waste. The “strategy,” therefore, was to “seize the initiative” and “utilize the technical resources of our own industry,” in order to “persuade the EPA that various waste streams produced in the industry are not hazardous and by this means seek to avoid the possibility of costly and cumbersome regulations for handling and treating hazardous wastes.” The institute invited financial contributions to “a highly professional, well-funded ad hoc group” formed to “respond affirmatively and successfully to the many challenges of these laws.”<sup>41</sup>

During this time of industry-wide alarm over looming regulation, several other studies were relayed about the industry. On 21 August, 1975, a TVA Power Research Staff member, James L. Crowe, sent a detailed memo to Mr. Kurt Yeager at the Electric Power Research Institute (EPRI), in Palo Alto, CA. The memo notes, “there is a growing concern of the effect sludge ash ponds will have on groundwater, especially from trace elements and other toxic species contaminants.” Monitoring at TVA sites is noted. However, “the problem with field monitoring is that, in many cases, the soil is so impervious that many years will be required to detect any ground water contamination. Also, many soils will attenuate certain trace elements, thus extending the time requirement for any observed contamination.” He recommends establishing leachability guidelines, yet notes, there is “an insufficient data base ... to complete this task.” The section concludes, “At present, it is difficult for a utility to define what material should be traced as a potential environmental problem, or even what method of control should be employed to prevent such contamination.”<sup>42</sup>

A few years later, at TVA, the leaching of ash pond waste was studied in a field research project at the Kingston Steam Plant. Eight sampling sites were chosen around the large pile of coal reserves waiting to be burned and in the various waste holding ponds. Prior to this study, “most ash leachate studies [had] been laboratory investigations.”<sup>43</sup> In those lab studies, ash was mixed with water to determine the rate of leaching of metals into the water from the ash. As a comparison, when scientists conducted field studies outdoors at Kingston, they found that, “The concentrations of metals found in the ground water beneath the ash pond were much higher than those observed in batch mixing studies performed in the laboratory, and pH values in the ground water were observed to be lower than those found in laboratory studies.” Also, “Anaerobic conditions were observed to exist in the ash pond leachate,” whereas the

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<sup>40</sup> William McCollam Jr., President, Edison Electric Institute, to Chief Executive of Member Company, 19 May, 1978, Office of Power Manager Files (OPM), RG 142, NARA, Atlanta, GA.

<sup>41</sup> *Ibid.*

<sup>42</sup> James L. Crowe, Power Research Staff, TVA, to Kurt Yeager, Electric Power Research Institute, Palo Alto, CA, 21 August, 1975, OPM, RG 142, NARA, Atlanta, GA.

<sup>43</sup> Jack D. Milligan, Doye B. Cox, and Richard J. Ruane, TVA, Chattanooga, TN, “Characterization of Coal Pile Drainage and Ash Pond Leachate,” OPM, RG 142, NARA, Atlanta, GA.

laboratory studies “reported in the literature” were carried out under “aerobic conditions.” What they found in the field was hardly more useful than what was found in the lab, however. The discussion of results points out that, “The concentration of iron, aluminum, nickel, lead, zinc, copper, chromium, and pH in the subsoil of samples varied with depth and location ...” Trends were difficult to discern. And “Mass loads of pollutants entering the ash pond are high, but there appears to be negligible effects on the ash pond effluent,” a characteristic attributed to “(1) neutralization, (2), dilution, and (3) adsorption.” It is perhaps this final sentence, as well as the general uncertainty of these studies, that helped TVA and the energy industry avoid most of the feared regulation.

Scientific research failed to present a compelling story of risk or harm at the level of the specific, isolable reaction. The pond, changing and heterogeneous, demanding long durations of time to understand its workings, did not lend itself to easy conclusions. The potential long-term impact of ash sludge remained unknown. A TVA/EPA report on cancer risk in the wake of the Kingston spill follows several pages of charts, graphs, imagined scenarios, and statements of low risk with a concluding section on “uncertainties.” The study notes three “key areas of uncertainty.” There are “data uncertainties,” “exposure scenario uncertainties,” and “toxicity value uncertainties.”<sup>44</sup> These unknowns mark knowledge’s absence where processes (always) already underway evade quantitative research methods used to predict future harm.

But James L. Crowe of the Power Research Staff at TVA understood that the use of scientific methodology to predict quantifiable risk did not capture the coal ash problem at all. In the abstract of a paper from 1974, he writes, “The major problems of sludge disposal are the huge tonnages of structurally unstable material and the need to commit large land areas to nonproductive use.” As an example, he notes that a single plant can produce as much as “1.23 million tons per year.” “In summary,” he writes, “the problems encountered with sludge disposal are so vast that byproduct disposal looms as a major obstacle in the future of sulfur oxide emission control.”<sup>45</sup> This abstract frames a paper on the specific topic of the increased amounts of waste produced from the *scrubbing* process, the technology behind “clean coal.”

Another memo from 1974 highlights TVA resistance to scrubbers, evidence of how desires and interests came into conflict as the nation and industry faced growing pollution problems. C. Jack Powell of the TVA Power Research Staff wrote a highly critical letter to Mr. John O. Rich of the Salt River Project in Phoenix, AZ. The letter concerns a study carried out by Battelle for the EPRI on tall stacks—such as the two very tall stacks used at Kingston for decades to put pollution higher into the atmosphere for the improvement of ground-level ambient air quality and everyday aesthetics. The letter expresses anger that Battelle “excessively stressed the limitations of the tall stack.”<sup>46</sup> Powell, of TVA, rejects the “authors’

<sup>44</sup> Tennessee Valley Authority/US Environmental Protection Agency, “Kingston Ash Recovery Project Non-Time Critical Removal Action River System Baseline Human Health Risk Assessment,” Prepared by Jacobs Engineering Group Inc., Document No. EPA-AO-052, 11 July, 2012, [http://www.tva.gov/kingston/admin\\_record/pdf/NTC/NTC83/App\\_H\\_BHHRA\\_2012-07-11.pdf](http://www.tva.gov/kingston/admin_record/pdf/NTC/NTC83/App_H_BHHRA_2012-07-11.pdf).

<sup>45</sup> James L. Crowe, Power Research Staff, TVA, to R. F. Skach, Burns & McDonnell, Miami FL, “Abstract: Sludge Disposal from Lime/Limestone Scrubbing Processes,” by James L. Crowe, 19 April, 1974, OPM, RG 142, NARA, Atlanta, GA.

<sup>46</sup> C. Jack Powell, Power Research Staff, TVA, Chattanooga, TN, to John O. Rich, Salt River Project, Re: Battelle Report on Scrubbing Technology for Electric Power Research Institute (EPRI), Palo Alto, CA, 12 December, 1974, OPM, RG 142, NARA, Atlanta, GA.

opinions, which definitely have no place in a technical report." Such "opinion" statements are that the tall stacks constitute a "minimal attack on a global problem," and promote a "false sense of security." Powell defends the tall stacks as great mechanisms for "controlling the SO<sub>2</sub> concentrations in the vicinity of large coal-fired power plants." He notes that the advantages of the tall stacks are their "low cost," "reliability in dispersing power plant emissions," and their "lack of interference with normal power plant operations."<sup>47</sup> It is notable that prior to Powell's defensive response, he was sent the report in draft form, from the EPRI, as they "hoped that we can avoid anything which might be inadvertently embarrassing to the utilities."<sup>48</sup>

In the wake of these exchanges, tall stacks remained in use at Kingston for the following three decades. One memo, from 1978, notes that studies on sludge disposal need to be completed. "Considering the likelihood of other scrubbers on the TVA system in the near future, the sludge management problem is becoming ever more important."<sup>49</sup> Scrubber technology demands major expansion of sludge holding ponds to correspond to its production of greater amounts of solid waste. The Kingston scrubber began operation two years after the ash spill, as a move toward cleaner emissions entering the air.

Looming all around the margins of these papers are the desires that propelled them into existence. The fact that industry responds conservatively to proposed EPA regulations is not surprising. But real feelings—anger, fear, anxiety, helplessness—underscore the production of these professionally worded managerial documents. These men presume a level of control over the situation. But what they faced in the 1970s, mere decades from when their plans went live, is a return of the force that exceeds their control. The force of the sludge is a nightmare counterpart to modernization dreams. It makes demands: thousands of acres of land committed to "nonproductive" use, unable to serve as the most basic unit of capital accumulation, real estate. Instead, the sludge guides the actions, pushing back against the desire for perpetual power.

Out of the labs of scientists and the desks of managers, these papers moved into the world, dispersed through the mail, and returned with notes of concern. In these responses, an industry grapples with the ways an emergent environmental awareness pressed upon a national government, and the ways that government pressed upon industry these desires. But there is a conflict at the heart of the desires, as expressed in the reactionary nature of the industry to protect its status quo, its profits, its "normal" operations, and its ongoing growth. TVA, as well as the electric power industry, leveraged scientific authority and professionalism to meet the challenge posed by the threat of regulation. Regulation threatens because it aims to correct only certain aspects of the problem, creating new problems for industry. Thus the reactionary stances do not surprise. Instead, I see these men working to protect interest at the local level: jobs, funds, and a machine that moves in a productive manner. Besides, these workers seem aware that the problem of the coal ash is nearly insurmountable, that it must be accepted as a transactional cost of this exchange. The workers in the management offices move invisibly in the flow of power generation. In the management narrative, the broad connections of

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<sup>47</sup> Powell to Rich, 12 December, 1974. Underline in original.

<sup>48</sup> EPRI, Palo Alto, CA, to C. Jack Powell, TVA, Chattanooga, TN, 16 Oct., 1974, OPM, RG 142, NARA, Atlanta, GA.

<sup>49</sup> Harry G. Moore, to J. P. Darling, TVA, 23 March, 1978, OPM, RG 142, NARA, Atlanta, GA.



landscape to national power and progress are rarely pointed out. But when they are, they stand out as moments with feeling. The “problems encountered with sludge disposal are so vast ...”<sup>50</sup>

At the Steam Plant, I am given an educational flow chart in which coal ash is not visualized or mentioned. It shows one small photograph of a locomotive in the upper left corner, leading to simplistic 2D graphics of a flow of coal from conveyor belt, to coal bunker, pulverizer, boiler, steam turbine, burners, generators, transformers, utility lines, co-op facilities, and finally to Your Home. Red arrows guide the eye through the flow chart. Despite the fact that as the tour unfolded, I would witness a vast landscape of waste holding cells and large multi-storey electrostatic precipitators for capturing enormous amounts of ash from the smoke, the flow chart depicts only a positive materiality—that which flows meaningfully and usefully into the American home. The flow of power on this graphic does not lead to industry, or to other cities, or to Oak Ridge, but to a single, simple one-storey home with the kind of façade that indicates a humble middle-class domesticity. Only machines and materials that flow productively into this destination require explanation to students, like myself.

At the end of my tour, I saw firsthand the new ponds necessary to house the scrubber waste. I saw the old ponds being covered in a liner, to be covered in clay and then grass, as part of the cleanup plan. Whereas before the flood, you could see several acres of gray ash in passing or when flying over, a new layer of invisibility, a grassy covering, will now hide the waste.

In the archives and at the Steam Plant, I retrace the desires, transactions, and processes that put materials into an economic logic of profit and accumulation. In the 1970s, these desires were brought into a conversation around “environmental quality.” Industry began to face limits, and it did so with fear. Out of the fear, it conducted research to avoid facing the limit, even if temporarily. But the resources are finite. The land for the waste is limited and the waste problem is incomprehensibly vast. Harmful effects may be unquantifiable, but I watch a former Swan Pond resident laugh viciously as she tells me what a TVA representative told her: that coal ash is safe enough, you could eat it.<sup>51</sup>

Everywhere in the archive, and in my tour at the Steam Plant, looms the forgetting that a false subject/object dualism of the world propels this arrangement. The language of “highly professional” men performs human agency; meanwhile, the sludge directs their actions. Consciousness must adjust to deal with this presence. What became the working problem of the 1970’s TVA and electric power industry is a manifestation of a forgetting at the heart of electric desires. We don’t (want to) know about the coal ash flood, because to face it is to face that which moves beyond our own life, and death—a force of sheer indifference.

### **Immanence and Potential**

People commonly imagine that coal comes from “nature.” Early industrialists exalted the black fuel as a gift from God, and even suggested that the United States was especially chosen by God to dominate the world based on the abundance of coal lying under the earth’s surface on the newly discovered and conquered continent.<sup>52</sup> As power flowed into homes in the domestic sphere, electricity was described in multiple twentieth century sources as a new “slave of

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<sup>50</sup> Crowe to Skach, 19 April, 1974, emphasis added.

<sup>51</sup> Former Swan Pond Resident, interview by Susie Hatmaker, Kingston, TN, 6 July, 2012.

<sup>52</sup> Barbara Freese, *Coal: A Human History* (New York: Penguin Books, 2004).

humanity."<sup>53</sup> The transference of a logic of enslavement is one way the flow of becoming an electrified nation made sense as a process of improvement, of wealth generation. The idea of something powerful and unruly that comes under control for the productive economy and everyday comfort of those with property and worldly resources links buried power lines to buried black bodies.

After the Kingston coal ash flood, about half of the ash was sold to one of the poorest towns in the nation, in Perry County, Alabama, a place with a majority African American population.<sup>54</sup> There, a new open-air landfill holds the waste above ground, where the wind dusts it onto the neighbors' clotheslines, cars, and homes. The environmental racism lawsuit filed against the landfill company failed after it received payment from TVA, then filed for bankruptcy.<sup>55</sup> A legal system designed to protect private property does little to renegotiate the sedimented practices of placing waste. When the ash sat in its holding pond it falsely appeared unmoving except to accumulate, or to steadily seep into the earth and water below its mass. It is a human mistake to think its apparent stillness equaled dormancy. Its body always stirred and compressed and reacted and transformed into new chemical and material arrangements, outside of the scope of cultural and scientific visibility. It was never at rest, nor was it ever a unified body or a bounded, singular object. It is excess always in excess of the ways we aim to know. And now some of it sits again, drier and more landlocked, but shifting in the wind and compressing and transforming life all the same. As the ash in Alabama blows in the wind, it moves outside of the field of visibility, again. Again, it forms new arrangements with the land and the people around it, new configurations of body, skin, pores, lungs, and environments. The landscape of the town looks different now; a new stack of waste from elsewhere takes up space. Unknown to most, this is the broad, gray landscape of lack. This landscape formed of an inability to reckon with the uncanny presence of our collective socio-cultural excess.

The EPA-led cleanup in Kingston achieved a visual restoration. I was told in an interview that the lake is cleaner than it's ever been, in this man's lifetime.<sup>56</sup> It sparkles now, catches the light, looks clearer. The importance of tidiness and order, overcoming the mess, is again about containment and disappearance. Tucking it away out of sight, the landscape remains conditioned by a forgetting of how flows of desire, hopes for a better future, and fidelity to a logic of progress over time, the bracketing of difference and continual attempts to homogenize place, physically produce a residue.

The flood is real change. Fluid, resistant to containment, the coal ash flood is immanent—the moving trace in the landscape that exceeds thought, representation, and all dichotomies (subject-object, thought-being, human-nonhuman, of course nature-culture) as a force of becoming, or one might say, of mattering. It produces worlds. It floods out of the

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<sup>53</sup> Arent, *Power*, 1.2, 16. This metaphor was also used in electric company advertisements, in Louisan E. Mamer Rural Electrification Administration Papers 1927-2002 (#862), Archives Center, National Museum of American History, Smithsonian Institute, Washington, DC.

<sup>54</sup> Shaila Dewan, "Clash in Alabama Over Tennessee Coal Ash," *The New York Times*, 29 August, 2009, <http://www.nytimes.com/2009/08/30/us/30ash.html>.

<sup>55</sup> Molly Moore, "Storage of TVA Coal Ash Waste Leads to Civil Rights Lawsuit," *Appalachian Voices*, 10 January, 2012, <http://appvoices.org/2012/01/10/tva-coal-ash-and-civil-rights-lawsuit/>.

<sup>56</sup> East Tennessee Resident, interview by Susie Hatmaker, Kingston, TN, 23 June, 2012.

earthen form (a big pond) designed to hold it, rejecting any implication of being-as-contained-object. The flood becomes a way to witness limits of knowledge, history, memory, science, and agency. It invites a study of affective forces that mix up in indistinguishable ways with the nonhuman forces that make worlds. It matters in this way, as a pressure point into which multiple affects, dreams for a better future, desires and epistemologies flowed, and out of which it emerged as a world-shaping force, exceeding and rejecting the desires of humans for its containment and perpetual invisibility—if only for a brief moment. Coal ash produces new ecologies regardless of the optics and politics of acknowledgement. The flood's potential is the potential to know differently. As a scholar, I seek new modes of engagement of this matter beyond representation—I know, I know, here I am writing this story—that can work with and through its movement. That is to say, I am with the coal ash, not against it. I accept its presence. I recharge this laptop knowing that I can infinitely study yet never fully account for it, and neither can science. I can only parse out bits and pieces of this gray flood in the attempt to illustrate a circuit of deep connectivity, which I can't help but feel should matter.

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**ACKNOWLEDGEMENTS** I would like to thank Professor Hoon Song for providing unwavering intellectual guidance, Benjamin Wiggins for valuable editorial insights, Michael Levy for tireless support and editing skill, as well as Thom van Dooren and the anonymous reviewers who took the time to help improve this piece for publication. The Wenner-Gren Foundation provided funding for the ethnographic fieldwork and archival research cited in this article.

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