COPPER AFTERLIVES:

Memory, Image, and Waste in the Postindustrial Landscape of Butte, Montana

A thesis presented in partial fulfillment of the requirements for the Master of Arts in Nature-Culture-Sustainability Studies in the Division of Liberal Arts of the Rhode Island School of Design in Providence, Rhode Island

by

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Abstract

This thesis studies the rhetorics and semiotics of open-pit copper mining in Butte, Montana, United States from the mid-twentieth century through the present day within an environmental historical and visual culture studies framework. In examining various spatial reconfigurations—including mass mineral extraction, industrial discard, historic preservation, and landscape remediation—this thesis decenters extractivist paradigms that have normalized physical, bureaucratic, and representational acts of violence against communities and more-than-human ecosystems. While copper has materially symbolized progress and technological innovation in the United States, the extraction of the mineral from rural peripheries has been achieved at a great cost—as White settlers forcibly removed Indigenous people including the Séliš and Qlispé from mineral-abundant regions; as the Anaconda Company and ARCO sought to offset their debts through off-shore operations; and as ever-larger industrial technologies wrest ore from the earth at an ever-intensifying speed and scale. In the context of the public-private management of extractive zones, neither critical representation nor ethical remediation of abandoned mines are guaranteed. This reality presents an imperative to critically unravel dominant narratives and extractive visual cultures of open-pit copper mining in Butte, Montana so that stories of care, reciprocity, and multispecies agency can emerge.

Keywords

Environmental history, Montana history, mining history, visual culture studies, discard studies, extractivism, open-pit copper mining, industrial waste, EPA Superfund, historic preservation, remediation

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To the mountains from which the red metal came. They are always near.

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email and allowed me to feature many images from *Wilderness to Wasteland*. Words cannot express my thanks to Norm DeNeal, urban gardener, philosopher, and former miner, for guiding me through the aspen grove, a space that embodies ethical remediation practices and emergent ecological relations.

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Table of Abbreviations

ARCO…Atlantic Richfield Company
BA&P…Butte, Anaconda, and Pacific Railroad
BSB…Butte-Silver Bow
CERCLA…Comprehensive Environmental Response, Compensation, and Liability Act
CSKT…Confederated Salish and Kootenai Tribes
CTEC…Citizens Technical Environmental Committee
EPA…Environmental Protection Agency
MRI…Montana Resources, Incorporated
MERDI…Montana Economic Revitalization and Development Institute
NRDC…Natural Resources Defense Council
OAPEC…Organization of Arab Petroleum Exporting Countries
OU…Operable Unit
RHPP/PA…Regional Historic Preservation Plan and Programmatic Agreement
RI/FS…Remedial Investigation/Feasibility Study
ROD…Record of Decision
STARS…Streamside Tailings and Revegetation Technology Studies

Introduction

"The history of capitalism is punctuated by intense phases of spatial reorganization."

– David Harvey in "The Urban Process Under Capitalism: A Framework for Analysis" (1978)

"Before the colonial project could prosper, it had to render territories and peoples extractible, and it did so through a matrix of symbolic, physical, and representational violence."

– Macarena Gómez-Barris in *The Extractive Zone: Social Ecologies and Decolonial Perspectives* (2017)

Figure 1: "The Anaconda Connection" Mural in Downtown Butte, July 2022. Author's photo.

Butte, Montana is not a ghost town, but there is something ghostly about the place, evident in voids carved out of the hillside, in mounds of the rock with too low an ore percentage to meet the smelter, and in patches of young aspens daring to grow through blighted soil. Ghosts are present in the old headframes dotting the city, in the foundations of the homes razed in the name of More Copper, in the brick walls where traces of subsidence remain. Silver Bow Creek, in particular, knows all too well the ghosts of mining past.

One of the most monumental ghosts of Butte is the Berkeley Pit. The former open-pit copper mine, measuring a mile wide by a mile-and-a-half long by 1800 feet deep, began to flood with groundwater after ARCO, the owner of the mines at the time, turned off the underground pumps in 1982. Rising groundwater mixed with residual minerals including cadmium, sulfur, arsenic, and lead, resulting in a highly-acidic body of water, hazardous to all life with the exception of extremophilic bacteria. Industry professionals assured the public that the water level within the pit would rise slowly and manageably over the span of many decades, but it was within only a few years that the water level rose to a point at which it threatened to contaminate the watershed.

Interpretive signage throughout the Butte-Anaconda Heritage District suggests that there was no other way for the timeline of events to have unfolded. However, the initial colonization of the region by White settlers, the century plus of mineral extraction, and the monumental flooding—though they were the fate—were in no way inevitable. Historian Michel Rolph Trouillot writes in *Silencing the Past* that history undergoes a transformation as it is assigned more palatable chronological narratives. The narrativization of history that reconfigures "what happened" into "what is said to have happened" allows state and corporate stakeholders to profit from a sanitized "product of power whose navel has been cleansed of traces of power" (Trouillot 1995, 114). Ghosts haunt the shadow space between history and history-as-narrated: specter thus challenges spectator to reassess the dominant historical narratives. As I moved through the postindustrial landscape of Butte, a consideration of ghosts and afterlives has necessarily complicated a linear and dualistic understanding of extractive histories.[1] History in the Americas did not begin in 1492 when

[1] My initial vision for this thesis considered "ruins" rather than "afterlives" of the mineral industry. Over time, I found that the categorization of Butte's landscape as "ruined" perpetuated a binary of decay in opposition with growth, leaving little room for both emergent ecological futures and human flourishing. While decay certainly fulfills an ecological purpose in the transformation of space, it does not exist in dialectical opposition to growth but co-occurs. During the presentation of my thesis prospectus, Professor Namita Dharia suggested the term "afterlife" as an alternative to "ruin." I found, accordingly, that "afterlife" lent much more positive connotations of agency, fluidity, and hope to the postindustrial landscape.

Columbus anchored in the Caribbean, and history did not begin in Butte and Silver Bow County in the 1864 when White placer gold miners stepped foot into Silver Bow Creek.

The rocky hills to the west of the Continental Divide were part of the ancestral homeland of the nomadic Séliš (Bitterroot Salish) and Qlispé (Pend d'Oreille) people, who commonly knew the area as a bison hunting ground with waters plentiful in trout. The Salish place-name for Silver Bow Creek and the Butte area is "Sntapqey" which means "the place where something is shot in the head" (Séliš-Qlispé Culture Committee 2019). During the eighteenth century, the spread of the smallpox virus and the settler colonial hunting of bison to the brink of extinction rippled westward, wreaking havoc on Indigenous ways of life and clearing the land for Euro-American settlers. The land on which Butte now rests remained an important hunting ground and meeting site for the Séliš and Qlispé throughout most of the nineteenth century, until settlers forcibly removed the tribes from the provisional Lolo Reservation in the Bitterroot Valley to the Jocko Valley—the site which became the Flathead Reservation. It was during this time that what is now called Butte and Silver Bow County was cleared for mineral prospecting and White settlement.

Butte is fondly remembered in the community for its boom days, when land and labor productivity were at their zenith. Those were the days of underground mining, defined by a subterranean network of tunnels sculpted carefully by immigrant miners to access rich veins of copper ore. Copper Kings Marcus Daly, William Clark, and Augustus Heinze, who first laid claim to the region's extensive mineral deposits, are celebrated in Montana for their solid investments in solid lodes—however, the manifestation of their wealth was only made possible through the genocide and displacement of Indigenous communities, the sweat of Butte's multiethnic working class, and the transnational extraction of labor and minerals from Latin America. Underground miners worked closely in pairs and depended on one another for survival, so the story goes, and

Butte was regarded as the "Gibraltar of Unionism" in the earlier portion of the twentieth century. Neighborhoods sprouted like fruiting bodies of fungi around openings to the tunnels, from which came one-quarter to one-third of the nation's copper supply during the first world war. Copper was critical to fortify, to electrify, and to galvanize the growth of the United States. Talk to any Butte resident to know that the copper industry is a point of utmost pride, for the extraction of the mineral shaped Butte into the community it is today.

At the same time, the underground geography of labor posed grave ecological, sanitary, occupational dangers. "History," as Trouillot reminds us, "is messy for the people who must live it" (Trouillot 1995, 110). Messy the history of underground mining was. The romanticization of the underground mining days obscures various harsh realities—that of silicosis, contaminated creek waters, mineshaft fires, slag heaps amassing between houses, company discrimination against unionized workers, gender-based violence, and the outright exclusion of Chinese, Latinx, Indigenous, and Black communities in Butte.[2]

In the mid-twentieth century came massive steam-powered shovels and diesel trucks capable of moving hundreds of tons of earth. Mass mining technologies allowed for the more efficient extraction of minerals, as they could rapidly blast away tons of low-grade ore to be hauled out of the pit for crushing and smelting. Although the scale of production increased, fewer miners were needed to work in the open-pit mines than in the underground tunnels. The Alice Pit in Walkerville, to the north of Butte, was one of the initial sites of open-pit mining in the region. Miners and community members banded together to protest the shift to open-pit mining, the loss

[2] This thesis does not comprehensively reckon with race and gender in Butte's mining communities. Several recent scholars have conducted exemplary research on early race and gender politics in Montana, including Matthew L. Basso in *Meet Joe Copper: Masculinity and Race on Montana's World War II Home Front* (2013); Laura J. Arata in *Race and the Wild West: Sarah Bickford, the Montana Vigilantes, and the Tourism of Decline, 1870-1930* (2020); Anthony W. Wood in *Black Montana: Settler Colonialism and the Erosion of the Racial Frontier, 1877-1930* (2021); and Mark T. Johnson in *The Middle Kingdom Under the Big Sky: A History of the Chinese Experience in Montana* (2022).

of jobs, and the fragmentation of neighborhoods that the industrial transition entailed. Corporate and political pressure to match other nations' speed and scale of mineral extraction, however, meant that Butte would have to adapt. While open-pit mining at the highly-contested Alice Pit was quickly abandoned, the expansion of operations at the Berkeley Pit continued, consuming entire neighborhoods and causing once close-knit communities to relocate to the South Flats of Butte or move out of the city entirely. Mass mining only turned a profit for the Anaconda Company at the Berkeley Pit from 1968 until 1971, but within the span of one decade, the open-pit mine went from a state of peak efficiency to abandonment. Anaconda was subsumed by oil and gas giant ARCO in 1977, and the Berkeley Pit closed in 1982. I specifically focus on the latter part of the twentieth century through the present due to the rapid deindustrialization of Butte, the neoliberal globalization of mineral and energy supply chains, the growing environmentalist attention, and the reconfiguration of urban space according to capitalist value systems during this time.

On Related Literature

Spatial reconfigurations, for the Butte community, entailed the obfuscation of corporate hierarchies, the fragmentation of communities, the decline of labor union power, and reckoning with mass quantities of waste. To provide a theoretical framework through which to understand the spatial afterlives of extraction, I draw on theories of space and landscape from Henri Lefebvre, Rob Shields, David Harvey, and W.J.T. Mitchell. I am interested in a definition of space as a "practiced place" that is both lived and imagined, "mediated through images and symbols" (Mitchell 1994; Lefebvre 1974). I understand landscape, based on this definition of space, to be the visual and affective representation of space. Because I seek to study how various actors encounter space and waste within Butte, I find landscape an apt concept through which to consider

both "real" and "imaginary" geographies. Popular photography and interpretive signage frame spatial perceptions of extractive zones for visitors and locals, and I therefore find it necessary to approach landscape, as the aesthetic representation of space, through a visual culture studies conception of the term.

To extend the notion of imaginary geographies, I also apply the term "place-image" as proposed by sociologist and cultural theorist Rob Shields. In *Places in the Margin: Alternative Geographies of Modernity*, Shields defines place-images as:

> …the various discrete meanings associated with real places or regions regardless of their character in reality. Images, being partial and often either exaggerated or understated, may be accurate or inaccurate. They result from stereotyping, which over-simplifies groups of places within a region, or from prejudices towards places or their inhabitants. A set of core images forms a widely disseminated and commonly held set of images of a place or space. These form a relatively stable group of ideas in currency, reinforced by their communication value as conventions circulating in a discursive economy. (60)

Places take on different meanings for different actors, and thus, the semiotic analysis of the polysemic place-image provides a framework for understanding unstable conceptions of heritage, waste, disaster, toxicity, purity, and efficiency within the landscape. Place-images, I argue, form the basis with which to construct narratives about place. Historical narratives draw upon core sets of mental images. The "place-myth," Shields writes, contains place-images that, "aligned and opposed, reinforcing or mutually contradictory—form a mythology or formation of positions which polarizes and dichotomizes different places and spaces" (Shields 1991, 63). As I examine real and imaginary geographies which shape certain narratives about Butte, I apply Shields' theories of the place-image and the place-myth.

To understand that which is obscured and marginalized by place-images and place-myths, I turn to the work of Macarena Gómez-Barris, who in *The Extractive Zone: Social Ecologies and Decolonial Perspectives*, employs a decolonial queer femme methodology to visualize what lies below the surface of extractivist projects across Latin America. Rather than apply a Eurocentric

theory of the gaze, Gómez-Barris identifies the existence of an "extractive view" to locate forms of power:

> Historically, the extractive view rendered Native populations invisible, which legally rendered the settlement of foreign populations onto communal properties, and facilitated the taking of those territories' resources. European colonization throughout the world cast nature as the other and, through the gaze of *terra nullius*, represented Indigenous peoples as non-existent. If settler colonialism and extractive capitalism reorganized space and time, then vertical seeing normalized violent removal. (6)

A consideration of the "extractive view" in Butte leads me to question why it is that interpretive signs prefer to ignore the presence of the Séliš, Qlispé, Nimiipuu, and Shoshone-Bannock people who came before. The reality that the colonial severing of Indigenous tribes from their homelands enabled capitalist modes of production in the Western United States is not so publicly palatable, particularly from the perspectives of state and corporate actors who seek to profit from the notion of a common industrial heritage. Extractive modes of seeing are embedded, too, in digital technologies which continue to commodify land and bodies. Visualizing that which lies "below the surface" of the extractive view, Gómez-Barris states, requires deep engagement with study and a "decolonial imaginary" which dares to find the shadow space "in which the visible and the invisible mix together" (Gómez-Barris 2017, 10).

A few crucial environmental historical works have shaped my contextual understanding of space, waste, and community in Butte. In *The City That Ate Itself: Butte, Montana and Its Expanding Berkeley Pit*, Brian James Leech provides a skillful and nuanced chronology of the shift from underground to open-pit mining in Butte. I cite Leech throughout my analysis in reference to the geographic imaginaries of political economic relations in Butte. Like Leech, I examine the manifestations of power in the open-pit landscape and focus on the later history of the city which has seldom been touched in comparison to the wealth of research on the days of underground mining (Leech 2019, 9). I attempt to understand why the relatively static space of the

Berkeley Pit is hypervisible to outsiders, whereas locals perceive toxicity and threat through the lens of everyday interactions. In my analysis of reconfigured sites, I draw on Leech's critical synthesis of primary sources including oral histories, news articles, and other archival files.

My understanding of the Anaconda Company's transnational mineral operations is supported by Janet L. Finn in *Tracing the Veins: Of Copper, Culture, and Community from Butte to Chuquicamata*. Finn studies the geographies, histories, and gendered politics of mass copper extraction across the borders of the United States and Chile. Rather than conduct a comparative analysis of Butte and Chuquicamata, Finn sees that the two cities are intimately linked in a planetary capitalist network (Finn 1998). Finn, who grew up working at her father's laundromat in Butte, applies a Marxist feminist theoretical perspective and adheres to an ethos of theory as liberatory practice—during a 1994 research trip, she marched with Indigenous feminist groups from Calama to a desert cemetery to demand justice for those who were murdered, tortured, or went missing during the Pinochet dictatorship. I draw on Finn's interdisciplinary research and humanist ethics in my discussion of the transnational politics of open-pit mining.

This thesis would not be possible without the polyphony of Butte voices. The 2009 edition of Drumlummon Views, *Coming Home: A Special Issue Devoted to the Historic Built Environment of Butte and Anaconda, Montana*, features the work of local essayists, historians, artists, and poets. In "The Industrial Undergirding to the Vernacular Architecture of Butte and Anaconda," one significant essay from the anthology, historian Fredric L. Quivik focuses on the simultaneous destructive and constructive qualities of the built environment. Quivik argues that it is necessary to consider contested histories of development and to imagine the invisible, like the smoke which once wafted from the top of the now-shuttered Washoe Smelter in Anaconda. For some, the smoke was a symbol of prosperity and job security, while for others, it symbolized illness and the

fragmentation of livelihoods. This localized consideration of the invisible—along with the hypervisible—has aided me in looking beyond extractivist paradigms crafted by and for the benefit of state and corporate stakeholders.

On Methods and Methodologies

Embedded in the postindustrial landscape are structures of power and structures of feeling. In this thesis, I employ qualitative methods to examine primary sources which have constructed, affirmed, or contested extractivist paradigms of space and waste in Butte, Montana. I fathom flows of waste and memories which state and corporate actors have attempted to discard, conceal, render profitable, and normalize. My guiding methodologies include "defamiliarization, denaturalization, decentering, and depurification" as discard scholars Max Liboiron and Josh Lepawsky outline in *Discard Studies* (Liboiron and Lepawsky 2022, 9). As I decenter dominant narratives and extractive visual cultures of open-pit copper mining, I challenge an industrial system of power that has marked entire communities and more-than-human ecosystems as discardable.

I pored over archival sources for many air-conditioned hours at the window table of the Butte-Silver Bow Public Archives. Among the archival sources I analyzed were photographs of mining operations, local news articles, EPA documents, corporate publications, promotional materials, and correspondence between state and corporate stakeholders. Additional primary sources I analyzed included interpretive signage, a Séliš and Qlispé place-name map, and photographs of the Silver Bow Creek/Butte Area Superfund Site by David T. Hanson. The abundance of archival and primary sources I encountered throughout my research process required that I include some sources and exclude others. In this way, research itself can be a form of discard.

I have attempted to select sources of analysis that get to the root of the constructions, confirmations, and contestations of power within Butte's postindustrial landscape.

Figure 2: A Spot to See and See From, July 2022. Author's photo.

Embodied immersion in reconfigured spaces of Butte has heavily informed my thesis. Walking across the remediated hillside in the heat of mid-summer, notepad in hand and camera at hip, formed the basis of my spatial and visual observations. Walking is political in the sense that movement through space is shaped by power relations. It can provide a way to re-member forgotten and fragmented pasts. I use manual DSLR photography as a method of spatially and visually mapping lived and imaginary geographies. A significant number of my photographs contain physical barriers, including fences, walls, and windows (Figures 1 and 2). Visualizing barriers through photography has provided me with a method to map private property, public lands, hazards to human and more-than-human health, and layered pasts. I attempt to subvert the extractive

conventions of landscape photography, a genre that has historically imagined vast expanses of "wilderness" as separate from society yet has paradoxically associated "pristine nature" with national identity and heritage. Whereas landscape photographs conventionally utilize wide-angle lenses, I alternate between the use of two standard lenses to capture "everyday" perspectives of the postindustrial landscape. I also frequently use low perspectives and digitally manipulate shadows and highlights in order to defamiliarize industrial sights and sites. As a means of situating the reader and visualizing temporal and scalar transformations of space in Butte's postindustrial landscape, I juxtapose my photographs with archival and popular landscape photographs.

Finally, I interviewed urban gardener, philosopher, and former miner Norm DeNeal in order to explore an emergent alternative to the federal-corporate remediation of the Butte hillside. As Norm led me through the six-acre aspen grove that he maintains on a former waste dump, I asked him a series of questions about the history of the grove, the logistics of stewardship, and the philosophy behind the project. The longform interview was semi-structured and rhizomatic in the sense that it had many points of entry, unfolded in a nonhierarchical manner, and was composed in part by the more-than-human actors within the grove. A mushroom that spouted out of the grassy path, for example, launched me and Norm into a conversation on mycelial networks, the aspen root system, and soil health. Following the interview, I manually transcribed the two-hour audio recording for clarity and brevity. I consider the second portion of the fourth chapter of this thesis to be co-created with Norm, who was most generous in sharing his work with me. Interview was the primary method that informed my study of the grove as an emergent remediation project that embodies an ethos of care.

On Positionality, Privilege, and Power

This project began, in part, with a fledgling desire to understand Butte in association with its mining history. Having grown up in the town of Hamilton, two valleys away from Butte, I grew up experiencing yet seldom questioning the legacy of the Copper Kings. I vaguely knew that my hometown, located in the Bitterroot Valley, had been a former milling site which supplied timber for underground mining operations and railway expansion. I did not learn until after exiting the public school system—which required little to no education about Montana history prior to White settlement—that the valley in which I grew up and to which I have returned was stolen from the tribes through trickery, forgery, famine, and military violence. What I now call the Bitterroot Valley is part of the ancestral home of the Séliš and Qlispé people, inhabited, also, by the Nimiipuu and Shoshone-Bannock people. The tribes knew this valley for its fertile soil and lush forests. As White settlers began to move south of Missoula, a common trading post and railway depot, they identified the valley's agricultural and timber potential. Legislative and corporate efforts to erode Indigenous sovereignty followed.[3]

It is no coincidence that Indigenous dispossession occurred in tandem with mineral extraction in the American West. The current site of Butte was also part of the ancestral homeland of the Séliš and Qlispé, who were displaced from the region as soon as settlers identified a wealth of silver and gold in its creeks. The project of colonial capitalism rendered people and territories here, as they did in many others places across the planet, extractible through "a matrix of symbolic, physical, and representational violence" (Gómez-Barris 2017, 5). Land became a commodity that

[3] My understanding of Indigenous dispossession in Western Montana comes from the Séliš-Qlispé Culture Committee educational resources and the Montana OPI report, "Montana Indians: Their History and Locations." In the latter report, nine sections about the current tribes in Montana were written in the tribal leaders' own words. *Land Grab* podcast by John Hooks and Matt Neuman also provides a comprehensive account of the legislative and corporate acts of violence which cleared Western Montana—specifically the Bitterroot and Jocko Valleys—for White settlement, commerce, and political gain.

could be stolen, sold, mined, and developed. I write from a profoundly anti-extractivist perspective, and I must emphasize that in order for a capitalist system to exist, Indigenous homelands were rendered commodities through colonial matrices of violence. While conducting research in Butte, I have observed countless examples of representational violence in the failure to acknowledge settler colonial violence below the surface of mining history. These surface-level histories, informed by corporate attempts to maintain a positive public image, trace back to a series of land grabs and transnational mining operations. Colonial and racial capitalist violence does not solely exist in the past but carries into the present.

The stories of pillage and dispossession are not mine as a White American woman to tell. I therefore attempt to turn my attention in this thesis to the state and corporate actors who have reconfigured space and continue to profit from colonial and capitalist paradigms. As I study primarily representational forms of violence, I am aware of my positionality as a non-Indigenous researcher of European descent whose ancestors and relatives profited from dispossession and extraction. I come from a long line of educators who, in the state of Montana, have taught subjects including history, math, and Spanish. As a young scholar who extends family tradition within an academic framework, I seek to recenter the memories which were subject to colonial capitalist revision for far too long, and to decenter an educational model which prefers empirical fact and certainty over contested and embodied experience.

Not far down the road from the brewery where I currently work as a weekend server—in an old industrial building that was once a granary and apple warehouse—is the former site of the Anaconda Company timber mill. As I walk through my current, middle-class neighborhood to work, I think of the trees that must have been here before they were milled, sent underground, and the earth was turned inside out. I think of the Séliš and Qlispé people, who were tricked and forced

out of this valley I call home. The reorganization of space may be less evident in Hamilton than in Butte, where the afterlives of extraction are impossible to miss. Still, these afterlives remain. I walk, in Hamilton and in Butte, with ghosts.

Chapters

Following the introduction, my evidence and analysis comprises four chapters. Each chapter examines reconfigured spaces, flows of waste, and imaginary geographies in the postindustrial landscape of Butte. There is a general temporal logic to the order of chapters. Chapter One, "Landscape in Reverse," focuses on the Copperway Heritage Park, the adaptive reuse of industrial vestiges, and the ongoing effort to promote Butte in association with its history of copper mining. Chapter Two, "Transformative Ground," tracks the technological shift from underground to open-pit mining at the former Alice Pit, the neoliberal globalization of the Anaconda Company, and the conversion of the open-pit mine into a scenic overlook. Chapter Three, "Pit Stop," analyzes the semiotics of open-pit flooding and studies the Berkeley Pit as a place-image for corporations, locals, and visitors. Finally, Chapter Four, "Adaptive Garden," looks to two remediation projects—the Streamside Tailings Operable Unit along Silver Bow Creek and the aspen grove on the Butte hillside—which have addressed soil and water contamination in markedly different ways.

Butte's past and present have not only been driven by change but by cycles. Certainly, there was no development in Butte's history that was not met with skepticism and resistance. For this reason, I remember the residents of the former Meaderville, McQueen, Finn Town, and East Side neighborhoods who stood in opposition to the formation and expansion of the Alice, the Berkeley, and the Continental. I remember the efforts of the labor unions in Butte who reclaimed

power over their employers through organized strikes, but not without complex internal politics. I look to environmental activists who remain skeptical of the federal-corporate agreement between the EPA, ARCO, and Montana Resources to clean up the same land from which the companies sought to maximize profit and assert political influence. I look, finally, to historians, artists, and memory workers who have sought to explore the nuance of Butte's many pasts in the form of essays, oral histories, photographs, and monuments, so that it remains possible to remember.

Cycles repeat as Montana Resources continues to carve out the side of a mountain, as robotic mining technologies enable the extraction of previously-discarded low-grade ore, as the state of Montana experiences a significant population influx, and as novel multispecies relations form. The remediation effort persists, as does the increasing demand for copper amid the shift toward renewable energy. More and more planetary spaces become subject to mineral prospecting and extraction with the rising demand for "critical minerals" required for electronics and renewable energy technologies. Meanwhile, the afterlives of dispossession and extraction haunt public memory and shape material realities of space. It is my sincere hope that the following analysis of dominant narratives and extractive views critically unravels extractivist paradigms and creates an opening for emergent stories of care, reciprocity, and multispecies agency.

Chapter One: Landscape in Reverse

"I saw the nostalgia of the entire West for a history that it never lived, its constant longing for a place that exists only in its mind."

– Michel Rolph Trouillot in *Silencing the Past* (1995)

Figure 3: "BA&P ore car in Mountain Con yard," March 30, 1927. Courtesy of Butte-Silver Bow Public Archives, *Anaconda Copper Mining Company Photograph Collection*, PH104, 2002.055.11
Figure 4: Mountain Con and Remediated Ground from the BA&P Hill Trail, July 2022. Author's photo.

From where I stood on the BA&P Hill Trail above Wyoming Street, I could see headframes in all directions. On the hillside above me, the Mountain Con (Figures 3 and 4). In the valley below, the Anselmo, the Original, the Steward, the Kelley. On the other side of the hill I had yet to summit, the Bell Diamond, the Granite Mountain, and the Badger. To each towering hoist, a unique superlative. *BUTTE'S FIRST COPPER MINE SITE*, claims the Original. *BUTTE'S MOST PRODUCTIVE COPPER-SILVER MINE*, reads the sign adjacent to the Steward. Mountain Con,

WORLD'S LARGEST COPPER PRODUCER. There used to be many more headframes, also known as "gallus" or "gallows" frames, before the expansion of open-pit mines exposed the innards of some tunnels to open air. Homes which once surrounded the entrances to each former mine were either demolished or transported to the South Flats, a suburban neighborhood which spread into the valley as the open-pit mines and the piles of non-ore rock expanded across the hillside.

The preservation of Butte's historic built environment ensured that traces of industry and power would remain highly visible in the landscape. I have come to understand the postindustrial landscape as it exists within geographic imaginaries and is shaped by sociopolitical constructions of gender, race, and class. This framework of conceptualizing landscape in its social and political dimensions emerges from the work of W.J.T. Mitchell, who in *Landscape and Power*, defines "landscape" as:

> …just a space, or the view of a place. In both the phenomenological and historical materialist traditions of this subject, space and place are the crucial terms, and landscape is taken for granted as an aesthetic framing of the real properties of space and places. (viii)

While Mitchell defines place as a "specific, definite location," the term space implies place as it is experienced or practiced (Mitchell 1994, viii). Mitchell makes a triangular formation of place, space, and landscape, stating, "if place is a specific location, a space is a 'practiced place,' and a landscape is that site encountered as an image or 'sight'" (x). The city of Butte, as it sits at a specific geographical location, exists as more than a place as it is lived, experienced, and represented.[4] In my particular study, I am concerned with representations of power within the landscape as they shape and are shaped by sociopolitical imaginations.

[4] In his discussion of "lived space," Mitchell draws on the work of geographer Henri Lefebvre, who outlines a triangular theory of "perceived, conceived, and lived space" (Mitchell 1994, ix). Lived space, the category which interests me the most, is "mediated through 'images and symbols'" and functions both materially and imaginatively.

Figure 5: "Mt. Con Mine and Centerville, Butte, Montana, 1985," David T. Hanson. Courtesy of the photographer and Taverner Press, 2016.
Figure 6: Mountain Con Mine and Centerville Revisited, July 2022. Author's photo.

In Centerville and Finn Town, two of the last remaining neighborhoods to be affected by the expansion of the Berkeley Pit, some of the workers' houses still stand as shabby and proud survivors of open-pit expansion—yet in other places, only the concrete foundations of the former houses remain (Figures 5 and 6). Though the postindustrial landscape of Butte defies categorization as "ruined," it is no stranger to transformation occurring across spatial, temporal, and material scales. I argue that concepts including "heritage," "toxicity," "purity," and "efficiency" are important narrative signifiers in Butte's postindustrial landscape. In this first chapter, I explore the concept of "heritage" present in some historical representations of Butte.

The asphalt path of the BA&P Hill Trail weaves through the Centerville in the same configuration as the former Butte, Anaconda, and Pacific Railway, the *LARGEST BUT SHORTEST RAILROAD* which once carted tons of crushed ore twenty-six miles from the mines in Butte to the Washoe Smelter in Anaconda. As I wandered along the reconfigured route, I paused at sites where remnants of the copper industry have been carefully preserved as relics within the Copperway Heritage Park—a joint effort between the National Park Service Preserve America Program and

the city-counties of Butte-Silver Bow and Anaconda-Deer Lodge.[5] The BA&P Hill Trail, functioning as part of a larger trail network within the Copperway, offers not only a physical space to recreate but a representational space upon which the various stakeholders project a public-facing historical narrative.

The public-private effort to transform industrial vestiges into artifacts emerged as an attempt to rebrand Butte and Anaconda following the decline of the former mining and smelting industries. The first initiative to establish a formal heritage district began in the early 1980's with the proposal of the "Butte and Anaconda Historical Park System Master Plan," coinciding with ARCO's attempt to phase out of its unprofitable mining operations. Built structures which no longer fulfilled their utilitarian purposes could reattain value as inert monuments, symbolic of a common industrial past. In 1994, public and private stakeholders approved the Regional Historic Preservation Plan and Programmatic Agreement (RHPP/PA) to mediate the process of historic preservation. These documents formed the basis for the construction of the BA&P Hill Trail, the Greenway along Silver Bow Creek, and the overarching Copperway plan (Figures 7 and 8).

[5] Numerous additional parties were involved in the design and funding of the Copperway, including ARCO, the EPA, the Montana DEQ, the Montana Historical Society, the Butte-Silver Bow Public Archives, Heritage Tourism Strategies LLC, and the Walden Mills Group.

Figure 7: "Butte Heritage Park Community Trail System," no date. Courtesy of Mainstreet Uptown Butte.
Figure 8: Copperway Sign on Landscape Renewal, July 2022. Author's photo.

According to the 2012 report, "Building Montana's Copperway: An Action Plan for Heritage Tourism in the Butte-Anaconda Heritage Corridor" compiled by Heritage Strategies LLC, the Copperway is a "unifying theme, a brand, to describe and promote this complex historic landscape" (Heritage Strategies LLC. 2012, 3). More than a recreational trail network, the Copperway assumes an idealized public identity and affectively demonstrates the extent to which industry in Butte and Anaconda "altered the course of American history." The connection between copper mining and patriotism is evident in American flags fluttering atop many of the headframes. One sign by the BA&P Hill Trail touts the region's high level of productivity during the World Wars, during which period somewhere between one-quarter to one-third of the national copper supply was mined from the Butte hillside. The Copperway, at its core, is not only designed to boost tourism and offer an outdoor experience. It is also an affective space as it seeks to elicit patriotic sentiments for the heritage tourist.

Heritage tourism emerged, more broadly, during the era of deindustrialization as one form of economic diversification. It offered a form of recreation for White, working-class families who

did not have the financial and material resources to travel far from home, according to historian Daniel Maher in *Mythic Frontiers* (Maher 2016). One goal of industrial heritage tourism is to elicit nostalgia and patriotism in association with industry, to the extent that nostalgia becomes a form of currency. Heritage tourism has the potential to establish a sense of community pride in association with industry even after deindustrialization occurs, according to Heritage Tourism LLC's report:

> In addition to creating new jobs, new businesses, and higher property values, well-managed tourism—especially cultural heritage tourism—improves the quality of life and builds community pride…Perhaps the biggest benefits of cultural heritage tourism, though, are diversification of local economies and preservation of a community's unique character. (6)

Heritage tourists who feel a connection to place are more likely to stay longer and spend money in the community. With the establishment of a heritage corridor, the hillside of Butte became mineable once again. Industrial vestiges transformed from former tools of resource extraction to valuable signifiers of the region's industrial past.

Historic preservation differed from Superfund remediation in purpose, and the two practices were often at odds with one another. The EPA initially sought to wipe Butte clean of its abandoned headframes, railway tracks, and other industrial structures. In *The City That Ate Itself*, environmental historian Brian James Leech suggests that the tension between preservation and remediation has waxed and waned since the initial 1982 CERCLA Superfund decision:

> Heritage concerns have also led some Butte locals to contest how the EPA goes about its cleanup efforts. With support from the State Historic Preservation Office, the grassroots heritage movement of locals and neo-locals eventually persuaded the EPA that mining dumps and headframes could be historic resources and tourist draws…although locals generally have a more positive view of Butte than outsiders, they often cannot agree on how to move forward. (341)

Underlying the tension between preservation and remediation, Leech argues, is a perceptive gap between locals and outsiders. The general assumption is that Butte residents heavily romanticize the copper industry while outsiders look on the city with a certain disgust, but the divide is neither

consistent nor monolithic. Even for historic preservationists, common ground has been difficult to achieve.

To better understand the complex sentiments fueling the debate, I find it necessary to examine the affective sway the regional copper industry possesses within the community. In my initial studies, I noted a certain pride that Butte has in association with its mining history. In an interview with Norm DeNeal, a former miner at the Steward Mine who now maintains an urban aspen grove on the Superfund Site, Norm told me that many locals have mixed feelings about the Anaconda Copper Mining Company. While Anaconda should rightfully get some credit for the growth of the town, Norm stated, miners and the community members do not consistently look favorably upon upper management in the company. To say that all Butte residents favorably remember Anaconda would omit decades of struggle between the working class and their employers. While I have observed that the public history of underground mining and the role of Anaconda Company is heavily romanticized in Butte, many residents have resisted placated narratives of corporate benevolence.

Community accounts of underground mining history, however, tend to look back fondly on life aboveground. Leech cites oral histories which recall an intimacy with the mines—children played on slag dumps and neighbors within ethnic enclaves formed close networks of support (Leech 2019, 33). These accounts are embedded, too, in interpretive signage that narrates the histories of the early communities in Butte—they become the basis for remembering a bygone era and constructing a sense of nostalgia in association with industry. Along the BA&P Hillside Trail, signs narrating life in the Muckerville, Dublin Gulch, Corktown, and Centerville neighborhoods focus on the "vast playground among mine dumps, slag piles, and toxic copper water" that young children enjoyed.

Nostalgia necessitates forgetting. In *Black Memory versus State Memory: Notes Toward a Method*, political scientist Michael Hanchard identifies memory as a socially-constructed phenomenon. Notably, Hanchard emphasizes that state representations of memory and history have been constructed and maintained for the sake of profit, nationalism, and sociocultural assimilation. State representations of memory intentionally pave over less palatable realities that would challenge state identity and the illusion of tolerant, democratic ideals. As "forgetting is inextricably bound up with memory," it becomes possible for state actors to craft a notion of national heritage through nationalizing projects which "involve the creation and maintenance of symbols, rituals, public gestures, rhetoric, and language used to invoke a notion of national belonging among the national populace" (Hanchard 2008, 46). Heritage, then, functions as an ideal tool through which the state can shape a sense of collective, universalized history—one that has been sanitized yet claims, simultaneously, to see history as it happened.

Reproductions of historical narratives occur through easily digestible chronologies and isolated events which emit an authoritative air of objectivity and incontestable fact. Heritage Strategies LLC. lists several guiding principles for heritage tourism. First, they recommend that their client "lighten up," as heritage tourists "love history but do not necessarily possess a large appetite for details" (Heritage Strategies LLC. 2012, 11). History buffs, the report suggests, are a niche and unprofitable group in comparison with the average heritage tourist. Ultimately, the configuration of heritage destinations determines where a tourist might stop for a meal, therein increasing profitability. The chronological ordering of complex histories into a cohesive narrative plays a role in generating mass appeal, or in other words, infantilizing the target audience.

The question of whose labor, and whose heritage, is memorialized thus becomes vitally important to ask in any interpretive space. Maher studies the "frontier complex" through his case

study of "Wild West" reenactments, which "function as an origin myth for communities as they tell the tale of how White Anglo-Saxon settlers came to dominate the landscape" (Maher 2016, 4). Paying homage to Trouillot, Maher writes that cultural heritage performances at tourist sites embody the practice of "silencing the past" through selective memory, therein minimizing the consequences of imperialism, racism, and sexism and valorizing a White, male version of history.

Frontier histories naturalize the notion of industrial heritage through spatial and material reconfigurations of built structures and artifacts, whether or not they are "authentic." Maher cites the National Trust for Historic Preservation's definition of heritage tourism as "traveling to experience the places, artifacts, and activities that authentically represent the stories and people of the past," and he raises several important questions in response:

> Who decides what is and what is not heritage or authentic? Whose heritage are we talking about, and does it need to be accurate or only to give the feel of authenticity? Is there any assurance that what is being presented is historically accurate? (21)

These questions lingered in my mind as I moved through the postindustrial landscape of Butte. While many interpretive signs importantly note that the working class is multi-ethnic, the history they narrate is primarily representative of a Euro-American working class. The signs routinely neglect any mention of Indigenous and Black pasts. During World War II, the federal government recruited Black miners to work in Butte's mines due to labor shortages. As a result, the White, multi-ethnic miners of Butte staged a wildcat strike, and contracts with Black miners were terminated (Leech 2018, 34). When the Anaconda Company warned miners that the federal government would once again send Black and Latino workers, Butte miners begrudgingly accepted White women in the mining and smelting workplaces.[6] Labor history signage, though it

[6] A sign in the Butte-Silver Bow Public Archive's lobby exhibition on Butte's history during WWII recounts the war-time acceptance of women in the mining and smelting industries due to labor shortages. The display does not connect the increase in women laborers to the exclusion of Black and Latino laborers.

acknowledges a multi-ethnic Euro-American working class, fails to comprehensively reckon with dispossession and racist exclusion.

Figure 9: Granite Mountain Speculator Mine Memorial, July 2022. Author's photo.

The discard of residual memories enabled the narrative formation of a singular industrial heritage. The publicly-visible accounts of mining history are strategically constructed, as they evoke a romanticized nostalgia, regardless of the material reality of labor relations. In the context of Butte, I find the distinction between public memory and state memory to be a hazy one. At the Granite Mountain Speculator Mine Memorial, a site of remembrance for the 168 miners who suffocated to death in the 1917 mineshaft fire, a sound display allows visitors to choose from a menu of twelve audio options, including excerpts from oral histories with miners who survived the accident (Figure 9). The memorial displays the national flags representing the nationalities of deceased miners, who immigrated to Butte from 25 countries in addition to the United States.

Interpretive signage at the memorial recounts past labor tensions, including the period of martial law and the lynching of Industrial Workers of the World (IWW) organizer, Frank Little.[7] As for the memorial's material and spatial design, cylindrical samples of granite line the perimeter and create a boundary between "hallowed ground" and the extractive zone. The Granite Mountain Speculator Mine Memorial, one destination within the Copperway, is perched at the hill's summit at which vantage point the current operations at Montana Resources are visible. The memorial is one of the most effective spaces in Butte to experience the landscape, as it considers the struggle of workers over time and exemplifies a more nuanced labor history than in the remainder of the Copperway Heritage Park.

Critically-narrated histories of open-pit mining, however, are largely absent from the postindustrial landscape of Butte. Labor is largely framed to the public as a matter of the past. In the next chapter, I will examine the sociopolitical currents behind the shift to open-pit mining and the obfuscation of corporate power throughout the latter half of the twentieth century.

[7] The murderer of Frank Little was neither identified nor convicted, but it is widely accepted in Butte that Little was "slain by corporate interests for organizing and inspiring his fellow men," as his tombstone in Mountain View Cemetery reads.

Chapter Two: Transformative Ground

I see / the mountains fall, / open up / the territory / in angry / grayish cavities, / the desert, the transitory / houses."

– Pablo Neruda in "Ode to Copper," *Odas Elementales* (1954)

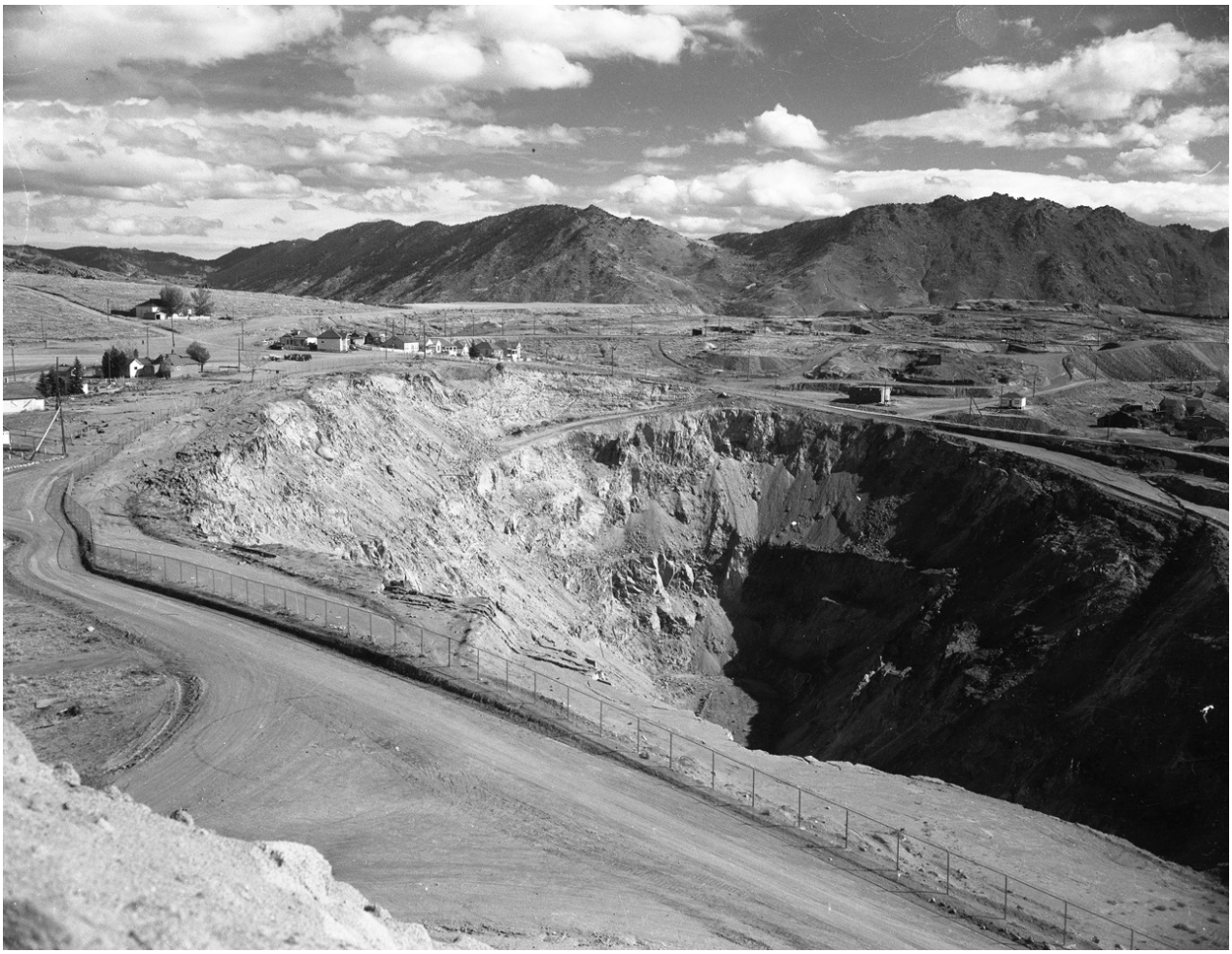

Figure 10: "Alice Pit North of Walkerville," C. Owen Smithers, October 1960. Courtesy of Butte-Silver Bow Public Archives, Smithers.11.068.02

Not long before sundown, I climbed the trail leading from the parking lot at the edge of the Alice Pit to the top of Knob Hill Park. The hill, before it was a gradually-sloping scenic overlook, was a steep mound of non-ore rock. It was only in 1998 that the innards of the Alice Pit mine were leveled, coated in limestone and soil, planted with a mix of grass seed, and crowned with picnic tables and trash cans. Knob Hill Park is a recreational and historical site within the Copperway network, but in years prior, it was known as one of the first sites of open-pit mining in Butte as

part of the Greater Butte Project to establish mass mining operations (Figure 10). Industrial steam shovels and diesel trucks capable of carrying hundreds of tons of ore provided the technological means to enable the extraction of low-grade ore, which could also be crushed in increasingly greater quantities. Mechanization of the workforce, however, was highly contested in the community.

Operations at the Alice Pit, spanning from 1955 to 1960, were relatively short-lived. Due in part to the fact that hazards of mining were more visible to the community than ever before, Butte's labor unions and Walkerville residents successfully organized to halt operations. Leech writes that the level of resistance in Butte was unusual in the postwar context of the industrial revolution and the Red Scare:

> Because the open pit exposed the mechanization of the workplace in such a dramatic fashion, Butte-area workers stood against mechanization despite Cold War pressures. Butte communities showed that they valued their social environment over jobs, and not all accepted open-pit mining as the best method for extracting ore, despite its efficiency. (103)

Janet L. Finn, Marxist and feminist scholar who studies the transnational role of the Anaconda Company in Butte and in Chuquicamata, Chile, similarly notes in *Tracing the Veins* that Anaconda had long used tactics to destabilize union power in Butte.[8] In their transnational operations, Finn notes, the company funded Chilean politicians whose interests aligned with the privatization of mining operations and free-trade agreements:

> Anaconda made its influence felt in national politics through payments to politicians for political favors, commission appointments, and intervention in electoral affairs…The story that unfolds illustrates the contradictions between state sovereignty and international capitalism. The history is one of a compromised democracy, in which the Chilean government contested and acquiesced to the demands of a powerful corporation that was often backed by U.S. government policy and politics. (36)

[8] These tactics included the use of a rustling card system and the deployment of the military during the period of martial law from 1914 to 1921. Anaconda owned the majority of newspapers in Butte throughout most of the twentieth century, and their publications stoked a growing xenophobia and nationalism with the intention to form, according to Finn, an "'all-American' labor force in Butte: subdued, patriotic, and more interested in consuming Irish whiskey than Socialist literature" (Finn 1998, 81). As the scale of production increased and workers were laid off *en masse*, the company retained miners who led conventional, nuclear family lifestyles and had no history of union organizing.

Open-pit mining, to Anaconda, entailed not only increased efficiency and profit but also a more ideological form of power during the postwar period in which McCarthyism and patriotic nationalism defined a distinctly American structure of feeling—nationalist exceptionalism and rugged individualism. The corporate opposition to syndicalism created an atmosphere of suspicion across workplaces, and it worked to drive a lasting wedge in the labor movement.

The first open-pit mine in Butte, though its operations were fleeting, was a space where fears about the changing workscape took root. While shaving down its labor force and scaling up production, Anaconda ruled over its operations with a heavy hand. Both Leech and Finn write about the culmination of Butte labor struggles in the 1959 strike which "broke the backs of the unions" as it lasted more than six months, resulted in few gains for the miners, and led to even more layoffs and mine closures (Finn 1998, 56). The community also played a significant role in protesting the expansion of the Alice Pit. Hundreds of complaints from Walkerville residents about blasting noise, flying rocks, bursting pipes, and cracking streets were met with outright denial from the company (Leech 2018, 117). Mayor Jim Shea sided with the residents of Walkerville to file a lawsuit against the company for their destructive open-pit operations.

The visualization of the damage through photography helped to render visible the struggle between labor unions, residents, the municipal government, and Anaconda. Leech writes that *Life Magazine* photographer Carl Iwasaki traveled to Butte to document the subsidence which occurred as a result of open-pit mining:

> [Iwasaki's] powerful photographs feature cracks funning through homes, streets crumbling into an almost-vertical pit, and children jumping across gaping holes. Other photographs show officials standing in and almost disappearing into cracks that were at least five feet deep. Many of the images also feature an enormous mound of overburden in the background—an ominous mass towering over north Walkerville. (124)

It is most probable, Leech suggests, that Iwasaki's photographs of the subsidence cracks were posted around the halls of the Butte Miners Union Hall in the Central Business District during the

1959 strike. Local professional photographer C. Owen Smithers also documented the damage in Walkerville (Figures 11 and 12).

Figure 11: "Subsidence cracks near Alice Pit," C. Owen Smithers, October 1960. Courtesy of Butte-Silver Bow Public Archives, Smithers.11.068.01.
Figure 12: "Crack caused by Alice Pit mining activity," C. Owen Smithers, October 1960. Courtesy of Butte-Silver Bow Public Archives, Smithers.11.068.15.

Smithers demonstrated the ways in which industry shaped everyday life in Butte while resisting an aesthetic sentimentality common to other representations of industrial presence in the Butte community.[9] At the same time, his photographs refuse to spectacularize environmental devastation in the same manner that popular ruins photography, also known as "ruin porn," portray extractive zones. Most often, Smithers takes photos at the same level as his subjects, unlike the Anaconda Company photographs which were almost exclusively taken at a higher vantage point, a form stylistically consistent with aerial military photography.[10] Smithers, in his photographic

[9] The body of work that C. Owen Smithers Sr. produced from 1921 until his death in 1973 is extensive and shows many facets of Butte and its people. The collection of film negatives was nearly demolished in a 2011 fire, but was successfully preserved by archivists at Butte-Silver Bow Public Archives. I am immensely humbled to have been able to view and share some of them.

[10] Many visual culture theorists have analyzed military photography in association with aerial or vertical seeing, including Ariella Azoulay in *The Civil Contract of Photography* (2008), Matt Dyce in "Canada between the photograph and the map: Aerial photography, geographical vision and the state" (2013), Stephen Graham in *Vertical: The City from Satellites to Bunkers* (2016), Paul Cureton in "Aerial Ontologies" (2021), and Miles Orvell in *Empire of Ruins: American Culture, Photography, and the Spectacle of Destruction* (2021).

practice, adhered to an egalitarian ethics of documentary photography as he artfully portrayed the characteristics and complexities of Butte, its transformations, and its people.

Walkerville ultimately won the settlement with Anaconda. The company paid $14,000 to the community for residential and municipal repairs and agreed to permanently suspend operations at the Alice Pit.[11] Though Anaconda experienced a massive decrease in profits from Butte operations in 1959, the company fortified its profits through the transnational extraction of labor and minerals. The same year of the strike, Finn writes, Anaconda was making record profits in Chile under the provisions of the *Nuevo Trato* (Chilean New Deal) under the Ocampo administration, which enabled the company to trade Chilean copper at a high profit margin. In 1959, Anaconda extracted 350,000 tons of copper from its Chilean mines, approximately five times what Butte produced that same year, while benefitting from *Nuevo Trato* provisions allowing for free-trade—Anaconda profited from minimal taxation on exports, production costs, and equipment (Finn 1998, 54). Taking transnational operations into consideration, it becomes evident that the so-called "Richest Hill on Earth" was only rich through the wealth that Anaconda extracted from the people and the high desert of Chile.

Political geographer Martín Arboleda writes in *Planetary Mine* that mines function as nodes within a global network rather than as singular, isolated extractive zones. In order to comprehend the temporal and scalar attributes of mining, Arboleda suggests that "it is by interrogating sensuous practice that we become better positioned to grasp the manifestations of the mystifying forms, the immanent rhythms, and the inner contradictions of the capitalist economy and bourgeois society in its totality" (Arboleda 2020, 21). This dynamic framework for conceptualizing extractivism applies to the mines of Butte and Chuquicamata, among other sites

[11] $14,000 in 1959, when adjusted for inflation, is equivalent to $143,343 in 2022, according to the CPI Inflation Calculator using U.S. Department of Labor data to account for inflation over time.

of mineral extraction as they operate across nation-state boundaries. Butte and Chuquicamata are not merely comparable industrial sites but inextricably connected.[12]

In the context of the fourth machine age, innovations in mining technologies not only resulted from neoliberal compressions of space and time but materialized through the socioeconomic and political marginalization of poor, working-class communities in the Global South (Arboleda 2020). Technology has the potential to liberate marginalized workers from manual labor and precarity, but when guarded by corporate stakeholders, the liberatory potential of technology only preserves hegemonic power structures. Capitalist modes of extraction and production link the many communities across the planet who are marginalized through those very spatial fluctuations of capital.

While the struggle looked different for the communities of Butte and Chuquicamata, they shared one key similarity. Corporate power was becoming increasingly deterritorialized and opaque. Despite the Alice Pit controversies, expansion of the Berkeley Pit continued and neighborhoods including Meaderville, McQueen, East Butte, Finn Town, and parts of Dublin Gulch suffered a fate that Walkerville had narrowly avoided. Houses were demolished in some cases and transported in others, and homeowners were largely relocated to the suburban South Flats. Homeowners experiencing dispossession were compensated by Anaconda for the loss of their homes, but not for the company-owned land upon which the homes were razed. There was also a stark gender disparity when it came to compensation for displacement. To the dispossessed widows of miners, Anaconda paid a mere flat rate of $1500—a sum less than what displaced couples, nuclear families, and single men received (Leech 2018, 126). Community members

[12] Finn takes this approach to her study of the two cities and the presence of the Anaconda Company in *Tracing the Veins*. While Finn focuses on the span during which Anaconda operated in both cities, I seek to extend her humanist research ethos to my discussion of the transnational dimensions of more recent open-pit copper mining.

seeking financial assistance from Anaconda and the government were hard out of luck. Butte had little choice but to accept open-pit mining as the *modus operandus* in the latter half of the twentieth century, but none of it went down without a fight.

As Berkeley Pit operations expanded, the surveillance of miners increased. Open-pit mining spatially allowed upper management to more effectively monitor miners, their productivity, and their interactions with fellow workers. Leech notes the panoptic characteristics of corporate oversight:

> By the mid-1960's the company had built a new control tower in the pit, furthering management's surveillance capability. Equipped with radio and closed-circuit television, the tower allowed engineers to more closely manage all drilling, blasting, loading, dumping, crushing, and conveying…The tower served a purpose somewhat like eighteenth-century Jeremy Bentham's panopticon, a place from which everyone could be watched, and, through the threat of possible observation, controlled. (159)

According to Foucault's theory of panopticism in *Discipline and Punish*, the subject of the panoptic gaze "is seen, but does not see" and therefore behaves under the assumption of perpetual surveillance, therein ensuring an "automatic functioning of power" (Foucault 1975, 5). Visibility, for the worker, is a trap. The conditions of surveillance made it harder for miners in the Berkeley Pit to organize, in addition to the reality that work was conducted more independently than in the underground tunnels—miners now worked primarily as lone operators of the shovels and drivers of ore trucks. It was during the era of open-pit mining that Butte's unions lost much of their power, due in part to spatial changes in the workscape and cuts to tens of thousands of jobs to just a few hundred. The working conditions also diminished the sense of camaraderie between miners and eroded multi-ethnic solidarity.

Corporate hierarchy within the urban landscape of Butte continued to shift dramatically as the Anaconda Company reorganized their business operations following the Chilean nationalization of mining operations in 1971 under the Socialist administration of President

Salvador Allende.[13] Following the nationalization, Anaconda lost two-thirds to three-quarters of its net profits (Finn 1998, 65). No longer able to secure a profit margin through the longtime dependence on Chilean copper and labor and influence of Chilean politics, Anaconda frantically sought to reorganize their business practices over the span of the next decade. Anaconda's headquarters moved from Butte to Tucson in 1972, and once again to Denver when gas and oil giant ARCO acquired the company's remaining properties in 1977. Rising costs of fuel in the context of the OAPEC oil embargoes of 1973 and 1979 additionally meant that the mass hauling of ore and non-ore rock from the Berkeley Pit was no longer economical.

ARCO assured the public that copper production in Butte would remain profitable through the end of the century, despite rumors of more layoffs to come and compounding supply chain disruptions. In March 1980, ARCO representative Jim Morrison publicly denied these rumors (*ArcoSpark* 1980). Only four months later, however, ARCO announced the shutdown of all mining and smelting properties in Butte and Anaconda, attributing the closure to a nationwide strike of 39,000 copper workers, including 2,900 in Montana. One of the final blows to the company came later that year in September 1980, when the company failed to update the Washoe Smelter according to new compliance standards for particulate matter emissions.[14] The unions agreed on a new contract with ARCO that November, thus resuming operations in the Berkeley Pit. ARCO assured the public that mining in Butte would persist for the next two decades, though copper ore would be transported to Japan for smelting following the closure of the local smelter. The contract

[13] Leech describes how Anaconda resisted closing their mining operations in Chile despite the fact that they were aware of the potential for nationalization. While the other American companies sold their Chilean operations prior to the event, Anaconda was under the impression that their relations with Chile were superior, evident in the belief that they would be granted special favors even in the event that nationalization should occur. They were quite wrong.
[14] Particulate matter compliance standards were established in the EPA Clean Air Act of 1970, and it was more than a decade after legislation was passed that Anaconda was held legally accountable for their stack emissions. Options they proposed during that time included retrofitting the existing smelter, building a new smelter at the existing site, or offshoring smelting operations to Japan. Anaconda chose the latter option.

with Nippon Mining and C. Itoh and Company in Japan, however, once again led to failure as the Japanese smelters were unequipped to process the high concentration of arsenic present in Berkeley Pit ore.

As I paged through corporate publications from ARCO between the years of 1980 and 1982 at the Butte-Silver Bow Public Archives, I picked up on a frenetic tone and a defensive public image. In the *ArcoSpark* newsletter, the company ran an advertisement campaign encouraging consumers to conserve energy and a column on corporate philanthropic endeavors including humanitarian involvement at a Cambodian refugee camp. ARCO clearly sought to maintain a public image of environmental sustainability and international benevolence, despite the material reality of their business operations. In June 1982, contributing writer Marion Fitzgerald wrote in an *ArcoSpark* article, "'More than geology' significant in Latin America minerals search," that Anaconda Minerals, the subsidiary company of ARCO, sought politically and economically "attractive" conditions under which to operate in Chile, Peru, Brazil, and Mexico:

> The first and major determining factor, of course, is the perceived mineral potential of the country. But, secondly, its socio-economic and political climate must be considered. This is monitored to determine if the country has the stability and general business atmosphere in which Anaconda Minerals is willing to work and invest…The company's first good opportunity in Latin America was in Chile, when it purchased the Chile Copper Co. from M. Guggenheim Sons for $77 million in 1923. By 1960, it had developed three major copper deposits there. The 1971 expropriation of these mines caused an eight-year break in Anaconda Minerals' activity there, but by 1978, Allende's government had been deposed, conditions had changed and the investment climate once again became attractive to foreign investors. Anaconda Minerals returned to Chile in 1979 with the purchase of the Los Pelambres copper property. 'Our return to Chile was welcomed by the Chilean people,' says Souviron [Anaconda Minerals' exploration manager in Latin America]. 'We have a very positive reputation there.'

ARCO was once again pursuing mineral operations in Chile, only this time, under the far-right dictatorship of General Augusto Pinochet. While profit became possible for the company once again under Pinochet's neoliberal Chilean Constitution of 1980, the reality for Chilean people was one of mass military and police violence. Those who stood in opposition to the new regime—labor organizers, artists, academics, journalists, Indigenous land protectors—were "executed,

imprisoned, or 'disappeared'" (Finn 1998, 10). Despite ARCO's claims of corporate diplomacy with the Chilean people, violence and subjugation enacted by the military dictatorship—in addition to the instatement of neoliberal trade policies—meant profit for the company.[15] It is no wonder that ARCO, with all the blood on its hands, sought to establish a benevolent public image.

While corporate structures of power were rendered distant and opaque for the Butte community, the power that unions formerly held had greatly diminished, and ARCO failed to turn a profit after many spatial and transnational reorganizations. Layoffs continued until the total halt in open-pit operations in 1982. I examine this critical moment in greater detail in the following chapter, but for now, turn to one significant consequence of the spatial reorganization of Butte's labor geography—the masses of non-ore waste rock which had come to blanket the urban landscape, burying some neighborhoods and encroaching on others including Walkerville, Centerville, and Dublin Gulch.

The movement of non-ore rock had become more feasible in proportion to technological advances which enabled the efficiency of low-grade ore extraction. Fewer bodies were needed to extract and transport copper ore and non-ore rock, and robotic drilling technologies could accurately determine where to expand mines. Advances in mining technologies, Arboleda writes, facilitated the extraction of low-grade ore, therein producing compounding masses of waste:

> The economic profitability brought about by the smart and robotized mine, however, pales in comparison to its material footprint, as an average large-scale extraction site produces up to a thousand times more solid waste than those working with older technologies. To put this figure into perspective, a large open-cast mine can produce up to forty times more solid waste in one year than any Latin American megacity produces during the same time period. Considering the radical externalization of biogeophysical costs that has developed in tandem with the increase in the production of raw materials, the fourth technological revolution has so far been unrevolutionary. (24)

[15] The Chilean Constitution of 1980 remains the primary legislative document despite the recent effort in 2022 to write a new Constitution—one that would formally recognize the Rights of Nature, prioritize Indigenous sovereignty, and expand social welfare programs.

Accordingly, the technological shift from underground to open-pit mining meant reckoning with mass quantities of waste for Butte. I define waste, in reference to non-ore rock, as a categorization which becomes waste only through material extraction and capitalist appraisal. Rock, in other words, categorically becomes waste once it is drilled and determined to contain too low a percentage of "critical minerals" to be of value.

The majority of rock extracted from the mines was not copper ore but non-ore rock. Since the advent of open-pit mining in Butte, non-ore rock has been piled into an expanding embankment above the Butte hill, separating the mines from the Yankee Doodle Tailings Pond. Non-ore rock was piled between houses, and some buildings, including the infamous Holy Savior Church in Meaderville, were buried under thousands of tons of mining waste. Non-ore rock lays discarded in mounds of overburden until remediation and "landscape renewal" occur. The subsequent conversion of non-ore rock piles into grassy, remediated hillside has accordingly played into the reconfiguration of the postindustrial landscape as much as historic preservation efforts.

I differentiate "landscape renewal" from remediation because the former strategy prioritizes aesthetic value in the landscape, while the latter strategy seeks to mitigate contamination through processes of removal and containment. In most cases in Butte, the partially-responsible parties applied a combination of the two mitigation strategies. With remediation, a combination of containment, dispersal, treatment, and offshoring controlled the movements of waste in the form of non-ore rock and mineral tailings. "Landscape renewal," however, addressed the visible barrenness of the Butte hillside and the outstanding heaps of non-ore rock and slag from earlier extraction and refinement, enabling the conversion of the postindustrial landscape to scenic heritage park.

In promotional material for Butte throughout the twentieth century, the city is never presented to visitors as beautiful and scenic but as weathered and dignified. One visitor's guide from the Butte Chamber of Commerce claims that the city's visage is "an honest face with wrinkles earned through a hundred years of smiles and frowns. There are visible scars gained in the many successful battles for respectability. Over all the face is masculine and ruggedly handsome."[16] The gendered aesthetic perception sees Butte as a homely and self-sufficient body. Miner's tales additionally suggest that the profession was "a *man's* work, a *man's* contest with Nature jealous of *her* riches, a struggle against dust and heat and fire and gas and death" (emphases mine; Leech 2019, 30). Butte's surface (the city) and Butte's underground (the mines) are gendered landscapes, linked through such descriptions.[17] Though Butte may not be a scenic gem like the two national parks it nests between, promotional material touts the city as a "diamond in the rough" with a robust industrial presence and a blossoming economy, evident in the new St. James Hospital, the burgeoning tourism industry, the growth of Montana Technological University, and fact that Butte rests at the midpoint between Glacier National Park and Yellowstone National Park. The city's promotional virtue is not in its "beauty" but in its "industrious" and "dutiful" qualities.

[16] The Chamber of Commerce visitor's guide, accessed at Butte-Silver Bow Public Archives, most likely dates to the late 1960's or early 1970's. Other pamphlets from the Promotional Literature collection refer to Butte as a feminine figure, evident in quotes such as, "The story of Butte is exciting…her history and the heritage she has collected and presents to her citizens and visitors—young and old—is one of hard work, success and true glory."

[17] I do not comprehensively examine the gendered rhetorics and semiotics of mining in this thesis. For more on the subject, Marxist and feminist scholar Janet Finn reckons with intersections of class and gender across Butte and Chuquicamata in *Tracing the Veins* (1998). More broadly, ecofeminist philosopher Carolyn Merchant associates mining with sexual violence against women and "Mother Earth" in *The Death of Nature* (1980).

Figure 13: Alice Pit and Knob Hill Park, July 2022. Author's photo.

"Landscape renewal" brought about the potential for aesthetic redemption—to re-green the hillside turned inside-out through the process of mass extraction. In 1998, the two million cubic yards of overburden from the Alice Pit was converted into a "site to see, and see from," according to a Copperway sign describing the reclamation process, a unique partnership between ARCO and the Montana state government (Figure 13). The slope of the pit was contoured to prevent further subsidence and caving, which involved the infill of the pit using some of the non-ore rock. While it may have been possible to fill the pit with all of the non-ore rock, the remainder of the overburden acted as an armature for the gradually sloping, grassy hill that Knob Hill is today. The waste dump was regraded, equipped with stormwater drains, covered with limestone and fresh soil, revegetated, and paved with a trail. From the top of the "eyesore" turned "natural hill," the sign

writes, “you’ll enjoy an excellent view of Butte.” The same process and aesthetic philosophy have shaped much of the rest of the Butte hillside outside the bounds of the Berkeley Pit, the Continental Pit, and the Yankee Doodle Tailings Pond. Foreman Park, in particular, exemplifies this same strategy of “landscape renewal.”

The signs at Knob Hill Park may describe the historic industrial transformations, but the future of the site has become uncertain. The former Alice Pit may go through yet another spatial rebirth as it is now prospect to claims by a Canadian mining company, Blackjack Silver Corporation. Based on this new development, the potential for future mining strikes me as the primary reasoning as to why the Alice Pit was not filled in completely with non-ore rock, which would pose a massive obstacle to future expansion. Blackjack has identified several veins of interest within their claim, including the Rainbow Vein, which breaks ground upon public land near the Alice Pit. While extraction has not yet begun, Blackjack is currently surveying the ore bodies to determine the economic feasibility of open-pit mining. The area that Blackjack is currently surveying near the Rainbow Vein covers all of Walkerville, Centerville, and the majority of the reclaimed Butte hillside north of the Central Business District. Two more veins, the Travona and the Marget Ann, cover additional hundreds of acres across the urban landscape. Though specific details of the claim and future operations remain unknown, it is quite probable that a renaissance of large-scale mining operations will occur in the coming decades, as mining technologies become more efficient to extract low-grade ore and the demand for copper increases.

Chapter Three: Pit Stop

"If timber and ore were gods of the old west, fire and flood are gods of the new one."

– Phil A. Neel in *Hinterland: America's New Landscape of Class and Conflict* (2020)

Figure 14: Violet-Green Swallow and Reflections at the Berkeley Pit, July 2022. Author's photo.

I followed the flight path of a lone violet-green swallow to the point where it perched on the chain link fence above the Berkeley Pit (Figure 14). On the other side of the fence from the viewing stand were steep, ridged walls and glassy, blue-green water, laden with cadmium, sulfur, arsenic, and lead. Water, that for some unfortunate birds, proved to be a final resting place. Reflected in the acidic water were the towering benches of non-ore rock and the ridgeline of the Continental Divide beyond. To the right of the pit, 240-ton haul trucks crunched and grumbled over the gravel road, carrying non-ore rock from current mining operations to be piled higher and higher outside the Continental Pit. Every few minutes, an oscillating siren rang from the opposite

shore of the strange lake—those were the devices to scare off migratory birds. The swallow on the fence refused to be hazed, but within several minutes, it took off for safer ground.

I sat for an hour, listening to the soundscape of the bird sirens, haul trucks, and visitors who sighed in awe over the sublime view and puzzled over the peculiar sounds. The Berkeley Pit Viewing Stand works as a template to frame a consistent visitor experience. Open-pit visitors can expect to pay three dollars to pass through the horizontal concrete shaft to the deck, where they may then lean up against the railing and face the open-pit mine. It is standard for visitors to snap tens of photographs before attempting to use the broken audio machine and the quarter-eating tower viewer. On to the signs, the visitors then turn, to read about the crater and its blue-green waters.

The viewing stand, constructed by the Butte-Silver Bow Chamber of Commerce in the mid-1990's, stands as an effort to promote Butte in association with its more recent history of open-pit mining. However, the signs fail miserably to portray a complex and dynamic socioecological landscape.[18] The narrative seeks to elicit a sense of awe in association with mass copper extraction and its scale, evident in the fact that signage emphasizes only technological aspects of open-pit mining and scientific facts about the rising water. Unlike the rest of the heritage tourism corridor, which attempts to portray a common social history of underground mining in Butte, the landscape of the Berkeley Pit represents a static history of a technical and empirical nature.

[18] The four interpretive signs, commissioned by the Chamber of Commerce, were made by the Berkeley Pit Public Education Committee and Hawe Steel with funding from Montana Resources. The signs show extreme evidence of wear, as they have not been well-maintained or updated since their installation.

Figure 15: "Berkeley Pit operations," C. Owen Smithers, 1955. Courtesy of Butte-Silver Bow Public Archives, Smithers.11.210.02.
Figure 16: "Berkeley Pit," circa 1970. Courtesy of Butte-Silver Bow Public Archives, *Anaconda Copper Mining Company Photograph Collection,* PH104, 2002.055.75.

Only one sign in the display references the sociocultural consequences of open-pit mining. As it describes operations in the Berkeley Pit during its years of operation, it reads:

> More than a dozen Butte mine yards were dismantled and relocated. Also, the residential communities of East Butte, Meaderville, McQueen, Dublin Gulch, and Finn Town were uprooted. Many of the relocated residents didn't mind because it meant good-paying jobs would stay in the community.

The sign then shifts to a description of the power of the haul trucks, capable of carrying between 25 and 200 tons of earth. Then, it notes the scale of copper ore and non-ore removal at peak production (Figures 15 and 16). The barely-extant description of relocation denies the reality that residents and miners—quite a lot of them—did indeed mind. The signs willfully ignore the history of labor and community resistance to open-pit expansion through strikes, public outcry, and legal action. As for the claim that well-paying jobs stayed in the community, it was only true insofar as jobs remained for few and far between, and notably, for the non-union workers. After billionaire Dennis Washington purchased the Berkeley Pit and the adjacent land from ARCO and Montana Resources in 1985, Montana Resources opened under Washington as a non-union workplace. The company remains non-unionized to this day. Unlike the signs in the Copperway corridor that

merely simplify social histories, the signs at the Berkeley Pit opt for outright denial of reality in favor of a placated corporate narrative.

In reference to the flooding of the underground tunnels and the Berkeley Pit, the viewing stand signage asks, "HOW DID THE WATER GET IN THE PIT?" The answer:

> During the years of underground mining, pumps were used to keep groundwater from filling the underground workings. The main pump station was located on the 3,900-foot level of the Kelley Mine. The pumps were turned off in 1982 and water started flowing back into the underground workings and Berkeley Pit. By 2012, the water volume in the Pit had risen to 41.2 billion gallons of water.

The passive voice in the clause "the pumps were turned off" sanitizes the actions of the responsible parties—ARCO, Montana Resources, and the geological engineers that the companies consulted. Bridget Barry similarly notes in her thesis, "Toxic Tourism: Promoting the Berkeley Pit and Industrial Heritage in Butte, Montana" that "the cultural element is missing" from the Berkeley Pit's landscape, as the audio recording, working as of 2012, explains that "the decision *was made* to turn off the pumps" (Barry 2012, 81). Barry concludes that "use of the passive voice removes the human agency, along with responsibility, from the decision." The flooding was not an inevitable consequence of the unprofitability of open-pit mining. The event marked, rather, a planned obsolescence that the companies enacted out of the sight of the public.

ARCO and Montana Resources intentionally obscured the flooding of the mines. Leech writes that there was no comment period for the public to weigh in on the decision, as consistent with EPA and Montana state regulations. Even city officials learned of the shut-down one day after the corporate decision, leaving no space for even the slightest semblance of democratic involvement. Former Montana Resources president Frank Gardner stated in a 2014 interview with Rayelynn Connolle of the Clark Fork Watershed Education Program that it was ARCO's executive decision to shut off the pumps. Both companies worked closely to assess the potential damage and contracted geological engineers as advisors (Gardner 2014). Both companies were aware of the

fact that neither party possessed the technological means to treat the quantity of contaminated water that would eventually flood into the pit, and both companies knew that there was limited time before the water level in the pit rose to a critical threshold, threatening to spill into the watershed.

Turning off the pumps was a leap into the dark, but the companies defended their decision fiercely. ARCO claimed that it was expensive to follow environmental regulations, to bargain with unions, and to constantly run the pumps—it cost $10 million per year to keep the underground mineshafts dry (Leech 2019, 313). However, the consequences of flooding, in addition to more extensive damage across the Silver Bow Creek/Butte Area Superfund Site, have required ARCO to spend $1.4 billion and counting. ARCO, attempting to clean its hands of the unprofitable mining industry, listed the Berkeley Pit and the adjacent land for sale with a purchase deadline of 1985. The trading price of copper had fallen from $1.25 in 1980 to $0.60 in 1985, according to Gardener, and it was at the final hour prior to abandonment that billionaire Dennis Washington finalized his risky investment in Montana Resources, the rapidly-flooding mine, and the adjacent land. At the Continental Pit, Montana Resources has projected that the extraction of molybdenum and copper will remain economically viable for 30 to 35 more years.

The intentional flooding of the tunnels solved several geophysical threats that plagued Montana Resources and ARCO at the time.[19] Aside from the economic rationale, there was also the fact that the underground tunnels were propped up by timber supports beginning to rot. Collapse of the tunnels meant further subsidence and sinkholes for aboveground properties in Butte. Another element in the decision, which was not explained to the public at the time, was the argument that the residual minerals would no longer oxidize when submerged in water. Though

[19] My understanding of the planned obsolescence of the mines comes from Connolle's interview with Frank Gardner and Leech's *The City That Ate Itself*.

the water, mixed with residual minerals, would be highly acidic and fatal to life, the treatment of the water over time would render the pH of the water decreasingly acidic. Profit was not the sole motive, but in terms of *efficient* solutions for ARCO to phase out of mining in Butte, allowing the tunnels to flood was the cheapest, fastest, and easiest mode of planned obsolescence. Though there may have been other potential solutions to provide ground support and address mineral oxidation, the sudden decision on the part of the two companies intentionally left the community and local elected officials in the dark until it was too late to propose alternatives (Leech 2019).

Figure 17: "Yankee Doodle tailings pond, Butte Area Superfund site, Butte, Montana, 1986" by David T. Hanson, 2016. Courtesy of the photographer and Taverner Press.

Prior to the commencement of operations at the Horseshoe Bend Water Treatment Plant, the companies relied on blind faith in technological advancements with which to treat the pit water, which was expected to rise at a faster rate than they could pump it to the tailings pond, a massive earthen dam that is still in use by Montana Resources (Figure 17). At the Yankee Doodle Tailings Pond, gravity does most of the work to separate hard minerals from the water, while magnesium chloride sprayers keep the mineral dust from dispersing aerially. The current treatment of the pit

water requires that water be treated through a process of reverse osmosis and the mineral sludge be redisposed of in the Berkeley Pit. The pH of the pit water continues to decrease as a result of alkaline sludge that Montana Resources also dumps into the pit. Water that undergoes treatment is either reused in current mining operations or travels to the polisher for further treatment before release in Silver Bow Creek.

While visitors and media frequently refer to the water as "toxic" waste, I must note that it is alluvial and bedrock groundwater that flows into the tunnels. The water is not inherently toxic but *becomes* toxic upon combining with the oxidized, residual minerals in the wake of extraction. I therefore perceive the distinction between natural and technological disaster in relation to the flooding of the Berkeley Pit as a blurry one. In *Signs of Danger: Waste, Trauma, and Nuclear Threat,* Peter Van Wyck writes that the distinction between natural and technological accident, in the case of nuclear systems failure, is less important than the fact that failure is not merely environmental but occurs systemically, on the level of the assemblage:

> The obviousness of the difference between a flood and an oil spill is only supported by the superficial opposition that the two terms impose. Considered from an assemblage level, the flood may well be as much technological as the spill is natural. And in any case, we could say that both would be considered 'normal'…The normal accident is inscribed into the design of technological endeavors. (1130)

Flood, at the Berkeley Pit, is both natural and technological, but the *origin* of the threat that the flood imposes to the more-than-human ecosystem is systemic. Here, a semiotic differentiation of the event emerges. For some, the flood represents failure, toxicity, and threat. For others, the event represents necessity, efficiency, and solution to a threat.

Though the movement of nuclear waste functions in a way that is materially unique, distinctive from the movement of mineral waste, the understanding of systemic failure that unfolds across multiple scalar and temporal axes applies to both the nuclear meltdown and the flooding of the pit. Nuclear waste, Van Wyck describes, does not conform to mere containment nor dispersal,

but some combination of both processes. The industrial system attempts to control movements of waste, often employing a "waste in place" strategy, in the case of underground nuclear storage facility of Three Mile Island. In regards to this instance of industrial failure—in which nuclear waste escaped containment and dispersed, resulting in both real threat and virtual threat—Van Wyck concludes that "the accident itself is always a part of our time, our progress. The accident is not accidental; it has become a 'paradox of necessity'…the accident is part of the endeavor" (Van Wyck 2004, 1129). Though the flooding of the Berkeley Pit does not embody this conception of "accident" in the same manner as the Three Mile Island nuclear meltdown, the event represents a parallel instance of failure that is inscribed into the design of the industrial assemblage. For the stakeholders who decided to shut off the pumps, the failure was paradoxically a success insofar as the event represented a *solution* to a different kind of threat, although it spurred many others. The failures, in both cases, function as material consequences of "progress" in the wake of resource extraction, which always involves reckoning with movements of waste. The "accident" is kept at bay and is mediated in public representation by the same hands that created the potential for accident. Though it has not yet played out on the most disastrous possible scale, the accident remains part of the endeavor.

Figure 18: Pumps Releasing Pit Water into the Tailings Pond, September 2022. Author's photo.
Figure 19: The Polisher, September 2022. Author's photo.

Like nuclear waste, the water in the Berkeley Pit undergoes simultaneous processes of containment and dispersal. I must note, also, that the pit additionally functions as a space to contain mineral tailings which, historically, were subject to dispersal in Silver Bow Creek. This movement of waste, distinctive from the flood, renders the pit a sort of landfill for liquid tailings, which are then processed along with the rising groundwater. As I toured the Montana Resources facilities, I saw a truck hauling the Parrot Tailings from their former burial site to their new site of containment (and dispersal) in the Berkeley Pit. The water level rises and requires maintenance in perpetuity so that the water level does not rise above the protective threshold. In this unique case of engineered flood, containment of the threat necessitates dispersal. Acidic water which rises within the pit is pumped to the tailings pond, where gravity works to separate water from minerals (Figure 18). Water flows to the deepest point of the tailings pond, at which point it is pumped back down to the Horseshoe Bend Water Treatment Plant for reuse or polishing (Figure 19). The water undergoes a transformation from contaminated liquid to valuable resource for current mining operations. As I examine the treatment of the water on a systemic level, I observe that these movements render the material flow of waste and water subjective to capitalist value systems. Because Montana Resources reuses water formerly appraised as contaminated, the company can factually claim that they practice circular forms of mining—a claim which feeds into their less factually-accurate public image as environmental stewards.

The threat of the rising water is virtual as much as it is real. The virtual threats, however, are largely mediated by corporately-funded public information campaigns. Leech writes that in 1994, the year that the Superfund Record of Decision ossified, the federal-corporate partnership limited public participation through the filtering of information about the flooding and treatment of water. The Berkeley Pit Education Committee established “Pit Watch” to update the community

and provide answers to frequently asked questions. The information campaign remains uncritical, however, of federal-corporate procedures. On the PitWatch website, sponsored by the partially-responsible parties as a requirement of the 2002 Superfund consent decree, the public can access basic information about the protective water level, the Superfund decision, the monitoring of the Mine Flooding Operable Unit, and the treatment of the water. Bar graphs model the rise of pit water over the years, comparing the measurements to the "protective water level" at 5410 feet above sea level. The water level plateaued at 5356 feet in 2019, when Montana Resources implemented the Berkeley Pit Pilot Project to pump and treat water at the same rate that water flows into the pit. What the graphs model is an empirical representation of accident prevention by the same partially-responsible parties who created the potential for accident. Mediating the virtual threat, for the companies, also seeks to conceal the very real threats which have actualized as a consequence of open-pit mining and flooding.

A well-known tale in Butte is that of the snow geese. In 1995, over three hundred migrating snow geese landed in the nest of the Berkeley Pit to rest their wings. There, the birds, parched and weary, took their final drink of water. After the lake was dragged to retrieve their avian bodies, autopsy revealed that the water had poisoned the birds—a slow and painful mass death by acute toxicity. The Butte community mourned the birds through a traditional Irish Wake, complete with bagpipes and a mourning song. The death of the birds attracted the eye of the media, and in turn, brought increased environmentalist attention to Butte, the Berkeley Pit, and the Superfund Site.[20] In a new materialist analysis of the event, historian Timothy LeCain writes that for many, "the beautiful white snow geese seemed an apt symbol of a pure and unsullied nature done in by the

[20] The number of articles about the Berkeley Pit surged in 1995, following the snow geese encounter. Among the most notable pieces published were "As the Snake Did Away with the Geese" in *Outside Magazine* and "1995: Did toxic stew cook the goose?" in *High Country News*.

corrupting artifice of human kind" (LeCain 2013, 17-8). The mainstream environmentalist view accordingly imagines the event as a collision between binary categories of "Man" and "Nature." As he critiques this anthropocentric dualism, LeCain argues that the projection of the snow geese as symbols of environmental purity renders the birds hollow, didactic signifiers within a reductionist story of "human" moral dereliction. The Berkeley Pit and its flooding, indeed, defies binary conceptions of the natural, the cultural, and the technical.

The open-pit landscape lives in geographic imaginaries as a contested space. Leech identifies the Berkeley Pit as an icon whose symbolic meaning varies for the companies, locals, and outsiders:

> The Berkeley Pit first functioned as an icon of industrial power and technological sublimity, then it became a symbol of corporate villainy. To journalists and newcomers in the 1970s and 1980s, the Berkeley Pit made Butte a pariah, representative of everything that was wrong with the extractive Old West, including environmental devastation and inevitable deindustrialization. Residents alternately saw it as a savior and an enemy, or, as its intrusive nature became normalized, an expanding organism outside of human control. City planners became convinced of the inevitability of the pit's continued growth, no matter what the company that controlled it said. The open pit exposed the often-ugly reality of mass industrial work, making it visible to the public. (9)

While the pit as a "place-image"—to apply the term from sociologist Rob Shields—signifies multiple meanings, hypervisibility is one of its defining characteristics. Underground mining remains relatively impossible for visitors to fathom, and thus, the earlier mining history is subject to facile romanticization in public, geographic imaginaries. Open-pit mining, however, represents a more "modern" form of ruin to visitors that is not as easily commodified through romance but through evocation of a toxic, industrial sublime. To visitors concerned with the ecological consequences of mass extraction, the pit becomes a place-image that signifies impermanence, disaster, and toxicity. To visitors with more reverence than disdain for industrial power, the pit as place-image signifies necessary industrial expansion and its inevitable cost.

Figure 20: SELFIE SPOT, July 2022. Author's photo.
Figure 21: Berkeley Pit Viewing Stand, July 2022. Author's photo.

Barry writes in "Toxic Tourism" that Butte has successfully constructed a narrative for visitors that directs the tourist gaze to the "polluted crater" at the center of the heritage tourism corridor, therein ensuring that "the tourist gaze rarely looks deeper than the water's surface" (66). The Berkeley Pit Viewing Stand functions as a moralized space in which the tourist might learn about industry and its costs—however, the lessons the interpretive space presents are overwhelmingly superficial. Barry argues that the pit, as a tourist attraction, goes so far as to make "environmental destruction comfortable for tourists" (Barry 2012, 67). The disaster that the pit as a place-image represents is paradoxically sensationalized yet minimized through the very façade of toxicity itself.

Photography plays a key role in imag(in)ing and reproducing the pit as toxic spectacle. Visitors immersed within the template of experience at the Berkeley Pit consistently stand at a precise vantage point at which to snap a picture (Figures 20 and 21). The same image may therefore be reproduced over and over again. I emphasize, here, that the visitor is not merely a detached observer of an objective history but rather acts as a participant within the postindustrial landscape,

even fueling the reproduction of spectacle. Some visual theorists have described the photographic reproduction of disaster as sensationalist "ruin porn," a genre made popular by photographers of a deindustrialized Detroit, including Andrew Moore, Camilo José Vergara, Yves Marchand, and Romain Meffre. In *Empire of Ruins: American Culture, Photography, and the Spectacle of Destruction,* art historian Miles Orvell conducts a comparative analysis of "ruin porn" in Detroit, concluding that Moore, Marchand, and Meffre demonstrate an aesthetic fascination with decay, and ignore, for the most part, the ongoing social harms of racial capitalism in Detroit. Orvell is least critical of Vergara, whose practice visualizes urban decay over the span of decades.

The aesthetic tradition of contemporary ruins photography emerged from Romanticist paintings of classical ruins. The photographic genre evokes elements of loss, destruction, and ruin present in the landscape paintings of Caspar David Friedrich and Thomas Cole, as Orvell notes. Orvell critiques ruins photography for letting images of ruins speak for themselves, void of context, and only occasionally addresses the human consequences of urban entropy—thus, the genre sensationalizes decay and normalizes the consequences of industrial capitalism. A more critical approach to interpreting images of ruins must go beyond the fetishized aestheticization of disaster and seek to recognize the "social history of urban change and the mortality of capitalism, the cause of the disease the photographer is clinically documenting" (Orvell 2021, 89). In the case of Detroit, Orvell argues, photographic representations of ruins symbolize not *failed* capitalism but *successful* capitalism, regardless of the cost to the community.

The dualisms of progress/ruin and success/failure in ruins photography blur, however, upon recognition of these binaries as fundamentally unstable. Just as people differently perceive the flooding of the Berkeley Pit as a solution or a disaster, photographs can only ever be subjective as they represent the so-called ruins. Due to the void of critical information regarding social and

political consequences of open-pit expansion, the practice of mass reproducing the Berkeley Pit through photography fails to do little more than aestheticize disaster. The formal and ideological compositions of ruins photography summon a Romanticist zeitgeist and naturalize the violence of open-pit extraction. Without a critical understanding of social and urban transformation in Butte, popular photographs of the open-pit landscape embody the extractive view in spectacularizing and normalizing spatial reorganizations of capital.

Admittedly, the Berkeley Pit inspires a visual and affective awe. Various scholars have noted experiences of the transcendental sublime and the American technological sublime for visitors of the Berkeley Pit (Barry 2012; Leech 2019). The aesthetic notion of the sublime originated from Burke's and Kant's Enlightenment-era conceptions of mental transcendence in response to awe- and terror-inspiring phenomena in "Nature." Visions of the sublime underlie popular landscape photography of unpeopled wilderness, and they form the basis with which to spectacularize decay in ruins photography. Orvell identifies the sublime in Cold War images of the mushroom cloud and in Edward Burtynsky's aerial landscapes of an industrially-devastated planet. The aesthetic experience of the sublime at the Berkeley Pit—enabled by a photographic composition which gazes down at the landscape from above, and by the spatial design of the viewing stand at the edge of the abyss—is easily commodified and reproduced. Critics of the pit as a tourist destination dismiss the attraction as toxic spectacle, perhaps a fair claim considering the void of critical context in the stand's interpretive signage.

I tie in a visual culture analysis of spectacle because the interpretive experience of the Berkeley Pit is mediated by images in tandem with state- and corporate-sponsored narratives. The pit as a polysemic place-image, unstable in its referential meaning, is more than the geophysical and technical sum of its parts. The open-pit landscape that lives within geographic imaginaries

shapes and is shaped by dominant narratives and extractive visual cultures. The narratives, be they of economic necessity, passivity, or sullied environmental purity, conceal the real socioecological and sociopolitical costs of open-pit mining. To critically understand the violence of extraction requires imagining the invisible, the intentionally-obscured, and the marginalized that lie under the surface of the spectacularized and the hypervisible. In all of Butte, there is so much more than what meets the eye.

Chapter Four: Adaptive Garden

We must temper our romantic notion of untrammeled wilderness and find room next to it for the more nuanced notion of a global, half-wild rambunctious garden, tended by us.

– Emma Marris in *Rambunctious Garden: Saving Nature in a Post-Wild World* (2013)

Figure 22: "Silver Bow Creek polluted by mine waste, 1985," David T. Hanson. Courtesy of the photographer and Taverner Press, 2016.

Not far from the Butte Chamber of Commerce, near the intersection of Montana Street and Silver Bow Creek, I pulled into the gravel lot by the "Greenway Demonstration." The four-acre park functions as a larger-than-life diorama of three distinctive ecological zones. Within the small space of the park, a path winds through a "natural" riparian habitat, a wetland habitat, and an upland habitat. Before it was a park, the space knew only sewage, municipal waste, and industrial

tailings, for Butte used Silver Bow Creek as the "open sewer" for its "open veins" (Figure 22). The Greenway, a trail system that stretches from the Chamber of Commerce to Warm Springs Ponds in Opportunity, Montana, joined the larger Copperway Heritage Park in 1998, the same year the Alice Dump was reconfigured into Knob Hill Park.

Over the years, industrial mineral tailings contaminated the creek, rendering the water toxic to aquatic, terrestrial, and avian creatures, livestock, farmers, fishermen, railroad workers, and residents. Acid mineral sediments accumulated along Silver Bow Creek, decimating the growth of riparian plants and contributing to the erosion of the bank, which led to further acid mineralization of the creek bed. Tailings that had dried along the creek could aerially disperse into adjacent residential, agricultural, and recreational zones. The riparian zone, no surprise, was all but uninhabitable.

The headwaters of Silver Bow Creek, to the immediate west of the Continental Divide, no longer exist. Expansion of the open pit carved away the source. Now, the water that runs through the channel comes from Blacktail Creek and Horseshoe Bend Water Treatment Plant. Silver Bow Creek is a tributary to the Clark Fork River, which feeds into the Columbia River before its waters meet the Pacific Ocean. The Clark Fork Superfund Mega Site extends 126 miles from Butte to Milltown Dam, east of Missoula. Community sentiments regarding the Superfund cleanup, like those regarding historic preservation, were highly charged. Superfund status meant coming to terms with the extent of ecological damage from a century of mining, or at the least, finding the most efficient solution to addressing the damage. 300 million cubic yards of streamside tailings had accumulated in the Clark Fork Watershed by the time the EPA conducted its Remedial Investigation and Feasibility Study (RI/FS) in 1995, and the process of selecting a mitigation

approach brought out conflicting opinions regarding remediation, restoration, economics, land use, and community involvement.

As local environmentalists sought to remove all tailings and revegetate the Clark Fork River, the question about what a "natural" state might look like had no determinate answer. In *Opportunity, Montana,* Brad Tyer writes that the Clark Fork has been "many different rivers over the course of geologic time" (Tyer 2013, 85). The contours of the valley formed tens of millions of years ago during the Eocene, and since, the valley has repeatedly dried and flooded as Glacial Lake Missoula filled and emptied. A consideration of deep time reveals millions of years of change and cycles in the geophysical landscape. The Salish place-name for the confluence of the Blackfoot and Clark Fork Rivers is Naayeêstm, "place of bull trout." The confluence of the two rivers was the eventual site of Milltown Dam, built in 1908 to trap mineral tailings that originated from Butte's mines, more than one hundred miles upstream. Over a century of copper mining, Tyer explains, have fundamentally shaped the watershed:

> If prehistoric torrents and ice ages and glacial floods defined the Clark Fork for millions of years, the digging of copper has defined it for the last two centuries and continues to define it. Of the many rivers the Clark Fork has been, the one that William A. Clark dammed in 1908 was the first fully bent to human intention. The one that's being restored now is the first to be truly human-built. (86)

The reshaped Clark Fork River, in the wake of extraction, exists as a sort of cyborg—engineered as much as it is "natural." In the current context of the Anthropocene, in which extractivist projects have materially rippled through the fabric of geologic space-time, the landscapes which some perceive as "untouched" are never truly pure. At its core, wilderness is an imagined space.[21] The

[21] Environmental historian William Cronon writes that wilderness is a profoundly social fabrication and that the movement to create national parks in the United States entrenched the settler mythology of the frontier. For such a grand illusion to be fabricated, Cronon attributes the settler colonial severing of tribes from their homelands "with the result that tourists could safely enjoy the illusion that they were seeing their nation in its pristine, original state, in the new morning of God's own creation…Meanwhile, its original inhabitants were kept out by dint of force, their earlier uses of the land redefined as inappropriate or even illegal" (Cronon 1996, 79).

restoration of Silver Bow Creek and the Clark Fork River could only ever emulate an imagined state of ecological purity and pristineness.

ARCO officials, however, proposed that the tailings remain in Silver Bow Creek where they would be treated *in-situ* using alkaline lime, in accordance with Streamside Tailings and Revegetation Technology Studies (STARS) methods. STARS had been recently developed as a cost-cutting measure for remediated mining sites in the region, and several local environmentalist activists expressed concerns regarding the effectiveness of the method. Sandra Stash, manager of ARCO's Montana operations responded in the *Montana Standard* to the proposal to move 1.8 million cubic yards of streamside tailings to a containment facility that, "We think it's crazy to even suggest moving this material 26 miles…Nobody's going to get arsenic contamination, but they might well get hit by a truck…You're asking for a much bigger problem than any of these Superfund sites are ever going to cause" (Rutland 1995). This rhetoric of comparative hazard was a negligent and downright dangerous claim, considering the past and present reality of arsenic exposure—the EPA had determined in the Remedial Investigation and Feasibility Study that arsenic levels in the creek were unacceptable for human health and the environment, based on EPA regulatory standards from the Clean Water Act of 1972.

ARCO knew very well of the many hazards that acid mineral contamination posed, evident in their decision to purchase all of the riparian land along Silver Bow Creek in order to reduce corporate liability through privatization and containment of the buffer zone. In short, ARCO planned to treat mining waste through a form of containment which would silo the body of water from human communities and otherwise "pristine" areas—an impossible feat because creeks are porous bodies that live within extensive ecological networks, shift across the floodplain, and

fluctuate in accordance with the hydrologic cycle. Through the attempt to contain what can never be contained, ARCO mistakenly sought technological mastery over ecological processes.

Jim Ford of the Montana Department of Health and Environmental Sciences, what is now the Department of Environmental Quality, stated in the same *Montana Standard* article that the treatment of mineral tailings with lime would fail due to stream migration across the floodplain, effectively separating heavy metals from lime used to treat the tailings in place. The state and the EPA recommended the greatest possible removal of the tailings, to be relocated to upland containment facilities. The 1995 Streamside Tailings Record of Decision (ROD) models seven potential alternatives to remediation, ranging from inaction to treatment of the tailings *in-situ* to total removal. Community members mostly sided with the state and federal government in voting for Alternative 6, which proposed the removal of most tailings and the containment of the remainder using STARS methods. In the ROD, the EPA documents the community sentiment that "the 100-year floodplain was an unsafe place to store tailings and that STARS technology long-term effectiveness was extremely questionable" (EPA 1995, 72). ARCO, who as the responsible party paying for remediation, "vehemently objected to certain cost elements of the proposed Alternative 6," successfully convinced the EPA to compromise state and public preferences. The final, EPA-approved plan—Alternative 5—opted for a greater percentage of *in-situ* containment, as opposed to removal, to minimize costs.

None of the remediation occurred without community struggle and public-private agreements which were often settled behind closed doors. Correspondence records between the County Attorney Robert M. McCarthy and Chairman of the Butte Silver-Bow Planning Department Steve Donaldson revealed that three meetings hosted by the city-county government regarding the mitigation of streamside tailings were held in the dark and without sanction of

representative government—in direct violation of the Montana Open Meeting Law (Butte-Silver Bow Planning Department n.d.). The meetings included private corporations including ARCO and Montana Economic Revitalization and Development Institute (MERDI) of *Project Green*, two parties who worked closely to determine land use of the riparian zones, discuss waste management strategies, and propose economical solutions. Two community organizations, Citizens for Labor and Environmental Justice and Citizens' Technical Environmental Committee (CTEC), played a key role in exposing the three meetings to the public.

CTEC was additionally concerned that *Project Green*, the initial inspiration for the Greenway, was more concerned with aesthetics and profitability than with long-term human and ecological health. In the newsletter article, "Is the Greenway Plan Pitting Permanence vs. Prettiness?" CTEC attempts to raise public awareness for the fact that restoration with a focus on aesthetic beauty does not ensure measures to protect ecological health (Citizens' Technical Environmental Committee 1995). While ARCO sought the cheapest possible remedy, MERDI envisioned the formation of a privately-owned recreational corridor as a win-win design solution to "accommodate urban dwellers anxious to spend time in a rural landscape" and "provide positive adaptations to environmental stress affecting the land for people to enjoy outdoor escapism" (Butte-Silver Bow Planning Department n.d.). The concept for *Project Green* proposed the planting of "aesthetically pleasing" trees and shrubs that are "often observed in the natural settings of Montana." MERDI does not propose the use of any specific plant species beyond the suggestion that the plants are "native" to Montana. The trail that would follow Silver Bow Creek from Butte to Opportunity would accommodate pedestrians, picknickers, cyclists, and equestrians. The plan, which mentions neither mineral tailings contamination nor Superfund remediation, hinges entirely on superficial "natural" aesthetics. The proposed "oasis" embodies a desire for "pristine" and

"pure" landscapes of the preservationist imagination. *Project Green* additionally conforms to a capitalist vision of remediation—one that builds on existing infrastructures as it maintains private ownership over land and water.

It is important to differentiate between cleanup and purity, and to observe where these environmental rhetorics are at play in and near Butte. Max Liboiron and Josh Lepawsky write in *Discard Studies* that the ethics of cleanup are "based in separation," while those of purity are "based in annihilation" (Liboiron and Lepawsky 2022, 27). The federal-corporate Superfund cleanup embodies the former category, as the strategies for the Mine Flooding OU and the Streamside Tailings OU seek to achieve some combination of removal and containment of mineral tailings, which may "waste in place" at sites that the organizations determine wastable. STARS methods to cap mineral tailings in the soil with limestone and "clean dirt" exists, too, as a form of separation-based cleanup. The limestone functions as a barrier, even as tailings remain buried underground. Though the rhetoric of cleanup is complicated by the fact that mining waste constantly cycles through processes of containment and dispersal, the separation of contaminants is the *intent*—not necessarily the *reality*—of the Superfund cleanup.

Purity, unlike cleanup, seeks to annihilate, to make pristine, and to achieve an imagined pre-colonial or pre-human baseline. Purity is the logic that motivates some environmentalists to want to rip out every plant they deem "non-native" or "invasive," even as these categories, based in subjective value systems, are unstable and constantly-evolving. Mineral tailings and the damage they have caused can never fully be reversed or reverted to a state resemblant of past ecological conditions. The environmentalist quest for ecological purity, though it may be well-intentioned, is deeply misguided. There is an additional paradox, Emma Marris describes, in the fact that the ecosystems which appear the most "native" and "pristine" are also the most heavily managed. One

problem with the notion of a pristine wilderness, according to Marris, is that "if we define wild as 'unmanaged,' then the ecosystems that look the most pristine are perhaps the least likely to be truly wild" (Marris 2013, 12). In the succinct words of Alexis Shotwell, to be against purity does not mean to be for pollution.[22] A state of purity is entirely imagined, but the goal of purity has had material consequences in shaping restoration efforts.

Figure 23: Norm DeNeal by the Compost Pile in the Aspen Grove, September 2022. Author's photo.

Up the hill from the creek is an aspen grove maintained by Norm DeNeal (Figure 23). When I met DeNeal at the grove in late summer, the milkweed pods were still firm and the quaking aspen leaves were still green. The air was an ashen grey from nearby wildfires, though, and the grass that was a vibrant green when I visited in July was now a straw yellow-brown. The six-acre

[22] Alexis Shotwell writes that "to be against purity is, again, not to be for pollution, harm, sickness, or premature death. It is to be against the rhetorical or conceptual attempt to delineate and delimit the world into something separable, disentangled, and homogenous" (Shotwell 2016, 15).

grove, adjacent to the BA&P Hill Trail and the Steward Mine, stands as a recent remediation project that differs vastly from the Superfund approach on the other side of the deer fence. For the last decade, urban gardener, philosopher, and former miner Norm DeNeal has lovingly tended to land that was granted to him one acre at a time with funding from the Natural Resources Defense Council and the city-county.[23] I met Norm by the first grove at ten o'clock on the dot. *Boy*, he told me as I approached, *I could wind a clock by you*. We shook hands and began our conversation on the history of the land under our feet. Sntapqey, the Butte area, is Salish ancestral homeland. In 1855, around the same time mineral prospecting began in the area, the Hellgate Treaty labeled the land part of the Common Hunting Ground before the tribes were forcibly removed to the Jocko Valley, site of the current Flathead Reservation.

These acres, Norm told me, were also part of Dublin Gulch, where the poorest of the Irish immigrants lived and worked. Norm referred fondly to Marcus Daly, who founded the Anaconda Company, and, an Irishman himself, promised jobs to thousands of Irish immigrants in the context of the widespread ethnic exclusion of the Irish. Norm pointed out a yellow house across the street that was once a hub for activists invested in the Irish Independence Movement. Many of the homes around here have since been razed as a waste dump amassed between houses, and later, as the Berkeley Pit expanded. Norm described that the former neighborhood here closely resembled that of Walkerville, further north. Houses cropped up around the mines, unlike with the planned grid of the mid-century Suburban Flats to the south of Butte. In former Corktown, there were many more pines and aspens throughout, but Norm told me that all the trees were cleared within a decade. Homes, decades later, followed the trees. Still, traces of the past remain in the aspen grove.

[23] The NRDC approved $272,500 for the grove as of 2016, according to Susan Dunlap in *The Spokesman-Review*. The city-county of Butte-Silver Bow additionally allocated $33,500 for water (Dunlap 2016).

Later in our conversation, Norm described an area in the grove where the dirt is particularly shallow. There, he once dug about six inches down and hit a sidewalk—Wyoming Alley. In the sixth acre, the grove Norm planted most recently, the soil is deep and rich with nutrients. Norm attributes the relatively healthy soil conditions to the fact that there used to be a backyard garden in the spot. The aspens in the sixth grove are noticeably taller than those in the first five groves. Norm told me that "plants don't lie. They tell you the truth, all the time. If there's good soil, they'll express themselves." Throughout the six acres, the soil conditions vary. Up the hill, there is no soil but only "dirt" that has yet to become soil—a process of becoming that requires many cycles of leaf and root decomposition. Norm has introduced a half-and-half mix of "clean dirt" and compost, particularly in the zones where he grows native plants—clarkia, bitterroot, rubber rabbitbrush, sage, milkweed, coneflowers, wild rose, currant, and more (Figures 24, 25, and 26). Like the hillside on the other side of the fence, a layer of lime separates the dirt from the toxins below. The process of using limestone as a barrier, "capping," is widely used in the Superfund remediation of abandoned mining properties and waste dumps.

Figure 24: Milkweed in the Aspen Grove, September 2022. Author's photo.
Figure 25: Coneflowers in the Aspen Grove, September 2022. Author's photo.

In the first grove, Norm stopped to admire a mushroom in the middle of the grassy path. I realized that after weeks of walking around the Butte hill, I had yet to see one until that moment. Norm told me that fungi "add enormous fertility to the soil, and act as a conduit to move nutrients from one area to another…It's like the electrical grid, you know? You really want these things. It's a sign that things are working right." Thanks to the mycelium and their mycorrhizal network, the aspens are able to share nutrients with one another. The plants thrive, Norm told me, as a community. He admonishes the fact that some organizations only symbolically implement "native plant programs" without a consideration for species that thrive in relation to one another.

When I visited Butte two months prior to my conversation with Norm, the aspen grove stuck out—the young trees seemed out of place on the hillside otherwise void of most trees, with the exception of a handful of lone pines and aspens. I remembered the few aspens I had seen growing above the Alice Pit and perched above the rocky rim of the Continental Pit. I asked Norm why he chose to plant aspens, as opposed to any other tree.

Not only are aspens native to the area, he responded, but they are resilient to climate change, drought, and acid mineral contamination. Norm and his team initially tried to grow many species of the genus *Populus*—birch, willow, cottonwood, and aspen—but all species except for the aspen failed to survive the blighted soil conditions. "Aspens," Norm told me, "are trees of the future…they send their roots down into the soil, into the dirt, and if they get close to toxins, the roots don't continue to go down—they recognize the toxins and grow horizontally. They find their way around…we've lost less than one percent of our aspen, and it wasn't because of the soil but usually predation." The reason why the ten-foot-tall fence surrounds the grove, Norm elaborated, is because deer like to snack on the sweet leaves of the young trees. The aspen root system is adventitious, meaning that the mother tree—the ortet—can asexually reproduce by sending out

suckers, often very close to the surface. These clones, also called ramets, share identical genes, and what looks like hundreds of separate aspen trees can actually be part of one larger organism.[24] While the lifespan of individual aspen trees rarely surpasses one hundred and fifty, a larger aspen grove can live for millennia through propagation.

Norm is less concerned with native restoration than he is with creating a system that can sustain itself in community, resilient to contamination and drought without the use of pesticides. I asked him, in the beginning of our conversation, whether his approach to gardening is restorative or adaptive. He rejected the binary altogether:

> This is obviously, obviously a manipulated landscape…First of all, I don't see conflict…Here, you're standing on urban ground. I think urban ground has to be done differently than revegetating a forest after a fire…since we're in an urban setting, it's appropriate to do something that's not totally natural. I want this to be a park, you know?

It's not native restoration, Norm told me, but that's beside the point. While he does strategically plant native species, he does so with the goal of enabling a robust, multispecies ecosystem of trees, plants, fungi, animals, gardeners, and visitors. Ideally, for Norm, the grove would be a place for visitors to enjoy the beauty of the garden and learn a more nuanced history of Butte. Norm and I agreed that it's a shame that Butte capitalizes on its mining history while largely omitting historical ethnic, race, gender, and labor relations. Norm imagines that the garden could be a place to tell a story about Butte that transcends the usual romanticized and spectacularized tales about mining—though he, like many in Butte, was an underground miner as a young man.

Norm imagines masonry where the current grassy path winds unevenly through the trees. He would prefer to remove the grass—sheep fescue, a grazing crop native to Eurasia. Norm considers the grass a nuisance because it can choke out other species he attempts to cultivate. It is

[24] The largest such aspen, Pando, is located in what is now called Utah. Pando, weighing six thousand tons, is one of the most ancient living organisms at several thousand years old. It is threatened, however, due to the suppression of forest fires (which have increased competition between species), the killing of predators who keep grazing populations such as deer in check, and drought.

the same monocultural grass that blankets the remediated hillside. Sheep fescue, common to Superfund Sites across the country, is resilient to drought and acid mineral contamination. The grass grows in dense clumps and is relatively easy to maintain. Maintenance workers routinely spray the hillside with pesticides, Norm explained, without discerning one plant from another. The fescue thrives, while the biodiversity of plants, fungi, and insect species are killed off. Norm follows a much different procedure for managing unwanted species. He told me that he does spray every once in a while—selectively, with mild herbicides, and in the fall, when the herbicide least impacts flowering pollinators. Norm emphasized the importance of identifying the plants before deciding how to manage unwanted growth. He pointed out a clump of sheep fescue growing against an aspen and told me that he refused to spray that patch because he doesn't want to hit the tree. There, he would prefer to dig the grass out by hand.

He has trouble, especially on the northern edge of the grove, keeping the grass away from the grove's border. A brick-and-mortar path would provide another barrier between the sheep fescue, the aspens, and the strip of plants between them. Norm told me that the garden could be so much more than its current state, but he's up against a lack of funding and strict zoning regulations which prevent him from making the aspen grove a public park. He additionally faces skepticism from some community members regarding what one person can do as a viable alternative to the federal-corporate cleanup. The limitations, however, have yet to deter Norm from his stewardship and his goal of shaping a space that is beautiful, ecologically-sound, community-oriented, historically-nuanced, and mostly self-sustaining. Norm was granted only eight years to establish a thriving ecosystem on just one acre, but the project has blossomed—spatially, temporally, and ecologically—into so much more.

Norm was modest when I told him that the grove is an incredible project. He sees what it could be. I could tell, though, how deeply he cares for the space and the plants in their present states. The grove stands out to me as it embodies an ethos of reciprocity, as opposed to efficiency. While Norm works within many limitations—including assumptions about what is possible with an ecologically-devastated plot of land in the wake of a century of mining and questionable Superfund remediation practices—his approach to remediation demonstrates that another way is possible, outside the capitalist, bureaucratic logic of disaster mitigation. Superfund Sites are notoriously underfunded—so is the aspen grove. The responsible parties of the Superfund remediation employ the most cost-effective and time-efficient means to mitigate ecological harm, but their solutions suffer from a lack of imagination and a failure to recognize reciprocal relationships between species. Responsibility without ethics renders the Superfund remediation effort mere begrudged obligation—a consent decree that the parties must legally fulfill. For Norm, though, the remediation effort is a labor of love against all odds. It stands as an emergent alternative to the federal-corporate management of waste.

Figure 26: Bucket with Holes to Water Rabbit Rubberbrush, September 2022. Author's photo.

The grove is not, per se, efficient like the Superfund cleanup on the majority of the hillside. It marks a slower form of remediation, even as Norm works within temporal and material constraints. I find it relevant to further examine the neoliberal logic of *efficiency* that underlies the federal-corporate mitigation standards. It is the same logic that determines the proximity of the waste dump to the mine. Non-ore rock is rarely transported far from the site of extraction, because it is time, labor, and energy-intensive to haul the "waste" any further than necessary. Capital is thus the root factor in determining what is efficient, and in part, how waste flows. Liboiron and Lepawsky similarly note that efficiency preserves power dynamics insofar as it facilitates the production of commodities:

> Mere gains in efficient use of matter and energy cannot mitigate the tonnage, toxicity, heterogeneity, and harms of contemporary waste. In fact, efficiency tends to enhance rather than alleviate demand for resources since gains in efficiency cheapen the production of end commodities…Nor does efficiency lead to justice. In fact, efficiency can use and discard labor at grander scales than other modes of production. (29)

As cleanup becomes more "efficient" for the responsible parties, it makes the extractive effort more profitable than before. Colonial capitalism renders regions of extraction "wastable" because federal-corporate actors decide what, who, and where can be wasted.[25] As the efficiency of production, discard, and cleanup increases, the companies are better positioned to expand the uneven geophysical scales of their operations. Efficiency enables the economic myth of endless growth, further entrenching a colonial capitalist rhetoric that the planet and its people are infinitely exploitable. An approach to remediation that pushes back against the neoliberal logic of efficiency is one, like the aspen grove, that takes time and care.

Additionally, the grove defies conventional narratives of conservation, including that of ecological purity. Aspens can thrive despite acid mineral contamination, and they also contribute to increasing the health of the soil over time. The grove defies multiple binaries, including native/invasive, nature/culture, growth/decay, and purity/pollution. Both pastoral and wild, it resembles what Emma Marris calls a "rambunctious garden." The land can never be restored to a "pristine" state, prior to colonization and extraction, and Norm recognizes that fact. Pristine, Marris writes, is a fragile fiction:

> Nature is almost everywhere. But wherever it is, there is one thing that nature is not: pristine…We must temper our romantic notion of untrammeled wilderness and find room next to it for the more nuanced notion of a global, half-wild rambunctious garden, tended by us. The garden isn't restricted to parks and protected areas. The rambunctious garden is everywhere…Rambunctious gardening is proactive and optimistic; it creates more and more nature as it goes, rather than just building walls around the nature we have left" (2-3).

While the grove may for now be fenced, Norm doesn't intend for it to be a siloed space where "Nature" can recover from a century of extraction. Norm does not seek to achieve an imagined baseline, to render the grove a "little island *like* the past" (emphasis original; Marris 2011, 8). The grove may very well be a sanctuary, but unlike the conception of the national park as "land before

[25] Traci Brynne Voyles refers to this form of discard as "wastelanding" in the book of the same title, on the cultural history of uranium mining on Diné (Navajo) land (Voyles 2015).

time," it pushes back against the imagined concept of a "pristine" nature. The nature and the culture of the grove is fundamentally shaped by human interference, as evident in the soils, in the slope of the hill, in Norm's choices of plant species, and in continued management.

The Butte hillside, like Silver Bow Creek and the riparian land alongside it, has assumed various shapes in imaginary geographies. To go uphill, upstream; to look underwater, underground; to shed illusions about the pure, the pristine, and the efficient requires defamiliarization of once-familiar landscapes. The hillside and the creek are hybrid landscapes, rambunctious gardens, to cherish and connect with, even as they are forever altered. Imagining another way—an emergent way—thus becomes the task of our time. Forms of stewardship that have been in place for millennia can guide this emergent way of coexisting within postindustrial landscapes, even as these spaces are forever altered.

These landscapes can be conduits of memories, too, rather than mere interpretive sites that narrate a dominant mode of pastness. In unraveling narratives of heritage, purity, and efficiency, there is hope. In realizing that dominant narratives are ones that state and corporate actors craft and benefit from, new stories about place and space can emerge. In countering the extractive view of a commodified visual culture, care-based ways of seeing and being in the wake of extraction can blossom.

Conclusion

Figure 27: "Man drilling on slag wall," C. Owen Smithers, no date. Courtesy of Butte-Silver Bow Public Archives, Smithers.40.078.01.
Figure 28: Slag Canyon near Montana Street, July 2022. Author's photo.

Before leaving Butte for the Bitterroot Valley, I stopped at the slag canyon at the site of what was once Butte Reduction Works. Near to where I stood at the mouth of the canyon was the first smelter in the region, before the Anaconda Company commissioned the Washoe Smelter further away from the urban center. The afterlives of smelting, as well as mining, remain visible in the landscape of Butte. The slag walls along Silver Bow Creek were constructed as an early measure to contain mineral tailings and smelter waste and to reduce erosion that occurred throughout much of the riparian zone (Figure 27). Even in its concrete form, however, the slag contains trace amounts of heavy minerals which leech into the creek. The closest neighbor to the former smelting site now is North Western Energy, Montana's leading electrical and natural gas company. Here, there is no trail—the slag canyon offers no space for visitors to stroll through a pleasantly-remediated landscape, nor to romanticize the days of underground mining. Here, there are no interpretive signs in sight.

Ash-black walls rise vertically from both flanks of the creek. Above the slag canyon, I can see a pile of non-ore rock on one side and a rusted piece of metal pipe on the other. I was surprised to observe greenery along the body of water, including patches of grass growing out of the slag brick cracks. I positioned myself to take a photograph of a row of Geyer Willow trees emerging from the bank of the creek.

Figure 29: Great Blue Heron Flying over the Slag Wall, July 2022. Author's photo.

To my right, there was a sudden movement. A great blue heron rounded a curve, its line of flight tracing the contours of the man-made canyon. The bird flew straight toward me before rising out of the crevasse. I instinctively snapped two photographs with no thought as to what settings I had selected to photograph the willows. In the first of the two photographs, the heron hovers in the left-center of the frame, where its outstretched wings blend in to the slag wall (Figure 28). The light catches the heron's orangey beak and a few spots of color on the front of each wing. In the

second photograph, the heron hovers above the slag canyon and a green and white tarp that hangs, curtain-like, over the wall (Figure 29). Then, as suddenly as it appeared, the heron dipped out of sight. I clicked off my camera and let myself stand motionless, feeling a still sense of awe at the strange mouth of the canyon. Enchantment can occur in even the most heavily manipulated of spaces—the heron, the willows, and the water showed this to be true. *Still*, these beings seemed to say, *there is so much life here, if only you can recognize it.*

On my drive home to Hamilton, I passed through Anaconda. Along the road was a mountainous range of slag that sparkled under the mid-summer sun (Figure 30). Up the hill was the Washoe Smelter that closed down in 1980, shortly before ARCO abandoned their mining operations in the area. Until now, the postindustrial landscape of Anaconda, unlike Butte, has remained largely unmitigated. In September 2022, as I write this thesis, ARCO signed a consent decree to complete the mitigation of the former Washoe Smelter and the adjacent land, including residential lawns, grazing pastures, and industrial sites (Faur 2022). The cleanup, subject to oversight by the EPA and the Montana Department of Justice, is expected to cost the oil and gas corporation over $83 million. A thirty-day public comment period will begin on September 30. On November 3, officials from ARCO and the EPA will deliver information about the legal agreement and the remediation process to the public.

Figure 30: Slag Pile near the Washoe Smelter, July 2022. Author's photo.

The smelter and the slag have lived large in the postindustrial landscape as symbols of labor, toxicity, and corporate negligence. U.S. Attorney for the District of Montana Jesse Laslovik stated in a press release that the smelter holds symbolic meaning for locals, including himself:

> I was born in Anaconda the same year the smelter closed and while I never saw smoke coming out of the Smokestack that still stands over Anaconda, I know what it represents…It is a symbol representing the hard work of many Anacondans, including members of my family, that built our town. But it's also a symbol of a Superfund site that has existed for far too long. If the Smokestack represents our past, this consent decree represents our future…Our water will be cleaner, our soils will be purer, our slag will be covered, and our future will be brighter because of this historic agreement.

Like the many vestiges of industrial presence in Butte, the abandoned Washoe Smelter exists not only within lived geographies of space but also within imaginary geographies of memory. It is for this reason that I have found it vital to study representations of these spaces and landmarks in the postindustrial landscape.

Ethical remediation in the wake of extraction is not guaranteed. Even after the remedial stages of mitigation are complete and Superfund ceases to be a descriptor for the landscape, the afterlives of mass copper extraction will remain buried under limestone and dirt, contained inside upland waste facilities, and layered in the built environment. In this thesis, I have turned my attention to the ghostly pasts of open-pit copper mining in Butte, Montana as a way to critically unravel extractivist paradigms that state and corporate actors have constructed and maintained. From the unraveling emerges possibilities of interspecies agency, ethical responsibility, and delicate, yet undeniable, hope.

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