

“Blossoming as the Rose”

The Interplay of Climate and Culture in the History of the Wasatch Oasis

by

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ABSTRACT

The Wasatch Front is an environmentally complex region, this area of northern Utah is mountainous and fertile enough to support a varied ecology. It has also supported healthy human populations. The marshy lands surrounding the gigantic lake antecedent to Great Salt Lake and Utah Lake provided food and resources for early peoples. Then, as the climate warmed and drought set in, the early Fremont culture was apparently unable to adapt. Now, the Wasatch Front is home to the majority of Utah's population, putting this sensitive environment under considerable strain. When early Mormon settlers arrived to colonize the area in the mid nineteenth century, they set to work making the Wasatch Front into their idea of paradise. They borrowed language from the Hebrew Bible to describe the changes they had made, claiming they had made the desert "blossom as the rose." The purpose of this dissertation is to examine the origins and manifestations of this complex ethos of "blossoming," how Mormon culture has conceived and reconceived it, and how climatic realities have shaped and are shaping it. On one hand, "blossoming" entails a form of stewardship that encourages conservation and temperance. On the other hand, Mormons have continually sought to incorporate American ideals of abundance and mastery over the natural elements. Today, population pressure combined with the prospect of megadrought makes these tensions even more salient and threatens to recapitulate the maladaptations of earlier cultures in a pattern of withering rather than blossoming. This dissertation illustrates how the ill consequences of "blossoming" have repeatedly forced a pattern of return to the ethos of stewardship and might do so again.

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Chapter 1: Introduction

An Oasis in the Desert

In February 1947, a mild-mannered but respected scientist took to the podium at the University of Utah's Kingsbury Hall. Walter Cottam reconstructed, for those in attendance, the Wasatch Front, the land situated between the Wasatch Mountains and the Great Salt Lake, as it would have existed nearly a hundred years before, when the first permanent white settlements began. Tall grasses and dark soil characterized a lonely oasis, where "no streets, no trees, no smoke" showed any sign of settlement. Armed with a clip of Kodachrome slides, Cottam then presented a stark view of the changes the Wasatch Front environment had endured over the previous century. The tall grasses were gone, erosion had depleted the soil, and asphalt streets lined the smoke-filled valley. "Every citizen of this state who loves to call Utah 'home,'" he remarked, "should become informed of the nature of the resources that support us and of what a century of white man exploitation has done to them."¹

Cottam's remarks came in the centennial year of the arrival of the Mormon pioneers. In July 1847, Brigham Young led a group of 143 members of the Church of Jesus Christ of Latter-day Saints (Mormons) across the plains of the Midwest, through the Rocky Mountains, and into the Great Basin. Much like the Europeans who ventured across the Atlantic to settle New England, the Mormons went about changing the landscape. They carved canals, dammed streams, and plowed the land. Traditional Mormon narratives asserted that these changes had made a desert "blossom as the rose."

¹ Walter Cottam, "Is Utah Sahara Bound?" *Bulletin of the University of Utah* 37, no. 11 (February 19, 1947): 1-40; "Dr. Walter P. Cottam Will Deliver Reynolds Lecture," *Utah Daily Chronicle*, February 17, 1947.

Mormon ingenuity, communal organizing, and theological imperatives had transformed a “desert containing nothing but a few bunches of dead grass, and crickets enough to fence the land” into a lush, hospitable landscape.²

To mark the centennial, a group of prominent Utahns re-enacted the Mormon trek from Illinois to the Salt Lake Valley—this time in Fords and Buicks decorated as covered wagons. At the end of the ten-day drive, a huge throng greeted them in Salt Lake. According to the trek history, “Now here they were at the place [where] the original group had seen nothing but sun-scorched desert. . . . But there it was, a valley transformed from a wasteland to a verdant paradise by a people who had vision and perseverance.”³

The centennial marked what the Mormons thought of as the conversion of a “sun-scorched desert” into a garden. Cottam lamented that conversion. Still, the two narratives did not necessarily tell different stories, nor did they speak of different results. They diverged on perspective. Where the Mormons of 1947 saw progress in the asphalt cities and smokestacks, Cottam saw erosion and pollution. One group saw the changes as evidence of God’s favor, while Cottam saw abuse of God’s creations.

Cottam represents a disruptive narrative thread occasionally visible through the environmental history of the Wasatch Front. Since the Mormons’ arrival, the “Cottam narrative” has periodically clashed with the traditional narrative as a perspective that has historically been overshadowed or neglected. Still, Cottam’s concerns tend to re-surface

² As described by pioneer George A. Smith, “Liberty and Persecution,” Jul. 24, 1852, *Journal of Discourses* (hereafter JD), vol. 1, 44.

³ D. James Cannon, ed., *Centennial Caravan: Story of the 1947 Centennial Reenactment of the Original Mormon Trek*, Salt Lake City: Sons of the Utah Pioneers, 1948, 152.

during environmental crises such as droughts, air pollution events, and floods—but generally not in any sustained way.

Ironically, these two contrasting narratives have a common origin in the complex environmental theology of Brigham Young. As we will see, Young preached an ethic of “stewardship,” which might be understood as cooperative community-building and responsible management of resources. “The teachings of early Mormon leaders contained significant threads of what today would be recognized as environmentalism,” as scholar Jerrold Long notes.⁴ However, “stewardship” for the Mormons cannot be so reduced. Stewardship was colored by a religious doctrine of unlimited progress—the belief that “faith over a few things” meant “rulership over many things,” as the Apostle Orson Hyde explained in a sermon on “The Progressive Character of Mormonism.”⁵ The Mormons defined progress as an ever-expanding spiritual and temporal stewardship over lands and kingdoms and worlds. By demonstrating temporal stewardship, Mormons believed they could enlarge their eternal domain without limit. There were thus two strains in stewardship: responsibility to the community of Saints was one strain; another was the promise of unbounded individual advancement and improvement.

The “blooming desert” narrative was an expression of this complex concept of progress. The Mormon mainstream has never recognized limits to the development of the children of God or their environment. “This being called man, said to have been formed in the image of God,” Mormon apostle Erastus Snow declared, “possesses the power of

⁴ Jerrold A. Long, “The Origins of a Rebellion: Religion, Land, and a Western Environmental Ethic,” *Social Science Research Network*, February 26, 2017. SSRN: <https://ssrn.com/abstract=2924231> or <http://dx.doi.org/10.2139/ssrn.2924231>

⁵ Orson Hyde, “The Progressive Character of Mormonism,” February 12, 1860, *JD* 7:152.

improvement, of advancement, *ad libitum*, and who shall set the bounds of the advancement and improvement of man any more than the gods of eternity?"⁶ The legend that a divine hand had moderated a harsh, unyielding climate, transforming a "desert" to a garden, obscured the fact that the Wasatch Oasis had been fertile and the climate generally cooperative from the beginning. Still, the climate-transformation narrative reinforced the Mormons' faith, derived from the Old Testament, that because of the efforts of righteous Israel, the Lord would "comfort all her waste places" and "make her wilderness like Eden, and her desert like the garden of the Lord" (Isaiah 51:3).

In Brigham Young's view, God designed the Wasatch Oasis in order to form "saints"—a people sanctified by their struggles with the environment. Within that narrative framework, the Mormons conceived of themselves as children of God destined to become gods themselves and their daunting homeland a training ground for that destiny. That identity required close cooperation and stewardship of resources with the goal of building "Zion"—the blossoming Eden that would mirror the heaven they hoped to inherit. The Latter-day Saints "looked forward to the coming of Zion in their hearts as a transformation from waste place and wilderness to a blossoming rose in their own moral being."⁷

Thus, we are dealing with a culture that sees the subduing of a challenging environment as the outward manifestation of a great spiritual test. The blossoming of the desert symbolizes the flowering of the human spirit from fallenness to fruitfulness, from

⁶ Erastus Snow, "Origin of Man," January 20, 1878, *JD* 19:326.

⁷ "Pioneer Day," Mormon Lectionary Project, *By Common Consent*, blog, July 24, 2014. <https://bycommonconsent.com/2014/07/24/pioneer-day-2/>.

degradation to divinity. So, it is essential to the Mormon cultural identity to perpetuate the story of the taming of a “harsh and brutal” climate.

At the same time, the Mormon narrative is also inscribed within the greater narrative of the culture of the American West, a culture characterized by a “frontier mindset,” by “rugged individualism” and competition for resources that Europeans considered “unpossessed,” although indigenous groups had populated the region for millennia. Inevitably, the East looked to the West as a new source of wealth and an outlet for a rising and ambitious population. The great obstacle to these dreams was climate. Due to its aridity, Euro-Americans referred to the area as “the Great American Desert.” The agriculture of the East depended on rain; in much of the land west of the 100th meridian, rainfall was insufficient for agriculture. The meridian line, which runs north to south down the middle of the continental United States (the geographic center of the country is only two degrees away), marked off half the country as arid terrain. As journalist Marc Reisner observed:

The hundredth meridian divides the country into its two most significant halves—the one receiving at least twenty inches of precipitation a year, the other generally receiving less. [The West] was a hostile terrain to a farmer depending solely on the sky. . . . Were it not for a century and a half of messianic effort toward that end, the west as we know it would not exist. The word “messianic” is not used casually.⁸

Certainly, the Mormons saw their mission as nothing short of messianic, as they were convinced that they were preparing the way for the literal return of a Messiah. In

⁸ Marc Reisner, *Cadillac Desert: The American West and Its Disappearing Water* (New York: Penguin Books, 1993), 3.

time, their unlikely achievement served as a kind of example for what might be possible in that difficult climate.

At the same time, a frontier mindset influenced the pioneers to resist a policy of cooperative stewardship. The frontier paradigm historically exhibits “higher contemporary levels of individualism, lower desired and actual levels of redistribution, and stronger opposition to government regulation.”⁹ Some psychologists who have identified, what they call, the “frontier mentality” find that it “remains prevalent in the western United States,” a mentality characterized by introversion, low levels of trust and conscientiousness, and a high value placed on a “sense of freedom.” Frontier settlement theory posits that “traces of that pioneer personality persist in the people who live out West.” The researchers found that “mountainousness,” or living in a mountainous area, is a “meaningful predictor” of a personality open to experience, but “lower on agreeableness, extraversion, neuroticism and conscientiousness.”¹⁰

The frontier mentality is shaped by the “total frontier experience,” a phrase coined by Boston University researchers exploring the persistence of rugged individualism and inflexible antipathy to the setting of boundaries—whether by law, custom, religion, or the state. The total frontier experience (TFE) is a quest for self-fulfillment on one’s own terms, they value unlimited freedom of action, independence, and self-sufficiency. The TFE mindset is bound up in the images of the frontier: the wide-open spaces, the heroism of the pioneer standing alone against the wilderness, the rancher on horseback who is

⁹ Samuel Bazzi, Martin Fiszbein, Messay Gebresilasse, “Frontier Culture: The Roots and Persistence of ‘Rugged Individualism’ in the United States,” *Econometrica*, 88, no. 6 (November 2020):1.

¹⁰ Friedrich M. Götz, Stefan Stieger, Samuel Gosling, “Physical Topography Is Associated with Human Personality,” *Nature and Human Behavior*, 4 (2020): 1144.

“monarch of all he surveys” (as the poet William Cowper described Alexander Selkirk, the model for Robinson Crusoe).¹¹ The TFE has political ramifications: scholars characterize TFE people as “embracing opposition to the welfare state, a strong belief in effort versus luck, the right to self-defense, and ‘manifest destiny.’”¹² The TFE mindset endures today in anti-environmentalist groups such as the Sagebrush Rebellion and the “Wise Use” movement, as well as in the political philosophies of many Westerners.

According to these studies, the frontier mentality is also marked by a noticeable lack of “conscientiousness,” one of the “Big Five” personality traits psychologists have defined. Conscientiousness is “the tendency to be responsible, organized, hard-working, goal-directed, and to adhere to norms and rules.”¹³ People who lack this trait tend to defy authority and deny responsibility for the well-being of the community. Additionally, low levels of conscientiousness are associated with a “conspiracist” mindset that sees tyrannical forces combining against freedom of action on the land.¹⁴ These tendencies may account for the antipathy toward government regulation that is typical of the frontier mentality.

The Mormons were inevitably influenced by such frontier values. Gentile migrants to the Valley who embodied frontier values surely had an impact on the

¹¹ See William Cowper, “Verses by Alexander Selkirk,” in *The Works of William Cowper*, ed. T.S. Grimshawe (Glasgow: Good Press, 2019), 596.

¹² Bazzi, et al., *Total Frontier Experience*, 11.

¹³ Brent W. Roberts, Jackson, Jenna V. Fayard, G. Edmonds, and J. Meints, “Conscientiousness,” in Mark R. Leary & R. H. Hoyle, eds., *Handbook of Individual Differences in Social Behavior* (New York: The Guilford Press), 369.

¹⁴ Robert Brotherton, Christopher C. French and Alan D. Pickering, “Measuring Belief in Conspiracy Theories: The Generic Conspiracist Beliefs Scale,” *Frontiers in Psychology*, 21 May 2013, <https://doi.org/10.3389/fpsyg.2013.00279>

community. However, most of the Saints were themselves products of rural American culture, so frontier values were not alien to them. Those values arguably gained force among the Saints who were, after all, living a frontier life. As the Boston scholars argue, “Long exposure to frontier conditions laid the foundation for a persistent culture of rugged individualism.”¹⁵

A corollary to rugged individualism, what Thomas Alexander calls “secularized entrepreneurship” develops and commodifies resources without much attention to cooperative planning for sustaining those resources.¹⁶ The introduction of the American developmental mindset complicated the definition of blossoming. For example, the nascent mining industry brought millions of dollars in investment to Mormon lands in the 1870s, and observers prophesied that “a vast field of enterprise will open. . . . Not only will mining be a glorious success but this American desert will become a harvest home, and blossom as the rose.”¹⁷ Industrial expansion came to be included in the blossoming narrative.

Thus, we are not dealing with a simple polarity of perspectives on the environment of the Wasatch Front. The cultural clash in the American West between economic growth and conservation is only part of this story. It is complicated by the peculiar Mormon narrative of progress and advancement, a story in which individual

¹⁵ Bazzi, et al., *Total Frontier Experience*, 9.

¹⁶ Thomas G. Alexander, “Lost Memory and Environmentalism: Mormons on the Wasatch Front, 1847-1930,” in *The Earth Will Appear as the Garden of Eden: Essays on Mormon Environmental History*, Jedediah S. Rogers, Matthew Godfrey, eds., (Salt Lake City: University of Utah Press, 2019), 48.

¹⁷ From J. Bonwick, *The Mormons and the Silver Mines*, cited in J. R. Nichols, *Mineral Resources of Utah* (Pittsburgh: A.A. Anderson & Sons, 1872), 8

progression, material prosperity, and spiritual development intersect in the complex metaphor of blossoming.

Additionally, the unique environment of the Wasatch Front imposes severe limits on the unrestrained growth associated with the American project of progress and advancement. Increasingly, atmospheric inversions fill the valley bowls with polluted air, while the lack of water acts as a natural curb on urban expansion. Climate change might be moving the region toward greater aridity. At this writing, a megadrought constitutes an existential threat to the region.

Western Mormon culture chafes at these limits. The broader American identity was shaped by the openness of the American continent to exploitation and appropriation—here were abundant resources for the taking. As de Tocqueville put it, “America opened a thousand new paths to fortune,” and the American project was to pursue those paths. The Turner thesis also expressed that American project: That every white American always stands at a frontier of unbounded possibilities. Mormon pioneers shared this frontier mentality to a great extent, and still do. In the Wasatch Oasis, the traditional Mormon narrative of the blossoming desert still energizes expansion, “a narrative of environmental transformation in which Mormons took a Fallen desert wilderness and restored it to the Garden from which humanity had fallen,” as Dan Flores put it.¹⁸

Now extensive development is putting increased strain on already ambivalent concepts of progress and stewardship. As Utah, one of the driest states in the nation,

¹⁸ Dan Flores, *The Natural West: Environmental History in the Great Plains and Rocky Mountains* (Norman, OK: University of Oklahoma Press, 2003), 128.

annually drinks up three times as much as water as the average state, the cultural urge to “blossom” may be forced toward a radical re-definition.¹⁹ The purpose of this dissertation is to examine the manifestations of this complex ethos of blossoming, how the culture has conceived and reconceived it, and how climatic realities have shaped and are shaping it. Additionally, we will see how the unexpected consequences of blossoming—overgrazing, air pollution, urban sprawl—have created problems that have forced a pattern of return to the ethos of stewardship and may do so again.

The scene in which this story plays out is the Wasatch Oasis on the eastern edge of the arid Great Basin. Although early observers such as Washington Irving depicted the Basin as an unwelcoming wasteland, it is a topographically complex region characterized by fertile, grassy oases as well as abrupt mountain ranges and deserts. The Wasatch Oasis is a transitional zone between the sheer Wasatch range and more arid lands in the rain shadow of the Sierra Nevada mountains to the west.²⁰ Between peaks and desert lies an area of relatively fertile alluvial soil. A principal feature of this land is the Great Salt Lake, a terminal lake with no outlet, the extensive saline remnant of a much larger pluvial lake that shrank into its current form about 13,000 years ago. It helps create the oasis. Prevailing northwesterly winds produces a lake effect, dropping mountain snow that

¹⁹ Nathalie Baptiste, “God Said to Make the Desert Bloom, and Mormons Are Using a Biblical Amount of Water to Do It,” *Mother Jones*, May 9, 2018.

²⁰ Charles S. Peterson, “Grazing in Utah: A Historical Perspective,” *Utah Historical Quarterly* (hereafter *UHQ*), 57, no. 4 (Fall 1989): 300; Thomas Alexander, “Stewardship and Enterprise: the LDS Church and the Wasatch Oasis Environment, 1847-1930,” *Western Historical Quarterly* 25, no. 3 (Autumn 1994): 340-364.

melts and flows into the basin in hundreds of short-lived streams that return the water to the lake.²¹

The transition zone might be said to produce a micro-climate, a localized set of conditions in some ways distinct from those in the surrounding areas. Statistically, average temperature, precipitation, and humidity in the zone vary a good deal from the dry sub-arctic climate of the Rockies to the east versus the dry desert to the west. On the Köppen scale, the zone is classified “hot summer-Mediterranean”—thus the appellation “oasis”—a temperate condition dependent on the presence of the lakes and the adjacent high mountains.²² This transition zone provides a kind of laboratory in which we can study how the elements of entrepreneurialism, “rugged individualism,” and sacral communitarianism intersect.

This zone is a liminal space not only geographically but also psychologically, as the cultures that have inhabited it must grapple with its demanding character and the limits it imposes on them. Thomas Alexander argues that “the gradual loss of the collective memory of a salutary environmental theology and its replacement by a memory of progress associated with secular entrepreneurship facilitated the environmental destruction that plagued Utah’s lands.”²³ I would add that despite the subsidence of cultural memories of a “salutary environmental theology,” the natural constraints of climate periodically force those memories to the surface. Too much pressure on the

²¹ W. R. Hassibe, W. G. Keck, “The Great Salt Lake,” U.S. Department of the Interior/U.S. Geographical Survey, USGS Report, 1991, 10.

²² Köppen types calculated from data from FR/SM Climate Group, Oregon State University, <http://prism.oregonstate.edu>

²³ Alexander, “Lost Memory,” 48.

environment and it cracks; consequently, we see a repeated pattern of return to “salutary” principles and practices of an earlier generation.

Additionally, the “loss of memory” of a more salutary concept of stewardship might be a function of the time orientation of the broader Euro-American culture. Despite a religious belief in eternal progress, the time orientation of the Oasis culture is not today characteristically progressive. People with a frontier mentality are less concerned about the long-term well-being of the culture and the environment; this characteristic short-term thinking explains the typical Western “boom-and-bust” syndrome. It is a mentality of “unrestrained development” that sets in motion “a vicious cycle of economic greed and environmental despoliation” which “escalated toward the close of the nineteenth century.”²⁴ The result was a slow dissipation of the stewardship ethos and in turn degradation of the environment. “The serious ecological problems which face us have as their basis a disordered spirituality,” wrote LDS authority Alexander B. Morrison.²⁵ The “blossoming of the desert” as undertaken by Utah Mormons turned into a kind of literary tragedy.

By contrast, the progressive mindset is typically oriented toward the future. “Future time orientation increase[s] individual perception of potential environmental risk,” according to research linking political ideology to environmental attitudes. In our day, for example, “people with a higher ideological agreement with liberalism perceive a

²⁴ Char Miller, “Tapping the Rockies: Resource Exploitation and Conservation in the Intermountain West,” in *Reopening the American West*, Hal Rothman, ed. (Tucson: University of Arizona Press, 1998), 171.

²⁵ Alexander B. Morrison, “Our Deteriorating Environment,” *Ensign of the Church of Jesus Christ of Latter-day Saints* 1, no. 8 (August 1971): 64-69.

higher risk of climate change.”²⁶ At the intersection of a frontier mentality characterized by a short time orientation with a consecrated stewardship mentality oriented toward eternity, we find the complex and contradictory cultural identity of the Wasatch Oasis.

There is always a danger of being taken as criticizing one ideology when contrasting it with another. Instead, I am analyzing the intersection of the dominant narratives that have shaped this land: One that views the environment as a useful tool for “making saints” (Mormon stewardship); another that finds spiritual fulfillment in uncrowded lands (environmentalism); another that valorizes a sense of freedom in a remote landscape (the rugged frontier mentality), closely associated with another that views the environment as a means to rapid self-enrichment (secular entrepreneurialism, which Brigham Young called “the American tradition”).

To illustrate how this singular environment shapes ideology, I examine in chapter 1 its effect on prehistoric cultures. I explore the influence of the Medieval Drought Anomaly on the apparent dissolution of the dominant Fremont culture. Additionally, we will see how early Euro-American adventurers produced a narrative of a land of overpowering bleakness in which survival required heroic effort—thus helping to shape the model of the American as the “rugged individual” on a quest to master nature, along with its magnetic effect on the exigent spiritual aspirations of Brigham Young and the Mormons.

²⁶ Saiquan Hu, Xiao Jia, Xiaojin Zhang, Xiaoying Zheng, Junming Zhu, “How political ideology affects climate perception: Moderation effects of time orientation and knowledge,” *Resources, Conservation and Recycling*, 127 (2017): 124-131.

In chapter 2, the Mormons arrive on the scene to construct a new identity for themselves as “Latter-day Saints.” Brigham Young saw the climate of the Wasatch Oasis as an instrument for “making saints.” He hoped that the cooperative process of transforming a desert into an Eden would also transform the souls of people he believed were destined for “godhood” in the eternities. Young insisted on carrying out this project according to the principles of stewardship, or cooperative management of resources. When in the 1850s, drought and insects threatened the Mormons with exile and hunger, their leaders blamed the calamity on a resurgence of the greedy “American” mindset among them and called them to repentance, which meant “re-forming” their identity into sainthood and a return to the stewardship ethic. A subsequent moderation of the weather reinforced that identity.

Chapter 3 is about the “stewardship of the land.” I trace through the work of James E. Talmage and others how science was used to advance a Progressive-era notion that the climate and the culture would improve interdependently. With both agricultural and urban development the Utah and the West would blossom into a paradise for agriculture and industry. However, repeated droughts and depressions undercut these expectations over the decades. Dust bowl conditions arose in areas along the Wasatch Front during the Depression era exacerbating the economic conditions that plagued Utahns. Mormon leaders tried to resist government intervention by renewing among members the ideals of cooperation and stewardship, although these ideals took a new form: The Mormon perception of “Stewardship” shifted from one that focused on environmental well-being and spiritual transformation to a more practical application for the the provision of relief.

Chapter 4 is about the “stewardship of the air.” I illustrate how the blossoming concept takes on a different meaning characterized by industry and the resulting degradation of air quality. Smoke from mines, mills, and smelters polluted the “air of Zion,” but the culture accepted toxic air as the price of progress and advancement. Mormon cultural norms changed: the language of “building Zion” faded and was replaced by the rhetoric of industrial development.

Eventually, air pollution became harmful enough that progressive women of Salt Lake City campaigned for smoke abatement, but the male establishment dismissed their concerns as “aesthetic.” With the arrival of Geneva Steel during World War II, air pollution intensified. The quasi-doctrinal emphasis on “pure air” among early Mormon settlers was not entirely forgotten, however, and the local tide of opinion turned against Geneva. BYU Professor Hugh Nibley’s appeal in his “Stewardship of the Air” speech is a marker of this shift in attitude. Air pollution remains a serious problem, although only a small group of Mormon environmentalists protest it in religious terms.

Chapter 5 is about the “stewardship of water.” I trace the history of floods along the Wasatch Front. The mountains are prone to cloudbursts that produce flash flooding, and spring runoff from heavy snowpack can swamp the valleys. The problem became increasingly worse as burgeoning livestock herds stripped the mountains of much of the vegetation that prevented erosion. Frontier-minded stockmen in the 1930s resisted regulation, but some, like John M. MacFarlane, head of the Utah Cattlemen’s Association, conceded to reality and helped design a cooperative federal-state-private solution to the problem of range deterioration. Overgrazing receded but expanding property development facilitated more flooding. Then came the disastrous flood of 1983

that caught the Wasatch Front unprepared. Although the community revived some of its “stewardship ethos” and massive volunteer efforts staved off even worse damage, the community invested in continued development rather than long-term water management. Although state and local governmentsgovernmentsgovernments adopted some flood-control measures, growth continues to blossom along the mountainsides, increasing the flood risk.

Chapter 6 is about the preparatory mindset of Utahns in dealing with notable climate disruptions, emergencies caused by prodigious winds, snowstorms, and fires. Utahns along the Wasatch Front have paid a heavy economic price for neglecting preparations for disasters such as the 1949 blizzards that killed a quarter of Utah’s livestock or the fires that decimated the forests of the Wasatch during the 1880s. Although the majority Mormons are well known for making personal preparations for disaster, Utah continues to neglect the investment necessary to prepare for large-scale climate events. Currently, stewardship consciousness trends away from community responsibility toward individual responsibility. The narrative of frontier enterprise persists, urging rapid development of the land and taking little account of climate risks.

To conclude, I examine recent efforts to rethink the “blossoming” of the Wasatch Front and to mitigate climate change, with particular attention to the story of “Envision Utah,” a public-private partnership begun in 1997 to bring back Brigham Young’s community-planning ethic. These efforts have borne some fruit—the air is measurably cleaner and higher-density housing is increasing—but few attempts to uproot the mindset of rapid growth have succeeded. The population of the Wasatch Front has grown by nearly a million people since 2000. The state legislature, dominated by entrepreneurial

interests combined with a frontier mentality,²⁷ has militated against regional planning, and mixed-use development is eating up more of the land every day.²⁸ Highway construction goes forward unabated, and traffic is worse. Air quality is still poor.²⁹

Perhaps the most salient threat to the future of the region is drought. Current research on long-term climate trends indicates a possible recurrence of the Medieval Drought Anomaly in this century due to temperature increase and natural oscillation of ocean currents.³⁰ Decades of dry conditions may have led to the collapse of the indigenous cultures of the thirteenth century³¹; if those conditions were to prevail again, what would be the impact on the society of the Wasatch Front?

Still, there are signs that Wasatch Front Utahns may be awakening to a renewed consciousness of community stewardship as both LDS scholars and leaders have begun to speak out more frequently and publicly in advocacy of responsible measures toward the environment and climate change. A pattern of remembering the ethos of stewardship might be forming up within the community. A growing environmentalist movement is

²⁷ A strong orientation toward business interests and individual self-reliance is “culturally embedded” in Utah’s legislative history. See Al James, “Everyday Effects, Practices and Causal Mechanisms of ‘Cultural Embeddedness’: Learning from Utah’s High-Tech Regional Economy,” *Geoforum* 38, no. 2 (March 2007), 402-405.

²⁸ Tony Semerad, “Over 20 years ago, Utah aimed for ‘quality growth’ as its population boomed. How has that turned out?” *Salt Lake Tribune*, July 11, 2020. <https://www.sltrib.com/news/2020/07/11/over-years-ago-utah/>.

²⁹ Brian Maffly, “Salt Lake City’s Air Quality Is Nation’s 7th Worst Among Large Metro Areas,” *Salt Lake Tribune*, January 31, 2020. <https://www.sltrib.com/news/environment/2020/01/28/salt-lake-citys-air/>

³⁰ Sloan Coats, Jason E. Smerdon, Kristopher B. Karnauskas, and Richard Seager, “Occurrence of Megadrought Clustering in the American West During the Medieval Climate Anomaly,” *Environmental Research Letters* 11, no. 7 (July 2016). <http://dx.doi.org/10.1088/1748-9326/11/7/074025>

³¹ Terry L. Jones, Gary M. Brown, L. Mark Raab, Janet L. McVickar, W. Geoffrey Spaulding, Douglas J. Kennett, Andrew York, and Philip L. Walker, “Environmental Imperatives: Reconsidered Demographic Crises in Western North America During the Medieval Climatic Anomaly,” *Current Anthropology* 40, no. 2 (April 1999), 156.

promoting a similar stewardship ethic from a secular perspective. But for now, the narrative of stewardship is still at the mercy of what Brigham Young called “the American tradition” of unlimited self-aggrandizement and the ethos of a frontier mentality that resists regulation. The future of the Utah Oasis, along with the rest of the Great Basin, depends on the course these various narratives take.

A relatively new formulation of a “Utah Way” for resolving high-stakes issues is now coming to the fore as political and thought leaders converge under the threat of climate change.³² Despite their tendency to downplay climate change, legislators feel increasing pressure from new coalitions of businesspeople, environmentalists, and church leaders who advocate a “Utah Way”—a non-confrontational, community-minded approach to accommodating diverse interests in dealing with climate challenges. Although skeptics find the label ambiguous and deceptive, the Utah Way is said to be rooted in Mormon communitarianism, respectful of business, and open to disparate voices.³³ One product of the Utah Way is the “Utah Roadmap,” a projection of the future of the Wasatch Front created by an impressive range of stakeholders.³⁴ An unusual surfacing of a future-time orientation, the Roadmap has been called “a most aggressive climate action plan in a Republican-led state—and potentially a path forward for other

³² Emma Penrod, “The Utah Way to Achieving 100 Percent Clean Energy: How a politically conservative state set aggressive goals for clean energy,” *Sierra*, July 1, 2019. <https://www.sierraclub.org/sierra/2019-4-july-august/feature/utah-way-achieving-100-percent-clean-energy>

³³ Brenda Scheer, *The Utah Model: Lessons for Regional Planning*, Brookings Mountain West, December 2012, 3-5. https://www.unlv.edu/sites/default/files/TheUtahModel_0.pdf

³⁴ *The Utah Roadmap: Positive Solutions on Climate and Air Quality*, Kem C. Gardner Policy Institute, University of Utah, January 31, 2020.

conservative states.”³⁵ The intersection of forces that produced the Utah Roadmap may symbolize the rebirth of a stewardship ethic within the communities of the Wasatch Front. Whether such efforts will bear fruit depends on whether the Utah Way begins to dominate the thinking of the political and economic elite of Utah and perhaps across the arid West.

³⁵ Judy Fahys, “Has Conservative Utah Turned a Corner on Climate Change?” *Inside Climate News*, January 22, 2020. <https://insideclimatenews.org/news/21012020/utah-climate-change-plan-conservative-legislature-coal-emissions-salt-lake>

Chapter 2

Early Responses to the Wasatch Oasis

In the mid-1980s, after floods from a massive El Niño event had receded, archaeologists found a trove of ancient objects from long passed Native American societies. The floods, mostly caused by a rising Great Salt Lake, had exposed the ruins of hundreds of villages and campsites and dozens of human skeletons as much as nine centuries old. The discoveries provided archaeologists and anthropologists with new information about the people who once made the Wasatch Front, just as it is now, the most populous area of the Utah region.³⁶

Now known as the Fremont culture, this population lived along the Wasatch Front and to the south and east from roughly 400 to 1350 C.E. Named after the Fremont River in central Utah, the Fremont were foragers and farmers of beans and squash. During the 1200s they represented the peak of Native American civilization along the Wasatch Front when their populations began a gradual decline.³⁷ Many scholars have tried to account for the disappearance of the Fremont, but it still remains mysterious. Whether they emigrated or assimilated and why has yet to be determined. We do know, however, that a climatic shift toward drought occurred roughly at the time they disappeared, which may explain their passing from the scene. Significantly, from the traces of rock art they left, which may represent deity, some have theorized that a shift in perhaps a religious ideology took place around the time the Fremont disappeared.

³⁶ Steven R. Simms, Mark E. Stuart, “Ancient American Indian Life in the Great Salt Lake Wetlands,” in *Great Salt Lake, Utah: 1980 Through 1998*, J. Wallace Gwynn, ed. (Salt Lake City: Utah Geological Survey Publications, 2002), 71.

³⁷ *Ibid.*

When white explorers arrived, they regarded the region as desolate. Their accounts of the climate—the stark clarity of the air and the withering aridity—reflected unsurety as much as awe, a sense of the sublime in which the impulse to possession and exploitation was subverted by an uneasiness that came from a foreign, semi-arid landscape to which they were not accustomed.

Both the native and early European experiences in the Wasatch provide an impetus for the conflicting narratives surrounding its environment. The climate specifically contributed to these contradictions. Authors like Washington Irving, who related the experiences of Benjamin Bonneville, and John C. Frémont helped to create an image of the region surrounding the Great Salt Lake. The two disagreed somewhat on the makeup of the Wasatch Valleys. While Washington claimed Bonneville saw nothing but desolation and aridity, Fremont commented on the abundance of grass and streams that would make for excellent foraging and crop cultivation, which would motivate Brigham Young to make it the new headquarters for the LDS Church.

However, to paint an accurate picture of the conditions that spurred the conflicting narratives, we need to go back several millennia. The Wasatch Front was once a very cold and wet place. During the Pleistocene, the Ice Age climate resulted in substantial change to the landscape. The cool climate, brought on by lower amounts of solar heat reaching the surface of the earth, created glaciers that crawled their way through the Wasatch Mountains, carving enormous gorges like Little and Big Cottonwood canyons just east of present-day Salt Lake City.³⁸ As the climate warmed,

³⁸ “The Ice Age in Utah,” *Wilderness USA*, n.d., <http://wildernessusa.com/learn/history-and-places/the-ice-age-in-utah/>. <https://geology.utah.gov>.

the glaciers melted into prehistoric lakes. One such lake, named after an explorer who would never actually see the area for another 33,000 years, was Lake Bonneville.

To create Bonneville, Cordilleran and Laurentide ice sheets calved off rivers that flowed down through the canyons into an endorheic basin from which the water could not escape.³⁹ With no outlet to the sea, the glacial runoff fed the lake for millennia. Then, the Hansel Valley volcanic eruption 28,000 years ago changed the course of the Bear River, diverting it into Lake Bonneville and significantly increasing the size of the lake.⁴⁰ Other rivers including the Provo, Weber, Beaver, and Sevier, eventually joined the Bear in feeding the lake, and soon Bonneville flooded the most remote areas of the eastern Great Basin, turning canyon mouths into bays and mountain slopes into beaches.⁴¹ The lake also fed itself. The prevailing westerly flow of wind and winter storms increased “lake effect” precipitation along the Wasatch Front on the eastern flank of the lake, which increased its size even further. The result was a massive, 20,000-square-mile fresh-water inland sea surrounded by marshy wetlands.⁴²

Because it had no outlet, Bonneville was especially susceptible to climate change. At its apex, Bonneville covered nearly half of present-day Utah, and even during dry periods when it would have been at its lowest levels, nearly all of Utah’s largest cities, Ogden, Provo, and Salt Lake City, would have been under water.⁴³ The climate around

³⁹ Kelsey Ann Howard, “A Late Pleistocene to Early Holocene Climate, Vegetation, and Fire History Record for the Bonneville Basin, Utah, US,” MA thesis, Univ. of Utah, 2016, 10.

⁴⁰ *Ibid.*, 9.

⁴¹ Thomas Alexander, *Utah: The Right Place* (Salt Lake City: Gibbs Smith, 1995), 18, 20.

⁴² Peter J. Mehringer, Jr. “Prehistoric Environments,” *Handbook of North American Indians: Great Basin*, Warren L. D’Azevedo and William C. Sturtevant, eds. (Washington: Smithsonian Institution, 1986), 33.

⁴³ Alexander, *Utah*, 18.

Bonneville was also capricious. For example, in the southern portion of the lake, near where Sevier lakebed now sits, mountain glaciers were actually much thicker and more expansive than typical climate patterns would dictate, making the waters at the south end of the lake much colder than other areas.⁴⁴ Roughly 16 thousand years ago, Bonneville reached its highest point at just over 5,000 feet above sea level. With a depth of over a thousand feet, covering nearly all of western Utah and much of Nevada and Idaho, the block-fault mountain ranges of these states, which now loom over semi-arid valleys, would have been islands.⁴⁵

The mountainous barriers surrounding the lake could not contain it forever. Approximately 17,400 years ago Bonneville began to overflow.⁴⁶ The rivers that had fed it for millennia never slowed, and eventually water began to breach at the lowest point of the lake's natural barrier on the northeastern shore. The result was a catastrophic collapse at Red Rock Pass in what is now southeastern Idaho. What must have been a spectacular flood emptied a large portion of the Lake's volume into the eastern Snake River plain, dropping the lake roughly 430 feet in less than a year. As the climate warmed, evaporation increased and the lake continued to slowly empty even after the flooding stopped. Bonneville lost one quarter of its surface area and dropped 300 feet to what is now known as the Provo level at 4,800-4,900 above sea level.⁴⁷

⁴⁴ Claire Todd, "Effect of Pluvial Lake Changes on Regional Climate Sensitivity and Glacial Mass Balance in Central Utah," *Quaternary International* 279-280, November 16, 2012: 494-495.

⁴⁵ Alexander, *Utah*, 19.

⁴⁶ Susanne U. Janecke and Robert Q. Oaks, "New Insights into the Outlet Conditions of Pleistocene Lake Bonneville," *Geosphere* 7, no. 6 (Dec 2011): 1399.

⁴⁷ Alexander, *Utah*, 18; Jared Farmer, *On Zion's Mount: Mormons, Indians, and the American Landscape* (Cambridge: Harvard University Press, 2010), 21; Charles G. Oviatt, "Chronology of Lake Bonneville, 30,000 to 10,000 yr BP," *Quaternary Science Reviews* 110 (February 2015): 166.

Just as climate change had created Bonneville, it also slowly killed it. Rising global temperatures brought the Ice Age to an end about 11,700 years ago, accelerating the lake's demise. Bonneville's waves continued to claw away at the Wasatch Range as if it were clinging to life, leaving descending shorelines along the sides of the mountains. As Bonneville drained into the Snake River Basin, it left behind old shorelines like rings on a giant bathtub.⁴⁸ At an elevation of 4,500 feet, Bonneville carved out the Stansbury bench, then the Gilbert Bench 250 feet lower. One of the ironies of the geological and climate history of Utah is that the Bonneville Salt Flats, a barren salt plain, was once the bottom of an enormous lake of the same name.⁴⁹ The demise of Lake Bonneville, although thousands of years in the making, was the most dramatic change to the Wasatch Front environment of the last 15,000 years. The claw marks and the mineral deposits left would ultimately become ideal settlement locations for indigenous peoples and Euro-American settlers.

Of course, the lake never completely dried up. The decline of Lake Bonneville culminated in a few shallow remnant lakes in closed basins: Utah Lake, the now-extinct Sevier Lake, and the Great Salt Lake.⁵⁰ Still, although Great Salt Lake and Utah Lake are impressive in their size, they are mere puddles compared to the immensity of their predecessor.⁵¹

Great Salt Lake is the largest body of water west of the Mississippi with an average surface area of 1,700 square miles. The lake is extremely susceptible to small

⁴⁸ Alexander, *Utah*, 18.

⁴⁹ *Ibid.*, 19.

⁵⁰ Mehringer, *Handbook*, 33.

⁵¹ Alexander, *Utah*, 18

variations in the climate. Its maximum depth is only 35 feet at the base of a shallow basin. So, the lake level can rise considerably and cover as much as a half-mile of land after meager precipitation, then recede just as fast in a drought.⁵² Prevailing windstorms can also elevate lake levels on the eastern shore by as much as two meters.⁵³

Great Salt Lake and the climate have a symbiotic relationship. The lake's shallow waters warm and cool quickly, which means that it can produce lake-effect snow or rain at almost any time after a warm spell, enhancing the unpredictability of the region's climate.⁵⁴ Cold air sweeps over the warm lake from the northwest combined with a humid upstream air mass, and the convergence of two land breezes creates lake-effect snow. The amount of snow produced depends on the humidity of the upstream air mass. At least sixty percent humidity is required, but a ten percent increase in relative humidity can potentially double the amount of lake-effect snow. Often, this convergence phenomenon produces intense "mid-lake bands" of snow that can potentially drop up to three inches per hour.⁵⁵

The disappearance of Bonneville represented the beginning of a relatively warm and dry climate period along the Wasatch Range. Vegetation and animals slowly adjusted to the shift. Temperatures warmed, but not significantly until about 6,000 years ago.

⁵² United States Geological Survey, <http://ut.water.usgs.gov/greatsaltlake/>.

⁵³ Simms and Stuart, "Ancient American Indian Life," 74.

⁵⁴ Jim Steenburgh, *Secrets of the Greatest Snow on Earth: Weather, Climate Change, and Finding Deep Powder in Utah's Wasatch Mountains and Around the World* (Logan, UT: Utah State University Press, 2014), 83.

⁵⁵ *Ibid.*, 87

Since then, the climate of the Wasatch Oasis has trended even more toward aridity, interspersed with brief wet periods.⁵⁶

The receding Lake Bonneville left behind on the slope of the Wasatch large deltas from mountain streams and alluvial shorelines from wave activity. The resulting loamy slopes and flat plain and wetlands lent themselves well to the uses of Native Americans, who moved into the area at least as far back as 9,000 years ago.⁵⁷ Except for periodic droughts, the climate probably seemed relatively stable to these early peoples over generations. As temperatures warmed, the spruce-fir forests that had flourished around Lake Bonneville's shores began to recede up the mountain slopes, leaving more heat-tolerant plants like pinion-juniper and sagebrush to replace them.⁵⁸ Paleoindians at first favored the wet bottomlands of the valley.⁵⁹ Anthropologist Peter Mehringer writes, "Volcanic activity, dune building, and vegetational changes all have elicited human responses; but overall, the extent of Great Basin lakes and marshes was most important to the numbers and distribution of people."⁶⁰ First peoples arrived and went where the water was.

Big-game hunters of the Pleistocene were likely still shifting into the foragers of the Holocene. Though the evidence is sparse and comes mostly from the western edge of the Great Salt Lake, remnants of fires, knives and other objects line the floors of ancient

⁵⁶ Melvin C. Aikens and David B. Madsen, "Prehistory of the Eastern Area," *Handbook of North American Indians: Great Basin*, 150.

⁵⁷ Richard Poll, Thomas Alexander, Eugene Campbell, David Miller, *Utah's History*, Logan UT: Utah State University Press, 8.

⁵⁸ Alexander, *Utah*, 24.

⁵⁹ Howard, "Late Pleistocene," 12.

⁶⁰ Mehringer, 31, 34.

caves from a time when Pleistocene vegetation patterns were shifting into those of more modern times.⁶¹ A period of foraging lasted from 7,500 to 4,000 years ago, focused on green shoots, roots, tubers, and seeds.⁶² Early peoples also relied on small mammals like rabbits and rodents, as well as birds during this period. Abundant waterfowl bones in caves indicate the presence of marshlands around early settlements that are now surrounded by barren salt flats.⁶³

At about 4,000 years ago, settlements in and around the eastern Wasatch valleys became more prevalent. Hunting also became more common as evidenced by abundant projectile points. Marshlands began to decline, but not because of drier weather. Above-average precipitation actually raised lake levels and drowned some of the marshlands on which many early peoples depended. Evidence suggests a period of flooding around 1,000 years ago that destroyed lakeside marshes and eliminated shallow-water resources. The flooding, however, may have led to improved living conditions: with the loss of the wetlands, the inhabitants were driven to higher ground with better access to fresh water. While foraging continued, hunting techniques improved with the introduction of the bow and arrow. Very early attempts at horticulture began around the turn of the first millennium B.C.E.⁶⁴

Roughly 400 C.E., the Fremont people arrived on the Wasatch Front, probably emerging from a diffusion of Southwestern culture. In general, the Fremont relied on village farming patterns in ways that previous peoples did not, although hunting and

⁶¹ Aikens and Madsen, "Prehistory," 154.

⁶² Simms and Stuart, "Ancient American Indian Life," 74.

⁶³ Aikens and Madsen, "Prehistory," 155.

⁶⁴ *Ibid.* 159, 160.

gathering remained important. They made and used pottery, constructed dwellings, and produced detailed rock paintings and clay figurines. The Fremont people of the Wasatch area did diverge somewhat from their Southern neighbors: architecture was much more elemental, and pit houses were used in place of stone dwellings. Marshlands became essential to them, as they had been for their predecessors. Early on hunting and gathering were more prevalent than horticulture as the soil in parts of the valley was too saline to grow maize.⁶⁵

Climate variability caused the Wasatch Fremont to diverge from the ways of their southwestern cousins. Temperature variances are much greater than in the south. The wetlands were (and still are) a very dynamic environment and required the Fremont to adapt their foraging and hunting strategies. At times they lived within the wetlands, then would move to the periphery. They would withdraw to pit houses in the winter and then disassemble them in the spring. Their fluctuating settlement patterns affected their social structures and, as a result, their ideologies. As anthropologist Steven Simms put it, “This human habitat was more of a dynamic theater of trade-offs than it was an idyllic and static Garden of Eden.”⁶⁶ Still, a thousand years of stable occupation must count for some sort of stasis, though perhaps not “idyllic.”

Around 1350 C.E., for reasons not entirely evident, the Wasatch Fremont culture began to disintegrate. Some sort of cultural regression set in. Anthropologist Dean R. Snow attributes the disappearance of the Fremont to decades of drought. “Fremont farmers did not successfully revert to the hunting and gathering adaptation of their

⁶⁵ J.P. Marwitt, *Median Village and Fremont Culture Regional Variation*, University of Utah Anthropological Papers 95, 1970, 161, 168.

⁶⁶ Simms and Stuart, “Ancient American Indian Life,” 74, 75.

ancestors when climate change forced the abandonment of farming,” writes Snow.⁶⁷ “This was a time of climate change in western North America and for the Fremont, a reduction in summer monsoon rainfall that negatively affected maize farming. While droughts had occurred previously, those of the twelfth and thirteenth centuries occurred in the context of the largest aboriginal population the region had ever supported.”⁶⁸ Oriented as they were toward “lake-marsh wetland subsistence,”⁶⁹ the overcrowded Fremont might have moved on rather than starved. There are some affinities between the Fremont culture and the Hopi culture of northeastern Arizona, so perhaps they migrated to that region.⁷⁰ Intriguingly, during this same period, the highly developed Hohokam culture in Arizona’s central valley also disintegrated, perhaps due to the same long and extensive drought, which is now known to scientists as the Medieval megadrought. Mounting evidence suggests that a similar pattern of drought is now increasingly likely throughout the American southwest due to rising temperatures.⁷¹ If so, the current culture of the Wasatch Oasis might well take note of the cautionary tale of the Fremont culture.

Still another possibility is that the Fremont merged with Numic-speaking peoples—Utes, Shoshone, and Paiutes—who were moving into the region as of about

⁶⁷ Dean R. Snow, *The Archaeology of Native North America*, 2nd ed. (London: Routledge, 2019), 171.

⁶⁸ Simms and Stuart, 79.

⁶⁹ Brian E. Hemphill, Clark Spencer Larsen, *Prehistoric Lifeways in the Great Basin Wetlands* (Salt Lake City: University of Utah Press, 1999), 214.

⁷⁰ See Lynda D. McNeil, David L. Shaul, “‘We Will Arrive as Rain to You’: Evidence of Historical Relationships Between Western Basketmaker, Fremont, and Hopi People,” *Journal of Southwestern Anthropology and History* 86 (2020), no. 3: 245-273.

⁷¹ Edward R. Cook, Richard Seager, et al., “Megadroughts in North America,” *Journal of Quaternary Science* 25, no. 1 (January 2010): 48.

1100 C.E.⁷² What might have caused this coalescence is still mysterious, inasmuch as the Numics evince no Fremont culture markers.⁷³ But the coalescence model is attractive because of the gradual decline of the Fremont and rise of the Numics within the same culture region. The Numic speakers seemed to have had superior techniques for gathering food and to be better adapted to navigating a variable climate alternating between hot and dry and cold and wet.⁷⁴ The argument that the disappearance of the Hohokam was due to coalescence is also gaining ground.⁷⁵ Coalescence might account for the missing Fremont culture, but there is one obstacle: DNA markers of the Fremont peoples show that they are not related to the Numic peoples who succeeded them.⁷⁶ So, climate change emerges as the most probable explanation for the substantial cultural shift that took place in the Wasatch Oasis during the fourteenth century.

The climate-forced dissolution of the Fremont civilization must have been accompanied by major ideological changes. For a thousand years, the Fremont had grown sedentary and numerous under relatively stable climatic conditions. By the end of the Fremont period, the valley was “fully utilized,” in the words of Simms and Stuart. The rupture that occurred around 1350 coincided with abandonment of the cultural artifacts

⁷² Dean L. May, *Utah: A People's History* (Salt Lake City: Bonneville Books, 1987), 23; Alexander, *Utah*, 39.

⁷³ Marwitt, *Median Village*, 169.

⁷⁴ Alexander, *Utah*, 43.

⁷⁵ J. Brett Hill, Jeffrey J. Clark, et al., “Prehistory Demography in the Southwest: Migration, Coalescence, and Hohokam Population Decline, *American Antiquity* 69, no. 4 (October 2004): 689-93. See also “Pieces of the Puzzle,” *Archaeology Southwest*, 2020. <https://www.archaeologysouthwest.org/exhibit/online-exhibits/pieces-puzzle/>

⁷⁶ Frederika A. Kaestle, David Glenn Smith, “Ancient Mitochondrial DNA Evidence for the Prehistoric Population Movement: The Numic Expansion,” *American Journal of Physical Anthropology* 15, no. 1 (May 2001): 1.

that characterized the Fremont, demonstrating that they either no longer relied on the convictions that had sustained them for so long or simply moved away from their material representations. Their elaborate rock art seemed centered on the worship of a water god, called *Awanyu* by the Tewa people, depicted as a serpentine stream of water often adjacent to a garden plot of maize. Typically, the god was surrounded by the angular figures of supplicants.⁷⁷ Creation of new rock art ended. The relinquishment of this ritual art perhaps signals a change of some kind in the Fremont belief system. While the drying climate contributed to a deterioration of their social systems, this may have also contributed to a change in their beliefs. They may have questioned why *Awanyu* ceased to bring water to their garden plots. We know little about their religion; but whatever religious beliefs they had or rituals they performed, their efforts failed to restore the harmony and balance of nature they were accustomed to. Perhaps the abandonment of their culture and lands paralleled an ideological surrender as well.

In any case, climate change seems to have contributed to a massive destabilization of the ancient Fremont culture in the fourteenth century. Drought, the arrival on scene of Numic-speakers with better adapted technology, the exigencies of overpopulation—all in play at the same time—could not help but disrupt a long-established culture. As the narratives that stabilized their culture either melded with or disappeared into other narratives, their identity disintegrated as well, a result that raises important questions

⁷⁷ Carol Patterson, Glade Hadden, “The Mu:kwitsi/Hopi (Fremont) abandonment and Numic Immigrants into Nine Mile Canyon as Depicted in the Rock Art,” Dominguez Archaeological Research Group, 2016, 3-6, https://www.academia.edu/36439563/The_Mu_kwitsi_Hopi_Fremont_abandonment_and_Numic_Immigrants_into_Nine_Mile_Canyon_as_Depicted_in_the_Rock_Art.

about the relationship between climate and cultural identity. Those questions take on urgent relevance in later periods of climate disruption, as we will see.

As great as the dislocation of the substantial Fremont culture must have been, the arrival of Europeans was even more impactful. Initial contacts left little trace. The 1776 transit through the southern Wasatch country of two Spanish friars, Dominguez and Escalante, produced the first appraisal of the climate in the European voice, prioritizing the practical value of the land. They described the Utah Lake region in terms of its potential for settlement. “The climate here is a good one,” they reported, “for after having experienced cold aplenty since we left El Rio de San Buenaventura, we felt warm throughout the entire valley by day and night.”⁷⁸ They estimated the area around the Spanish Fork River sufficient for two settlements, while another and larger river (the Provo) could easily sustain three. Abundant pasture filled the valley, and plenty of timber could be found in the surrounding mountains. The entire valley could be turned into farmland.

The most appealing feature of the valley, however, was the lake. The Timpanogotzis Utes showed the friars Utah Lake’s potential as a fishery. Their journal describes how the Timpanogotzis lived off fish from the lake, while seeds, rabbits and waterfowl around it supplemented their diet. “The lake must be six leagues wide and fifteen long,” they reported. “It extends toward the northwest and, as we were informed comes in contact through a narrow passage with another much larger one.” The “much larger one” had “harmful” waters that made the skin itch. At this point, they withdrew,

⁷⁸ Ted J. Warner, *The Dominguez-Escalante Journal: Their Expedition Through Colorado, Utah, Arizona, and New Mexico in 1776* (Salt Lake City: University of Utah Press, 1995), 71.

turning southward. Hugging the eastern edge of the Basin, the high-country winter of the basin and range region near present-day Cedar City forced them to abandon their route.⁷⁹ After a desperate crossing of the desert, they made it back to Santa Fe. In a report to the King of Spain, Captain Don Bernardo Miera y Pacheco wrote that a major settlement could be built along the shores of Utah Lake as it was the most “fertile site in all New Spain.”⁸⁰ Still, it would be fifty years before another European would attempt to reach the Great Salt Lake region.

In 1827, to get from the Pacific coast to a rendezvous in southern Idaho, a young trapper named Jedediah Smith trekked eastward toward Great Salt Lake. His route took him through one of the most arid landscapes in the country. While the Wasatch Front, on the eastern side of the Lake, is a relative oasis, the western region is a literal desert. One anecdote illustrates the harshness of the regional climate and the desperation of the situation in which Smith found himself.

I started verry [sic] early in hopes of soon finding water. But ascending a high point of a hill I could discover nothing but sandy plains or dry Rocky hills with the exception of a snowy mountain off to the NE at the distance of 50 or 60 miles. When I came down I durst not tell my men of the desolate prospect ahead.⁸¹

Thirst nearly killed Smith and his party. Finally, on June 27, 1827, after a four-day journey across the desolate landscape, Smith glimpsed Great Salt Lake. His joy was immense: “The Salt Lake a joyful sight was spread before us. Is it possible said the

⁷⁹ Ibid., 70-71,72, 85.

⁸⁰ Herbert E. Bolton, *Pageant in the Wilderness: The Story of the Escalante Expedition to the Interior Basin, 1776* (Salt Lake City: Utah State Historical Society, 1950), 244.

⁸¹ George R. Brooks, *The Southwest Expedition of Jedediah S. Smith: His Personal Account of the Journey to California, 1826-1827* (Lincoln: University of Nebraska Press, 1977), 187-188.

companions of my sufferings that we are so near the end of our troubles. For myself I durst scarcely believe that it was really the Big Salt Lake that I saw.”⁸²

The first people of European descent in the Lake region were overwhelmed by the vastness of the parched landscape and a wild climate that threatened death by freezing or scorching heat. Euro-Americans had rarely encountered such an intimidating environment. It required re-construction of an identity formed in a much tamer world.

Washington Irving described that former world in his *Sketchbook*. Of England, he wrote:

A great part of the island is rather level, and would be monotonous were it not for the charms of culture, but it is studded and gemmed, as it were, with castles and palaces, and embroidered with parks and gardens. It does not abound in grand and sublime prospects, but rather in little, home scenes of rural repose and sheltered quiet. The great charm, however, of English scenery, is the moral feeling that seems to pervade it. It is associate in the mind with ideas of order, of quiet, of sober well established principles, of hoary usage and reverend custom. . . . All these common features of English landscape evince a calm and settled security.⁸³

Reading Bonneville’s account of western North America, Irving observes in it the violent contrast between the Rocky Mountain valleys and the English countryside, a contrast that threatens the moral order of civilization.

This vast wilderness is interrupted by mountainous belts of sand limestone, broken into confused masses; with precipitous cliffs and yawning ravines, looking like the ruins of a world; or is traversed by lofty and barren ridges of rock, almost impassable. . . . The stern barriers of the Rocky Mountains, the limits, as it were, of the Atlantic world. The rugged defiles and deep valleys of this vast chain . . . Such is the nature of this immense wilderness of the far West.⁸⁴

⁸² Brooks, *Southwest Expedition*, 193.

⁸³ Washington Irving, *The Sketch Book of Geoffrey Crayon, Gent.*, (New York: G.P. Putnam, 1844), 53-54.

⁸⁴ Washington Irving, *Astoria; or Anecdotes of an Enterprise Beyond the Rocky Mountains* (Paris: Baudry’s European Library, 1836), 136-37.

Irving and other Euro-centric authors of the era created a perception of the West as an inhospitable waste land. The orderly, carefully cultivated, controlled European identity begins to disintegrate in the face of this vast, lofty, barren, rugged, confused wilderness. It “defies cultivation” of land or character. Its main feature is “vastness.” And it would take a truly industrial and enterprising people to settle it.

In 1837, Irving published his account of Captain Benjamin Bonneville’s expedition to the Great Salt Lake region. The publication was the third volume of a series of potboilers on frontier life which Irving wrote to strengthen his claim as an “American” writer.⁸⁵ He based the book on Bonneville’s own maps, journals, and notes, which he bought from the explorer for \$1,000, but took some liberties to make it more dramatic and appealing to readers. Irving confesses the inability of the Euro-American identity to impose his moral order upon the landscap—an identity that was no longer equal to the environment. Nevertheless, Irving sees a new American identity in formation in the character of Bonneville:

Captain Bonneville now found himself at the head of a hardy, well-seasoned, and well-appointed company of trappers. . . . He determined, therefore, to strike out into some of the bolder parts of his scheme. One of these was to carry his expeditions into some of the unknown tracts of the Far West. . . . Among the grand features of the wilderness about which he was roaming, one had made a vivid impression on his mind, and been clothed by his imagination with vague and ideal charms. This is a great lake of salt water, laving the feet of the mountains, but extending far to the west-southwest, into one of those vast and elevated plateaus of land, which range high above the level of the Pacific.⁸⁶

Although Bonneville went to the region to profit from the fur trade, Irving says that the man’s “uppermost” motive was the conquest of the unknown. In Irving’s view, Bonneville embodied de Tocqueville’s view of the “new American”—motivated by

⁸⁵ Stanley T. Williams, *The Life of Washington Irving*, (Oxford: Oxford University Press, 1935), 77-78.

⁸⁶ Washington Irving, *The Adventures of Captain Bonneville* (New York: J.W. Lovell company, 1883), 132.

“extreme forms of the spirit of adventure and risk fostered by the growing abundance and the limitless opportunities for gain.”⁸⁷ Bonneville was the hardy, bold new American on a quest. The destination was “vague, ideal . . . a great lake of salt water,” a fitting symbol of the limitless imagination. Bonneville was enthralled by his mental picture of the lake as the emblem of the “unknown” with its secret “charms.” Never having seen it himself, Bonneville had digested the scanty reports of William Sublette and others and could “give a striking account of the lake”:

As you ascend the mountains about its shores, says he, you behold this immense body of water spreading itself before you, and stretching further and further, in one wide and far-reaching expanse, until the eye, wearied with continued and strained attention, rests in the blue dimness of distance, upon lofty ranges of mountains, confidently asserted to rise from the bosom of the waters.⁸⁸

Irving implies that the new American imagination is captivated by endless vistas, which represent the boundless possibilities they see in themselves. In Bonneville’s imagination, the Great Salt Lake Valley figured those possibilities, providing in the “transparent atmosphere of these lofty regions” a clear vision of an inexhaustible economy of achievement and plenty, and thus a kind of realization of the American self. Still, Irving detects in Bonneville’s story something menacing about the climate: “The admirable purity and transparency of the atmosphere in this region, allowing objects to be seen, and the report of firearms to be heard, at an astonishing distance; and its extreme dryness, causing the wheels of wagons to fall in pieces . . . are proofs of the great altitude of the Rocky Mountain plains.”⁸⁹

⁸⁷ Aurelian Craiutu and Jeremy Jennings, “The Third Democracy: Tocqueville’s Views of America after 1840,” *The American Political Science Review* 98, no. 3 (August 2004): 400.

⁸⁸ Irving, *Bonneville*, 132.

⁸⁹ *Ibid.*, 134.

Irving the New Yorker responds to these descriptions of such a “high and dry” country and climate with a note of fear. The astonishing distances, the clarity and aridity of the country, made him apprehensive of Bonneville’s “fanciful views.” In this respect, while appreciating the “grand scheme of the captain,” Irving foreshadowed later realists like John Wesley Powell and Walter Cottam for whom dreams of a western utopia ran up against the actualities of the climate. When Bonneville sent his assistant Joseph Walker with a party to explore the Great Salt Lake, they described a fearful landscape:

The party . . . soon found themselves launched on an immense sandy desert. Southwardly, on their left, they beheld the Great Salt Lake, spread out like a sea, but they found no stream running into it. A desert extended around them, and stretched to the southwest, as far as the eye could reach, rivalling the deserts of Asia and Africa in sterility. There was neither tree, nor herbage, nor spring, nor pool, nor running stream, nothing but parched wastes of sand, where horse and rider were in danger of perishing.⁹⁰

Desperate for water, Walker’s group abandoned the effort to explore the lake and struck out west in hopes of finding more promising country. Walker’s journey along the western lakeshore was no doubt a harrowing one. He nearly died of thirst and exposure in the merciless climate of the Great Salt Lake Desert. Ironically, of course, Walker had missed exploring the more inviting Wasatch Oasis east of the lake and so had nothing but tales of horror to report. Bonneville disputed the report but never fulfilled his dream of exploring this emblem of the “charming unknown.” Perhaps Walker’s fearful account discouraged him.

When published in 1837, Irving’s account of Bonneville’s adventures became wildly popular. His depictions of the West drew great interest and reinforced a narrative of bleak and deadly grandeur, the haunt of “desperadoes” and the “debris” of civilization.

⁹⁰ Ibid., 232.

While Irving had never been further west than Oklahoma, he in a sense re-made his reputation by writing about the adventurers who explored the region. The first of these was an account of John Jacob Astor's investment in the Columbia fur trade in *Astoria, or Anecdotes of an Enterprise beyond the Rocky Mountains*, (1836), which he based on conversations with participants and contemporary records.⁹¹ Irving's *Astoria* quickly became even more influential than the failed settlement itself. Becoming one of the most read books of its time, *Astoria* had an incalculable impact on westward expansion, particularly to the Pacific Northwest.

From Bonneville's account, Irving viewed the region around the Great Salt Lake as "rivalling the deserts of Asia and Africa," adding to the American imagination of the West a sense of the exotic. Additionally, Irving helped create the narrative of the intrepid "pathfinder" as the ideal American type—based on robust, resolute figures like Jedediah Smith and Joseph Walker—those daring enough to do battle with the desolate western climate and come out victorious.

The very embodiment of the bold pathfinder was John C. Frémont. Future presidential candidate and Civil War general, Frémont built his romantic reputation on his explorations of the West in the early 1840s, ostensibly to make scientific surveys but possibly even more to play the promoter. His aim was to locate alternative routes to the Pacific Coast in the Oregon and California regions, but "an examination of the great [salt] lake . . . the principal feature of geographical interest in the basin, was one of the main objects contemplated in the general plan of our survey." His observations of the Wasatch

⁹¹ William Brandon, "Wilson Price Hunt," *Mountain Men & Fur Traders of the Far West*, edited by LeRoy R. Hafen, (Lincoln: University of Nebraska Press, 1982), 63.

oasis are perfunctory for the most part: “In this eastern part of the Basin, containing Sevier, Utah, and the Great Salt lakes, and the rivers and creeks falling into them, we know there is good soil and good grass, adapted to civilized settlements.” He was impressed with the potential of the Utah Lake valley for agriculture:

We entered a handsome mountain valley covered with fine grass, and directed our course towards a high snowy peak [Mt. Timpanogos], at the foot of which lay the Utah lake. . . . In the cove of mountains along its eastern shore, the lake is bordered by a plain, where the soil is generally good, and in greater part fertile; watered by a delta of prettily timbered streams. This would be an excellent locality for stock farms; it is generally covered with good bunch grass, and would abundantly produce the ordinary grains.⁹²

Frémont’s reports were among the first from the Great Basin to assert a potential for agriculture and would foster future colonization of northern Utah. By providing detailed scientific information on the environment of the Wasatch Oasis, his widely published reports fostered future colonization of northern Utah—Mormon leaders in Illinois in particular would take note of his description of an isolated, yet fertile valley as a possible refuge for their people.

At the same time, Frémont was not sanguine about the region as a whole. He had established that there actually was a large endorheic zone—he was the one who named it “the Great Basin”—conceding that it was a desert and that “sterility may be its prominent characteristic.” Further, it appeared to him that the inhabitants were few and dehumanized: “The contents of this Great Basin are yet to be examined. That it is peopled, we know; but miserably and sparsely. From all that I heard and saw, I should say that humanity here appeared in its lowest form, and in its most elementary state . . .

⁹² John Charles Frémont, *Report of the Exploring Expedition of the Rocky Mountains in the Year 1842: and to Oregon and North California in the Years 1843-'44* (Washington: Blair and Rivers, Printers, 1845), 2:139, 273-4.

the miserable *Digger*.”⁹³ The so-called “Diggers,” the Numic-speaking hunters and gatherers of the region, struck him as the primitive opposite of his own self-image: the enlightened, sophisticated, scientific American who represented the apex of human achievement.

Frémont was unimpressed by the cursory accounts of the Great Salt Lake given by fur trappers; he was interested in conducting more scientific observations. He accessed the Great Salt Lake by following the Bear River away from the Oregon trail. In late August 1843, he reached the river and camped near present-day Cokeville, Wyoming. From here, he could probably see the peaks of the northernmost Wasatch mountains, though he makes no mention of them.⁹⁴ In an 18-foot-long boat, which he described as resembling a “bark canoe,” his party floated along most of the way. His references to the climate included almost daily thermometer readings, descriptions of the local flora, and observations of the width and depth of the Bear River. He described it as 60 to 100 yards wide at various points, with a depth that exceeded 15 feet. Pleasant temperatures and plenty of grass made his journey along the Bear River relatively unremarkable.

In early September, Frémont finally reached the Great Salt Lake, a milestone he had set for himself from the first of his journey. On September 6, he and his companions ascended an overlooking butte, which gave them an impressive view of the lake:

It was one of the great points of the exploration; as we looked eagerly over the lake in the first emotions of excited pleasure... It was certainly a magnificent object, and a noble terminus to this part of our expedition; and to travelers so long shut up among mountain ranges, a sudden view of the expanse of silent waters had in it something sublime.⁹⁵

⁹³ *Ibid.*, 237.

⁹⁴ *Ibid.*, 147.

⁹⁵ *Ibid.*, 151.

Here Frémont abandons what had been a disinterested tone of voice and nearly breaks into what resembles song lyrics. In his eagerness and excitement over the “magnificent, noble” prospect of the great lake before him, he echoes the longing for the “sublime” we hear in Irving’s account of Bonneville’s imaginings.⁹⁶ The concept of the “sublime,” of that which is “beyond the limit” of human experience, underlay all the narratives of those Euro-Americans who came into this region. But the sublime also generates anxiety.

The night before Frémont and his band were to float out to one of the islands and explore the lake, he reported bad dreams among his men, which “always preceded evil.” They set off near the mouth of the Bear River in a small, fragile skimmer, which they had to drag through knee-deep mud banks before they reached water deep enough to sail on. They sailed for a fair distance before they reached “a small black ridge,” and the water suddenly became salty. They were now floating on Great Salt Lake.⁹⁷

Except for a few large swells, the trip to the nearest island was uneventful, though Frémont found some things worrisome. Patches of foam floating on a current, Frémont remarked, reminded him of the dramatic stories he had heard of a whirlpool in the center of the lake, and their inability to see the lake’s bottom gave him and his crew pause. But they eventually disembarked on an island with little trouble.

On the island, Frémont surveyed it and wondered at the views of the lake: “As we looked over the vast expanse of water spread out beneath us, and strained our eyes along the silent shores over which hung so much doubt and uncertainty, which were so full of

⁹⁶ Ibid., 151

⁹⁷ Ibid., 153.

interest to us, I could hardly repress the almost irresistible desire to continue our exploration.”⁹⁸ At sundown, the party camped on the island’s beach. They slept soundly despite the wind stirring up waves that crashed on the beach not far from their camp. “I had not expected in our inland journey,” Frémont recounted, “to hear the roar of an ocean surf.”

The snows that were covering more of the mountain tops each day worried Frémont, and the prospect of oncoming storms quenched his “irresistible desire” to continue exploring. He chose to return to the shore rather than to tempt fate on the homemade skiff. Because the island lacked the timber and water Frémont hoped to find there, he named it Disappointment Island. Ironically, the island is now named after him.⁹⁹

An atmosphere of foreboding and “bad dreams” hangs over Frémont’s account of his Great Salt Lake adventure. The lake tantalized him with its limitless vista, but the vastness was also “overhung” with “doubt and uncertainty.” The ominous environment—the roar of an “ocean,” the threat of an imaginary whirlpool, the howling winter ahead—unnerved him. The sterile name “Disappointment Island” could be regarded as a metaphor for himself in his sense of being unequal to the demands of this land. He says the landscape “strained our eyes.” This psychic “strain” is basic to the “tradition of the sublime,” which, in the words of Rachel Carson Fellow Amanda Boetzkes, “articulates a tension between a sense of being overwhelmed by nature on the one hand, and an equally potent drive to contain it on the other.”¹⁰⁰

⁹⁸ Ibid., 153-54, 155.

⁹⁹ Ibid., 156.

¹⁰⁰ Amanda Boetzkes, “Waste and the Sublime Landscape,” *Canadian Art Review* 35 (2010), no. 1: 22.

This haunted undercurrent in Frémont’s text did not detract from the enormous impact on the nation of the *Report of the Exploring Expedition*, which was published in 1845. The national ferment over Oregon and California and the imminent annexation of Texas was nearly at full boil. By then, Frémont the romantic hero was covertly taking control of California, and his reputation was flourishing. He was credited with “realizing a new empire.” Telling stories of rich lands and vast settlement prospects in California and Oregon, he was said to have “lifted the veil, which since time first began, had hidden from view the real *El Dorado*.”¹⁰¹

Thanks to Frémont’s reports, a flood of emigrants headed for Oregon and California, but they skirted the Great Basin—his descriptions of that region attracted almost nobody, except the Mormons. The radical discontinuity between the green and picturesque states of the East and the stark sublimity of the Great Basin in Frémont’s accounts discouraged settlement. “The whole idea of such a desert,” he wrote, “and such a people [as the “Diggers”] is a novelty in our country, and excites Asiatic, not American ideas.” The alien character of the climate clashed with the “American idea” of limitless material progress and expansion. “Interior basins . . . often sterile, are common enough in Asia; people still in the elementary state of families, living in deserts, with no other occupation than the mere animal search for food.”¹⁰² For Frémont, the “Basin” encloses in a sterile envelope people who become totally disempowered, scrounging like animals for basic survival. Americans, on the other hand, would be repelled by such a radically limited existence.

¹⁰¹ Tom Chaffin, *Pathfinder: John Charles Frémont and the Course of American Empire* (Norman, OK: University of Oklahoma Press, 2014), 383, 385.

¹⁰² Frémont, *Exploring Expedition*, 277.

At the same time, Frémont described the Wasatch Oasis in very different terms:

The bottoms are extensive; water excellent; timber sufficient; the soil good, and well adapted to grains and grasses suited to such an elevated region. A military post, and a civilized settlement, would be of great value here; grass and salt so much abound. The lake will furnish exhaustless supplies of salt. All the mountains here are covered with a valuable nutritious grass, called bunch-grass, from the form in which it grows, which has a second growth in the fall. The beasts of the Indians were fat upon it; our own found it a good subsistence; and its quantity will sustain any amount of cattle, and make this truly a bucolic region.¹⁰³

Settlers seemed to ignore Frémont's short paragraph about the Oasis in their aversion to the Basin as a whole. American cultivation of the Great Basin would require "nothing less than the re-imagining of the very idea of America and its inhabitants," as Frémont's biographer, Tom Chaffin, puts it.¹⁰⁴ The dependence of identity and ideology on climate is demonstrated by this observation, as well as by the remarkable disappearance of the civilization that now bears Frémont's name. Climate change upset the equilibrium of the Fremont. Their experience suggests that the stark and volatile climate of the Great Basin threatens massive cultural disruption or even extinction, even within the relatively sheltered Wasatch Oasis. A sense of anxiety haunts the accounts of early Euro-American explorers as they identify little pockets where human civilization might get a foothold within the mighty badlands, but they cannot shake the feeling that there is peril here to Euro-American ideas of order and stable identity. Bonneville and Frémont experienced the region as a manifestation of the "sublime," which has been defined as "an ungraspable force that presents itself at the edges of human territory."¹⁰⁵ But "sublime" did not mean "hospitable." Based on Bonneville's report, Washington

¹⁰³ *Ibid.*, 307

¹⁰⁴ Chaffin, *Pathfinder*, 238.

¹⁰⁵ Boetzkes, *op. cit.*, 22.

Irving dismissed the region around the Great Salt Lake as unfit for cultivation and consigned it to a future “mongrel” race of the marginalized and the desperate.

In his ambivalence, Frémont saw the potential of the Oasis for “blossoming” but also raised much apprehension about the difficulty of the enterprise. His account, coupled with the ominous narrative of Bonneville/Irving, drew a picture of a land demanding but still tantalizing to Tocqueville’s “new American” who brooked no conventional limits to his aspirations.

Frémont’s account of the Wasatch Oasis—the region’s “fertile and timbered” valley surrounded by a desolate wilderness—did catch the attention of such a “peculiar people.” Geographer Richard Francaviglia has characterized the region as a place where people come to “search for something beyond normal experience.”¹⁰⁶ This certainly applies to the Mormons, who came to the Wasatch Front searching for a place that would isolate them and enable them to generate a new kind of selfhood, as we will see.¹⁰⁷

¹⁰⁶ Richard Francaviglia, *Believing in Place: A Spiritual Geography of the Great Basin* (Reno: University of Nevada Press, 2003), xix.

¹⁰⁷ Chaffin, *Pathfinder*, 245.

Chapter 3

“A Good Place for Making Saints”

In 1855, the Great Salt Lake Valley was no longer a quiet grassland. Buildings had popped up in the first major Euro-American settlement in the Great Basin. Hundreds of acres of irrigated farms had replaced much of the grass. Streets lined with canals ran in a grid pattern stretching north and south from the center of a village that was quickly becoming a bustling city. What was once the bottom of an inland sea was now the center of a growing American community.

Eight years earlier, Mormon pioneers, members of the Church of Jesus Christ of Latter-day Saints, had begun streaming into the Wasatch Oasis. These migrants had left the United States to seek refuge in what was then the northernmost territory of Mexico. What they saw as religious persecution had pushed the Mormons from place to place—New York to Ohio to Missouri to Illinois—before they decided to leave the country altogether. The valley of the Great Salt Lake offered them a chance to build a new settlement from scratch without having to worry about religious and political opposition.¹⁰⁸ As for the Native Americans in the area, the Saints hoped they would be able to convert them to their religion and make them into allies.

Concern about survival in the semi-arid landscape and foreign climate replaced their worries about persecution. Since Lake Bonneville dried up, the Oasis had undergone long, slow change, trending mostly toward desiccation. Now the Mormons produced

¹⁰⁸ “Coun. G. A. Smith, Monday September, 8 [9] 1845,” Joseph Smith Papers: Administrative Records, Council of Fifty Minutes, March 1844-January 1846, Ronald Esplin, Matthew J. Grow, Matthew C. Godfrey editors, (Salt Lake City Utah: Church Historian’s Press, 2016), 476. Hereafter JSP.

rapid change as they worked to reshape the landscape and make the climate work in their interest. A new cultural era had begun in the Wasatch.

Part of what engineered this change was a mentality that the Mormon settlers had brought with them. Brigham Young would soon encourage an “improvement” of the land, which meant a more developed landscape filled with orchards, farms, and homes. This would reflect the sanctification of his people. He believed that as the land changed, so would his people. This would require a rejection of American values—in particular, individualism and secular entrepreneurship. Instead, his people would need to focus on communal achievements. They would share resources, distribute wealth, and all would work towards a common purpose—to build Zion, a holy society. As they set out to build Zion, God would support them with abundance: “The wilderness and the solitary place [would] be glad for them; and the desert rejoice, and blossom as the rose,” according to a much-quoted Bible passage (Isaiah 35:1). The blossoming of the desert was a favorite theme of the Mormon leaders, an ideal cited dozens of times as they preached to the Saints over the pioneering decades.¹⁰⁹ By keeping an “eye single” to making the desert blossom, the Saints hoped to blossom spiritually as well.

If they lost focus, however—faltering in their obedience, allowing a concern for profits to dominate their behaviors—they would lose their divine support, their leader claimed, and the land would cease to provide for them. So, when a grasshopper plague, a

¹⁰⁹ See for example Jedediah M. Grant, “The Present Scarcity,” January 27, 1856, *JD* 3:201; Daniel H. Wells, “The Gospel of Salvation,” April 14, 1861, *JD* 9:47, 48; Brigham Young, “Eternal Existence of Man,” September 28, 1862, *JD* 10:6; Orson Pratt, “Second Coming of Christ,” December 18, 1870, *JD* 15:57 and “Fulfillment of Prophecy,” August 30, 1875, *JD* 18:145; Wilford Woodruff, “Simplicity of the Gospel,” August 13, 1876, *JD* 18: 221; Charles W. Stayner, “Fate of the Ancient Apostles,” May 25, 1879, *JD* 20:210; John Taylor, “The Gathering,” November 30, 1884, *JD* 26:69, 76.

dry summer, and a harsh winter left the Mormons suffering, Young took it as a sign of God’s displeasure, and he reinforced his efforts to shun American ideals and create a new Mormon identity.

Under increasing political and religious pressure in their headquarters at Nauvoo, Illinois, Mormon leaders were attracted by the prospect of a refuge in the West. As those pressures intensified, Joseph Smith, the founder and leader of the Mormons, formed in March 1844 a standing committee formally known as the “Kingdom of God,” but usually known as the Council of Fifty.¹¹⁰ One of the council’s primary missions was to plan and prepare for what they called “the Great Western Measure”—a wholesale relocation of the Latter-day Saints beyond the reach of hostile governments and mobs. In 1843, newspaper editor John L. O’Sullivan had coined the term “manifest destiny,” the idea of the West as the great outlet for an expanding American population.¹¹¹ This idea appealed to the Mormons. After the assassination of Smith in June 1844, the Council continued under the leadership of Brigham Young to consider a new Western home in Texas or Oregon. Later in 1845, Mexico’s Upper California region, then comprising most of the present states of Nevada, Utah, Arizona, New Mexico, and California, became the primary intended destination. Preparations began for a large group to move there the following spring.¹¹² The Council even went so far as to vote that Young become the next governor of California.¹¹³

¹¹⁰ “Preface to the Joseph Smith Papers: Administrative Records, Council of Fifty Minutes, March 1844–January 1846,” JSP, xxiii. (Joseph Smith Papers hereafter referred to as JSP.)

¹¹¹ John L. O’Sullivan, “Annexation,” *United States Magazine, and Democratic Review* 17, no. 85 (July–August 1845), quoted in JSP, xxvii.

¹¹² Willard Richards, Journal, 27 August 1845, JSP, 464

¹¹³ Willard Richards, Journal, 28 and 31 August 1845, JSP 464.

The Council took into account several different factors in choosing where they would relocate. They wanted a place close to a port for trading, remote for defense, and beyond the control of the United States government, which they viewed as corrupt and hostile.¹¹⁴

Additionally, they put special emphasis on finding a suitable climate. As the council assembled the afternoon of August 14, 1845, they “had conversation on various subjects particularly about removing to a healthy climate after we have done the work appointed us in Nauvoo.”¹¹⁵ Of the climate of Texas, they noted, “It is a perfectly healthy location . . . the climate is mild, though hot at mid day in the sun.”¹¹⁶ Of Oregon, one member remarked that the Willamette valley was the “finest country in the world,” but too cold to grow corn. Another noted that Upper California had “perhaps the most moderate climate” of all the possible locations. They had just received a copy of Frémont’s report on the Great Basin expedition and were eager to study it.¹¹⁷

Their concern for a “healthy climate” was no doubt motivated by dismay over the “unhealthy” climate in which they lived at the time. Malaria and cholera plagued the upper Mississippi valley. Most Mormon families suffered “swamp fever,” particularly in 1839-1840 when they were building their city of Nauvoo. They even wondered if the prevalence of the sickness was due to divine displeasure: Joseph Smith preached in July

¹¹⁴ "Council of Fifty, Minutes, March 1844–January 1846; Volume 2, 1 March–6 May 1845," 18 March 1845, JSP, 131.

¹¹⁵ Willard Richards, Journal, 14 August 1845, JSP, 464.

¹¹⁶ “Council of Fifty Minutes,” 3 May 1844, JSP, 144.

¹¹⁷ “Council of Fifty Minutes,” 18 March 1845, JSP, 327.

1840 that if the faithful could only cease expressing their discontent . . . good health would return.”¹¹⁸

Most people believed malaria (“bad air” in Spanish) came from breathing “miasma,” vapors arising in the heat and humidity of summer from decomposing plants and swampy lowlands. During the nineteenth century, under frontier conditions . . . “fever and ague” or the “chills” were regarded as a necessary part of acclimatization. “He’s not sick, he’s only got the ager” was a prevailing idea. All authorities agree that during this century, “malaria” was *the* American disease . . . its hotbed was what up to the 1850s was still called “the west,” the valley of the Mississippi and its tributaries.¹¹⁹ The mosquito-borne disease was particularly severe in Illinois. Congressman John Reynolds (who introduced Joseph Smith to Martin Van Buren) reported that “the idea prevailed that Illinois was a graveyard.”¹²⁰

Brigham Young had his own agonizing bout with malaria in the winter of 1842-1843. On January 18, Joseph Smith welcomed Young to a meeting, noting that he “was present, altho’ very feeble. This was the first time that he had been out of his house since he was taken sick, his fever had been so severe, that he had lain in a log house, rather open, without fire most of the time, when it was so cold that his attendants, would freeze their toes and fingers, (while fanning him,) with great coat and mittens on.”¹²¹

¹¹⁸ Benjamin E. Park, *Kingdom of Nauvoo: The Rise and Fall of a Religious Empire on the American Frontier*, Kindle Edition (New York: Liveright, 2020), 57.

¹¹⁹ Paul F. Clark, *The Wisconsin Magazine of History* 29, no. 1 (1945): 103.

¹²⁰ Bill Kemp, “Illinois Once ‘Emporium’ of Malaria,” *The Pantagraph*, Bloomington, IL, Jun 21, 2008. https://www.pantagraph.com/news/illinois-once-emporium-of-malaria/article_4f275bad-9e66-5ff2-8746-fdeef95bd8de.html Malaria continues to be a problem in the region: Illinois reported 54 cases of malaria in 2007

¹²¹ “History,” 1838–1856, volume D-1 [1 August 1842–1 July 1843],” JSP, 1456.

So, along with the antagonism of their neighbors, the Mormons had to wrestle with “*the American disease.*” Although unaware of the real cause of malaria, the Mormons knew that the miserable sickness was connected with the hot, humid, lowland climate of Nauvoo—and they longed to escape it. Impatient with it all, Joseph Smith called for removal to a healthier environment:

I instructed the Twelve Apostles to send out a delegation and investigate the locations of California and Oregon, and hunt out a good location where we can remove to after, the Temple is completed, and where we can build a city in a day, and have a Government of our own; get up into the Mountains where the Devil can not dig us out, and live in a healthy climate—where we can live as old as we have a mind to.¹²²

In their search for a healthy place to settle, the Council of Fifty took immediate notice of John C. Frémont’s explorations of upper California. Excerpts from his reports appeared in the Mormon newspaper *The Nauvoo Neighbor* in March 1845, the same month Frémont submitted them to the U.S. Senate.¹²³ In fact, Stephen A. Douglass had gifted Joseph Smith a copy the published account of Frémont’s 1842 expedition. The *Neighbor* noted that, according to Frémont, the Rocky Mountains were not the impassable barrier once thought. Instead, there were numerous passes, “of which the South pass is the finest.” The mountain valleys were reported to feature “beautiful valleys, rivers, and parks, with lakes and mineral springs.”¹²⁴

By late August of 1845, Mormon leaders were seriously considering Utah Valley as the location for their new settlement. Soon, however, they redirected their focus

¹²² “History,” 1838–1856, volume E-1 [1 July 1843–30 April 1844],” JSP, 1896.

¹²³ “History,” JSP, 18 March 1845, 326.

¹²⁴ “Western Mountains and Rivers on the Route to Oregon,” *Nauvoo Neighbor*, 17 September 1845; 9 September 1845, JSP, 472.

towards the Salt Lake Valley. The *Neighbor*'s reports of the Valley from Frémont's account were enthusiastic and captivating. "The Great Salt Lake, one of the wonders of nature, and perhaps without rival in the world... is for the first time revealed to our view," began an article from September 17, 1845, "The Bear River Valley, with its rich bottoms, fine grass, walled up mountains, hot springs, mineral springs, soda fountains, volcanic rock, volcanic crater, and saline effervescences, and four thousand five hundred feet above the sea, is for the first time described." Historian Alexander Baugh posits that the *Neighbor*'s glowing descriptions of the region indicate the Mormons' enthusiasm at the prospect of making it their new homeland. Years later, when asked why he chose the Great Salt Lake Valley as the home for the saints, Young responded, "Well, we had read an account of Gen. Fremont's travels—how he found a large salt lake in the interior of our continent, in the middle of a fertile plain."¹²⁵ Perhaps the greatest contribution Frémont made to the Mormons' decision to relocate to the Salt Lake Valley, was his description of how well the Valley would support a large population. His description of the soil, the water, and especially the climate convinced the Mormons that the Salt Lake Valley was worth trying.¹²⁶

The *Neighbor* continued to print excerpts throughout the year; and on September 9, Young notified the Council of his intention to settle in Frémont's Great Basin "near the Great Salt Lake."¹²⁷ Preparations for the move began.

¹²⁵ Alexander L. Baugh, "John C. Frémont's 1843-1844 Western Expedition and Its Influence on Mormon Settlement in Utah," *UHQ* 83 no. 4 (Fall 2015): 264, 265.

¹²⁶ *Ibid.*, 267.

¹²⁷ "History," 9 September 1845, JSP, 472, referenced in Baugh, 264.

In his choice of a destination, Young was careful about climate considerations. Frémont reported plentiful grass, “good subsistence” for animals, and that “a civilized settlement would be of great value here.”¹²⁸ Lansford Hastings, author of a guidebook on the Rocky Mountains (excerpted in Church publications), advised Young that the Basin climate north of the 42nd parallel (Oregon territory) was unsuitable for farming.¹²⁹ Trapper Jim Bridger later told Young the same thing.¹³⁰ While Utah Valley and Bear River Valley were beautiful, Bridger said, the Great Salt Lake valley left much to be desired: the soil was good, but the frosts were terrible, which would make supporting a large population nearly impossible.¹³¹ There was, Bridger said, a “great desert,” which extended from the Great Salt Lake to the sea and was “perfectly barren.”¹³² According to some reports, Bridger was so confident in the aridity of the region that he wagered \$1,000 for a “bushel of corn raised in the Basin.”¹³³ Ironically, this news seemed to confirm Young’s resolve to settle in the valley, as we will see.

The Mormons began their exodus from Nauvoo in 1846. After spending the winter near present-day Omaha, a select group of 143 pioneers, including Brigham Young and Orson Pratt, Church theologian and self-educated scientist, set out west towards the Salt Lake Valley in April 1847. Leading the vanguard, Pratt first laid eyes on

¹²⁸ Frémont, *The Exploring Expedition*, 274

¹²⁹ Richard Jackson, “Mormon Perception and Settlement,” *Annals of the Association of American Geographers*, 68, no. 3 (1978): 320.

¹³⁰ Jackson, “Mormon Perception,” 323.

¹³¹ Farmer, *Zion’s Mount*, 41.

¹³² *William Clayton’s Journal: A Daily Record of the Journey of the Original Company of “Mormon” Pioneers*, Salt Lake City: The Deseret News, 1921, 325.

¹³³ Journal History of the Church, June 28, 1847.

the Salt Lake Valley July 21, 1847. In a rare emotional note, he recounted how he “could not refrain from a shout of joy” at the view. The next day he explored the valley and recorded his admiration for the landscape. He found plenty of grass for animals and ample mountain streams. The soil looked fertile and suitable for farming.¹³⁴ On July 23, Pratt directed newly arrived members of a scout party in the first tasks in building a settlement.¹³⁵ He also offered a prayer in which he “consecrated and dedicated the land to the Lord and entreated his blessings on the seeds about to be planted and on our labors in this valley.”¹³⁶ Hours later, they had a plowed field ready for planting and a small reservoir for irrigating it.

All told, the promised land did not please everyone. Many pioneers, accustomed to the lush meadows and forests of the East, were disappointed at its unpromising character. “Weak and weary as I am,” said Harriet Decker Young, one of three women in the vanguard company, “I would rather go a thousand miles further than to remain in such a forsaken place as this.”¹³⁷ Harriet’s daughter Clara, one of the other three women to make the journey, recalled, “My poor mother was heart-broken because there were no trees to be seen, for I don’t remember a tree that could be called a tree.”¹³⁸ Harriet’s husband, Brigham’s brother Lorenzo Dow Young, expressed similar sentiments, “This

¹³⁴ *The Orson Pratt Journals*, comp. Elden J. Watson, 1975, 455.

¹³⁵ *Pratt Journals*, 457.

¹³⁶ Thomas Bullock Journal Friday July 23, 1847, <https://history.churchofjesuschrist.org/overlandtravel/sources/4398/thomas-bullock-journals-1843-1849-journal-1847-april-june>.

¹³⁷ Alexander, *Utah*, 96.

¹³⁸ Clara Decker Young, “A Woman’s Experience with the Pioneer Band,” *UHQ* 14 (1946): 216.

day we arrived in the valley of the great Salt Lake my feelings were such as I cannot describe everything looked gloomy and I felt heartsick.”¹³⁹

Brigham Young, however, had the final say. He arrived the following day, July 24, 1847, and confirmed the location as the new Mormon homeland. His colleague Wilford Woodruff described the valley as highly promising. He and Young “gazed with wonder and admiration upon the vast fertile valley spread out before us for about twenty-five miles in length and sixteen miles in width, clothed with a heavy garment of vegetation, and in the midst of which glistened the waters of the Great Salt Lake, with mountains all around towering to the skies, and streams, rivulets and creeks of pure water running through the beautiful valley.”¹⁴⁰

The environment in which the Saints had decided to settle was not a desert, but an oasis bordering on semi-arid territory. According to historian Thomas Alexander, annual precipitation on the Wasatch Front varies from “twelve to twenty inches per year,” most of which falls as snow. This was enough to fill the valley with tall grasses in a variety of species. Even more snow falls in the mountain tops, then runs down in streams, making dry farming with irrigation possible. Despite the abundant snowpack and the reliable streams, the Wasatch Oasis was (and is) still a semi-arid region with insufficient precipitation during the growing season to grow crops without irrigation.¹⁴¹ While the

¹³⁹ “Diary of Lorenzo Dow Young,” *UHQ* 14 (1946):163. There is some question as to whether Lorenzo actually felt this way, as Harriet was actually the primary author of his journal. He could be echoing her sentiments.

¹⁴⁰ Wilford Woodruff, *Journal*, Saturday, July 24, 1847.

¹⁴¹ Thomas Alexander, “Irrigating the Mormon Heartland: The Operation of the Irrigation Companies in Wasatch Oasis Communities, 1847-1880,” *Agricultural History* 76, no. 2 (Spring 2002): 177.

Salt Lake Valley was certainly hospitable, it would still be challenging for the Saints to build any kind of long-term settlement.

Brigham Young and his associates were not simply fleeing the hostility of their religious and political enemies. And unlike most pioneers of the time, they were not just looking for a nice stretch of “free” land or a gold strike. They had a much more ambitious aim—the forming of a new identity, the “Latter-day Saint,” and Brigham Young saw the climate of the Wasatch Oasis as his instrument for achieving that aim. He clarified this purpose in an 1856 address to the Mormon people:

My soul feels hallelujah, it exults in God, that He has planted this people in a place that is not desired by the wicked; for if the wicked come here they do not wish to stay, no matter how well they are treated, and I thank the Lord for it; and I want hard times, so that every person that does not wish to stay, for the sake of his religion, will leave. This is a good place to make Saints, and it is a good place for Saints to live; it is the place the Lord has appointed, and we shall stay here until He tells us to go somewhere else.¹⁴²

Ostensibly, Young concerned himself with colonizing a pioneer country, which intertwined with his mission to gather and refine a holy people. In this arid land, he saw that survival would be a backbreaking prospect—dams, canals, and vast networks of ditches would be required to irrigate food crops. Long, hard journeys in search of timber would be necessary for fuel and building materials. Drought, insects, and hunger would humble and purify a people. A new kind of selfhood would emerge from “hard times” that the “wicked” would never endure. Bridger had warned him that successfully farming the Salt Lake Valley would likely be impossible due to the climate, which seemed to be just what Brigham Young wanted to hear. Meeting the overwhelming challenge of cultivating such a country would prepare the Saints for a radical new identity: “godhood.”

¹⁴² Brigham Young, “The Holy Ghost Necessary in Preaching,” August 17, 1856, *JD* 4: 32.

In the theology of the Latter-day Saints, human beings are the offspring of God and destined to become gods themselves in the eternities if they demonstrate faithfulness in mortality. Joseph Smith taught, “You have got to learn how to be Gods yourselves . . . by going from one small degree to another, and from a small capacity to a great one— from grace to grace, from exaltation to exaltation.” This doctrinal premise—that “saintliness precedes godliness”—provided Brigham Young his fundamental motivation in situating the Mormons in a harsh land that would cultivate their souls while they cultivated the land. The Great Basin climate was perfect for his purpose. This was a place for “making Saints,” he said, “and I thank the Lord for it.”¹⁴³ The valley culture had a transcendent purpose—to remake souls into gods by transforming a hellish country into heaven.

Beginning with Salt Lake City, the Mormon settlements hewed to a town plan developed in 1833 by Joseph Smith for the City of Zion in Missouri. Every new town was to be a sacred gathering place, with a grid of homes centered on buildings for public worship. Agriculture and industry would take place outside the town limits. Smith’s vision was to “fill up the world” with such compact gatherings of Saints. The Mormons planted some 300 such settlements in a string stretching from Southern California to Canada, including every town on the Wasatch Front.¹⁴⁴ Each colony was to be a carefully controlled site for the development of Saints.

However, the “frontier mentality” of many of the pioneers chafed against the project of cultivating souls. Psychologists who have studied the frontier mentality, which

¹⁴³ Joseph Smith, “Character and Being of God,” April 6, 1844, *JD* 6: 4.

¹⁴⁴ Craig D. Galli, “Building Zion: The Latter-day Saint Legacy of Urban Planning,” *BYU Studies* 44, no. 1 (Winter 2005): 111-112.

is “prevalent in the western United States,” describe it as a mindset characterized by acquisitiveness, low levels of trust and conscientiousness, with a high value placed on a “sense of freedom.” Frontier settlement theory posits that the geography of the West originally attracted such personality types, and that “traces of that pioneer personality persist in the people who live out West.” The researchers found that “mountainousness,” or living in a mountainous region, is not so much an influencer, but an indicator of personality type.¹⁴⁵

The frontier mentality is shaped by the “total frontier experience,” a phrase coined by Boston University researchers exploring the persistence of “rugged individualism” and inflexible antipathy to the setting of boundaries—whether by law, custom, religion, or the state. The total frontier experience (TFE) is a quest for that most American of goals, “self-fulfillment” on one’s own terms and unlimited freedom of action, independence, and self-enrichment. The TFE mindset is bound up in the images of the frontier: the “wide-open spaces,” the mythic heroism of the pioneer standing alone against the wilderness, the rancher on horseback who is “monarch of all he surveys” (as the poet William Cowper described Alexander Selkirk, the model for Robinson Crusoe).¹⁴⁶ Researchers characterize TFE people as “embracing opposition to the welfare state, a strong belief in effort versus luck, the right to self-defense, and ‘manifest destiny.’”¹⁴⁷ This mindset endures in anti-environmentalist groups such as the Sagebrush Rebellion

¹⁴⁵ Friedrich M. Götz, Stefan Stieger, Samuel Gosling, “Physical Topography Is Associated with Human Personality,” *Nature and Human Behavior*, 4 (2020): 1144.

¹⁴⁶ T.S. Grimshaw, ed., “Verses by Alexander Selkirk,” in *The Works of William Cowper* (Glasgow: Good Press, 2019), 596.

¹⁴⁷ Bazzi, et al., *Total Frontier Experience*, 11.

and the “Wise Use” movement, as well as in the political philosophies of many Westerners.

According to these studies, the frontier mentality is also marked by a noticeable lack of “conscientiousness,” one of the “Big Five” personality traits psychologists have defined. Conscientiousness is “the tendency to be responsible, organized, hard-working, goal-directed, and to adhere to norms and rules.”¹⁴⁸ People who lack this trait tend to defy authority and deny responsibility for the well-being of the community. Additionally, low levels of conscientiousness are associated with a “conspiracist” mindset that sees tyrannical forces combining against freedom of action on the land.¹⁴⁹ These tendencies may account for the antipathy toward government regulation that is typical of the frontier mentality. The Mormons were inevitably influenced by such frontier values. Gentile migrants to the Valley who embodied those values had an impact on the community. However, most of the Saints were themselves products of rural American culture, so frontier values were part of their heritage. Those values arguably gained force among the Saints who were, after all, living a frontier life. As the Boston scholars argue, “Long exposure to frontier conditions laid the foundation for a persistent culture of rugged individualism.”¹⁵⁰

Although not wholly incompatible with the Mormon saint-making narrative, TFE values and Mormon values clashed in significant ways. Their leaders countered “rugged individualism” with an ethic of cooperation; they opposed the impulse to appropriate and

¹⁴⁸ Roberts, et al., *Handbook of Individual Differences*, 369.

¹⁴⁹ Brotherton, et al., “Measuring Belief.”

¹⁵⁰ Bazzi, et al., *Total Frontier Experience*, 9.

possess with an ethic of stewardship; and they devalued independence and individualism in favor of interdependence and submission to “the oracles of God”—the prophet and leaders of the Church. Saints were to be conscientious—that is, “responsible, organized, hard-working, goal-directed, and obedient.” According to church leaders, “making something of oneself” was not the same as “making oneself a Saint.”

The narrative of saint-making dominated official Mormon attempts at culture-making in the Great Basin. “God has given us mental and physical powers to be improved,” Young preached, “and these are most precious gifts; more precious are they to us than fine gold. God is our Father, and he wishes his children to become like him by improving upon the means he has supplied for this purpose.”¹⁵¹ One of the “means supplied” was their exacting physical environment, and “improvement” of that environment from a “desert waste” to an “Eden” was instrumental to making saints: “It was impossible for any person to live here unless he labored hard and battled and fought against the elements, but it was a first-rate place to raise Latter-day Saints, and we shall be blessed in living here, and shall yet make it like the Garden of Eden.”¹⁵²

According to Young, the goal of re-creating Eden in the Great Basin could only be accomplished by people who were willing to transform themselves into characters “worthy” of an Eden.

The desert shall blossom as a rose, pools of living water shall spring up on the parched ground, and the wilderness shall become glad. The Lord has planted the feet of the Saints in the most forbidding portion of the earth, apparently, that he may see what they will do with it. I may confidently say that no other people on the earth could live here and make themselves comfortable. If we settle on these desert and parched plains, upon the sides of these rugged and sterile

¹⁵¹ Brigham Young, “Advice to California Emigrants,” July 8, 1863, *JD* 11: 231.

¹⁵² Brigham Young, “Obedience,” May 21, 1871, *JD* 14: 121.

mountains, and cultivate the earth, praying the blessing of God upon our labors, he will make this country as fruitful as any other portion of the earth.¹⁵³

The theme of making the “desert blossom as the rose” dominated the narrative of the Mormon acculturation to the Wasatch Oasis and to more marginal surrounding lands. Isolated from other Americans by mountains and managing a toehold in a fragile oasis, the Mormons set themselves the task of nothing less than fulfilling Biblical promises of re-creating paradise. It was a powerful narrative within which the Mormons could constitute a new and robust identity.

The theme also remained central to the Saints’ view of themselves as a holy people selected for their mission by prophecy. Mormon leader Orson Pratt made much of this transformation. In quoting from the Book of Isaiah, Pratt said:

The wilderness and the solitary place shall be glad for them; and the desert shall rejoice, and blossom as the rose.” “It shall blossom abundantly, and rejoice even with joy and singing...Notice now that the Lord, by his Spirit, is to have a great gathering in the latter days of his people, and we are advised to seek out of the book of the Lord and learn of this gathering, and how his Saints should inhabit the land. It should be divided unto them by lot, the same as many people received their inheritances when they came into this desert. They cast lots, and drew their lots and inheritances. “And the wilderness and the solitary places shall be glad for them. If you can find a country that answers better the description here given anywhere in the four quarters of the earth, I should like to know it. When we came here, the country to all natural appearance was so barren that it seemed impossible to locate a people upon it. But you see what we have accomplished. Not by our own wisdom nor by our own strength, but by being gathered by the voice of the Lord and by his commandment, and being guided and directed by the spirit of inspiration. After we are gathered, the desert is to rejoice and blossom as the rose. How often I have thought of this in the spring time, when all of this city, covering some four, or perhaps five square miles with orchards and gardens, is in bloom! Then is the time to realize how literally this prophecy has been fulfilled.¹⁵⁴

¹⁵³ Brigham Young, “Eternal Existence of Man,” September 28, 1862, *JD* 10:6.

¹⁵⁴ Orson Pratt, “Second Coming of Christ,” December 18, 1870, *JD* 15: 57-58.

Brigham Young oversaw this Edenic project, relying on a template given him by Joseph Smith years before. When the Saints had escaped to southern Illinois in 1839, Joseph Smith had directed them to turn the swampland they had settled into a major city, changing its name from “Commerce” to “Nauvoo” (a form of the Hebrew word for “beauty”). He instructed them not only to build homes, pave streets, and erect buildings, but also to beautify the city with vegetation. In a revelation, he asked his followers to “bring the box tree, and the fir tree, and the pine tree, together with all the precious trees of the earth” to their new city.¹⁵⁵ Young did the same in the Great Salt Lake Valley. He encouraged immigrants to build homes and a temple and to import fruit trees and foreign plants. “The method of organizing and using land exercised by the Mormons is, to a great degree, a result of a distinctive theological doctrine,” writes geographer Karl Raitz. “The Mormon community is focused on the ‘gathering’ or the farm village. . . . The Mormon village grid plan lowers the density of community settlement while still providing all the desired communitarian qualities that were first outlined by Joseph Smith.” Although they exhibited much of the “rugged individualism” of the Western pioneer, Mormon settlers generally defined themselves by their place in the community of Saints. Raitz observes:

This method also allowed for the cooperation of all in financial and secular matters, in digging irrigation ditches and fencing fields, and in making other necessary domestic improvements. . . . A further advantage of the compact farm village was that it precluded the risk of loss of social and civic responsibilities and character which might otherwise have occurred on widely spaced farmsteads. Rather, intercommunication was simple, convenient, and inexpensive.¹⁵⁶

¹⁵⁵ Doctrine and Covenants of the Church of Jesus Christ of Latter-day Saints, 124:26.

¹⁵⁶ Karl B. Raitz, “Theology on Landscape: A Comparison of Mormon and Amish-Mennonite Land Use,” *UHQ* 41, no. 1 (Winter 1973): 23-24.

The climate required that this project of creating a blossoming Eden be communal. The grand narrative of America has always featured the figure of the rugged individual (imaged by the “pathfinder,” the “frontiersman,” or the “cowboy”), but to engineer an Edenic environment in the arid valleys could not be accomplished by lone heroes. Only close organization, communication, and dedication to a common purpose could work that miracle.

For these reasons, Mormon leaders de-emphasized private property in favor of Church oversight. Brigham Young linked “inequality in the human family” to unbridled individualism: “One man was not made to trample his fellow man under his feet, and enjoy all his heart desires, while the thousands suffer.”¹⁵⁷ There should be no inequality in Zion; the Church would apportion the same amount of land to each family, and common resources—water, timber, grazing land, minerals—would be held in common. Families would hold land in “stewardship”; that is, their title to land would depend on their faithfulness in cultivating and beautifying it.

Of course, the climate made cooperation necessary or the colony would not flourish. One student of Mormon economics concludes, “Individualism was out of the question under these conditions, and in Mormonism we find precisely the cohesive strength of religion needed at that juncture to secure economic success.”¹⁵⁸ However, the Mormon hierarchy could not prevent individuals from transferring land titles if they

¹⁵⁷ Brigham Young, “The Work of the Priesthood,” May 27, 1877, *JD* 19: 46.

¹⁵⁸ Richard T. Ely, “Economic Aspects of Mormonism,” *Harper’s Magazine*, April 1903, 669, cited in Sara Dant “The Lion of the Lord and the Land,” in *The Earth Will Appear*, 32.

wished, and within a few years of their arrival, the pioneers were acquiring and speculating in land.

The high, dry climate especially appealed to the leaders of the Saints. Orson Pratt spoke to the Saints just a week after their arrival:

When we get used to this healthy climate the people will not say, I am sick, but will be able to smite the gentiles. They will grow up strong and will not be in jeopardy from sickness. The wilderness shall become as a fruitful field and a fruitful field as a forest. We know that the time will come that the great Jehovah will cause springs of water to gush out of the desert lands and we shall see the lands survive that the gentiles have defiled. Isaiah speaks of the heritage of Jacob being in a high place. This is about four thousand feet above the level of the sea and the high mountains will still catch the hail and we shall be in a low place. We will not feel discouraged but will feel full of vigor.¹⁵⁹

Young echoed Pratt's sentiment. "You are here commencing anew. The soil, the air, the water are all pure and healthy," Young told the saints. "Do not suffer them to become polluted with wickedness. . . . Keep your valley pure, keep your towns as pure as you possibly can, keep your hearts pure."¹⁶⁰ The Mormon leaders hoped to create a new kind of selfhood, a purer subjectivity, mirroring the "pure" climate that they had sought out. Construction of the new Mormon self, if not climate forced, was at least climate stimulated. A fresh climate encouraged a fresh start for the human subject. In their view, the character of that new subject reflected the climate: pure and clear in contrast to the putrid "miasma" that destroyed health; exalted high above the "wickedness" of the lowland, the Gentile world they had left behind; unfazed by omens of disaster in the volatility of the climate and consequent insect infestations—although the Mormon

¹⁵⁹ *Orson Pratt Journal*, 463.

¹⁶⁰ Brigham Young, "Fidelity of the Saints," June 10, 1860, *JD* 8: 78, 80.

leaders would make use even of these threats to help them in their project of forming saints.

Soon after settling in Great Salt Lake Valley, the Church issued an epistle to Mormons around the world encouraging them to gather there. The epistle provided a detailed yet hyperbolic account of the climate. Mountains that were “capped with perpetual snow” and “watered with daily showers” would provide plenty of timber and enough water for healthy crops. The soil appeared good, “but will require irrigation to promote vegetation.” Above all, “The climate is warm, dry, and healthy.”¹⁶¹ The environment would be sanctified if the saints sanctified themselves. Like the “children of Israel,” to whom they frequently compared themselves, the Mormons felt they had found their “land of Promise.”¹⁶²

Ironically, in contrast to these assertions about the salubriousness of the climate, the first few years in the valley were quite rough for the Saints. The winter of 1847-48 was mild and had given them a false impression of what to expect. The following year dispelled any notions that the Wasatch Front was home to tepid winters. In early December 1848, for example, the temperature dropped below zero degrees.¹⁶³ In January, a group of church leaders met to discuss the perilous situation of the community’s cattle. Roughly eight inches of snow had covered Salt Lake City, burying feed and killing many of the animals. They eventually began rationing food by controlling prices and

¹⁶¹ “General Epistle from the Council of Twelve Apostles, to the Church of Jesus Christ of Latter-day Saints Abroad, Dispersed Throughout the Earth” (Liverpool: R. James, 1848), 3.

¹⁶² Jackson, “Mormon Perception,” 324.

¹⁶³ Jedediah S. Rogers, *The Council of Fifty: A Documentary History* (Salt Lake City: Signature Books, 2014), 136.

distributing to the poor.¹⁶⁴ 1848 also brought a cricket invasion, though it passed reasonably quickly.

Despite these early struggles, the Saints began to enjoy a modicum of prosperity. The *Millennial Star*, the Church organ in Britain, reported on “the health of this Valley!”:

[There are] mountain streams gushing into the Valley from all quarters, clear and sparkling as the rills that trickle down the mountains of Virginia or Vermont . . . the purest beverage that ever slacked [sic] the thirst of man, or washed God’s footstool. . . pure mountain air . . . even Italy, has no purer atmosphere than that we breathe in the great Mountain Basin. . . . No diseases are known in these Valleys that observe periodicity. . . The goddess of health makes her home among the granite peaks . . . the zephyrs she breaths [sic] o’er our valleys, kill away the pains and aches of old age.¹⁶⁵

Outsiders were also impressed with the Mormon achievement. Captain Howard Stansbury, who experienced the worst of the Great Basin climate in his 1850 near-death exploration of the Great Salt Lake Desert, was astonished:

The founding, within the space of three years, of a large and flourishing community, upon a spot so remote from the abodes of man, so completely shut out by natural barriers from the rest of the world, . . . isolated by vast uninhabitable deserts, and only to be reached by long, painful, and often hazardous journeys by land—presents an anomaly so very peculiar, that it deserves more than a passing notice. . . The success of an enterprise under circumstances so at variance with all our preconceived ideas of its probability, may well be considered as one of the most remarkable incidents of the present age.¹⁶⁶

Anyone who reads Stansbury’s account of his Great Salt Lake expedition will readily understand what he means by “circumstances at variance with all our

¹⁶⁴ Rogers, *Council*, 144, 149.

¹⁶⁵ “From the GSL Valley,” Anonymous to Elder Orson Hyde, GSL City, September 10, 1850, *Latter-day Saints’ Millennial Star* 13, no. 6 (March 15, 1851): 87.

¹⁶⁶ Howard Stansbury, *Exploration and Survey of the Valley of the Great Salt Lake of Utah, Including a Reconnoissance of a New Route Through the Rocky Mountains* (Philadelphia: Lippincott, Grambo, & Co., 1852), 123.

preconceived ideas.” Starved, thirsty, often marooned in vast mudflats, plagued by mosquitoes, nearly drowned and almost killed by the freezing winds of the lake—Stansbury had reason to consider it an unwelcoming place. Stansbury’s sentiments show a connection between the Mormon narrative and American idealism. Manifest Destiny, the belief that white Americans were destined to spread throughout and tame the American continent did not exclude Mormons. Stansbury, and those who accepted his assertions of the wonders of Mormon colonization, accepted Mormons as part of the American destiny. For their part, Mormons considered themselves the fulfilment of the American destiny.

In the Oasis, however, “The harvest of 1850 had been ‘abundant,’ and the harvests had increased each year thereafter for four straight years.”¹⁶⁷ Immigrants moving westward supplied a healthy market for trade, and Great Salt Lake had risen every year since their arrival—indicating that the supply of water to the valleys was apparently increasing.¹⁶⁸ This modicum of prosperity began to trouble Brigham Young: “Now the people are led into riches,” he observed “They are on the highway to wealth; *and there is danger in it.*”¹⁶⁹ At first, the Church had distributed land equally among the settlers. No one had to pay for the land; just a small fee for the titles.¹⁷⁰ Soon however, this all changed as the settlers began to buy and sell their lands. “The market rather than religious stewardship” quickly dictated the price of land, and speculation took off. Lots in the city

¹⁶⁷ Leonard J. Arrington, *Great Basin Kingdom: An Economic History of the Latter-day Saints* (Urbana, IL: University of Illinois Press, 2004), 148.

¹⁶⁸ Dale Morgan, *The Great Salt Lake* (Indianapolis: Bobbs-Merrill, 1947), 23.

¹⁶⁹ Brigham Young, “Confidence,” September 11, 1853, *JD* 1:78, emphasis in original.

¹⁷⁰ Thomas G. Alexander, “Stewardship and Enterprise: The LDS Church and the Wasatch Oasis Environment, 1847-1930,” *Western Historical Quarterly* 25, no. 3 (Autumn 1994): 362.

purchased in 1847 for the surveying fee of \$1.50 were going for more than \$1,000 in 1851.¹⁷¹ Apostle Orson Hyde chastised the church members for their greed in acquiring more and more farmland to increase personal wealth: “If we branch out so largely in plowing, sowing and reaping, we have no time to make necessary improvements around our homes and our cities.”¹⁷² The leaders of the Saints viewed these developments with wariness. It was the beginning of what historian Jeff Nichols calls a “tension between self-sufficient, communal economics and a capitalistic striving for individual wealth.”¹⁷³

Disaster came in early 1855. Beginning with a plague of grasshoppers, which devastated their crops, followed by a seasonal drought that destroyed what was left, the Saints had never seen a harder year in Utah. Then a shocking winter engulfed Wasatch Front in a deep freeze, which nearly destroyed the one untouched resource the Saints had left—their livestock. The Saints were pushed back to a state of near starvation. The volatile climate of northern Utah had finally revealed itself to the new inhabitants in its full force. What they had initially perceived as a welcoming environment, with abundant grass, flowing streams, and temperate seasons, could readily turn on them. Their Eden threatened to collapse, and with it their burgeoning self-concept as strong, vigorous, prosperous “Israelites” building a New Jerusalem in the West.

Then in spring 1855, drought suddenly became an existential threat to the Mormon project. Roughly two thirds of the grain in Utah County died that year. Farmland south of Salt Lake City became “nearly a desert” as most of the small streams

¹⁷¹ Alexander, “Lost Memory,” 53.

¹⁷² Orson Hyde, “Instructions Concerning Things Temporal and Spiritual,” October 7, 1865, *JD* 11: 150.

¹⁷³ Jeff Nichols, “Before the Boom: Mormons, Livestock, and Stewardship, 1847-1870,” in *The Earth Will Appear*, 161.

in the area dried up. In some places as much as two thirds of the harvest was destroyed.¹⁷⁴ Beet crops completely failed, and potato and corn crops were dismal.¹⁷⁵ One farmer reported a harvest of only five hundred bushels of wheat, down from 1,700 the previous year.¹⁷⁶ Forest fires in the canyons around the Salt Lake Valley significantly decreased available timber. The church historian in 1855 emphasized, rather ominously: “This is rather a dark picture, but I regret to say it is not overdrawn.”¹⁷⁷

Compounding the drought was the increase in population: 4,225 people arrived in the Oasis in 1855, the biggest year for migration since 1852. The spike in population put a strain on irrigation water and the communal facilities for housing livestock. In an effort to alleviate the burden on resources in the Salt Lake Valley, cattle drivers moved 2,000 church cattle and 1,000 private cattle to Cache Valley, another oasis like the Salt Lake Valley roughly 80 miles to the north. Drought had not hit the Cache Valley so badly. Ironically, however, the drought ended with an early and devastating winter. By November, heavy storms sent temperatures plunging and covered grazing lands in deep snow. The decision to move the cattle north turned out to be disastrous. The cattle were dying, and herders tried to drive them back to the Salt Lake Valley in a desperate attempt to save as many as possible. They were forced to push the cattle through night and day to keep the narrow Sardine Pass open. By the end of winter, only 420 of the 2,000 church cattle remained.¹⁷⁸

¹⁷⁴ Arrington, *Great Basin Kingdom*, 150.

¹⁷⁵ Paul H. Peterson, “The Mormon Reformation of 1856-1857: The Rhetoric and the Reality,” *Journal of Mormon History* 15 (1989): 63.

¹⁷⁶ Arrington, *Great Basin Kingdom*, 150.

¹⁷⁷ Church Historian’s Office, June 30· 1855. Image 82.

¹⁷⁸ Arrington, *Great Basin Kingdom*, 150, 151.

Heber C. Kimball wrote to his son, “Our winter has been extremely hard, and has caused great loss among our cattle.” Grain was almost completely gone. “There are not more than one half the people that have bread,” he continued, “and they have not more than one half or one quarter of a pound a day to a person.”¹⁷⁹ Many Saints resorted to eating roots and plants like sego bulbs and pigweed greens.¹⁸⁰ Without animals, farmers were forced to plow and plant by hand. Food prices skyrocketed. Butter, at 35 cents a pound before the drought, now sold for between \$1.50 and \$2 a pound, and flour was sold on a black market.¹⁸¹ Poverty and pillaging spread through the colonies.¹⁸²

To add to the misery of 1855, the drought produced an overwhelming invasion of grasshoppers. Known as Rocky Mountain locusts, these brown, spotted hoppers had powerful jaws and remarkably efficient digestive systems. On their own they were small and unimpressive—only one-and-a-quarter inch long: In large numbers, however, they could wreak havoc. A witness saw them as “insignificant individually but mighty collectively, in their destructiveness.”¹⁸³ Another said, “They would come suddenly, millions of them and eat every green thing in their way . . . the air would be darkened with them.”¹⁸⁴ They were a “dark, moving mass” that caused the air to rasp with the sound of their flight.¹⁸⁵

¹⁷⁹ Heber C. Kimball to William Kimball, April 13, 1856, *Millennial Star* 18, no. 30 (July 26, 1856): 476.

¹⁸⁰ Peterson, “Mormon Reformation,” 43.

¹⁸¹ Arrington, *Great Basin Kingdom*, 152.

¹⁸² Peterson, “Mormon Reformation,” 42-43.

¹⁸³ Arrington, *Great Basin Kingdom*, 149.

¹⁸⁴ William Jennings, “Material Progress of Utah,” 1884, MS., Bancroft Library, 4-7, quoted in Arrington, 149.

¹⁸⁵ Morgan, *Great Salt Lake*, 254.

Their eggs and larvae are vulnerable to frost and dew, which made the drying climate ideal for them. Also, periods of above average dryness concentrate grasshopper populations around more lush areas like swales, marshes, or, as was the case in Utah, well-tended agricultural fields.¹⁸⁶ Ironically, drought conditions also shrink the suddenly overpopulating insects' habitat, driving them into panicking masses in search of food.¹⁸⁷ The intersection of newly cultivated lands with drought produced a massive plague.

The creatures descended on the Wasatch Oasis in a fury, ravaging the landscape throughout summer 1855. "Grasshoppers have made their appearance," wrote Young, "and are doing extensive damage."¹⁸⁸ The *Deseret News* encouraged Mormons to remember the victory over the 1848 cricket plague, "We are perfectly aware that thro' [sic] faith and obedience we can prevail in the grasshopper war, at least as well as they did in the cricket war of 1848." They also published advice on how to limit the destruction—to plant certain crops that the grasshoppers seemed to avoid, and to continue planting, even after crops were destroyed.¹⁸⁹

But the plague intensified. "The grasshoppers have cut down the grain, and there is not fifty acres of any kind of grain now standing in Salt Lake Valley, and what is now standing they are cutting down as fast as possible. In Utah County the fields are pretty much desolate." The scene was the same throughout Utah. Gardens were decimated. Fruit trees, promising a healthy crop, were stripped. Kimball lamented, "There does not seem

¹⁸⁶ Jeffrey Lockwood, *Locust: The Devastating Rise and Mysterious Disappearance of the Insect that Shaped the American Frontier* (New York: Basic Books, 2009), 22.

¹⁸⁷ Jeffrey Lockwood, "The Death of the Super Hopper," *High Country News*, February 3, 2003.

¹⁸⁸ Letter from Brigham Young to John Taylor April 30, 1855, cited in Peterson, "Mormon Reformation," 40.

¹⁸⁹ *Deseret News* (hereafter *DN*), May 23, 1855.

to be any chance for recovery.”¹⁹⁰ Of the 1855 plague, Leonard Arrington wrote, “No previous grasshopper infestation had borne any comparison in destructiveness to that of 1855.”¹⁹¹

Through this disastrous period, the Church tried to ease the suffering of the poorer members. Leaders put out circulars with instructions on how to best use the land. They admonished members to mend their fences to prevent wayward livestock and encouraged mechanics and artisans to return to the fields to grow food for their families. They asked those with abundance to share with those in need. The Church also instituted a program called “fast-day offerings” in which members would fast for twenty-four hours and donate their unused food to the bishops for redistribution. A voluntary rationing program also emerged in which families went with only one-half pound of breadstuff per day and gave surplus to needy members of the congregations. More prominent members contributed to the poor, with Young reportedly feeding an estimated 200 people a day.¹⁹²

Despite the destruction, Church leaders preached that these plagues were blessings. They hoped that the blight would force a return to a community of consecrated stewardship. The plague they really feared was the advancing desire among the saints for “worldly honor,” so the leaders expressed gratitude, which they felt would winnow out the faithless. Wrote Kimball, “We have not seen one face with a down cast look—all look lively, cheerful, and pleasant, with the exception of the faithless and the apostates. We are in hopes that their sorrow will increase—that they will start for California or

¹⁹⁰ Journal History of the Church, May 29, 1855.

¹⁹¹ Arrington, *Great Basin Kingdom*, 149.

¹⁹² *Ibid.*, 152-153.

some other place.”¹⁹³ For Brigham Young, the grasshoppers were a divine instrument of chastisement to show the Saints how the accumulation of wealth was meaningless:

All belongs to the Father in heaven . . . these mountains are His; the valleys, the timber, the water, the soil; in fine, the earth and its fulness. You now see one of His armies passing through here, sweeping everything before them. Has He nothing to do with these grasshoppers that are destroying our crops? Yes, as He has with everything else on the earth. Has He anything to do with the locusts in Egypt? Yes; but they are not satisfied with eating the vegetation, but will eat a man’s shoes off from his feet, and the beard from his face, for when a man lies down to sleep, he is in danger of losing his mustachio. These are some of the armies of the Lord; He made them and He made man, the one as well as the other. . . He made the earth and all connected with it, organized it, and brought it forth, and now He intends to see what the people will do with it; whether they are disposed to do anything more than to say, “This is mine, and that is thine.”¹⁹⁴

The leaders connected what they perceived as growing avarice to weakening faith and warned that calamities would continue until the Saints reformed. Kimball wrote, “My feelings are and have been, that if the Lord should so order it that our crops are destroyed, I shall take it as a forewarning that there would have been a greater evil coming on us than a famine of bread.” He would rather suffer through plagues, famines and extreme cold than see the new Eden polluted by Gentiles and non-believers. “For, if we have no bread,” he concluded, “they will not be very apt to come to us.”¹⁹⁵ The extreme climate events, he hoped, would flush out the sinners.

Jedediah M. Grant, Young’s second counselor who could always provide a good tongue lashing, roared, “There is a drought and has been; the people have felt too much like their temporal affairs first, and then attending to the spiritual at their leisure.”¹⁹⁶ So,

¹⁹³ Journal History of the Church, May 29, 1855.

¹⁹⁴ Brigham Young, “Consecration,” June 3, 1855, *JD* 2: 308.

¹⁹⁵ Journal History of the Church, May 29, 1855.

¹⁹⁶ Jedediah M. Grant, “Overcome the Powers of Darkness,” October 12, 1856, *JD* 4: 151.

Young and his associates found in the crisis an opportunity to “re-form” the people by turning their experience into a more severe stage of saint-making. What followed was a period known as the Mormon “Reformation,” characterized by fiery preaching and the religious and social re-structuring of Mormon identity.

The religious identity of the Mormons was strongly linked to their concept of themselves. But, as historian Thomas G. Alexander observes, even though “Mormons carried a theological disposition to live on earth as stewards. . . . they also shouldered the Euro-American cultural baggage of secular business entrepreneurship.”¹⁹⁷ To view oneself as a “steward” of the earth was a theological imperative for Mormons; they were taught that they stood in the place of God just as a king’s steward stands in the place of the king, exercising the authority of the king in caring for the king’s property. Stewardship was a necessary stage in becoming like God. Young taught, “We can show to our Father in Heaven that we are faithful stewards; and more, it is a blessing to have the privilege of handing back to Him that which He has put in our possession, and not say it is ours, until He shall say it from the heavens.”¹⁹⁸ To perform faithfully as a steward was to qualify for an “inheritance” in the kingdom of God, that is, a kingdom and godship of one’s own.¹⁹⁹ Mormons were obliged to re-conceive themselves as stewards if they expected to fulfill their divine destiny.

Joseph Smith laid the groundwork for an environmental theology by revealing the stewardship principle. In an 1831 revelation, God promised “the fullness of the earth” to

¹⁹⁷ Alexander, “Stewardship and Enterprise,” *op. cit.*

¹⁹⁸ Brigham Young, “Consecration,” June 3, 1855, *JD* 2: 305.

¹⁹⁹ For the distinction between “stewardship” and “inheritance,” see Orson Pratt, “Progress of the Saints,” November 1, 1879, *JD* 21: 150.

the Saints if they would “keep his commandments.” All creation was for “the benefit and use of man” and to “please the eye and gladden the heart.” These resources came with a word of caution: “It pleaseth God that he hath given all these things unto man; for unto this end were they made to be used, with judgment, not to excess, neither by extortion.”

²⁰⁰ Thus, the Saints were not to abuse their natural resources. The environment was a divine tool for testing and shaping saints: those who avoided “excess and extortion” but built their self-concept around the principle of stewardship would be rewarded with more responsibility and blessings and ultimately attain to godhood. The Wasatch Oasis was to be a training ground for gods.

However, as Alexander points out, the Saints were Euro-Americans carrying the “cultural baggage” of secular materialism. William James, who studied the structure of American selfhood, would define the American as “the sum of things he owns.”²⁰¹ The tension that arose between the concepts of self-as-steward and self-as-possession counted for much more among the Mormons than did the classic tension between the strains of Puritanism and materialism in American history. Much more was at stake: the Mormon concept of potential divinity, disruptive to orthodox American religion, was incompatible with the fatally distracting acquisitive Euro-American concept of self. “You cannot serve God and mammon” had particular resonance for Mormons. Brigham Young would call this fundamental fragmentation of the self “a divided heart.” His “Reformation” project was aimed at resolving that fragmentation. As catastrophe hit the valleys, Young became blunt on this point:

²⁰⁰ “Book of Commandments, 1833,” JSP, p. 142.

²⁰¹ See Russell W. Belk, “Possessions and the Extended Self,” *Journal of Consumer Research* 15 (September 1988): 139.

I see some men so greedy after the things of the world, that they will take their grain from the mouths of innocent, helpless women and children who are suffering for food, and sell it to Gentile merchants to speculate upon. I have learned, since this Conference commenced, a circumstance that took place a year ago; it may appear trifling to some, but to me it is grievous. Some of the brethren from San Pete and Fillmore came here last year, when they had plenty of wheat, and sold their flour to C. A. & E. H. Perry, for three, four, and four and a half dollars per hundred weight, and that firm sold all they could to the poor women and children, and made them pay a very high price. . . . They have not raised any wheat this year, and now they are whining after me, “Will you let us have a little tithing wheat?” They ask what I have to say to them; I have this to say to every man in this congregation and throughout this Territory, and from this time henceforth, know my feelings, if you will sell grain to the Gentiles, or to your enemies, for the sake of their money when it is needed to be distributed among this people, I wish you would take your property and leave this Territory, for you are not worthy of belonging to the Church of Jesus Christ of Latter-day Saints.²⁰²

From the first, Young had asked Mormons to push for conservation of natural resources through communitarian practices, but his followers overgrazed, overfished, over-hunted, and over-harvested timber as they gave way to the psychological power of the “American tradition” of entrepreneurialism and the frontier mentality. Church leaders had divvied out plots of land in equal portions, but soon settlers began buying up large swaths of acreage in hopes of strong land appreciation. What avid “Gentile” Americans might have counted as normal behavior was destructive of saint-making.

Scolding from Young and other leaders accompanied programs to revive the commitment of the people. A large cadre of “home missionaries” was recruited to travel the colonies and “catechize” the people. As a result, “there were many evidences of spiritual renewal. Church attendance increased dramatically, and often people had to be turned away from meetings. Tithing and free-will offerings increased significantly.”²⁰³

²⁰² Brigham Young, “Necessity of Home Missions,” October 8, 1855, *JD* 3: 117.

²⁰³ Peterson, “Mormon Reformation,” 76.

Brigham Young's chief agents in carrying out the Reformation were his counselors Heber C. Kimball and Jedediah Morgan Grant, who gave blistering speeches on the climate catastrophe to reinforce the ideal of stewardship. "Brother Brigham, myself and others have been crying unto this people for more than three years," declared Kimball, "to lay up their grain for a time when they would have much need of it."²⁰⁴ Grant also admonished his followers. "I am aware that all do not husband their grain as they should," he growled. "They have been anxious to sell their wheat, corn, and such staple articles of food as might have been secured in granaries, and laid up for a hard time, or against a day of famine." Disobedience to their leaders had caused their problems, so Grant had no sympathy.²⁰⁵

For Grant, the climate-forced calamities of 1855 were a "great blessing." They would teach the people about spiritual famine by afflicting them with physical famine. Plagues on an epic scale would reinforce their self-identification as a "chosen people" who must choose in their turn whether to be stewards—gods-in-training—or mere accumulators like their Gentile neighbors. "The grand difficulty with this community is simply this, their interest is not one. When you will have your interests concentrated in one, then you will work jointly," said Young. "I can see no good accruing to this community in maintaining a divided interest; our interest must be one throughout, in order to produce the good we desire."²⁰⁶ His most cherished goal was to see the Saints having "all things in common," like the primitive Christians.

²⁰⁴ Heber C. Kimball to William Kimball, April 13, 1856, *Millennial Star* 18, no. 30 (July 26, 1856): 476.

²⁰⁵ Jedediah M. Grant, "The Present Scarcity of Food," January 27, 1856, *JD* 3: 200, 201.

²⁰⁶ Brigham Young, "The Holy Ghost Necessary," op. cit., 31.

Young was battling two related narratives: first, the story of the rent-seeking entrepreneur and, second, the frontier experience. Brigham's son Joseph A. Young commented, "The feeling 'Mine' is the greatest feeling we have to combat."²⁰⁷ Beyond the moral and spiritual value of "oneness" in temporal things, Brigham Young believed it would result in greater productivity and more equality of incomes. Why own one's own team when a collectively owned team could yield a good return on a much lower investment? Many competing teamsters would only drive down wages—an example of rent dissipation that cooperative ownership could prevent.²⁰⁸

But the battle against "selfishness" was complicated by the mindset of "rugged individualism." The frontier cultivates individualism and an aversion to authority, particularly when that authority advocates redistribution of incomes.²⁰⁹ For Brigham Young, the cultural pressure on the pioneers to gain unlimited control of their environment for their personal gain was supposed to give way to an ethic of stewardship that would "bring about a condition of relative temporal equality."²¹⁰ Apostle Orson Hyde observed, "It seems that men's inordinate desire for wealth and extensive possessions is hard to overcome," and that people "hate to be limited."²¹¹ As "control" is

²⁰⁷ Leonard J. Arrington, Feramorz Y. Fox, Dean L. May, *Building the City of God: Community & Cooperation Among the Mormons* (Salt Lake City: Deseret Book Company, 1976), 201.

²⁰⁸ To see how rent dissipation can be prevented by a homogeneous group of owners, see Terry L. Anderson and Peter J. Hill, "Cowboys and Contracts," *The Journal of Legal Studies* 31, no. 2 (June 2002); see also Arrington, Fox, and May, *Building the City*, 178.

²⁰⁹ Bazzi, et al., *Total Frontier Experience*, 1.

²¹⁰ Arrington, Fox, May, *Building the City*, 16.

²¹¹ Orson Hyde, "Instructions," 150.

“the critical determinant of feelings of possession,” such a surrender would involve a genuine re-formation of the Euro-American identity.²¹²

Only “one calamity after another” would suffice to bring about such a re-formation. Orson Pratt preached that the climate was providing a “course of purification” for the Saints to persuade them away from avarice: “one calamity after another, one punishment after another, is enough to convince us that all proceeded from the hand of the Lord our God. Has He not a purpose in this? Is it not an affliction to us, to you and me? Do you not feel it? Will it not learn us a lesson? Yes, it will.”²¹³

The Mormon leaders thus used the climate of the Wasatch Oasis in all its vagaries for pedagogical purposes. The primary attraction of the climate for them was its utilitarian character as a means for constructing a peculiarly Mormon identity. They held out the ideal of valleys that “flourish and blossom as a rose” as an outward manifestation of that identity: What they really wanted was for the people themselves to “flourish and blossom.”

To motivate the Mormons to re-conceive themselves as stewards of the environment united in one saint-making enterprise¹⁸⁵⁴⁻⁵⁵ united in one saint-making enterprise, leaders spoke of a further dimension to the disruption in the climate. It was time for a “Sabbath.” Mormon theology imbued the earth with anthropomorphic qualities. It had a soul and was therefore a living thing.²¹⁴ After his standard rebuke for not storing up grain, Kimball spoke in a July 1855 sermon of the need for the earth to

²¹² Belk, “Possessions,” 141.

²¹³ Orson Pratt, “The Salvation of the Soul,” February 10, 1856, *JD* 3: 296-97.

²¹⁴ See the Book of Moses 7:48-58 in *The Pearl of Great Price* for the scriptural basis for this Mormon belief.

“rest,” in keeping with Leviticus 25:4: “In the *seventh year* there shall be a *Sabbath* of solemn rest for the land. . . . You shall not sow your *field* or prune your vineyard.” He continued, “The earth is determined to rest . . .and it is right that it should.” Since their arrival in the valley roughly seven years before, the earth had been laboring to produce food. “This is the seventh year,” Kimball affirmed, “did you ever think of it?”²¹⁵ This narrative worked to show that the drought, the grasshoppers, and the heavy snow had a divine purpose. Only a greedy people would force the earth—or themselves—to overwork. Of course, fallowing soil is an ancient practice for renewing its fertility, but then fallow fields do not turn a profit. By preaching an “earth Sabbath,” Mormon leaders tried to deflect their followers from the exploitative lifeways of Gentiles and toward sacralizing themselves and the land. In doing so, they nourished the seeds of a Mormon conservation ethic planted by Joseph Smith. This idea was not unique to Mormons. Jewish traditions also consider a “seventh year” necessary for replenishing and renewing the environment.²¹⁶

Prosperity began to return for the Saints in 1856, although the Reformation continued. The climate started cooperating, as heavy snow made for a good water year and crop yields. In time, Reformation rhetoric softened. Beyond some programmatic measures such as fast days and home missionaries (which evolved into a system of ministering to families), the impact of the Reformation “was of short duration and minimal consequence.”²¹⁷ The conservation ethic continues as a muffled drumbeat in

²¹⁵ Heber C. Kimball, “Times for All Things,” July 13, 1855, *JD* 3: 57

²¹⁶ David Krantz, “Shmita Revolution: The Reclamation and Reinvention of the Sabbatical Year,” *Religions*, August 8, 2016. <http://aytzim.org/DK-Shmita-ReligionsJournal.pdf>.

²¹⁷ Peterson, “Mormon Reformation,” 79.

Mormon rhetoric to this day, although the theme of emergency preparedness eventually came to replace environmental care and conservation in the Mormon concept of stewardship. The narrative of “saints-as-stewards” has been reworked in favor of “self-reliance.”

Brigham Young was far from satisfied with the results of the Reformation. To him, the project of “re-forming” Saints fell short. As the weather moderated, an entrepreneurial ethic soon supplanted the environmental stewardship ethic within Mormon communities. Timber harvesting, for example, continued out of control. In keeping with their communal ideology, timberlands were supposed to be community property. Grantees were to make timber accessible to settlers and charge a fair price to compensate them for road building and maintenance. However, “greed” soon set in. Grantees failed to regulate timber harvesting and allowed loggers to cut across large swaths of forest. Timber was soon in short supply. By the mid-1850s, Wilford Woodruff was noting difficulties in finding accessible stands. The clearcutting would not only lead to lumber shortages, but also contribute to widespread erosion, which, as the settlers would realize too late, contributed to devastating floods.²¹⁸

Even more than abusive land practices, land ownership gave church authorities the biggest headache. On July 25, 1847, Brigham Young laid out instructions for how settlement should proceed, including the policy that “no man should buy land who [comes] here . . . but every man should have his land measured out to him for city and farming purposes. He might till it as he pleased, but he must be industrious and take care

²¹⁸ Alexander, “Stewardship and Enterprise”

of it.”²¹⁹ The Church tried limiting each household to enough land to harvest in one day. Grazing fields were held in common. The land belonged to God and was to be used as a medium for “saint-making.” Godliness required the power to create beauty, which required industriousness within manageable limits. The Saints were to bring into shape and position the assets allotted to them to please the eye and create comfort and happiness.²²⁰ To beautify the environment was part of the saint-making project: “He that is unfaithful in . . . beautifying what is in his possession, who will commit to that man or people the great things of the kingdom of God?”²²¹ “Our work,” Young declared, is “to beautify the whole face of the earth, until it shall become like the Garden of Eden.”²²²

But the saint-making project faltered as trading and speculating in land grew among the Mormons, despite the wishes of the leaders. In 1865, Orson Hyde noted that settlements had grown larger than they were intended to be, due to the impulse to possess as much land as possible. “There is a good deal of ambition among our people to cultivate a great quantity of ground,” he said, “the result of which is that we cultivate our lands poorly in comparison to what we would if we were contended to a smaller area, and would confine our labors to it.” The Saints in some areas had apparently complained to him of a lack of water, which he believed was sufficient for settlers’ needs if they were to decrease the amount of land they tried to cultivate. “Would it not be better,” he asked rhetorically, “to confine our energies to a small tract of land, put in our crops in due

²¹⁹ Rebecca Anderson, “Between Mountain and Lake: An Urban Mormon Country,” PhD dissertation, Arizona State University, 2015, 80.

²²⁰ Brigham Young, “Future State of Existence,” October 6, 1862, *JD* 10: 25.

²²¹ Brigham Young, “Salvation and Condemnation,” June 12, 1860, *JD* 8: 295.

²²² Brigham Young, “Use and Abuse of Blessings,” June 5, 1853, *JD* 1: 254.

season, have ample time to do it, do it well, and then it would only require one-half or one-third the amount of water to mature them?” That spring, frosts had destroyed much of the grain the Mormons had raised. Hyde reassured them that there was plenty in storage, but that the frosts had come to enforce his beliefs that they should confine themselves to smaller farms.²²³

Hyde also noted that overgrazing had become a problem. “The longer we live in these valleys,” he observed, “the range is becoming more and more destitute of grass.” He lamented that herds not only ate all the forage, but also “tramp[ed] it out by the very roots.” A mere two decades after their arrival, the grasses that the early settlers had rejoiced in seeing in 1847 were gone, replaced by desert sage and other plants that made “very poor feed for stock,” which would consequently sicken and starve in winter. Hyde knew the importance of conservation not only to the land but to the character of the people. Keeping farms relatively small and herds from overgrazing would ensure the Mormons’ well-being; instead they were becoming “everlasting slaves” to acquisitiveness and “the authors of misery to creation.”²²⁴

“The grand difficulty” with his people, in Brigham Young’s view, was the persistence among them of an American tradition of competition and avarice. They had brought that covetous tradition with them to Zion: “There exists a double spirit, there is a false, hypocritical spirit in many of the people; it is bred in the flesh, and in the bones, it is received from their fathers and mothers.”²²⁵ This tradition would disunify the Saints,

²²³ Orson Hyde, “Instructions,” October 7, 1865.

²²⁴ *Ibid.*, 150.

²²⁵ Brigham Young, “Management of the Canyons,” October 9, 1852, *JD* 1: 215.

making them proud, self-absorbed, and litigious. For Young, the American tradition of accumulation and self-aggrandizement was “mean and contemptible.”²²⁶ Still, as we have seen, land speculation “blossomed” very early among the saints and continued to shape Mormon community development in the late 19th century.

Mormon leaders chose the Wasatch Oasis not only as a refuge for a beleaguered people, but also—and primarily—as a place suited by climate and land for “saint-making.” They believed themselves destined to become like God and that this world was a crucible for preparing them for that destiny. Such a project would require a severe process of spiritual refinement and growth, which could be carried out only under challenging conditions. Thus, Brigham Young settled his people in a semi-arid valley oasis next to a saline lake. The climate of the Oasis—semi-arid, unpredictable, and for agriculture far more exacting than the lush climate of the East— was to serve as a training ground for saints. In this water-starved country, they would succeed only through communal effort to irrigate the land. The same effort would be required to build and fuel their communities due to the sparseness of timber and other resources. So, they were encouraged to think of the country as “the place which God for us prepared,” according to a favorite hymn, “far away in the West.”²²⁷ Here, as gods-in-training they were called to transform themselves into “stewards” of the environment rather than masters, learning to shape a land “without form and void” into a garden of Eden. They were taught to view their exodus as an escape from a low, corrupt, diseased climate to an elevated, pure,

²²⁶ Brigham Young, “Disinclination of Men to Learn,” April 20, 1856, *JD* 3: 326.

²²⁷ William Clayton, “Come, Come, Ye Saints,” *LDS Hymns* (Salt Lake City: Church of Jesus Christ of Latter-day Saints, 1985), 30.

healthful climate where they could “start anew” the task of re-making themselves into gods.

Still, the attempt of Mormon leaders to counter the traditional Judeo-Christian accommodation with the world was a challenge from the beginning. As conditions improved for the community, the Mormons began to re-structure themselves not as pilgrims on a quest for godhood but as property developers. Young and his associates lamented this trend, and the sudden climate-related shocks of 1855 presented them with an opportunity to launch a deliberate campaign to “re-form” the saints into stewards. An unprecedented drought, a deluge of insects, famine, and engulfing snows—the climate crisis was not wasted by the leaders in their anxiety to carry out a “course of purification” and to call the saints back to their calling as stewards. But the Reformation did not have the lasting influence Young hoped for. The ethic of stewardship continued to dissipate under new pressures from the outside world; e.g., increasing land values, rising interest in the potential of mining and commerce, the promise of the railroad, and a growing federal presence.

At the same time, the Mormon project had capitalized to a great extent on the assets of their environment. Paradoxically, irrigation made farming more manageable and less dependent on rainfall. The dry climate discouraged malaria, the insect-borne “American disease” that afflicted earlier Mormon settlements in the Mississippi Valley. Outsiders like Stansbury honored the Mormon achievement in a stark land. Veteran explorer Sir Richard Burton, visiting in 1860, saw the Great Basin as “a howling wilderness . . . bleak and liable to great vicissitudes of temperature . . . a ‘mean’ land,

hard, dry, and fit only for the steady, sober, and hard-working Mormon.”²²⁸ The jaded Burton was moved by the vision of what the Mormons had accomplished: “Though uninfluenced by religious fervor—beyond the satisfaction of seeing a brand-new Holy City—even I could not, after nineteen days in a mail-wagon, gaze upon the scene without emotion.”²²⁹

Finally, the Reformation gave some impetus to a pro-environmental stewardship movement, a thread that would persist in the fabric of Mormonism and create tension in years to come as the Saints engaged in schemes of “dominion over nature” more typical of the gentile worldview. Harsh climatic conditions had forced at least a temporary return to their ethic of consecrated stewardship; and the thundering preachments of the Reformation still echo in the Mormon culture today despite the irresistible clamor of the “American tradition” of self-enrichment and unrestrained development. These echoes create a certain ill ease within the culture and a lack of clarity about the meaning of a “blossoming” land.

²²⁸ Richard Francis Burton, *The City of the Saints, and Across the Rocky Mountains to California* (London: Longman, Green, Longman, and Roberts, 1861), 10, 334, 343.

²²⁹ *Ibid.* 193.

Chapter 4

Drought and Depression

In 1900, Utah geologist James E. Talmage published a 116-page natural history of the Great Salt Lake. Like Orson Pratt, Talmage saw himself as a scientist, but unlike Pratt he had a Johns Hopkins University education.²³⁰ Also like Pratt, he believed that the climate of the Wasatch Front was ideal for supporting extensive settlement and that the region was experiencing climatic change in the direction of producing more water. Eleven years after writing *The Great Salt Lake*, Talmage was named one of the twelve apostles of the LDS Church, which greatly magnified his influence not only as a religious leader but as a sort of “official Church scientist.” Talmage’s overly optimistic account of a growing water supply in the Wasatch Oasis substantially advanced the narrative that his Mormon forebears had constructed decades earlier. For Talmage, an amalgamation of righteous effort and divine providence had changed the hydrological cycles of the region and made it bloom. This traditional narrative gave Utahns confidence that the climate was changing for their benefit.

Talmage was not alone among scientists in this view. In the 1870s, a wet period in the Midwest led some observers to theorize that prairie agriculture might have induced a change in the climate. “Suddenly, what had previously been considered a barren waste was seen as a potential garden. . . Many attributed the increased rainfall to the effects of human settling activities.”²³¹ Cyrus Thomas, professor of ethnology at Southern Illinois

²³⁰ Andrew Jenson, “James E. Talmage,” *Latter-day Saint Biographical Encyclopedia: A Compilation of Biographical Sketches of Prominent Men and Women in the Church of Jesus Christ of Latter-day Saints* (Salt Lake City: Western Epics, 1971), 3: 788.

²³¹ Michael H. Glantz, “Drought Follows the Plow: Cultivating Marginal Areas,” in *Climate Variability, Climate Change, and Social Vulnerability*, J.C. Ribot, ed. (Cambridge University Press, 2005), 125.

University, was one of the first to suggest this theory. A member of the U.S. Geological Survey team, he observed that since the prairie country “has begun to be settled, towns and cities built up, farms cultivated, mines opened, and roads made and travelled, there has been a constant increase of moisture. . . I, therefore, give it as my firm conviction that this increase is of a permanent nature, and not periodical, and that it has commenced within eight years past, and that it is in some way connected with the settlement of the country, and that as the population increases the moisture will increase.”²³²

Thomas’s “firm conviction” gave rise to runaway boosterism. To railroads and land developers, the “news” about the putative climate change led to a bonanza. Charles Dana Wilber, a prominent booster, capitalized heavily on the Thomas theory. With agricultural expansion, Wilber wrote in a popular book that “reduction of temperature must at once occur, accompanied by the usual phenomena of showers. The chief agency in this transformation is agriculture. To be more concise. *Rain follows the plow.*”²³³ Wilber’s phrase echoed across the world, and thousands of farmers soon took possession of the arid midwestern prairies. The Cyrus Thomas thesis was widely accepted, and Talmage clearly relied upon it in his study of the climate of the Wasatch Oasis.

In *The Great Salt Lake: Past and Present*, (1900) Talmage provided a description of the hydrology of the Great Basin and a history of human interaction with the lake. He noted with a hint of satisfaction that the lake, and the Wasatch Oasis in general, had experienced a “notable increase” in precipitation, and thus the volume of water available

²³² Charles Dana Wilber, *The Great Valleys and Prairies of Nebraska and the Northwest*, 3rd ed. (Omaha: Daily Republican, 1881), 161.

²³³ Wilber, *Great Valleys*, 68.

for use, in the five decades since the arrival of European settlers.²³⁴ Drawing on Howard Stansbury's 1850 survey, maps, and contemporary data (although his measurements lacked detail), Talmage attempted to trace Great Salt Lake's fluctuating levels. He believed that the lake had been in a decline before bottoming out "at the lowest level observed by man" in 1850, after which, when settlers began to cultivate the land more earnestly, the lake "reached its maximum height in the course of this increase of volume about 1872 or 1874."²³⁵ He did acknowledge that at the time of his writing the lake had been receding, but it had "not yet reached its low level of 1850."²³⁶ The lake was actually hovering around its average elevation of 4,200 ft when the pioneers arrived in 1847, and began to climb in the early 1850s. Then, a period of frequent droughts dropped water levels, but not until the late 1890s did the Lake fall to its average elevation.²³⁷ While Talmage correctly observed that the Lake was high in 1872, Great Salt Lake was certainly not at its lowest in 1850.

In sum, Talmage associated the lake's overall rise of the previous half century with a general upsurge in moisture in the region. "As is now generally known," he postulated, "there has been a notable increase in the water supply in the Salt Lake Valley, and indeed in the entire Basin Region, within the period of human occupancy."²³⁸

So, a prominent Mormon scientist confirmed in "scientific" terms that God was indeed transforming the climate of the Mormon holy land. Reportedly, the Saints had

²³⁴ James E. Talmage, *The Great Salt Lake Present and Past* (Salt Lake City: The Deseret News, 1900), 49.

²³⁵ *Ibid.*, 44.

²³⁶ *Ibid.*, 45.

²³⁷ Ted Arnow, "Water-Level and Water-Quality Changes in Great Salt Lake, Utah, 1847-1983," Geological Survey Circular, 913, U.S. Department of Interior, 1984, 4.

²³⁸ *Ibid.*, 49.

begun to notice a great “change” as early as 1871. That year, the *Latter-day Saints’ Millennial Star*, the British organ of the Church, published one of the earliest accounts of the change:

When the Latter-day Saints first penetrated the wilds of the Rocky Mountains and the valleys of the Great Basin of North America, that whole region was considered an arid, unproductive desert, utterly incapable of supporting cultivated human life, and utterly unfit for decent human residence. . . . But the Saints had faith in God, and they set themselves busily to work to redeem the desert and make the wilderness blossom as the rose. . . . The face of the country for hundreds of miles has been completely changed, transformed from a sterile and most forbidding desert to a well-cultivated country. . . . The Saints have not only proved, by their faith and works, with the blessing of the Lord superadded, that the Basin region can be made to sustain life comfortably, but much more good has resulted—through their extensive cultivation of the arid soil and the liberal planting of trees, the Lord has greatly tempered the natural aridity of the climate, largely multiplied the rains, and caused the atmosphere to become far more humid than formerly.²³⁹

The Mormon account echoed the larger American narrative of the West as a vast agricultural paradise-in-waiting that would require only cultivation to change the arid climate. The apparent success of the Mormon experiment in modifying the climate became a central theme in that narrative. In 1870, the widely circulated *American Agriculturist* periodical based in New York called the nation’s attention to the Mormon achievement as presaging a climate revolution in the great West:

A remarkable instance of the effect of man’s labor upon climate is now going on in the Great Salt Lake Valley. . . . When the Mormons first settled this region, they were entirely dependent upon irrigation for their crops. The supply of water was small, and they feared lest, with the increase of their population, there might not be at last enough to irrigate all their lands, and famine must stare them in the face. But they have tilled their lands, planted trees, which are now large and completely embower their city, and their gardens are full of fruit trees and flowering shrubs. Many thousands of acres once barren, have been made more productive than in rainy climates. Enormous sums have been spent on bringing water by artificial channels from the distant mountains to make these now fertile fields. The face of the earth has been changed, and there has been a corresponding

²³⁹ “Replenishing the Earth,” *The Latter-day Saints’ Millennial Star*, May 30, 1871, 340-41.

change in the climate. They now have rains from the sky, almost enough to meet the wants of growing crops, a thing unheard of until within a few years. The effect of the increased rain-fall in the Valley has had a very marked effect upon the Great Salt Lake... It has risen 12 feet since the Mormon occupation. . . The change has also affected the streams that flow through the Valley, and it is estimated that the same channels carry twice as much water as formerly for the purposes of irrigation. These facts are very encouraging, not only to the Mormons, but to the settlers along the line of the Pacific Railroad, where there is little rain. It may be expected that irrigation and cultivation, and the planting of trees, will gradually work a change in the climate, and make rainless regions productive.²⁴⁰

So, based on the Mormon story, the nation began to envision a “great change” that would transform the vast western half of the country, which was to that point considered a wasteland.

Talmage believed that he had detected real evidence for that change. A key data point was the experience of the small town of Kaysville, just north of Salt Lake City. He briefly recounted the history of Kaysville beginning with its settlement between 1850 and 1860 when only a dozen or so families lived there and, according to Talmage, they wanted to keep it that way. “The settlers were loath to welcome additions to their numbers, owing to scarcity of water,” he explained. The creek on which the town relied was too small to accommodate any more people and farms. Yet the population of Kaysville more than tripled between 1890 and 1900, from 548 to 1,708.²⁴¹ Talmage also referenced neighboring Bountiful and Farmington as examples of the same phenomenon. Each started out with a low water supply but, he claimed, due to human determination and know-how, each eventually obtained enough water to support substantial populations.

²⁴⁰ “Remedy for Drouth,” *The American Agriculturist* 29, no. 12 (December 1870): 457.

²⁴¹ “Summary of Population and Housing Characteristics,” Census of Population and Housing, 1900, [census.gov](https://www.census.gov).

To explain the increase in moisture in the Salt Lake Valley and its peripheries, Talmage drew on two theories in the reports of John Wesley Powell, chief ethnologist at the Smithsonian Institution and famed explorer and surveyor of Utah.²⁴² The first theory was that the increase was attributable to a “permanent change in the conditions controlling precipitation and evaporation” leading to more rainfall. Natural climate change “appears to be a probable explanation,” he says, but did not express unequivocal certainty about it.²⁴³ His second theory, which he seemed to favor, was that human activity boosted the amount of water in the valley. He cited Powell’s claim that agriculture and deforestation seemed to increase available water by clearing the way for more precipitation to reach rivers and streams.²⁴⁴ Talmage reasoned, “Well covered soil retains the moisture whether it falls as rain or snow,” he explained, “and in time returns it to the atmosphere through the medium of evaporation.”²⁴⁵ Trees, brush, and other forms of vegetation hinder water flow, retaining it or sending it back into the atmosphere instead of downhill where it could be useful.

Talmage assented to Powell’s conclusion: “Whatever man has done to clear the way for the flowing water has diminished local evaporation and helped to fill the lake. Whatever he has done to increase local evaporation has tended to empty the lake. The white man has modified the conditions of drainage, first, by the cultivation of the soil; second, by the raising of herds; and, third, by the cutting of trees.”²⁴⁶ However, Powell

²⁴² See John Wesley Powell, *Report on the Arid Regions of the United States* (Washington: U.S. Government Printing Office), 1879, pp. 68-77.

²⁴³ Talmage, *Great Salt Lake*, 51.

²⁴⁴ John Wesley Powell, “Tree-Growth on Arid Lands.” *Science* 12, no. 297 (October 1888): 170-71.

²⁴⁵ Talmage, *Great Salt Lake*, 52.

²⁴⁶ Powell, *Arid Lands*, 73.

did not necessarily view this development as an unmixed blessing—he reports it neutrally. Nor did he agree that the absolute volume of water was increasing, merely its availability for agriculture. Moreover, neither Talmage nor Powell seemed aware of—or at least did not mention—the increased danger of floods, erosion, land slippages, and other potential threats from hillsides stripped of natural vegetation by plowing or grazing.

Although the tone of Talmage’s book is neutral, the narrative of the “blossoming desert” is hinted at. He does not specifically commit to Powell’s theory of human agency in the expansion of water, but he does not admit that the trend toward increased supply might be temporary or even reversible. At the time of his writing, Talmage concedes that “the lake is now steadily decreasing in volume. This cannot be regarded as evidence of a turn in the series of climatic changes toward a state of increasing aridity, nor as proof of less potent human influences.” This assertion of a permanent trend toward moisture seems oddly unsupported by the evidence, but it makes sense in light of the background assumptions and sentiments with which he approaches this project. He was, after all, a committed Latter-day Saint, raised in the ideology of eternal progress and the theology of the blossoming desert. Surely the blessed trend toward humidity and productivity in the consecrated land could not possibly turn toward aridity and waste.

Where Talmage differed from Powell most was in the question of where the increase in water came from. While Powell emphasized a decrease in evaporation due to more irrigation and fewer wetlands, Talmage would probably attribute an actual apparent increase in the “water supply” to effective Mormon “stewardship” of the land and water—if it had occurred to him to put it in that context. Subliminally, Talmage credited divine intervention from Mormon obedience to the increase. His own conception of

stewardship had little to do with the environment. Along with other Mormon leaders, he had come to view the doctrine of consecration and stewardship as dealing more with economics than with “saint-making.” When he spoke of the stewardship doctrine, it was all prospective: “The saints confidently await the day in which they will devote all that they have . . . to the service of the Lord, a day in which no man will speak of mine and thine, but all things shall be theirs and the Lord's.”²⁴⁷ The doctrine of stewardship had been put on hold. Whatever had produced the blessing Talmage perceived, it was not the consecration of the Saints to a communal Zion.

Ironically, Powell would not have supported Talmage’s thesis that the climate of the Wasatch Oasis was becoming steadily more fruitful because of the activities of the Saints. Powell was a well-known critic of Cyrus Thomas’s notion that “rain follows the plow.” Speaking to the North Dakota Constitutional Convention in 1889, he deflated any such claims: “You hug to yourselves the delusion that the climate is changing. This question is four thousand years old. Nothing that man can do will change the climate. A long succession of years will give you the same amount of rainfall that any other succession of the same length will give you. The settlement of the country, the cultivation of trees, the building of railroads—all of these matters will have no influence upon your climate.”²⁴⁸ Although reliant on Powell’s science, Talmage would probably answer that even if human agency does not affect the climate, divine agency certainly could.

In any case, more current observations have undercut Talmage’s theory that the rise in elevation of the Great Salt Lake signaled a permanent trend toward increasing

²⁴⁷ James E. Talmage, *The Articles of Faith* (Salt Lake City: The Deseret News, 1919), 452.

²⁴⁸ John Wesley Powell, “Address to the North Dakota Constitutional Convention, August 5, 1889.” In *Reclamation Era* 26/9: 201-2, 1936 (1889).

moisture in the Valley. Research now shows that lake levels are associated with a phenomenon called “Pacific Quasidecadal Oscillation (PQD), the periodic fluctuations in sea-surface temperatures in the tropical Pacific, which in turn affect precipitation along the margin of the American continents. The lake rises and falls “in coherence with” the PQD. The period of the shift from warmer to cooler Pacific water and back again seems to be about ten to thirty years (thus “quasidecadal”) and can be verified as far back as the seventeenth century (through tree-ring analysis). This shift explains why, for example, the Great Salt Lake dropped to a historic low in 1963 only to fill up again to a historic high in 1986. At this writing it is dropping again due to a long term megadrought, which I will discuss in a subsequent chapter.²⁴⁹

Of course, in Talmage’s time, lake-level research had not advanced this far. The popular narrative that the agriculture of the white man would bring rain and fertility to the West was invigorated by the notion that divine providence was at work. Widely read on the subject, Charles Dana Wilber’s book reinforced the white Christian’s assumption that “the great movement of which he [the white Christian settler] is a part has Providence for its mainspring.”²⁵⁰ The West was “God’s country . . . where good land is cheap, where labor and capital find profitable employment. . . . Our Churches are going, *have gone, west*.”²⁵¹ Wilber’s readers saw in the West a pious, profitable paradise where the divine blessing of rain would follow their efforts.

²⁴⁹ Shih-Yu Wang, Robert R. Gillies, J. Jin, L. E. Hips, “Coherence between the Great Salt Lake Level and the Pacific Quasi-Decadal Oscillation,” *Journal of Climate*, 23 (2010): 2161.

²⁵⁰ Wilber, *Great Valleys*, 354.

²⁵¹ *Ibid.*, 351.

Talmage was deeply committed to the local version of the “blossoming rose” narrative. When writing a missionary pamphlet, *The Story of “Mormonism,”* he trades his academic tone for an epic tone in a florid rendering of that narrative:

Such was the scene of desolation that greeted the pioneer band. A more forsaken spot they had not passed in all their wanderings. And is this the promised land? ... was it not wholly pardonable if some did sigh with longing for the leeks and flesh-pots of the Egypt they had left, or wished to pass by this land and seek a fairer home?”²⁵²

Here again is the story of the waterless wasteland. The narrative had become basic to the parable of progress and development that was central to the Mormon as well as the American project, particularly with the rise of Progressive ideologies of social improvement. The valley was “spread out like a scroll” waiting for the Euro-Christian narrative of providential progress to be written upon it.

What Talmage saw as an improving climate reflected the enthusiasm of Progressives for increasing “vitality” in the culture. Central to the Progressive project was the notion that vitality—the “life force”—must be cultivated and promoted. The Progressive discontent with “political and social sag,” in the words of Jane Addams, and preoccupation with creating a bracing, healthful environment that would promote the “vitality of the race.”²⁵³ Addams and other Progressives worried over a “loss of vitality and lowered industrial efficiency” in American youth due in part to environmental issues such as air and water pollution and, in the West, drought.²⁵⁴

²⁵² James E. Talmage, *The Story of “Mormonism”* (Salt Lake City: The Deseret News, 1914), no page number.

²⁵³ Cited in Michael McGerr, *A Fierce Discontent: The Rise and Fall of the Progressive Movement in America* (Oxford: Oxford University Press, 2003), 315.

²⁵⁴ Jane Addams, *Twenty Years at Hull House* (New York: Macmillan Company, 1912), 79, 99, 174, 367.

Some progressives found a remedy for the endangered vitality of the American population in the climate and culture of the Mormons. Prominent progressive scientist Ellsworth Huntington asserted a now defunct theory in 1915 that there was a correlation between climate and the “vitality” of a culture. Huntington created “maps of the world depicting the distribution of climatic energy and of civilization” and found that the most vital cultures were located in a belt of high “climatic energy” (apparently defined by a wide range of temperature variance) that ran from northern Europe to southern Canada and dipped into the western United States: “The outstanding feature of the vitality map is its agreement with the map of climatic energy.”²⁵⁵

Huntington’s primary measure of “vitality” was the level of education in a population. Among the states of the Union, he said, “Utah stands highest in education” (based on per capita literacy). He concludes:

The proud position of Utah is presumably the result of Mormonism. The leaders of that faith have had the wisdom to insist on a thorough system of schools, and have obliged the children to attend them. . . . Whatever one may think of Mormonism as a religious belief, it must be credited with having accomplished a remarkable work in spreading a moderate degree of education almost universally among the people of Utah.²⁵⁶

Ultimately, Huntington attributes the “vitality” of the Mormon people to the “energy” of their climate.

Like Huntington, Talmage was also preoccupied with Mormon “vitality.” In 1919, Talmage published an ambitious apologetic work entitled *The Vitality of Mormonism*. Unlike Huntington, he proclaimed “the vital character of the Church of

²⁵⁵ Ellsworth Huntington, *Civilization and Climate* (New Haven: Yale University Press, 1915), 183, 188-89.

²⁵⁶ Huntington, *Civilization and Climate*, 193-94.

Jesus Christ of Latter-day Saints” as the result of divine direction, demonstrated by the material achievements of the Mormons in transforming the forbidding environment of the Great Basin. Talmage asserted that the climate should mirror steady social development toward perfection. The progressive narrative requires a distinction between “growth” and “development,” as Talmage explains:

The Church has not only grown; it has developed. Between growth and development there is an essential difference. . . Growth alone is the result of accretion, the accumulation of material, the amassing of stuff. Development involves an extension of function, a gradation of efficiency, a passing from immaturity to maturity, from the seed to the fruiting tree.²⁵⁷

The increase in water in the valleys of the Wasatch was thus a positive “development” rather than a random phenomenon of nature, a mindless “growth.” In Talmage’s text, divine design was at work. The Mormons’ expanding mastery of a desolate environment must provide “vitality,” a confirmation of progress toward a spiritual and temporal Eden. “True,” he wrote, “the heat of persecution has scorched and withered a few of the sickly plants, such as had little depth of sincerity; but the general effect has been to promote a fuller growth, and to make richer and more fertile the Garden of the Lord.”²⁵⁸ The imagery of plant and pioneer meld in this narrative; therefore, more water in the fields is emblematic of more vitality in the Saints. That is why it would be so disillusioning if the improving “trend” were to be illusory after all.

The notion that Mormon agriculture and irrigation practices might have changed the Wasatch climate was not lost on others. In 1891, William Ellsworth Smythe, a journalist and something of a professional colonizer, organized the first National

²⁵⁷ James E. Talmage, *The Vitality of Mormonism* (Boston: Richard G. Badger, 1919), 15.

²⁵⁸ *Ibid.*, 15.

Irrigation Congress, which met in Salt Lake City. Ellsworth's motivation for putting the conference together, was the belief that Mormon irrigation had changed the Wasatch climate.

Smythe had come of age in Nebraska where he had seen farms fail and families suffer from drought. As a result, he set out to improve the conditions of poor American farmers in the West and irrigation became his life's work.²⁵⁹ Smythe organized the congress with Wyoming Senator Francis Warren and Elwood Mead, an engineer also from Wyoming, to raise awareness of the value of irrigation. Of course, the underlying theme of the congress was that because intrepid pioneers had (supposedly) changed the climate in parts of the western United States, others could finish the job.

Ironically, however, the immediate impulse for the congress was a severe Midwestern drought in 1889-90.²⁶⁰ The drought came as a shock to settlers in the semi-arid belt east of the Rockies. The irrigation congress report opined that "large areas of arid lands and semi-arid lands, situated upon the great plains . . . were settled upon in good faith by home-seekers, under the supposition that they were entering agricultural lands." The supposition turned out to be wrong. "The settlers upon such lands have expended much time and labor upon the same, and paid . . . therefore many millions of dollars, only to discover that irrigation, to a greater or less extent, is necessary in making

²⁵⁹ Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Oxford University Press, 1985), 119.

²⁶⁰ William Ellsworth Smythe, *The Conquest of Arid America* (New York: Harper & Brothers, 1900), 115.

homes for themselves thereon.”²⁶¹ So the expected rain had not followed the plow after all.

Utah territorial governor Arthur Thomas called the congress to order and reminisced about the early Mormon successes with irrigation. To Thomas, Salt Lake City was the perfect location for the meeting, and Fred Simon, the president of the Salt Lake City Chamber of Commerce agreed, referring to the city as the “cradle of all irrigation.”²⁶² Thomas remarked, “In 1847 the cultivation of the soil by irrigation was commenced by Mormon settlers and where, upon success or failure, depended the life or death of the country.”²⁶³ Thomas, who was not a Mormon, nevertheless believed the Mormon pioneers had laid out a successful blueprint for irrigation systems that could be used throughout the West. “There are few places more inviting than the well-cultivated valleys of the West, and the government can render its people no greater service than to assist in a material way in reclaiming every acre possible.” Other members of congress agreed. “We have within these various states and territories a domain of arid lands which are well capable of supporting a greater population than is now living East of the Mississippi River.”²⁶⁴ Despite the drought shock of the previous two years, optimism ran high. It was still anticipated that irrigation would turn out to be a temporary measure as the climate changed with the extension of agriculture across the West.

²⁶¹ *Memorial to the Congress of the United States from the National Irrigation Congress*, Press of the Irrigation Age, 1892, 4.

²⁶² *Irrigation Congress*, 6.

²⁶³ *The Irrigation Congress*, 2.

²⁶⁴ *The Irrigation Congress*, 5, 12.

On the second day, September 16, Wilford Woodruff, then president of the LDS Church, was invited to address the congress. He expressed confidence that hard work and irrigation techniques would change the climate of the West for the benefit new settlers, just as it had for the Saints. The 84-year-old Woodruff stepped to the podium and gave his account of the settlement of Salt Lake Valley. “This country we arrived upon was called the Great American Desert,” he began, “and certainly as far as we could see it did not deviate from that in the least. We found a barren desert here.”²⁶⁵ His recollection of a “barren desert” was a far cry from the “vast rich fertile valley” that he wrote of in his journal in 1847.²⁶⁶ He continued: “We found neither wood nor iron were strong enough to make furrows in this hard soil. It was like adamant.” Woodruff told how irrigation had made the ground fertile and that without it “this country would be as barren as it was in 1847.” He concluded his short speech with the admonition that if the congress could expand irrigation and turn “two drops of water where there was one” they would be “benefactors to mankind.”²⁶⁷ He mirrored the hopes of the congress that the West would become less arid in time with the application of industry and ingenuity.

Smythe, the force behind the congress, was champion of another narrative. Where Talmage and Woodruff and the Saints as a whole, whose faith upheld the notion of gradual climate improvement under divine “development,” saw aridity as a challenge to be overcome, Smythe, like Young, saw aridity as a benefit. “In any just estimate of the relative worth of western resources the fact of aridity must be rated as high above the

²⁶⁵ *The Irrigation Congress*, 43.

²⁶⁶ Wilford Woodruff Journal, July 24, 1847.

²⁶⁷ *The Irrigation Congress*, 43, 44.

value of forests and mines as human progress is dearer than money,” Smythe wrote in his popular book, *Conquest of Arid America*, released the same year as Talmage’s *Great Salt Lake*—1900. Smythe’s book was a paean to the high, dry climate of the West. Due to higher mineral content, Western soil was superior: “In productive capacity, twenty acres in the Far West should equal one hundred acres elsewhere.” As for the prospects for industry, “arid lands were infinitely better than humid lands because they presented conditions much better suited to the industrial polity.”²⁶⁸

Ironically, Smythe advocated Western settlement *because* of its aridity. He believed that only in the West would the “ideal” American culture arise. Aridity, he argued, required community rather than unbridled individualism. To be habitable, the land required irrigation, which in turn required co-operation; in the West, no one could “build his home and make his living regardless of his neighbor. . . .The association and organization of men were the price of life and prosperity in the arid West. The alternative was starvation.” For Smythe, the Western climate would have a deterministic effect on settlement. It would have to take a certain form or fail. “Irrigation means heavy investment of capital or labor, hence the co-operation of many and the construction of permanent works: it necessarily implies the correlative existence of a stable social organization.”²⁶⁹

Smythe found that stable society in the example of the Mormons. “The Mormon commonwealth suggests itself irresistibly as the starting-point of any proper study” of a culture that succeeds in an arid climate. He pointed out that the Mormon settlers began

²⁶⁸ Smythe, *Conquest*, 30, 31, 35, 44.

²⁶⁹ *Ibid.*, 31, 33.

their project “at almost the exact geographical centre of that great arid region” with no assets but their labor. Appealing to racial stereotypes, Smythe asserted that Mormons were the “First of the Anglo-Saxon race . . . to encounter the problem of aridity,” they turned to irrigation as the only solution to survival. Although the Mormons attribute their success to “the direct revelation of God,” Smythe argues that “it is plain that the system was born of the necessities of the place and time—the product of the peculiar environment of the arid region.” The great necessity was what Smythe called “industrialism”: a culture of smallholders bound together in a climate where water was more valuable than land and where only through social co-operation could water be conserved and distributed. This system discouraged land speculation and monopolistic practices, which in Progressive eyes worked against the “equitable division of land values” necessary to an egalitarian culture. While still based on individual proprietorship, the system promoted “the principle of public ownership and control of utilities,” another Progressive ideal.²⁷⁰

The culture of more humid climates, Smythe argues, is based on the speculative instinct: thus, the giant plantations of the Mississippi valley and the resulting inequality between the owning and the laboring classes, such as the southern plantations. Such a climate leads inevitably to severe economic dislocations. Success in an arid climate, by contrast, depends on a culture that balances self-reliance and co-operation. Aridity requires co-operative enterprise: “As all had started on a basis of equality, so all were given an equal chance to participate” in the rewards of the commonwealth. By 1900, the “Utah system,” Smythe calculates, netted each household “a considerably higher return

²⁷⁰ *Ibid.*, 56-59.

than the *gross* amount averaged by wage earners in the United States.”²⁷¹ For Smythe, an arid climate necessarily led to a more thriving culture than a humid climate, especially when the American values of democracy and egalitarianism are measures of success.

Smythe saw himself as a scientist with no illusions and so gave no credence to the notion that the Mormons’ religious beliefs could have had any effect on their success in building a model culture—their success was determined by their particular climate-adapted modes of social and economic organization:

It is generally believed that Church solidarity is the true explanation of the economic prosperity of the Mormons. This conclusion rests upon the theory that the Church sustains the industrial system. The writer emphatically dissents from this notion, and confidently asserts that precisely the reverse is the truth—that the industrial system sustains the Church... The writer believes that the attraction of Mormonism has consisted mostly in what it offered to the home-seeker, and that the secret of its cohesion is the prosperity that has resulted from its industrial system rather than the occult power of its creed.²⁷²

In Smythe’s view, the increasing prosperity of the Mormon enterprise arose not in spite of but because of the exigencies of the arid climate and would undoubtedly continue to increase untouched by the kind of economic disruptions common to more humid climates. The experience of Utah in the Panic of 1893 demonstrated that for him:

Nowhere else has the common prosperity been reared upon firmer foundations. Nowhere else are institutions more firmly buttressed or better capable of resisting violent economic revolutions. The thunder-cloud which passed over the land in 1893, leaving a path of commercial ruin from the Atlantic to the Pacific, was powerless to close the door of a single Mormon store, factory, or bank. Strong in prosperity, the co-operative industrial and commercial system stood immovable in the hour of wide-spread disaster.²⁷³

²⁷¹ *Ibid.*, 62, 70.

²⁷² *Ibid.*, 74-75.

²⁷³ *Ibid.*, 71.

Smythe was wrong about this. The economy of Utah had been severely damaged in the national depression of the 1890s, as Leonard Arrington points out: “The distress in the nation was accentuated in Utah, for Utah's economy in the 1890's depended upon agriculture, mining, and transportation, all three of which were marginal to the national economy and accordingly suffered heavy cutbacks with the onset of the depression. As elsewhere in the nation, farm income dropped heavily.” Industrial production in Utah dropped from fifty percent in metals to ninety percent in some other products. The depression in Utah continued long after it had eased in the rest of the country.²⁷⁴

Additionally, Smythe seemed unaware of the consequences of developing ever more marginal lands. As Mormon settlements expanded into drier and less fertile areas, the idea of a network of small, thriving agricultural settlements began to falter. In the western and northwestern parts of the Salt Lake Valley, for example, the extreme lack of water made irrigation too difficult, leading to the adoption of dry-farming, which made for large, isolated farms too distant from each other to form into the meaningful communities envisioned by Joseph Smith. Furthermore, plowing and overgrazing of these marginal lands destroyed the delicate biotic balance that kept the soil intact, which led to increasing dust storms.²⁷⁵

Such counter evidence did not disturb Smythe's enthusiasm for development of the arid country. The word “development” (listed as an “Americanism” as of 1885 in the Oxford English Dictionary) occurs more than a hundred times in *Conquest of Arid*

²⁷⁴ Leonard J. Arrington, “Utah and the Depression of the 1890s,” *UHQ* 29 (1961), no. 1: 6.

²⁷⁵ For an account of Mormon over-expansion onto sub-marginal lands, see Brian Cannon, “‘There Are Millions of Acres in our State’: Mormon Agrarianism and the Environmental Limits of Expansion,” in *The Earth Will Appear*, 195-214.

America. He was an archetypal American promoter who foresaw the entire West under the successful cultivation of a Mormon-style culture. “Imagine the Republic of the twentieth century, all its magnificent resources under process of development on lines of enlightened co-operation,” he wrote, within the Enlightenment narrative of a society inevitably “evolving” toward a utopia. “The American people will press on . . . by gradual industrial and social evolution to the realization of their great destiny.”²⁷⁶ Smythe used the Mormon model to introduce a new type of Americanism. Brigham Young would have been proud.

This new Americanism was not completely Mormon, however. Nor did it last very long. Both Talmage the Mormon and Smythe the promoter lived within the grand narrative of Progressivism, the ideology that human ingenuity could bend nature to its will; that a culture founded on “scientific principles” would necessarily “improve” over time and that climate and culture would “develop” together. The Spencerian ideology of purposeful evolution toward a utopian destiny dominated their thinking. Talmage’s confidence in a continually improving climate was bolstered by selective observation, as he did not account for the intensifying drought surrounding him as he wrote *The Great Salt Lake*. Perhaps this selective use of data was due to his underlying loyalty to the narrative of an ever-blossoming desert produced by a “righteous” culture. Smythe’s confidence in an ever-improving arid climate-culture was based on the Mormon experience; “science” told him that arid climates produce superior cultures. Aridity would result in a culture in near-perfect equilibrium. However, his account of the impact in Utah of economic depression and expanding agriculture in marginal lands contradicted

²⁷⁶ Smythe, *Conquest*, 308, 310.

the facts on the ground, undercutting his pretensions to a “scientific” social theory of climate. Historian Donald Worster claimed Smythe believed that irrigation would “save the West from economic ruin and...create a new and better world.”²⁷⁷ In this, Smythe shared a similar worldview to the Mormons. Industry through irrigation would bring about a more prosperous and democratic civilization in the American West.

The Irrigation Congress initiated by Smythe continued to meet almost annually for the next quarter of a century with the same objective of making the West more habitable (and profitable) through irrigation development. But the hope of a permanent trend toward increased moisture grew dimmer over the years with repeated wet and dry cycles. As a result, the congress shifted its vision toward reclamation of existing water sources. The enemies of progress were now evaporation and “wasted” runoff; but by using aggressive irrigation and water storage techniques, they felt, westerners could overcome both. In Utah, as long as the Wasatch and other mountain ranges bore a healthy snowpack most years, progress could continue despite the persistence of an arid climate.

As we have seen, when Talmage published his book in 1900, Utah was in the middle of a devastating drought. From 1898 to 1905, Utah endured one of its driest periods in its history. It first struck in the southeast but eventually covered the entire state, including the Wasatch Oasis.²⁷⁸ While the elevation of the Great Salt Lake sat at 4,200 feet in 1886, it had been declining ever since and bottomed out at 4,196 feet in 1906.²⁷⁹ Ranchers struggled, and many cattle operations completely folded. Many Utahns

²⁷⁷ Worster, 119.

²⁷⁸ “Drought in Utah: Learning From the Past—Preparing for the Future,” Utah Division of Water Resources, April, 2007, 19.

²⁷⁹ “Great Salt Lake Annual Level Prediction,” Utah Climate Center, <https://climate.usu.edu/GSL.php>.

relocated to find better conditions, causing LDS Church leaders to try to stem the tide by encouraging members to stay on Utah farms.²⁸⁰ The women's organization of the Church, the General Relief Society, donated roughly 35,000 bushels of wheat to help struggling farmers. Eventually, the drought receded, but it was only a taste of what was to come.

Meanwhile, Mormon leaders continued to preach that obedience and hard work along with divine favor had tamed the western landscape for the Mormons. In a church-wide conference held in 1909, future church president David O. McKay, one of the Twelve Apostles, spoke of the changes the landscape had undergone over the last century. "There was nothing here inviting," he said of the early pioneers and in an apparent reference to Jim Bridger's early warnings recalled that "they had been warned nothing would grow." In short, McKay summarized, "There was no apparent place for a home." But that changed. "Now what do we see? Just look at our city today; its climate modified." McKay went on to credit the early pioneers as "builders" and "benefactors to humanity."²⁸¹ Their work in transforming the West had not only created the ideal of the hard-working, faithful Mormon but also paved the way for future settlers to develop the West. In this way, they had benefited humanity.

McKay continued the pattern started by Woodruff and Talmage of merging their unique and holy history and identity into the broader American identity. In some ways, the Mormon identity, which Young had tried so hard to isolate, was now becoming Americanized by twentieth-century leaders. The Church continued to develop and promulgate a narrative of redemption that pioneer descendants could follow: Have faith,

²⁸⁰ "Drought in Utah," 19; For information on Mormon leaders' efforts to keep members on farms, see Cannon, "Millions of Acres," 195-214.

²⁸¹ David O. McKay, 79th Annual Conference Report, April 1909, 65.

work hard, hold to the community, and the climate would adjust and change for their benefit. Now, however, they believed it was an American narrative as much as a Mormon one.

Their emphasis on irrigation and preaching of human-induced climate change extended to boosters and politicians trying to tame the West. Specifically, they carried on the belief that with superior reclamation techniques, the effects of drought in the West could become a thing of the past. The state also tried to take a more scientific approach to managing droughts. They repeatedly petitioned Washington for more and better water strategies for the West. The Newlands Reclamation Act of 1902 kicked off massive federally funded damming and irrigation projects, which increased confidence that the Mormon experience might be generalized across the region. In 1921, the legislature created the Utah Water Storage Commission with the intent to develop water plans to use the state's supply as efficiently as possible.²⁸² With a sense of "mission accomplished," the National Irrigation Congress met for the last time in 1916 to honor the completion of the Elephant Butte Dam in New Mexico, at the time the largest artificial dam in the Western Hemisphere. Despite the confidence of the reclamation Progressives, they were unprepared for the disastrous drought cycle of the 1930s. What started as just another dry spell turned into one of the most devastating climate events in the history of the West—and particularly of the Wasatch Oasis.

The Utah community was slowly discovering that drought rather than rain was more likely to follow the plow, which is the view of Michael H. Glantz, at the time of this

²⁸² Robert E. Parson, "George Dewey Clyde and the Harvest of Snow," *UHQ* 84, no. 3 (Summer 2016): 242.

writing senior scientist at the National Center for Atmospheric Research. Glantz posits that increased population, overcultivation, overgrazing, and deforestation in Utah led over time to exhaustion of the land and a desiccation or desertification effect.²⁸³ Over the historical record, the Wasatch Oasis experiences a drought approximately one out of every three to five years on average.²⁸⁴ Droughts along the Wasatch can last for one season or go on for years. The Utah Division of Water Resources categorizes three kinds of drought: (1) Meteorological drought, which is measured by how much precipitation deviates from normal or average rates. This kind of drought affects soil moisture and produces seasonal declines in agricultural productivity. (2) Hydrological drought occurs when the overall water supply of a watershed decreases from long-term averages. (3) Socio-economic drought occurs when dry conditions persist to the point of affecting an entire community and its water supply, resulting in economic loss that can last even after water levels have returned to normal.²⁸⁵

Though the worst droughts in the long-term climate record occurred before the instrumental record, the Wasatch Oasis has experienced six socio-economic droughts since the end of the nineteenth century, along with an overall trend toward hydrological drought.²⁸⁶ The Palmer Drought Severity Index (Figure 3.1), which measures the severity of drought conditions, has dipped to -4 three times: in 1934, 1961, and 1991. In 1935, the Wasatch Front reached the most severe drought ranking of -5.²⁸⁷

²⁸³ Michael H. Glantz, *Drought Follows the Plow* (Cambridge: Cambridge University Press, 1993), xvi.

²⁸⁴ "Drought in Utah," *op. cit.*, 19.

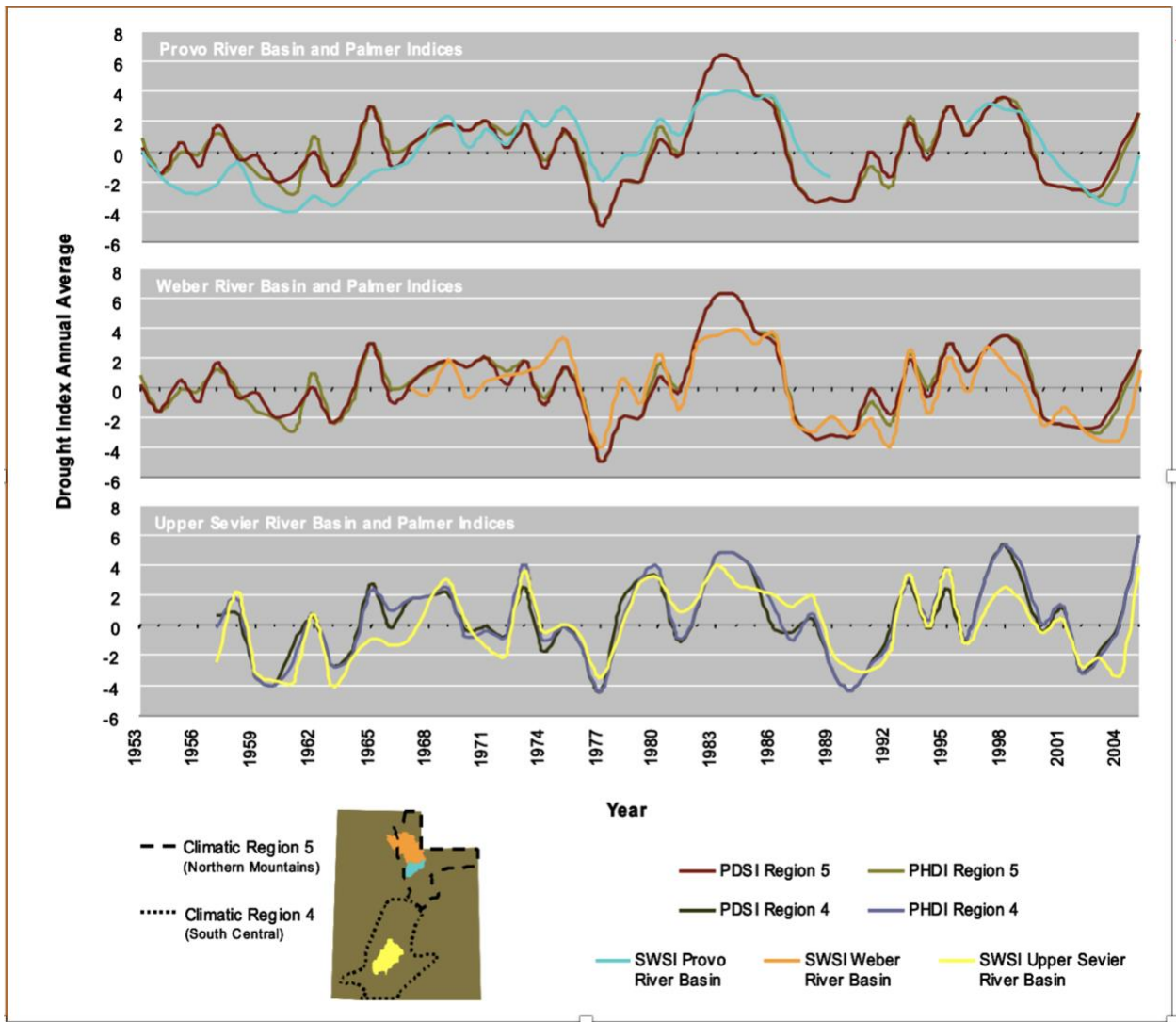
²⁸⁵ *Ibid.*, 2-4.

²⁸⁶ See chapter 1 on the trend toward drought in the Wasatch Oasis.

²⁸⁷ Climate at a Glance, Divisional Time Series, https://www.ncdc.noaa.gov/cag/divisional/time-series/4203/pdsi/1/1/1895-2019?base_prd=true&firstbaseyear=1901&lastbaseyear=2000.

FIGURE 3.1²⁸⁸

Palmer Drought Index



Utah was already in the throes of an economic depression before the nationwide Depression hit in 1929 and was already suffering from drought before the especially

²⁸⁸ "Drought in Utah: Learning from the Past—Preparing for the Future," Utah State Water Plan, Utah Division of Natural Resources, April 2007.

severe drought years of 1935-1936 hit. Beginning in 1920, recurring droughts and low prices kept farmers down.²⁸⁹ The post-World War I years had not been kind to the narrowly focused Utah economy. Only three sectors made up 73 percent of Utah's economy—mining, farming, and manufacturing. Over a decade, mining had declined 85 percent, farming 66 percent, and manufacturing 65 percent.²⁹⁰ Utah had not experienced much of the “Roaring Twenties.” When the Depression officially began in 1929, per-capita income nationwide was \$703 but only \$559 in Utah. By 1933 Utah's per capita income had fallen to \$303 and by 1940 it was still only at \$487 (\$595 nation-wide).²⁹¹

The factors that Smythe falsely described as protecting Utah against economic disaster in the 1890s—the communitarian ideals—had dissipated after Brigham Young's passing in 1877. One of the primary characteristics of Mormonism's shared economy was the communal ownership of natural resources. Now, in the same year that Young died, Congress passed the Desert Land Act, which laid the foundation for the legal principle of “water as a private property commodity.”²⁹² Three years after the prophet's death, Utah began to pass laws allowing for individual ownership of water rights. Donald Worster reminds us that with this opening of Utah's water market, “a key element in Mormon communalism was thus destroyed.”²⁹³ In 1882, the church's first presidency ended a boycott on non-Mormon businesses; and even during the 1893 Depression, Mormon

²⁸⁹ Wayne K. Hinton, “The Economics of Ambivalence: Utah's Depression Experience,” *UHQ* 54, no. 3 (Summer 1986): 271.

²⁹⁰ Joseph F. Darowski “The WPA Versus the Utah Church,” in *Utah in the Twentieth Century*, Brian Q. Cannon, Jessie L. Embry, eds. (Boulder: University Press of Colorado, 2009), 168.

²⁹¹ *Ibid.*, 168.

²⁹² Sara Dant, “The ‘Lion of the Lord’ and the Land,” in *The Earth Will Appear*, 42.

²⁹³ Worster, 82.

leaders worked with non-Mormons in building and financing different corporations and enterprises.²⁹⁴ This was also the beginning of the opening up the economy to non-Mormons who had historically been excluded.²⁹⁵ The 1896 declaration of statehood accelerated the shift towards a market economy.

The new century saw Mormons take a sharp pro-business turn. A younger generation of church leaders, while still preaching the virtues of agriculture, had taken up white collar vocations. Both church presidents Joseph F. Smith and Heber J. Grant, were businessmen. While some elements of communalism remained in instances of shared land and water rights, by 1930, Mormon leaders for the most part had moved away from the cooperative community efforts that had characterized their religion for so long.²⁹⁶

The shift away from communalism was more than just an economic decision. Mormonism was trying re-brand itself as part of mainstream America. This meant political pluralism, support for American military campaigns, and, most notably, abandonment of plural marriage. Mormons concerned themselves less with the imminent arrival of Christ's millennial rule, and more with a desire to simply fit in.²⁹⁷ When the economy crashed in 1929, the Wasatch culture was no longer what it was in the 1893 depression.

²⁹⁴ Thomas Alexander, *Mormonism in Transition: A History of the Latter-Day Saints, 1890-1930* (Salt Lake City: Greg Kofford Books, 2012), 79.

²⁹⁵ Worster 79.

²⁹⁶ Alexander, *Mormonism in Transition*, 196.

²⁹⁷ *Ibid.*, 8-11.

In 1928, the Great Salt Lake elevation sat at just over 4,195 elevation, already roughly five feet below its average, when a dry period settled over the Wasatch Front.²⁹⁸ For the next twelve years, the region suffered through extreme drought conditions. From 1928 to 1940, only three years saw a positive Palmer Drought Severity Index (PDSI) measurement, and none were above a +1 rating.²⁹⁹ Utahns battled to maintain their livestock, their farms, and their livelihoods while the drought ate away at their already fragile economy. It was not the longest drought the region had seen, but it was, in many ways, the most severe.³⁰⁰

In 1930, U.S. Secretary of Agriculture Arthur M. Hyde officially designated large parts of the West as “sub-marginal lands” on which farmers could not “produce a living equal to the American standard.”³⁰¹ Millions of acres were beyond reclamation because of “soil exhaustion or natural infertility.” This announcement marked a stark departure from the progressive attitudes of government spokesmen at the numerous National Irrigation Conferences held between 1891 and 1916. Although they never expected to make the *entire* West blossom, most believed that so-called “desert” could generally

²⁹⁸ Great Salt Lake Annual Level Prediction, Utah Climate Center, <https://climate.usu.edu/GSL.php>; Utah Division of Water Resources, in “Drought in Utah,” 14.

²⁹⁹ NOAA National Centers for Environmental information, Climate at a Glance: Divisional Time Series, August 2019, , https://www.ncdc.noaa.gov/cag/divisional/time-series/4203/pdsi/1/1/1900-1950?base_prd=true&firstbaseyear=1901&lastbaseyear=2000.

³⁰⁰ 1931-1935 held an average value on the Palmer Drought Severity Index (PDSI) of -5.08 in the climatic region encompassing most of northern Utah’s mountains, from which the Wasatch Front receives most of its water supply. Precipitation records also show that from 1926-1936 the Wasatch Front experienced below average precipitation levels. 1952-1962 is the only other ten-year period with below average levels. https://www.ncdc.noaa.gov/cag/divisional/time-series/4203/pcp/12/5/1895-2018?base_prd=true&firstbaseyear=1901&lastbaseyear=2000

³⁰¹ Sara Gregg, *Managing the Mountains: Land Use Planning, the New Deal, and the Creation of a Federal Landscape in Appalachia* (New Haven: Yale University Press, 2010), 92, 98..

support settlements with proper reclamation in place. Now, the government was telling Americans that most of that land was simply unproductive and would continue to be. “The possibility that soil conditions could be inconducive to agriculture clashed with the Mormon spiritual conviction that with irrigation water, dry farming techniques, and a faith in divine providence the desert would blossom as a rose,” as Brian Cannon observes.³⁰²

In 1932, like nearly everyone else, Utahns threw their support behind Franklin D. Roosevelt believing he could bring the relief they sorely needed.³⁰³ But the following year, farm income dipped from \$69 million in 1929 to \$30 million, and 43,000 people, representing twenty-five percent of the state’s workforce, were unemployed. Additionally, roughly 36,000 families were out of work.³⁰⁴

In 1932, the climate seemed to be rebounding somewhat out of the dry spell that had gripped the state since 1928. The 1932-1933 winter season saw an astounding accumulation of 70.9 inches of snow, the most since the early 1920s.³⁰⁵ This was the first time that the Wasatch Front had a positive PDSI rating since 1926.³⁰⁶ Although the 1932-1933 snows did not quite get water levels back to where they were supposed to be, the drought seemed to be on its way out. Then everything dried up again.

³⁰² Cannon, “Millions of Acres,” 205.

³⁰³ <https://www.270towin.com/historical-presidential-elections/>.

³⁰⁴ Arrington, *Great Basin Kingdom*, 249.

³⁰⁵ National Weather Service, Salt Lake City Climate Book, Seasonal Snowfall by Year, <https://www.weather.gov/slc/ClimateBook#>.

³⁰⁶ NOAA, *Climate at a Glance*, op. cit.

1934 was the driest year Utahns had seen since 1856.³⁰⁷ Precipitation all but disappeared; the winter of 1933-1934 was one of the warmest on record.³⁰⁸ Only 14.3 inches of snow fell in Salt Lake City and from February of 1933 to January of 1934, the entire north-central region of the state received only 10.63 inches of precipitation—over five and a half inches below the average. Stream flows were only at twenty-five to fifty percent of 1933 while the stored water supply was only twenty-five to thirty-five percent of the 1933 amount. In the journal *Science*, U.S. Weather Bureau employee J.B. Kincer wrote that “never before in United States history had so little rain fallen over so wide a territory during an entire growing season as in 1934.”³⁰⁹

As a result of the low streamflow the lakes and reservoirs shrank considerably. Utah Lake, the state’s second largest body of water, lost two-thirds of its total volume. In an average year the lake provided roughly 200,000 acre-feet of water for irrigation, but only 50,000 would be available in 1934. Some residents considered draining it even more. Irrigation needs were so great that one plan called for a pumping station that would reach the deepest parts of the lake. The new pump station would cost up to \$400,000, a prohibitive amount for the time.³¹⁰ Nothing ever came of the pumping

³⁰⁷ “Drought in Utah,” 3.

³⁰⁸ December 1933 to February 1934, Salt Lake City averaged 39.2 degrees Fahrenheit, the warmest on record. R. Clayton Brough, Dale J. Stevens, “Climatology of Salt Lake City, 1847-1988.” However, the National Weather Service said that Salt Lake City averaged 37.8 degrees Fahrenheit, a third-place record behind 2014-2015 (38.3) and 1977-78 (37.9), National Weather Service, Salt Lake City Climate Book, <https://www.weather.gov/media/slc/ClimateBook/Warmest%20and%20Coldest%20Winter%20Seasons.pdf>

³⁰⁹ J.B. Kincer, “Data on the Drought” *Science* 80, Issue 2069 (August 24, 1934), 179.
DOI: 10.1126/science.80.2069

³¹⁰ “Compact Near Division for Lake Flow,” *DN*, April 4, 1934; “New Pumping Plant Sought on Utah Lake,” *Provo Evening Herald*, February 23, 1934.

station, but Utah Lake continued to dry up. Great Salt Lake also shrank substantially. The inland sea dropped an additional six feet below its 1928 levels to 4,196 feet.³¹¹

Tragically, because 1932-1933 had seen normal or wetter than normal precipitation, not many expected the drought to continue, which hampered the state's preparedness when conditions worsened in 1934. In April 1934 an unusual late winter storm blew across the Wasatch dropping three inches of snow in Salt Lake City. Although there were some concerns the storm had damaged the fruit crop for the year, most farmers were encouraged and hoped that the storm signaled an end to the drought.³¹² It did not. The storm had proved to be something of a cruel joke. With the onset of summer, the land dried out, and that harvest season Utah farmers produced only fifty-nine percent of the average crop yield for the years 1921-1930.³¹³ They had also begun the irrigation season early. Typically, farmers would start watering their crops on or around May 1, but despite the late spring snowstorms, the winter of 1933-1934 proved to be quite dry and they began watering as early as April 1. Roughly two weeks later, some were drawing from water supplies that they typically did not tap until July.³¹⁴

Utahns struggled to mitigate the disaster. In some places, community leaders enacted water restrictions, with some families only able to water their grass twice a week.³¹⁵ State officials also appealed to the Federal Government for help. Governor Henry Blood applied for federal aid in early 1934. The primary agency in dealing with

³¹¹ "Drought in Utah," 22; Great Salt Lake levels--"Great Salt Lake Annual Level Prediction," Utah Climate Center, <https://climate.usu.edu/GSL.php>.

³¹² "Early Spring Gets Setback by Late Snow," *DN*, April 2, 1934.

³¹³ "Drought in Utah," 21.

³¹⁴ Leonard Arrington, "Utah's Great Drought of 1934," *UHQ* 54, no. 3 (Summer 1986): 253.

³¹⁵ Fred May, "Utah Drought Mitigation Plan," unpublished, 2000, referenced in "Drought in Utah," 22.

Utah's problems was the Federal Emergency Relief Administration (FERA). Born out of a slew of New Deal legislation, FERA came to life with an appropriation of \$500 million with the purpose of subsidizing state relief funds. In Utah, Robert H. Hinckley was appointed state administrator for the organization. Hinckley, a car dealer turned politician, was a New Deal Democrat who would go on to serve as Assistant Secretary of Commerce in the Roosevelt administration. Hinckley had developed a reputation as a dependable New Deal Democrat. He had actually encouraged Blood to run for governor and had been a member of the Volunteer Relief Committee. Blood then enlisted his help in enlisting young men to sign up for the Civilian Conservation Corps.³¹⁶ Blood also appointed George Dewey Clyde, an engineer with the Utah Agricultural College and future governor, as the state's water conservator and to make a study of the water prospects for the coming year.³¹⁷

A product of Logan's Agricultural College, Clyde had earned a master's degree in engineering before returning to Cache Valley as an irrigation engineer for the state. Since 1923, Clyde had been measuring the state's snowpack. Within just a few years, all of Utah's approximately 24,000 irrigated farms came to rely on Clyde's forecast. While Clyde was not much of an environmentalist, he did realize that water was Utah's "most important natural resource," and made it his life's work to predict how much water farmers could anticipate each year. Using a simple but state of the art snow sampler made of a tube and scales, Clyde was able to measure the water content in any given snowpack. By placing these samplers in various watersheds around the state, Clyde could accurately

³¹⁶ Parson, 245.

³¹⁷ Arrington, "Drought," 252

predict runoff amounts. His forecasts changed the way Utah farmers grew crops and demonstrated the connection between the state's economy and a healthy water supply.³¹⁸

Clyde knew that 1934 would be a dry one; perhaps even “the most severe drought in the history of the West.” After just a week, he had finished Hinckley's report. Using the twelve months of data accumulated from his snow samplers, Clyde confirmed his fears of a dry year.³¹⁹ He estimated that in 1934 the state would have only 25-35 percent of the water available in 1933. He also reported that although Utah's irrigation canals received an annual average of four million acre-feet of water, only one million would be available for the year. As a result, Clyde estimated that only 25 percent of Utah's crop would mature. He speculated that more water might be found in springs or groundwater basins, but the price tag to access these waters made these suggestions impractical.³²⁰

Governor Henry H. Blood used the data from Clyde's report to appeal for emergency funding from the newly created Federal Emergency Relief Administration. He also called the first ever “drought conference” which adopted a “two-pronged approach” to tackle the drought—conserve water and develop a supplementary water supply.³²¹

To encourage conservation Clyde canvassed the state with other engineers in an awareness campaign. The canvassing encouraged farmers to use water more efficiently. This included repairing leaky dikes and canals and modifying “the number of planted

³¹⁸ Parson, 238, 239.

³¹⁹ *Ibid.*, 243.

³²⁰ George D. Clyde to Robert H. Hinckley, May 5, 1934, as reported in S. R. DeBoer, “Report of Drouth Emergency in the State of Utah for 1934,” a report for the Utah State Planning Board, in papers of Henry H. Blood, folder on “Drouth Relief in Utah,” Utah State Archives, Salt Lake City, cited in Arrington, “Drought,” 253.

³²¹ Parson, 244-245.

acres.”³²² While Utahns had largely migrated away from cooperative economic practices, the tradition of communalism was awakening again.

Cities and towns took action to conserve water. In Salt Lake for example, city officials placed a moratorium on watering lawns during times of “maximum sun.” The order read, “Only fortuitous rainfall can bring about any modification to the order.”³²³ Nearly three weeks later, the city encouragingly reported that their citizens’ efforts were making a difference. “Water is being saved!” read the first line in a news article titled “Suggestions for Saving Water in Drouth Crisis Produce Quick Results.”³²⁴

In response to Clyde’s report, Hinckley contacted Harry Hopkins, the FERA supervisor in Washington, in early May requesting \$600,000. Such an investment, Hopkins insisted, would save the state \$3,600,000 in crops that year and in the future. Within 36 hours, Roosevelt approved the request. A month later, the state requested another \$400,000 which Roosevelt also approved. The grants funded new water projects all over the state—sinking wells, laying pipelines, and digging ditches.³²⁵

Based on Clyde’s claim that the state’s economy depended on irrigation water, the majority of the initial FERA funds went to irrigation projects. Of the \$600,000 granted by FERA, \$500,000 went to building and improving the state’s irrigation system. The most expensive project was a canal dug on the western shore of Utah Lake. The lake, which was already struggling, was drained even further, but helped to save an estimated 60,000

³²² Ibid., 244.

³²³ “Water Use Restricted,” *Salt Lake Telegram*, June 2, 1934.

³²⁴ “Suggestions for Saving Water in Drouth Crisis Produce Quick Results,” *Salt Lake Telegram*, June 21, 1934.

³²⁵ Arrington, “Utah’s Great Drought,” 252, 253-254, 255, 258.

acres of crops, while a second canal dug near the lake's outlet at the Jordan River saved roughly 106,000 acres in Salt Lake County. Years later, Clyde estimated that his snow survey program, which had cost only \$2,500, had saved more than \$5 million in Utah crops. Utah Lake, however, dropped to an all-time low and has never fully recovered.³²⁶

Utahns had contributed to overgrazing since their first arrival. To better understand the conditions that lead to the problems of the 1930s, a clearer picture of grazing history in Utah is necessary.

From the first Mormon settlements, the culture of optimistic expansion, whether motivated by religion or by promotional schemes, had led to cultivation of marginal lands and overgrazing, taking a terrible toll on the landscape. In 1847, Mormons had brought a grazing culture to the region, with 19 cows, 66 oxen, 93 horses, and 52 mules. Later that year, a second group of settlers brought even more animals. By 1850 there were 5,266 oxen, 4,861 sheep, and 2,489 cattle, making Utah home to more grazing animals than people.³²⁷ Things did not slow down. By 1860, the number of cattle in Utah had more than tripled.³²⁸

Grazing quickly began to make its mark on the Wasatch ecosystem, and not everyone was pleased. In 1865, Apostle Orson Hyde preached:

I find the longer we live in these valleys that the range is becoming more and more destitute of grass; the grass is not only eaten up by the great amount of stock that feed upon it, but they tramp it out by the very roots; and where grass once grew luxuriantly, there is now nothing but the desert weed, and hardly a spear of grass is to be seen. Between here (Temple Square) and the mouth of Emigration Canyon when our brethren, the Pioneers, first landed here in '47, there was an abundance of grass over all those benches; they were covered with it like a

³²⁶ Parson, 245, footnote 20.

³²⁷ Nichols, "Before the Boom," 160.

³²⁸ Agricultural Census of 1860 shows 34,094 cattle in Utah as referenced in Nichols, 168.

meadow. There is now nothing but the desert weed, the sage, the rabbit bush, and such like plants, that make very poor feed for stock. Being cut short of our range in the way we have been and accumulating stock as we are, we have nothing to feed them with in the winter and they perish.³²⁹

Despite warnings from their leaders, Mormons continued to overgraze the countryside; and when the railroad arrived in 1869, things really took off. By 1885 there were 200,000 cattle in Utah, and the number climbed to 356,000 fifteen years later.³³⁰

While cattle continued to play a prominent role in the grazing economy, sheep eventually took over as the prime commodity, and wool became Utah's number one export.³³¹ By 1885, there were one million sheep in the state, one and a half million by 1890 and 3,818,000 by 1900. After 1925 sheep populations began to decline. Fifty-six percent of the state's sheep grazed the northern counties (dropping to 34 percent by 1925), though Salt Lake County held only seven percent of the state's sheep population.³³²

The growth in the sheep and cattle industry led to heavy stocking of both winter ranges and high-altitude summer ranges. By 1900, since most sheepherders did not have their own land, they would send their sheep up the mountain slopes during the summer and then transfer them to the west deserts during the winter. This led to overgrazing in both areas, though few seemed to acknowledge it. In Ogden for example, people blamed the shortage of grass on the sheep's "poisonous breath" rather than overgrazing.³³³

³²⁹ Orson Hyde, October 7, 1865, in *JD* 11: 147-54.

³³⁰ Peterson, "Grazing in Utah," 303.

³³¹ Nichols, 168.

³³² Charles S. Peterson, "Grazing in Utah: A Historical Perspective," *UHQ* 57, no. 4 (Fall 1989): 313.

³³³ Peterson, "Grazing in Utah," 308, 312-14, 317.

On one hand, Mormon herders and ranchers considered raising cattle and sheep to be a sacred calling. In 1889, Joseph F. Smith, the nephew of church founder and future president of the church, remarked “I believe there is no labor on earth more essential to the well-being of a community or more honorable than the labor which is necessary to produce food from mother earth. . . . And next to it is the tending of the flocks of sheep and cattle.”³³⁴ According to historian Donald Dyal, Smith was merely “reiterating the doctrines established by his predecessors.”³³⁵ At the same time, there was plenty of earthly wealth to be gotten from livestock, and ranchers were disinclined to reduce their capital stock. They apparently felt no tension between consecrated stewardship of the land and the allure of the market. Now, however, climate realities were beginning to trouble their complacency.

In 1934, to mitigate the disaster of the drought, the government started buying livestock, not only to help ranchers, but also to provide food for low-income citizens. The government also bought sick or dying animals and then put them down. Approximately 126,000 cattle and 206,000 sheep were taken this way, which gave ranchers a modest price for otherwise unmarketable livestock.³³⁶

While the Wasatch Front never experienced a dust-bowl event to the same degree as parts of the Southern Plains, dust storms and dust bowls did occur in certain areas. Like salt on a wound, they added to the misery of the Great Depression in northern Utah.

³³⁴ Joseph F. Smith, *59th Annual Conference Report of the Church of Jesus Christ of Latter-day Saints*, April 1889, 70.

³³⁵ Donald H. Dyal, “Mormon Pursuit of the Agrarian Ideal,” *Agricultural History* 63, no. 4 (Autumn 1989): 21.

³³⁶ Arrington, “Utah’s Great Drought,” 258.

The town of Grantsville in particular suffered so badly from intense dust storms that its residents almost abandoned it.

In the western part of the greater Salt Lake Valley, Grantsville had always been thought ideal for grazing livestock. On the eastern edge of the Salt Lake Desert, the narrow valleys around Grantsville became a good resting point between summer and winter grazing lands for travelling wagon trains or migrating livestock. The region around Grantsville, known as the Tooele and Rush valleys are the last fertile spots before the Wasatch Oasis turns into a barren desert. Apostle Parley P. Pratt first identified the area as an ideal location for grazing: “[The] supply of pasture for grazing animals is without limit in every direction” he reported, “Millions of people could live in these countries and raise cattle and sheep in any amount.”³³⁷

Grantsville’s climate is quite mild and does not feature much snowfall.³³⁸ Since 1906, the small town has averaged only 0.03 inches of precipitation per month and 0.1 inches of snow per year. Temperatures do not vary too widely with the yearly average high at 53.3 degrees and the average yearly lows at 48.3 degrees.³³⁹ Spring runoff from the mountains to the east and plenty of groundwater make it a suitable if not comfortable

³³⁷ George Stewart, “Historic Records Bearing on Agriculture and Grazing Ecology in Utah,” PAM 848, Utah State Historical Society, Salt Lake City, Utah, 370, quoted in Brandon Davis “The Desert Blossoms as a Wasteland: An Environmental History of Utah’s West Desert,” MA thesis, Simon Fraser University, 2007, 14.

³³⁸ Ouida Blanthorn, *A History of Tooele County*, Utah Centennial County History Series (Salt Lake City: Utah State Historical Society, 1998), 24.

³³⁹ Monthly Mean Precipitation for Grantsville 2W, UT, <https://w2.weather.gov/climate/xmacis.php?wfo=slc>; Monthly Mean Snowfall for Grantsville 2W, UT, <https://w2.weather.gov/climate/xmacis.php?wfo=slc>; Monthly Mean Average Temperature for Grantsville 2W, UT, <https://w2.weather.gov/climate/xmacis.php?wfo=slc>.

place for human settlement and animal grazing.³⁴⁰ By the 1930s, the region around Grantsville was one of the leading producers of wool in the state, yielding almost 1.2 million pounds in 1934.³⁴¹

The high wool production came at an enormous environmental cost, though. As early as 1860, Mormon settlers began to notice their livestock had significantly depleted the forage of Tooele Valley. As a result, many moved their animals southward to nearby Rush Valley which also began to experience extensive damage. One herdsman remembered “When we first came to the south end of Rush Valley in 1860 we thought it was the best range in Utah, because we could stay in one place year round. But by 1875 it was all et [sic] out.”³⁴²

The overgrazing eliminated the ground cover from Tooele and Rush valleys. Even in the 1850s, massive clouds of dust began shrouding Grantsville and the surrounding region, and the dust storms continued to worsen. In 1896, Joshua R. Clark, who had lived in Grantsville for almost thirty years, wrote, “This evening a heavy dust storm from the west, wind and dust from the desert.”³⁴³ Five years later he wrote again, “We had a dust storm about sunset,” and “Wind, wind, again today. It is drying out the ground very fast.”³⁴⁴

³⁴⁰ Blanthorn, op. cit.

³⁴¹ Ibid., 235.

³⁴² Glynn Bennion, “A Pioneer Cattle Venture of the Bennion Family,” *UHQ* (Fall 1966), 319.

³⁴³ “Clark, Joshua Reuben, 1840-1929” <https://snaccooperative.org/ark:/99166/w60d2ssj>; Journal of Joshua R. Clark, July 1, 1896, quoted in Alma A. Gardiner, *The Founding and Development of Grantsville, 1850-1950*, MA thesis, Brigham Young University, 1959, 319.

³⁴⁴ Journal of Joshua R. Clark, May 1, 1901, quoted in Gardiner, 319.

By the time the Great Depression hit, both migrating and local herds had done serious damage to the valley's vegetation. Of Rush Valley, one farmer recalled massive dust storms were "caused by overgrazing. Sheep was all over here. They used to run an awful lot of sheep on the desert, they used to trail right through Grantsville . . . There were six, seven thousand sheep in this small area six to ten miles square [that] denuded the vegetation."³⁴⁵ The dust storms increased in frequency and severity until they were downright intolerable by the 1930s.³⁴⁶

In December 1934, the day after Christmas, dust engulfed Grantsville. The cold but dry winter left the ground exposed to the rough canyon winds which whipped the powdery soil into an apocalyptic cloud.³⁴⁷ The storm lasted into the next day, prompting the *Tooele Transcript-Bulletin* to report that it was the "worst dust storm ever experienced by any town during the winter."³⁴⁸ Days later, townspeople gathered in a special city council meeting to discuss what could be done. The problem must have seemed immense to members of such a small town. Grantsville had no police cars and had to request resources from Salt Lake City to help manage the town's traffic. With few resources and little political backing, the people of Grantsville had few options. Nevertheless, they knew something had to be done. Accordingly, Mayor James Williams appointed a special committee to investigate the "feasibility of eliminating the storms."³⁴⁹

³⁴⁵ *The Grantsville Dustbowl*, Documentary by KUTV News, Utah Agriculture in the Classroom, John Greene, dir. n.d.

³⁴⁶ "Reclaims Big Area in Utah Dust Bowl: Wind Erosion Project Restores 31,895 Barren Acres to Grass-Covered Land," *New York Times*, August 24, 1936.

³⁴⁷ For more information on Grantsville's weather conditions on December 26, 1934 see Almanac for Grantsville 2W, UT, December 26, 1934, <https://w2.weather.gov/climate/xmacis.php?wfo=slc>.

³⁴⁸ *The Tooele Transcript-Bulletin*, January 18, 1935 quoted in Gardiner 319-320.

³⁴⁹ Grantsville City Council Minutes, January 2, 1935, Utah State Archives.

Initially, progress was slow. By February 1935, government agencies were investigating the problem but because most of the land from which the dust originated was under private ownership, little could be done. Despite this obstacle, the committee and the city council proposed a stoppage on animal grazing and trampling, reseeding the area southeast of town, and appealing to Washington for federal assistance.³⁵⁰ By March, Mayor Williams reported a “favorable reply” from Washington.³⁵¹ Utah’s Senator William H. King, a Mormon Democrat, appealed to the Department of Interior to put their soil erosion service “at the bidding” of Tooele County commissioners.³⁵²

Before any real work could be done, however, Grantsville still had to find a way to obtain control of roughly one hundred parcels of privately held land. Another special session of the city council was called on April 8, and the county commissioners mulled over possible solutions. Not only would the government need full access to the land, they would also need to hold it for at least ten years to undo the damage.³⁵³ They decided to lease roughly 4,100 acres south of Grantsville where the dust storms originated and request that the Utah State Board of Health declare the region “a nuisance,” as the dust storms were destroying the “peace, health, and economic prosperity” of Grantsville.³⁵⁴ Soon, soil erosion engineers had surveyed the area to determine the severity of the situation and plan remediation. Things appeared to be looking up.

³⁵⁰ Gardiner, *Grantsville*, 321.

³⁵¹ Grantsville City Council Minutes, March 6, 1935, Utah State Archives.

³⁵² Gardiner, *Grantsville*, 321.

³⁵³ *Ibid.*, 321.

³⁵⁴ Grantsville City Council Minutes, April 8, 1935, Utah State Archives.

A week later, another series of storms hit Grantsville. After a 36-hour long storm had buried the town in two inches of dust, another cloud, this one 6,000 feet high, hit the town on April 15.³⁵⁵ The wind whipped up a wall of dust from the south of Grantsville and carried it north to Davis County and east to Salt Lake City.³⁵⁶ It blew out store windows, brought down telephone poles, and lifted roofs off buildings. Visibility fell to a quarter mile in Salt Lake City as the dust brought life to a standstill. The storm continued moving up the Wasatch Front, slowing traffic and forcing motorists as far north as Kaysville to use their headlights during the day. Air traffic slowed, with some planes forced to land before reaching Salt Lake City.³⁵⁷

County commissioners asked motorists to stay off the roads, warning that the dust could cause “suffocation and death.”³⁵⁸ Although dust storms had become more frequent, this storm proved to be much stronger than anyone had anticipated. At 7 A.M. on April 15, 1935, the dust blotted out the sun in what must have felt like an apocalyptic event. In the region around Grantsville, visibility was virtually zero. By noon, students at the schools were trapped in darkness.³⁵⁹ Residents blanketed their faces with handkerchiefs while dust invaded their homes, leaving a coating of up to half an inch. Animals also suffered. Sheep and cattle desperately huddled together with tails to the wind to ward off asphyxiation. Some animals died. State police blocked off the eastern access road to Grantsville to deter motorists from continuing into town. Those who proceeded did so at

³⁵⁵ “Dust Storm Rages Over Utah,” *DN*, April 15, 1935.

³⁵⁶ “Governor to Survey Dust Area,” *DN*, April 16, 1935.

³⁵⁷ “Dust Storm Rages Over Utah,” *op. cit.*

³⁵⁸ Gardiner, *Grantsville*, 322.

³⁵⁹ “Dust Storm Rages,” *op. cit.*; Gardiner, *Grantsville*, 322.

their own peril. Their headlights were useless, and horns blared all through town to warn anyone foolish enough to be out in the storm to get out of the way.³⁶⁰ Grantsville was essentially cut off from the rest of the world.

A reporter from the *Salt Lake Tribune* was there to witness the dark clouds engulf the town. “Choking, blinding dust driven by a heavy gale throughout the day keep the people of this western Utah town in a state of fear and despair all day Monday as it shut them out from the world and smothered them into frantic efforts to protect their lives from being snuffed out.”³⁶¹ By midafternoon, the freak storm had mostly moved on from Salt Lake City, but Grantsville had experienced the brunt of it.³⁶²

The citizens of Grantsville were at their breaking point. In many places the dust had penetrated storage areas and ruined food supplies. Livestock lay dead in the fields. One rancher lost his hope of any kind of relief. To a reporter he simply remarked, “I’ve quit.” Mayor Williams desperately declared, “Something has to be done about this and done quickly.” Children were especially susceptible to the perils of the dust storms. The principal of Grantsville High School, Leo Frandsen, declared that the school simply could not continue under these conditions, adding that many of his students were suffering from “throat and nasal irritations.”³⁶³ Peoples’ health suffered through the dust bowl area, causing eye problems and respiratory ailments, including pneumonia, bronchitis, laryngitis, and influenza. One doctor from FERA reported that numerous cases of respiratory illnesses had popped up in the Grantsville area as a result of the dust storms.

³⁶⁰ Ibid.

³⁶¹ Gardiner, *Grantsville*, 322.

³⁶² “Dust Storm Rages Over Utah,” op. cit.

³⁶³ “Dust Storm Rages,” op. cit.

State health commissioner T.B. Beatty remarked, “Conditions in Grantsville are extremely injurious to health.”³⁶⁴

Many believed the only solution was to leave town. “We must have help, or we will have to leave the community,” Frandsen lamented. “These people can’t handle much more of this,” echoed the mayor. “Already some of our people are making plans to move away from here.” The *Deseret News* reported that “Stockmen, businessmen, farmers, who see the fruits of years of toil and labor swept away by the ravages of nature are ready to take their families and start anew in some other location.”³⁶⁵ Grantsville was on the verge of becoming a ghost town. For many, personal and familial safety took precedence over economic concerns. “My children and my family mean more to me than the business,” said one business owner.³⁶⁶

On the same day that the storm wrought its havoc, Congress passed a bill creating the Soil Conservation Service (SCS), which gave the Secretary of Agriculture the ability to combat dust storms around the country.³⁶⁷ The SCS would have had an important effect on the future of Grantsville. The day after the storm, Governor Henry H. Blood set out with state engineer T. H. Humphreys to assess the damage in Grantsville. “I am told that crops have been destroyed, irrigation ditches filled, and a terrific blow has been struck at the morale of the Grantsville residents,” Blood remarked before making the journey. Although Blood claimed he had to know the entirety of the situation to apply for federal assistance, the main purpose of the trip was probably to reassure Grantsville

³⁶⁴ “Governor to Survey Dust Area,” *DN*, April 16, 1935.

³⁶⁵ “Dust Storm Rages,” *op. cit.*

³⁶⁶ “Governor to Survey Dust Area,” *op. cit.*

³⁶⁷ “Dust Storm Bill Passes House in 5 Minutes Time,” *DN*, April 15, 1935.

residents that the state cared about them. “I wish to assure the residents of Grantsville,” he remarked, “that the citizens of the state are solidly behind them in this crisis.”³⁶⁸

After Governor Blood’s visit, the wheels started turning. Gradually, officials gained control of the area from which the dust originated, clearing one of the primary hurdles for rehabilitating the land. By late September, twenty local men began work on the Grantsville dust erosion control project, and a federal supervisor arrived from Albuquerque to oversee the project’s beginnings.³⁶⁹ Three months later, over one hundred men were working to stabilize the soil in the area. In addition to preparing the soil for re-seeding grasses, they built fences and a flood control system.³⁷⁰

Within three years, the project showed surprising results. Paul Dunn, dean of the School of Forestry at the Utah Agricultural College, reported an astonishing comeback. After achieving a modest degree of soil stability, farmers and ranchers started applying for “light grazing” permits in December 1938. Although Grantsville remained somewhat susceptible to dust storms in subsequent years, the town was saved from abandonment, and the disastrous storms of the mid-1930s never returned. It was primarily government action that helped reverse the situation. The SCS (now called the Natural Resources Conservation Service) carefully planned and executed conservation measures to restore grasses and helped farmers implement techniques like conservation tillage to reduce erosion. Local soil conservation districts were established, which still promote soil conservation on public and private lands today.

³⁶⁸ “Governor to Survey Dust Area,” op. cit.

³⁶⁹ Gardiner, *Grantsville*, 324.

³⁷⁰ *Transcript-Bulletin* December 20, 1935, in Gardiner, *Grantsville*, 325.

In October 1928, during the first year of the drought, Mormon Apostle Melvin J. Ballard visited a small, suffering community called Pahvant Valley at the south end of the Wasatch Mountains. Acknowledging their plight, Ballard prophesied to a congregation at a regional meeting that if they remained faithful, rain would fall and relieve their burdens. They would be able to pay their creditors and “redeem” the land. Ballard preached that hard work and obedience to God would bring on a more fruitful climate, echoing the promises which had driven the Mormon pioneers to dig ditches, build dams, and plant farms almost a hundred years before.³⁷¹

That same year, Mormon soil scientist Thomas Martin published an article in the LDS Church periodical *The Improvement Era* arguing that no lands were really “sub-marginal”—there were only sub-marginal farmers who lacked vitality and were not “progressive” enough in their methods. “Let a vigorous community become shiftless and the quality of the land will deteriorate and soon such areas will become the homes of a lower class of people,” Martin wrote. Some farmers are “resigned to poor crops and hard work; uncouth in dress, slow to raise their standard of living . . . slouchy in their habits.” The character of the people and the character of the environment were interwoven. “Soil has a great influence upon the character of citizenship in the community. . . This unprogressive type of person seems to adapt himself to soils of low fertility.” People who lack strong moral and religious fiber can turn good land into bad. “The country over, marginal lands are held by marginal peoples and sub-marginal lands by sub-marginal

³⁷¹ Cannon, “Millions of Acres,” 204.

peoples. Allow the soils to deteriorate and slowly the quality of the citizenship will deteriorate.” But this decay can be reversed by “vigorous, progressive farmers.”³⁷²

In 1928, Martin explained how soil erosion works, then drew historical parallels between the fall of once great civilizations and the degradation of their soil: as the soil erodes, so does the society. He was adamant that Mormon farmers should practice good soil management not only to leave their children with an honorable legacy, but also to maintain their own dignity. “All forces of this country,” he concluded, “should center upon the problem of good soil management because a depleted soil means a depleted citizenship.”³⁷³ Martin stopped short of an earlier Mormon claim that God cursed the land when the Saints were unrighteous. For Martin, the issue was people harming themselves and thus harming the environment. Martin’s soil science was subordinate to his spiritual views. He definitely belonged and contributed to the narrative that the spiritual quality of the culture affects the quality of the environment: If the people don’t “blossom” spiritually, neither will the land. As the droughts and dust bowl events of the Great Depression Era rolled in, research on erosion would become more common. Eminent scientist Paul Sears wrote *Deserts on the March* in 1935, which also spoke of the correlation between the degradation of civilizations and soils though from a more secular and scientific perspective. The book grabbed the attention of ecologists across the

³⁷² Thomas Martin, “A Depleted Soil Means a Depleted Citizenship,” *The Improvement Era* 32, no. 2 (December 1928): 118-21.

³⁷³ *Ibid.*, 119.

nation, including one Walter Cottam, a young Mormon scientist who would later push for greater environmental awareness.³⁷⁴

Of course, as we have seen, the U.S. Department of Agriculture disagreed with Martin's assessment. While Church leaders and Church scientists like Thomas argued that a "vigorous, progressive" culture could transform the environment, the government held that the return on sub-marginal lands did not justify cultivation. Where the Church taught that a virtuous people energized by faith could farm anywhere, the Roosevelt government began to buy up vast tracts of unproductive land to be re-purposed away from farming. Additionally, Church members themselves were becoming discouraged with the view that prosperity depended on the vigor and spiritual vitality they could demonstrate.

In particular, young Mormons began to think beyond farm life and ranching despite the call of their leaders to make the marginal lands "blossom." Philip Cardon, a son-in-law of an apostle and student of scientist-apostle John A. Widtsoe, admitted in 1942 that the pioneers had settled in many places that were indeed sub-marginal. An administrator in the federal Agricultural Research Administration, Cardon joined many Mormons who served in the New Deal. Like Cardon, many struggled to reconcile new scientific concepts regarding land use with what they had always believed, that their land could be infinitely productive if only they worked righteously and hard. Historian Brian Q. Cannon tells of Reed Beebe, a farmer who heard and believed Ballard's promise that

³⁷⁴ Dianna Everett, "Sears, Paul Bigelow," *The Encyclopedia of Oklahoma History and Culture*. <https://www.okhistory.org/publications/enc/entry.php?entry=SE001>.

righteous living would bring a fertile climate, but he had not seen it come to pass. “How had we failed to keep God’s commandments?” Beebe wondered.³⁷⁵

Still, Church leaders were not ignoring the members’ need for relief. In 1933, early in the Depression, they encouraged members to seek emergency relief wherever they could find it. They also foresaw that things would probably get worse and that the Church would have to take a more active role: “While it seems our people may properly look, as heretofore, for relief assistance from governmental and perhaps other sources, it cannot now be certainly foretold either what or how fully sufficient this assistance will be, and we must therefore prepare ourselves to meet the necessities that may fall upon us.”³⁷⁶

J. Reuben Clark, Jr., newly appointed a member of the Church’s ruling First Presidency, worried about the spiritual effects of long-term dependence on Roosevelt’s New Deal, which he perjoratively referred to as the “dole.” Instead, he proposed a relief program that would take Church members off federal assistance. Born and raised in Grantsville, Clark was the son of the same Joshua Clark who had witnessed and recorded the dust storms of the 1890s. Joshua Clark was a frontiersman who had worked his way across the continent as a miner, trapper, and freighter before joining the Mormon Church. At the University of Utah, the younger Clark became a protégé of James E. Talmage, who had yet to publish his study on the Great Salt Lake and who was president of the college. Talmage sent him east to complete a law degree at Columbia, and he went on to

³⁷⁵ Cannon, “Millions of Acres,” 209.

³⁷⁶ “A Message Concerning Preparation for Relief Measures,” Letter from the First Presidency to Stake Presidents, July 1933, <https://www.Churchofjesuschrist.org/study/ensign/2003/03/the-road-to-financial-security?lang=eng>

serve as an under-secretary of state and eventually ambassador to Mexico. Despite his international stature, Clark never forgot Grantsville and would frequently return to work the land and tend his cattle.³⁷⁷

In 1933, Clark left government to serve as a Counselor to LDS President Heber J. Grant. A devoted Mormon and Herbert Hoover-style conservative, Clark looked at the intervention of the federal government in local affairs with a jaundiced eye. He was a disciple of Hoover and his philosophy of “rugged individualism” in opposition to “state socialism.”³⁷⁸ He worried that the many forms of government assistance during the Depression were causing the Mormon people to lapse in the work of building the LDS vision of the Garden of Eden in the desert. In his first sermon as one of the top three Mormon leaders, Clark urged Church members to “shun idleness” and to “return to old-time virtues—industry, thrift, honesty, self-reliance, independence of spirit, self-discipline, and mutual happiness.” If members would draw back from government assistance, Clark promised, “we shall be on our way to returned prosperity and worldly happiness.”³⁷⁹

Six months later, in the Church’s general conference, Clark was even more alarmed at what he saw as the radical programs of the unfolding New Deal. “I approach this subject with a great deal of feeling and strong conviction,” he began before denouncing a wealthy Utah farmer who had accepted government relief. “Relief is not for

³⁷⁷ D. Michael Quinn, *Elder Statesman: A Biography of J. Reuben Clark, Jr.* (Salt Lake City: Signature Books, 2002), 3, 9.

³⁷⁸ For Herbert Hoover’s thoughts on “rugged individualism,” see his campaign speech “Principles and Ideals of the United States Government,” October 22, 1928. <https://millercenter.org/the-presidency/presidential-speeches/october-22-1928-principles-and-ideals-united-states-government>

³⁷⁹ J. Reuben Clark, *103rd Annual Conference Report*, April 9, 1933, 104.

those who are in that situation,” he scolded: “By my standards it is wicked, and followed out it will destroy us.” He compared the Church members’ current situation with that of the Mormon pioneers. “I can but wonder what they would have thought of our fears, our apprehensions, our complaints,” he said before concluding that Church members should be grateful for the relative ease of their lives. Compared to those who had undergone the frontier experience, they were living in abundance.³⁸⁰ Church President Grant agreed. In the conference of October 1935, he condemned Church members who had received aid: “Instead of being Latter-day Saints [they] have been latter-day sinners.”³⁸¹ His listeners must have squirmed in the already uncomfortably stiff wooden benches of the old Salt Lake Tabernacle.

Mormons like Clark were inheritors of a “total frontier experience” ideology. He was not only a prominent diplomat but also a Grantsville cattle rancher. Those two roles mingled in his career: to the independent Western stockman, individual and national autonomy was nearly a religion. A strict opponent of American intervention in foreign affairs, his isolationism was close to absolute.³⁸² Clark’s America was to stand just as independent, sovereign, and unfettered as the intrepid rancher on horseback surveying his domain. In him, the TFE mindset offset the more cooperative, communally oriented thread in Mormon culture; self-sufficiency and independence were hallmarks of his identity. Clark echoed Thomas Martin’s thinking that government aid would debase that identity and lead to degradation of the environment. He believed that government relief

³⁸⁰ J. Reuben Clark, *104th Semi-Annual Conference Report*, October 1933, 103.

³⁸¹ Special Priesthood meeting, October 7, 1935, quoted in Quinn, 393.

³⁸² For information on Clark’s unwavering isolationism, see Martin B. Hickman and Ray C. Hillam, “J. Reuben Clark, Jr.: Political Isolationism Revisited,” *BYU Studies* 13, no. 3 (Summer 1973): 426-440.

would make not just the Mormons but all Americans helplessly dependent on free handouts and that Roosevelt was conspiring to lead the country to moral ruin.³⁸³

Mormons had a tradition of “work-fare” from pioneer days when Brigham Young put indigent immigrants to labor on public works, but by the early twentieth century those days were in the past.³⁸⁴ Before the era of “drought and depression,” dependent Church members had been cared for by their local congregations. Clark knew that this system was unequal to the new crisis, and that was why members were turning to government aid. To declare the Church independent of the government, Clark suggested a plan that would centralize Church relief efforts through the Church’s presiding bishopric, a group of three who were responsible for the “temporal affairs” of the Church. But Presiding Bishop Sylvester Q. Cannon, who favored the federal relief program, did not see the need for a centralized plan at that point, and Grant agreed. They believed that economic recovery was just over the horizon and that local Church relief efforts would be sufficient until the crisis passed.³⁸⁵

Clark did not give up. He felt vindicated when welfare surveys showed that local congregations were overwhelmed and that Church members were increasingly turning to New Deal programs for relief.³⁸⁶ In 1934, at the height of the drought, 20 percent of Utahns were receiving federal aid of some sort; and from 1933 to 1939, “Utah received 156.6 percent of the nationwide average per-capita aid on a statewide basis.”³⁸⁷ Finally,

³⁸³ Joseph F. Darowski, “The WPA,” op. cit., 170. Hammond, F. Melvin, “Some Political Concepts of J. Reuben Clark, Jr” (1962). All Theses and Dissertations. 4747, 78. <https://scholarsarchive.byu.edu/etd/4747>

³⁸⁴ For more on the work-fare program, see Arrington, *Great Basin Kingdom*, 211.

³⁸⁵ Darowski, 170.

³⁸⁶ *Ibid.*, 171.

³⁸⁷ *Ibid.*, 169.

in 1936, three years after Clark had proposed it, the Church announced a new Church Security Plan (eventually known as the Welfare Program).

Intriguingly, by 1935 Roosevelt felt as Clark did, that direct relief was contributing to “spiritual and moral disintegration.” He decided to curtail direct relief programs in 1936, leaving thousands of Latter-day Saints in a difficult position. This decision made the new Church welfare program even more urgent. The Church would centralize welfare planning, buy up farms and factories, put unemployed members to work on them, and provide the resulting commodities to the needy. Still, resonating with Clark, Grant made it clear that while the Church was committed to providing relief, the aim of the new program was to restore the identity of the Saints as “independent, self-respecting, and self-reliant.” “Our primary purpose in organizing the Church Security Plan,” Grant announced, “was to set up . . . a system under which the curse of idleness would be done away with, the evils of the dole abolished, and independence, industry, thrift, and self-respect be once more established.”³⁸⁸ Democratic Governor Blood praised the Church plan as a “progressive step,” and Roosevelt “gave his personal commendation” and promised “full cooperation” from the federal government.³⁸⁹

Since the days of Brigham Young, market forces had eroded the cooperative stewardship ethic among the Mormons. Still, there was “a memory of institutionally sponsored cooperation among the Mormons of Utah,” says scholar Jeremy Bonner.³⁹⁰

³⁸⁸ “The First Presidency on Church Security,” *Improvement Era*, January 1937, 1.

³⁸⁹ Leonard J. Arrington, Wayne K. Hinton, “Origin of the Welfare Plan of the Church of Jesus Christ of Latter-day Saints,” *BYU Studies* 5, no. 2 (April 1964): 81.

³⁹⁰ Jeremy Bonner, “State, Church and Moral Order: The Mormon Response to the New Deal, in Orem, Utah, 1933-40,” *Journal of Mormon History* 28, no. 2 (2002), 84, 90.

Forced by the combined effects of what Leonard Arrington called “the dual crisis of drought and depression,” the Church Welfare Program was thus an attempt to revive the stewardship ethic of an earlier generation.³⁹¹ Clark said, “While the Church Welfare Program aims of course to help those in need, its real purpose is not merely to substitute Church gratuities for others furnished by charitable or governmental agencies but to rebuild the characters of its members and to promote and to foster the patriotic, civic, and spiritual qualities of the people.”³⁹² Clark believed that members were suffering not so much because of tumbling markets, drought, or overgrazing, but because they were neglecting to live by principles that in his view had made the desert blossom. He preached that greed, laziness, and general indiscipline among the Church members themselves had led to their tribulations³⁹³—echoing the response of Church leaders to the crisis of 1856 and the rhetoric of the consequent Reformation.

Clark’s paramount concern was the “character of the members”—in his view, too many of them had ceased to blossom “in their own moral being.” For another top leader, Antoine R. Ivins, ambition and greed had brought on the crisis: “We are ambitious, it is true, and many of us desire the power that comes from large property holdings, and to get that power we have shouldered upon our backs obligations that we are now unable to fulfill.”³⁹⁴ Apostle Stephen L. Richards proposed that the dual crisis of drought and depression was a form of divine chastisement. “There have been many hundreds of self-reliant, self-respecting, proud people who have been humiliated to the dust by the hard

³⁹¹ Arrington, “Utah’s Great Drought of 1934,” 164.

³⁹² J. Reuben Clark, Jr., *108th Annual Conference Report*, April 3, 1938, 109.

³⁹³ See J. Reuben Clark, *110th Semiannual Conference Report*, October 1939, 109.

³⁹⁴ Antoine R. Ivins, *105th Semiannual Conference Report*, October 1934, 41.

circumstances which have been forced upon them. . . . Strange as it may seem, for their own good, I want them to continue to be humiliated in their own feelings.”³⁹⁵

The humiliation was real as the dual crisis took its toll on communities in Utah. Farming especially suffered. The state lost 3,000 farms, roughly 10 percent of its 1934 total, and 73,000 head of cattle, a 15 percent reduction.³⁹⁶ Gradually, however, the climate for agriculture improved. By the time the Church’s relief plan went into effect, drought conditions began to abate. By 1937, precipitation levels climbed above average for the first time since 1931. PDSI ratings also went up and in Salt Lake City, snowfall topped out at 55.7 inches for the winter of 1935-36 and 73.3 inches for 36-37.³⁹⁷ The Great Salt Lake continued to shrink into 1936 before making a modest recovery.

With the moderating climate, the Church relief program lost its urgency, along with a revived mindset of environmental stewardship. Ten years after the Grantsville Dustbowl, the lands had still not fully healed, and the lessons were not fully learned. The fragile condition of the land did not stop ranchers, including J. Reuben Clark, from pushing their cattle back on to the range. In a speech to Utah’s cattlemen, Clark said they had a “moral right [to control of the federal grazing land] because they had been the ones to explore it, use it, and manage it”—this despite their record of land abuse.³⁹⁸ Mormon scholar John Bennion refers to the action of the ranchers as a “tragedy of the commons”: They “damaged their own interest by over-exploiting what seemed to be an endless

³⁹⁵ Stephen L. Richards, *105th Semiannual onference Report*, October 1934, 34.

³⁹⁶ *Ibid.*, 22.

³⁹⁷ NOAA, *Climate at a Glance*, op. cit.

³⁹⁸ Thomas Alexander, *The Forest Service and the LDS Church in the Mid-Twentieth Century: Utah National Forests as a Test Case* (Ogden: Weber State College Press, 1987), 9.

resource, a complex grass colony that had developed over centuries.”³⁹⁹ Clearly, there was a basic disagreement about what it would take to “make the desert blossom”—or even what “blossoming” meant.

By contrast, another influential Mormon leader held out for community and government planning to mitigate climatic disasters such as drought and flood. Sylvester Q. Cannon, presiding bishop of the Church in the 1930s and later a member of the Quorum of the Twelve Apostles, was an M.I.T.-educated engineer who studied the effects of grazing on the mountains. His research, sponsored by the state of Utah, showed that the crises were “due to the depletion of the natural plant growth by overgrazing, by fire, and to a small extent by over-cutting of timber.” He proposed the elimination of grazing on the mountains for a period of years. Cannon’s “vision” for the Wasatch Oasis included “heavy doses of governmental regulation, land purchases by the federal government, and strong limits on the use of private property”—all of which would have been anathema to J. Reuben Clark.⁴⁰⁰

Where Cannon saw the value in what government agencies had to offer in restoring rangelands, Clark took the side of the ranchers, who, heavily influenced by the TFE mindset, insisted that they had the right to make their own decisions. The recent memory of the dust storms did not deter stockmen eager to continue with business as usual.

³⁹⁹ John Bennion, “Ideology of Land Ownership: Homesteading Practice and Frontier Narratives of Glynn Bennion,” *ISLE: Interdisciplinary Studies in Literature and Environment* 27, no. 1 (Winter 2020):159.

⁴⁰⁰ Thomas Alexander, “Sylvester Q. Cannon and the Revival of Environmental Consciousness in the Mormon Community,” *Environmental History* 3, no. 4 (1998): 492, 500.

So, to avoid soil degradation in much of the Wasatch Oasis, the national government required adjustments in stocking rates on federal lands according to forage availability. Although the locals had taken steps in some places to limit misuse of the land, the twin crises of drought and depression forced a return to something like the managed use of Brigham Young's time. This development produced contrasting reactions in the culture. A strong frontier mentality intersected with the faith of men like Clark and Talmage that divine providence would once again make the desert blossom if the people returned to principles of self-reliance and independence. On the other hand, Presiding Bishop Sylvester Q. Cannon "championed comprehensive planning and environmental protection."⁴⁰¹

In his evaluation of the Wasatch slopes in the early 1930s, Cannon implicitly rejected the frontier ideal of unrestrained independence in his calls for public ownership and rehabilitation of sensitive lands, temporary curtailment or reduction of grazing, and collective management. He was keenly aware of the "contributor's dilemma"—no one can be excused from contributing, and everyone's contribution must be managed in order to sustain public goods. Sustainable development requires collective goals based on a long-term orientation—an orientation viewed with suspicion by Clark and others who valued the stockman's independence. In contrasting ways, both Clark and Cannon might be seen as advocating a return to abandoned value systems: Clark to a vision of the autonomous yeoman farmer, and Cannon to the future-oriented vision of community in the tradition of Joseph Smith and Brigham Young.

⁴⁰¹ Ibid., 502.

Despite the promotional outlook of people like Cyrus Thomas, Charles Dana Wilber, William Ellsworth Smythe, and Ellsworth Huntington, cultivation would not turn these marginal lands into a humid agricultural paradise. James E. Talmage's similar predictions would not come to pass even with divine help. Nor would J. Reuben Clark's dream of an autonomous people living "peacefully in austerity, frugality, and virtuous simplicity," as Tocqueville would have it, unfettered in a land of unlimited resources.⁴⁰² When in later years Ezra Taft Benson, Clark's associate in Church leadership, became U.S. Secretary of Agriculture, Clark tried unsuccessfully to press his case for ending federal management. "I did not think the S[ecretary] of A[griculture] would yield to argument," Clark told sympathetic stockmen in 1958, and by 1960 Clark conceded that "Sec'y Benson's policies have about extinguished the small farmer and small cattleman."⁴⁰³

Today, although the tension persists in the region between those favoring collective action and those influenced by TFE thinking, a fragile balance between them has lasted most of a century. A 2010 documentary produced for Utah educational television shows examples of the careful planning that currently goes into the management of Tooele Valley lands. "Today, in the Grantsville Soil Conservation District, decisions are made as to the number of cattle [and] the type of planting," according to John Robert Droubay, a district board member:

The pastures are all rotated so they are not overgrazed. We've experimented with various grasses to find out which will produce the most forage

⁴⁰² Craiutu and Jennings. "The Third 'Democracy,'" "Democracy" 393.

⁴⁰³ Reuben Clark memorandum of conversation with "Chairman Hopkin," Don Clyde, Lawrence Johnson, Hugh Colton, Howard J. Clegg, Ted Crawford, and Art Woolley, 18 Apr 1958; Clark farm diary, 5 June 1960, Clark Papers, in D. Michael Quinn, "Ezra Taft Benson and Mormon Political Conflicts." *Dialogue: A Journal of Mormon Thought* 26, no. 2 (Summer 1993): 2.

and preserve the land. In this area we manage here, we're careful to see the cattle numbers are kept in good numbers with the feed that's available. . . . The lesson we learned is conservation—take care of what you have and improve it all the time.”⁴⁰⁴

Under district management, this part of the desert is now blossoming once again. Where government has imposed a balanced-time perspective—looking to the future as well as the present—on some agricultural practices in the region, there remains strong resistance to conservation. Short-term thinking still dominates much of the discussion. For example, in 1991 the state legislature ordered a water development project on the Bear River to divert water for agriculture and Utah's growing population. The project would divert some 220,000 acre feet of water and lower the level of the Great Salt Lake by 8.5 to 14 inches at a time when the lake is in danger of shrinking beyond recognition.⁴⁰⁵ Such a reduction would push the shoreline one to two miles forward.⁴⁰⁶ A new dam on the Bear would have massive impact on the lake's ecology, wetlands, and the migratory bird population. At risk also is the health of the 2 million people who could be subject to toxic dust from a drying lakebed.⁴⁰⁷ Because Great Salt Lake is largely stagnant with no outlet, the massive amounts of microbes in the water absorb large amounts of mercury from the air. They then transform that mercury into methylmercury, an organic form of mercury that does not evaporate easily and can move through the food chain. The bed of Great Salt Lake is coated with it. In 2005,

⁴⁰⁴ *The Grantsville Dustbowl*, op. cit.

⁴⁰⁵ *Bear River Development*, Utah Dept. of Natural Resources, <https://water.utah.gov/bear-river-dev/>

⁴⁰⁶ Brian Isom and Randy T. Simmons, “Dammed if We Do: Trouble on the Great Salt Lake,” *Strata Policy*, October 18, 2016. <https://medium.com/@stratapolicy/dammed-if-we-do-trouble-on-the-great-salt-lake-720ab37b0484>

⁴⁰⁷ Emily Benson, “Will Utah Dam the Bear River?” *High Country News*, September 4, 2017.

U.S. Geological Surveys concluded that the lake had some of the highest mercury readings in any body of water.⁴⁰⁸ If the lake bed were to become more exposed, methylmercury laced dust would become more prevalent in the atmosphere. Meanwhile, proponents argue that the project is necessary to “keep the desert blossoming.” State Senator Stuart Adams advanced funding of \$1.5 billion for the project, arguing “It’s not a matter of if but when we are going to need more water.”⁴⁰⁹ (Ironically, Stuart oversees the Commission for the Stewardship of Public Lands).

The Bear River Project threatens to dry up the region’s most valuable source of water—the lake-effect snow driven by Great Salt Lake—and desertify the entire landscape of the Wasatch Front, radically distorting the project of “making the desert bloom.” No one knows where the lake will find its tipping point and disappear, producing an Aral Sea effect.⁴¹⁰ The Bear River Project may not represent the secular entrepreneurialism narrative, as it is a state-funded program meant to bring support to the broader community in a way that individuals could not do on their own. This falls more in line with the communal stewardship narrative while also causing significant harm to the surrounding environment. The Bear River Project, then exposes the deficiencies in a communal approach to stewardship. In any case, however,

⁴⁰⁸ Carla Valdes, “Total Mercury and Methylmercury Response in Water, Sediment, and Biota to Destratification of the Great Salt Lake, Utah, United States,” *Environ. Sci. Technol.* 2017, 51, 9, 4887–4896, April 12, 2017. <https://pubs.acs.org/doi/abs/10.1021/acs.est.6b05790>. This same study also indicates that methylmercury within the lake have actually gone down, but since high amounts are still found in the surrounding wetlands and bird carcasses found on the lake, the results are inconclusive.

⁴⁰⁹ Jim Carlton, “A Booming Utah Searches for Water Solutions,” *Wall Street Journal*, September 13, 2017.

⁴¹⁰ See Daniel Bedford, “The Great Salt Lake: America’s Aral Sea?” *Environment: Science and Policy for Sustainable Development* 51 (2009), no. 5: 8-21.

the project pits the present desires of a booming, blossoming population against a future “tragedy of the commons” that looms ever nearer.

Those who hold to the TFE perspective continue to discount the tradition of a consecrated community that faced the limitations of the Wasatch Front climate with realism. The metropolitan sprawl now growing beyond those limits has mostly given up the conservation ethic implicit in the land-use planning of not only Joseph Smith and Brigham Young, but also the ambitions of the New Deal which sought to curtail environmental damage. Nor can we lay the blame completely on TFE and secular entrepreneurialism. As the Bear River Project shows, state and community projects that more closely reflect the ideals of environmental stewardship which are meant to serve the greater population can over compensate in harmful ways. The idea of blossoming then is diluted between the Edenic ideal and the industrial sense of progress.

Chapter 5

The Red Cloud

William Clayton could finally breathe easy. His long journey to the Great Salt Lake had taken him across vast prairies, winding rivers, steep canyons, and craggy mountain tops. Now it was finished, and he surveyed his new surroundings. A native of the damp English city of Penwortham, the site of a major textile mill that filled the air with smoke and cotton lint, Clayton grew up in the heartland of the Industrial Revolution. After embracing the Mormon Church, he served a mission to the smoggy industrial city of Manchester. At last, he emigrated to the humid Mormon capital in Nauvoo, Illinois, where he became the personal secretary to Joseph Smith.⁴¹¹ Now at age 34, Clayton found himself in the Great Basin, one of the most remote locations in North America. Hundreds of miles from the nearest smokestack, chimney or locomotive, Clayton wrote “The atmosphere appears very different here...The evenings and nights are very warm and pleasant, and the air appears pure.”⁴¹² Clayton, and many of the other Mormon settlers, enjoyed breathing in the air of the Wasatch Oasis.

The quality of the atmosphere was important to Mormon settlers. As they settled into the Wasatch Front, they gained a stronger appreciation for the clear air of the high mountain valleys. Much like other American settlers, Mormons believed that there were parallels between the body and the land. Just as bodies could be sickly or unhealthy, so could an environment. The good air quality of the elevated Wasatch Front further cemented their belief that God had set the region aside for them. But the Mormon identity

⁴¹¹ “William Clayton,” *Latter-day Saint Biographical Encyclopedia* 1: 717-18.

⁴¹² *William Clayton's Journals*, July 27, 1847, 323.

was not static and, in many ways, would fracture under the pressures of American cultural norms and expectations.

Soon after Clayton and the rest of the Mormon settlers arrived at the Wasatch Front, Mormon identity came under stress because of the rise of secular entrepreneurialism. Where the norms of action for the people of Zion were focused on the creation of a tranquil Eden, broader American cultural norms were commercial and imperialistic. The American self was constructed out of possessions, as William James observed. Although “Industry” was the Mormon motto, for the Mormons industry initially meant diligence in one’s “calling” to become like God; for Gentile Americans, industry was the production of wealth. After the first heavy industry—an ore smelter—went up in the middle of the Salt Lake Valley in 1870, these two self-concepts were to clash and coalesce in substantial ways over the next 150 years. As the economy shifted towards more heavy industry, the secular rewards began to outweigh the cultivation of Eden—the product of a consecrated community of Saints. Due to the constraints of the climate and topography, intense air pollution filled the valleys of the Wasatch Oasis that the pioneers had valued for “pure, clean air.” Compared to the rewards of joining the national economy, “stewardship of the air” receded in importance for the local culture. Even attempts at mitigating the contamination were usually motivated by a desire to attract more business to the region. With the construction of a massive steel mill at Geneva on Utah Lake, toxic air was accepted as the price of prosperity. Only federal interference in the form of clean-air legislation eventually began to force a return to stewardship values.

Toward the end of Brigham Young's life in 1877, smelters, factories, and refineries began popping up across the valley, increasingly pumping smoke into the air and thickening natural inversions into soupy, pungent fog. Where Young had strongly advocated reverence for clean air as a symbol of Zion, a smoky atmosphere came to symbolize jobs, wealth, and progress. Heavy industry eventually overtook agriculture as Utah's main source of income towards the end of the nineteenth century. Mining made "a major long-term contribution to the wealth, employment, and tax base of the state, stimulating an endless range of secondary businesses and enterprises."⁴¹³ The majority Mormon population thus came not only to accept but also to welcome the influx of wealth brought by the high-polluting extractive industries Young had so vigorously opposed in his lifetime.⁴¹⁴ This "about-face" began with the arrival of the railroad, which ended Young's control of the local economy, and expanded the opportunities for mining profits. One observer at the time noted, "The Mormons have to a considerable extent caught the prevailing fever, and are locating and prospecting ledges with truly Gentile zeal."⁴¹⁵

Under the pressure of rapidly developing technology and a modernizing American economy, Mormons fumbled with the theological thread that tied them to their earlier self-concept of Zion dwellers building a "heaven on earth." Apparently, that identity was

⁴¹³ Colleen K. Whitley, ed., *From the Ground Up: A History of Mining in Utah* (Logan: Utah State University Press, 2006), xiii.

⁴¹⁴ Young always encouraged his followers to forego mining, which he regarded as a get-rich-quick scheme, and stick to farming. Even when a group of Mormons helped discover gold at Sutter's Mill in 1848, they did not stay to take advantage of the new discovery, but instead traveled eastward to the Salt Lake Valley, taking what gold they had to help build up Mormon settlements.

⁴¹⁵ Brigham D. Madsen, "General Patrick Edward Connor, Father of Utah Mining," in Whitley, *From the Ground Up*, 69.

bound too tightly to an agrarian economy that was becoming less influential, and the Mormon identity was to a great extent subsumed into the dominant American project of self-enrichment. The language of stewardship faded from the rhetoric of the leaders.⁴¹⁶ “Driven by market opportunities, they valued jobs and wealth more than the sanctity of life, stewardship, and reverence for the earth,” in historian Thomas Alexander’s words.⁴¹⁷ Mormons themselves would struggle against the perception that this shift had taken place, continuing to denounce materialism in conferences and publications. There was a lot of rhetoric about how the “desert” had “blossomed like the rose,” but Mormon cultural norms clearly changed in the last decades of the nineteenth century. Along with this change in self-concept came an alteration in their reverence for clean air..

Air quality gradually degraded as smokestacks went up around the valley. The Southern Utah Railroad, completed in 1871, provided a new avenue of transportation that allowed polluting industries—rather than the desert—to blossom. By 1880, there were thirty-four locally owned smelters in the valley.⁴¹⁸ In 1899, the American Smelting and Refining Company (ASARCO) began buying up the smaller smelters around the valley and consolidating them under their company umbrella. Salt Lake City was an attractive location because of its close proximity to three major mines at Tintic, Park City, and

⁴¹⁶ The term “steward” appears 66 times in the *Journal of Discourses*, the record of speeches given by Mormon leaders between 1844 and 1886. It generally disappeared from General Conference addresses after 1900 (based on a random sampling of Conference Reports available by date at <https://archive.org/details/conferencereport>).

⁴¹⁷ Alexander, “Stewardship and Enterprise,” 362.

⁴¹⁸ Miriam B. Murphy, “The Great Smoke Nuisance,” *Beehive History 9: The Utah Environment* (Salt Lake City: Utah State Historical Society, 1983), 18; Michael A. Church, “Smoke Farming: Smelting and Agricultural Reform in Utah, 1900-1945,” *UHQ* 72, no. 3 (Summer 2004): 197.

Bingham.⁴¹⁹ As a result, ASARCO built a new lead smelter in 1902 on the east bank of the Jordan River near the town of Murray. Another company, the United States Smelting and Refining Company (USSRCO) also bought up some of the local smelters and began building in Midvale. Between the two companies, five plants (two for lead and three for copper) increased the amount of smelted daily material from 288 tons in 1871 to more than 6,000 tons in 1906. The consolidation increased production and generated significant amounts of industrial waste in quantities Utah had never before seen.⁴²⁰ The output of fumes and smoke was tremendous; neither company attempted to reduce or recover any of it.⁴²¹ By the early 20th century, smelting and mining together became Utah's most profitable industries, producing \$34 million of income in 1903 while farming generated only \$17 million.⁴²²

Like other elements of environmental quality, the idea of “blossoming” changed when it came to air quality. Brigham Young's emphasis on keeping the air pure took a backseat to smokestacks and their emissions. Blossoming meant progress, and smokestacks exemplified that progress.

In making their plans to move west, Mormon newspapers had published excerpts from Lansford Hastings's *Emigrants' Guidebook*, which described the climate as the region's best attribute. “The purity of the atmosphere, is most extraordinary,” Hastings wrote. “So pure is it, in fact, that flesh of any kind may be hung for weeks together in the

⁴¹⁹ Church, “Smoke Farming,” 197-198.

⁴²⁰ *Ibid.*, 197.

⁴²¹ Courtney De Kalb, “Smelting Conditions at Salt Lake,” *Mining and Scientific Press* (January 2, 1909), quoted in Church, “Smoke Farming,” 198.

⁴²² Murphy, “Great Smoke Nuisance,” 19.

open air and that too in the summer season, without undergoing putrefaction.” In an era when “bad smells” were thought to cause most illnesses, Hastings noted that “disease of any kind is seldom known, in any portion of the (valley).”⁴²³ Another settler of 1847, Robert Bliss, said, “The atmosphere is pure and there has been no sickness as yet among us to speak of.” A few months later, he reported, “All are pleased with the climate.”⁴²⁴

In the mid-nineteenth century, there was not much of a distinction between a “healthy climate” and “air quality.” Clayton and his fellow settlers had crossed the plains from Nauvoo, where mosquitoes spread malaria and every summer the Mormons fell ill to the disease.⁴²⁵ In contrast, the dry mountain air of the Wasatch did indeed suppress the insect-borne diseases of the Mississippi Valley. Historian Jared Farmer explains that the Mormons, like many nineteenth century Americans, measured the quality of a place by its “elevation, vegetation, wind, water, soil and air.”⁴²⁶ The Valley did not meet all of these criteria, but the one most mentioned was the freshness of the air. Air quality was at the time the main indicator of a healthy climate; and, according to Farmer, the climate of the Wasatch was a major reason Brigham Young, upon first seeing the valley, uttered the legendary statement “This is the right place.”⁴²⁷

The Mormons attributed the fresh air to the elevation, lake, and canyons of the area. William Clayton reported that the “air is good and pure, sweetened by healthy

⁴²³ Lansford W. Hastings, *The Emigrants Guide to Oregon and California*, reprint of 1845 ed. (Princeton: Princeton University Press, 1932), quoted in Richard Jackson, “Mormon Perception and Settlement,” *Annals of the Association of American Geographers* 68, no. 3 (1978): 321.

⁴²⁴ Everett L. Cooley, “The Robert Bliss Journal,” *UHQ* 27 (October 1959): 381-404.

⁴²⁵ Richard Bushman, *Joseph Smith: Rough Stone Rolling* (New York: Alfred Knopf, 2005), 384-85.

⁴²⁶ Jared Farmer, *On Zion’s Mount*, 43.

⁴²⁷ *Ibid.*, 42.

breezes from the Salt Lake.”⁴²⁸ Others commented that the dry climate made the “sky very clear and the air delightful, and they believed that the canyon winds tempered the climate. All this, one settler remarked, made the Salt Lake Valley “the most favored spot for health on the globe.”⁴²⁹ Mormons theorized that, unlike in a fresh body of water, where parasites and organic contaminants could multiply, the salinity of the Great Salt Lake prevented contamination and the emission of “poisons” into the air.

Brigham Young spoke forcefully on the central importance of air quality. “It enters into the minds of but few that the air we inhale is the greatest source of our life,” he declared. Beyond this, the air was “filled with the spirit of life which emanates from God.”⁴³⁰ Air was a divine element that sustained the life that God had given; as such, it must be protected. Young insisted that the people maintain the purity of their new environment: “You are here commencing anew. The soil, the air, the water are all pure and healthy. Do not suffer them to become polluted with wickedness. Strive to preserve the elements from being contaminated by the filthy, wicked conduct and sayings of those who pervert the intelligence God has bestowed upon the human family.”⁴³¹ Pollution of the environment mirrored the moral pollution of sin. Fresh air was not only healthy but also holy.

As we have seen, Mormon doctrine required the Saints to conceive themselves “anew” as “stewards” of their environment, which required preserving the air from

⁴²⁸ William Clayton, *The Latter-day Saints' Emigrants' Guide* (St. Louis: Missouri Republican Steam Power Press—Chambers and Knapp, 1848), 20.

⁴²⁹ Norton Jacob letter to his father, 23 April 1848, quoted in Richard Jackson, “Mormon Settlement and Perception,” 325

⁴³⁰ Brigham Young, “Intelligence, Etc.,” October 9, 1859, *JD* 7: 282.

⁴³¹ Brigham Young, “Fidelity of the Saints,” June 10, 1860, *JD* 8: 78, 80.

contamination. Failure to become faithful stewards would mean losing their “inheritance”—the prospect of godhood—in the eternities. Orson Pratt taught, “He that proves himself a faithful and wise steward in time, will be counted worthy to receive not only a stewardship but an inheritance in eternity. What is the object of the stewardship? Is it not to prepare us for that still higher order of things that shall exist when we shall receive an inheritance?”⁴³²

Mormon leaders associated bad air not only with physical disease but with neglect of the holy obligation to “steward” the environment. Air pollution was associated with spiritual and moral decay. Several of the apostles had served missions in Great Britain and experienced the ravages of the Industrial Revolution on the atmosphere there. They connected the appalling condition of the impoverished, ill-educated, irreligious laboring class of Britain with the environment of the mill towns where they preached. Wilford Woodruff wrote that the air was “disagreeable throughout England . . . filled with smoke, smut, & gases . . . vary [sic] heavy & bad for the lungs” due to the burning of coal and other factory wastes.⁴³³ Such places degraded the divine spirit in man, according to Mormon observers. In *The Latter-day Saints’ Millennial Star*, the Mormon organ in Britain, an editorial appeared in 1855 (possibly by Franklin D. Richards, editor of the *Star*), contrasting the industrial “valleys of death” in England with an idealized “vale of Zion” in the mountains:

Place yourself on an eminence near one of these unfortunate spots of land. . . the “dark valley of the shadow of death.” . . . Suddenly, to your great astonishment, you discover that this dreary spot is inhabited by human beings! Yes, a hundred thousand of your fellow creatures, created originally in the image

⁴³² Orson Pratt, “Progress of the Saints,” November 1, 1879, *JD* 21: 150.

⁴³³ Wilford Woodruff to Phebe Carter Woodruff, January 29, 1844, cited in “We Seldom Find Either Garden, Cow, or Pig,” in *The Earth Will Appear*, 89.

of their Father, who dwells in the midst of celestial light and glory . . . Such a course, instead of replenishing and beautifying the earth, and making it as the garden of Eden, fit to be the residence of the family of God, defiles and pollutes it, until it festers with corruption, and is filled with disease and death, and made fit only for the burning...The sons and daughters of Zion are spreading forth . . . and will so continue until they fill the land with cities...Look in that lovely vale, smiling with the fruits of the earth...airy, splendid houses . . . delightful Edenic gardens, and beautifully ornamented public grounds, while rising in majestic grandeur far above all stands a magnificent Temple of the Lord... The air is charmingly pure and bracing... the City of God.⁴³⁴

For the *Star* writer, a prime benefit to the people of the “vale of Zion” was light, sweet air. The Gentiles, physically trapped in “labyrinths” of reeking odors and dark pits, were by contrast spiritually degraded. A peculiarity of Mormon theology is the identification of “temporal” with “spiritual,” a connection made clear in the conjoining of “pure air” to the Edenic “order of heaven.”⁴³⁵ The Saints in Utah, declared Daniel H. Wells, a counselor to Young, “breathe the pure mountain air, and drink from the cool mountain stream, and dwell in a lighter and purer atmosphere, not only physically, but socially and morally.”⁴³⁶ Citing the sweetness of the air, Young equated the Wasatch Oasis with the “New Jerusalem” in an address to immigrant Saints:

Our cities are open, our streets are wide, and we have the sweet mountain air, and a healthy country...What kind of air did *you* breathe, who lived in eleven, twelve, and fourteen story houses in your native country? If you could live in such confined circumstances, why cannot you live here, while breathing air as sweet, I may say, as the New Jerusalem.⁴³⁷

Mormon identity was thus wrapped up in the light, fragrant, healthful atmosphere of Zion, particularly in contrast with their perception of the dark, putrid, disease-ridden

⁴³⁴ “Replenish the Earth,” *Latter-day Saints’ Millennial Star* 17, no. 22 (June 2, 1855): 337-38.

⁴³⁵ See Doctrine and Covenants 29:34.

⁴³⁶ Daniel H. Wells, “Persecutions, Duties, and Privileges of the Saints,” July 24, 1854, *JD* 2: 28.

⁴³⁷ Brigham Young, “Confidence,” 78

environment of the “Gentile order.” This contrast was often noted and no doubt one of the reasons thousands of the English laboring class emigrated to Utah in the nineteenth century. However, the association of Zion with pure air was eventually disrupted.

As early as 1867, residents had noticed that temporary inversions would cloud over the Salt Lake Valley during the winter months, turning the air stale and heavy.⁴³⁸ These inversions formed when anticyclones pushed cold air down the mountains to be trapped by a cushion of warmer air floating at higher elevations. It was like living at the bottom of a bowl of soup. At times, inversions would last for days or weeks. In December 1876, for example, a thick fog covered Salt Lake City for two weeks.⁴³⁹ This natural radiation fog occurs when moist air is cooled by the earth’s surface and condensation sets in; it was a predictable nuisance, but most of the time residents enjoyed clear air.⁴⁴⁰ The first somestacks which began popping up at the end of the 1870s, added industrial emissions to the inversions, making them denser and more dangerous every year. Some residents did not like this smoky state of affairs. As smokestacks went up, farmers began to complain that smelter emissions were damaging crops and livestock. Over the years, the complaints grew louder and more frequent.

Finally, in 1903, the smelter owners hired one of Utah’s best scientists, John A. Widtsoe, to try to prove their smoke was harmless. Widtsoe had come to the United States as a boy at the age of eleven when his widowed mother converted to Mormonism

⁴³⁸ Linda Sillitoe, *A History of Salt Lake County*, Utah Centennial County Histories Series (Salt Lake City: Utah State Historical Society, 1996), 148.

⁴³⁹ Journal History of the Church of Jesus Christ of Latter-day Saints, December 5-19, 1876. Church Historical Library.

⁴⁴⁰ Jon Erdman, “How Does Fog Form?” The Weather Channel, October 14, 2013. Accessed on December 21, 2019. <https://weather.com/science/news/how-does-fog-form-20131010>.

and settled in Logan, Utah. While the smelting industry was spouting black smoke into the air above Salt Lake City, Widtsoe was growing up under clear skies in a small rural community some 80 miles to the north.⁴⁴¹ The native Norwegian quickly learned English and progressed easily through his elementary education. Widtsoe proved exceedingly bright, and after graduating from Brigham Young Academy in Logan and enjoying a stint at Harvard, he returned to Utah to head up the Utah Agricultural Experiment stations where he became an expert on irrigation. Like Orson Pratt and James E. Talmage, Widtsoe was a scientist who would later become an apostle of the church.

Widtsoe's reputation caught the attention of ASARCO and USSRCO. Hoping for a favorable result, the companies commissioned Widtsoe to research the effect of their smokestack fumes on Salt Lake Valley crops. He jumped at the opportunity.⁴⁴² However, much to the dismay of the smelter owners, Widtsoe's research did not support their position. He found that while farms lying near and in the path of the smokestack fumes suffered the most, the damage was actually widespread. Chemicals within the smoke, such as sulfur dioxide (SO²), arsenic, and copper, polluted the atmosphere and severely damaged vegetation. While garden vegetables were somewhat resilient, shade trees suffered, and fruit trees were especially vulnerable.⁴⁴³ Still, Widtsoe did not condemn the smelters outright. Instead, he made specific suggestions to farmers to help prevent some of the damage, such as planting annual crops and not orchards. Understandably, this did little to satisfy the farmers and even less to placate the smelter companies. "In the end,"

⁴⁴¹ John A. Widtsoe, *In a Sunlit Land: The Autobiography of John A. Widtsoe*, Milton R. Hunter and G. Homer Durham, eds. (Salt Lake City: Deseret News Press, 1952), 93.

⁴⁴² Murphy, "Great Smoke Nuisance," 19.

⁴⁴³ Murphy, "Great Smoke Nuisance," 19.

Widtsoe would later write, “I lost the work, when I was obliged to report that smelter smoke was carried far and wide, into the very heart of Salt Lake City.”⁴⁴⁴

No Luddite, Widtsoe represents the generation of Mormons for whom a new “rationality” enters into their self-construct (in fact, he authored a book called *A Rational Theology*). Because of his scientific training, he saw himself as a “rational” person for whom religion has meaning insofar as it “finds expression and use in the everyday life of man.”⁴⁴⁵ Widtsoe’s practical conception of his religion shows how far the Mormon identity had gone towards accommodation with norms of the larger market-based culture. He sought to serve “interests” defined as economic advantage rather than as “Eden-building” and “saint-making”:

Utah . . . finds the markets afforded by the mining camps of decided advantage to the farmers. On the other hand, the interests of all phases of mining ventures are furthered by the proximity of prosperous agricultural communities. Agriculture and mining, the two great industries of this region, are mutually helpful, and both aid in the development and growth of the State of Utah.⁴⁴⁶

Widtsoe’s report began with a comparison of the economic contribution of the mining industry compared to that of agriculture, demonstrating that his primary concern was with the economic influence of any recommendations he might make. He noted throughout his research the presence of smelter dust on fields and the widespread death of shade and fruit trees. He said nothing about the aesthetic or human health impact of smoke and toxic dust and dead trees—the sort of thing that would have alarmed earlier

⁴⁴⁴ Widtsoe, *In a Sunlit Land*, 93.

⁴⁴⁵ John A. Widtsoe. *A Rational Theology as Taught by the Church of Jesus Christ of Latter-day Saints* (Salt Lake City: General Priesthood Committee, Church of Jesus Christ of Latter-day Saints, 1915), 1.

⁴⁴⁶ John A. Widtsoe, "Bulletin No. 88 - The Relation of Smelter Smoke to Utah Agriculture" (1903). *UAES Bulletins*. Paper 39. https://digitalcommons.usu.edu/uaes_bulletins/39

Mormon leaders. Clearly, “pure air” no longer entered into the new “rational” version of Mormon theology.

Widtsoe’s research was not the last word, however. Further research in time showed that the smelters were puffing large quantities of heavy-metal dust containingcontaining lead and arsenic, along with sulfur dioxide gas, into the air. Roughly three thousand pounds of sulfur dioxide along with heavy-metals dust made it into the air on a daily basis. As it mixed with the moisture in the atmosphere, the result was acid rain, which burned farmers’ crops and stock.⁴⁴⁷

Farmers around the valley fought back. In 1904 they organized and brought the pollution issue to the attention of the Salt Lake County Board of Health, which labeled the smelters a “public nuisance” and ordered the companies to reduce their smoke output. ASARCO and USSRCO, however, were slow at best to incorporate the necessary changes or, at worst, simply ignored them. The farmers, left with no choice, took the companies to court.⁴⁴⁸

After Salt Lake County farmer David McCleery won a lawsuit against the smelters in 1904, 409 more farmers followed suit. The decision in *Godfrey v. ASARCO* favored the farmers and the smelters were ordered to implement the new mechanisms and procedures which they had refused to do voluntarily to curb pollution.⁴⁴⁹ The owners of the smelters appealed the ruling in 1907 in the U.S. Circuit Court of Appeals in St. Paul, Minnesota. Once again, things did not go their way as the court upheld the previous

⁴⁴⁷ Church, “Smoke Farming,” 199.

⁴⁴⁸ Murphy, “Great Smoke Nuisance,” 19.

⁴⁴⁹ Church, “Smoke Farming,” 199-200.

ruling. Furthermore, the court permanently enjoined the smelters from releasing smoke containing more than ten percent sulfur, or any amount of arsenic and lead.⁴⁵⁰

So, the smelter owners had no recourse but to adhere to the court decisions. By 1908, all the smelters were either complying with the new regulations or had relocated out of the valley.⁴⁵¹ The only remaining smelters, owned by ASARCO and USSRCO, grudgingly reengineered their smokestacks to comply with the new regulations, installing a device known as a “baghouse” to trap lead and arsenic, which the company then sold as insecticide.⁴⁵² While the baghouses prevented solid materials from escaping, the smokestacks continued to billow sulfur dioxide into the atmosphere.⁴⁵³ Farmers continued their litigation, Salt Lake City hired a “smoke inspector,” but air pollution unsurprisingly continued unabated.

In the mid-1910s, the two smelting companies began developing their own research as a defensive measure. The executives at ASARCO commissioned their own Department of Smoke Investigations and a Department of Agriculture to conduct research on smoke pollution.⁴⁵⁴ They established their own research farms always within a few hundred yards of their smokestacks. For some experiments, they would grow plants in boxes, cover them with wood and celluloid and blow smelter fumes over them while controlling other elements like light, temperature, and humidity. In 1915, ASARCO conducted over 3,500 of these experiments. They found that damage would occur within

⁴⁵⁰ Murphy, “Great Smoke Nuisance,” 19.

⁴⁵¹ Church, “Smoke Farming,” 201.

⁴⁵² The insecticide proved harmful to crops and vegetation, especially when farmers, unclear about the application process, over-sprayed. See Church, “Smoke Farming,” 217.

⁴⁵³ Church, “Smoke Farming,” 203.

⁴⁵⁴ *Ibid.*, 202.

a very specific set of conditions. When temperatures exceeded 40 degrees, relative humidity 70 percent, and, apparently, a “wind prevalency at three hours or more”—combined with strong sunlight—sulfur dioxide levels would rise above one part per million of air. At those levels, plants would be harmed. But if SO² remained below that level, then plants would remain unharmed. When those conditions appeared, ASARCO would cease operations until circumstances changed.⁴⁵⁵ They also attempted to dilute the SO² concentration by raising their stacks, which the courts accepted as a suitable solution.⁴⁵⁶

The notion that “the solution to pollution is dilution” is both true and cynical at the same time. Of course, if the level of a toxic substance in the air is low enough, there will be little short-term toxic reaction. However, the smelters were not approaching anywhere near an acceptable level of dilution. The smelters adopted a very superficial definition of “damage” to crops, and did not look at long-term cumulative damage to soil. Only visible alterations counted; they considered as pollution only the amount of sulphur dioxide that visibly damaged plants. They did no research on the effects of long-term exposure to lower levels of sulfur dioxide, but instead claimed that there was no way to tell the difference between sulfur dioxide “bleaching” and damage from other elements such as insects or disease.⁴⁵⁷

Naturally, the farmers found the smelters’ conclusions suspect. For one thing, the smelters studied only farm crops in Murray near their smokestacks, neglecting the farms

⁴⁵⁵ Ibid., 204.

⁴⁵⁶ Murphy, “Great Smoke Nuisance,” 20.

⁴⁵⁷ Church, “Smoke Farming,” 205.

and forests miles away that were being affected by acid rain.⁴⁵⁸ So the farmers hired Stanford University botany professor George J. Peirce, an eminent plant physiologist, to study the situation. Peirce was alarmed enough by his research to call the smelters “trespassing neighbors” who were violating the farmers’ “natural right” to make money off their crops; and that although sulfur dioxide could be controlled, the smelters had refused to take the necessary steps. Peirce believed their claims were merely a display of their economic power.

Afraid of losing public support, the smelter owners retaliated with a campaign to prove that the farmers were not “progressive” enough—they were inept, backward, and too stubborn to embrace new technologies and techniques. The companies began marketing and selling their own produce from their experimental farms—and with great success. Their produce even won awards at the Utah State Fair. Additionally, the smelter owners turned the farmers’ argument against them and blamed them for their own bad crops—they didn’t know “scientific farming” and were too stubborn to learn, so damaged crops were their own fault. The farmers who filed suit were called “smoke farmers,” implying they were too lazy to adopt better and more efficient techniques and were thus trying to get easy money off the smelters.⁴⁵⁹

To recoup the cost of controlling their pollution, and to further capitalize on their new agricultural pursuits, smelters began turning arsenic from their baghouse filtration systems into cheap pesticides. (Ironically, smelters had argued in court that it was overuse of pesticides that damaged crops, not air pollution.) They also claimed that

⁴⁵⁸ Murphy, “Great Smoke Nuisance,” 20. .

⁴⁵⁹ Church, “Smoke Farming,” 203, 205, 207, 210.

farmers could not tell the difference between crops damaged from pollution and crops damaged from pesticides. So, from 1920 to 1935, the use of arsenic-based pesticides increased significantly along the Wasatch Front, adding to the growing air pollution problem.⁴⁶⁰

Business was good for smelters through the years of World War I and into the 1920s, but smoke pollution continued to get worse. A national magazine, *The Outlook*, reported that “Salt Lake has become a fit rival of Pittsburgh, Cincinnati, Chicago, and St. Louis as a smoke-plagued city.”⁴⁶¹ Reaction set in. This was the Progressive Era, and civic improvement was growing into a nation-wide movement. Numerous social organizations, including the Kiwanis Club, the Boy Scouts, and the Real Estate Board, united to fight against pollution. Perhaps the strongest effort to fight against pollution, however, came from women’s clubs, which had a long history of working to clean up Salt Lake. In 1877, Protestant and Mormon women joined together to form the Ladies Literary Club, in part, to help rid the city of litter and air pollution. In 1890, several women’s groups joined to form the Utah Federation of Women’s Clubs. Then in 1912, another emerged as the Salt Lake Council of Women. All of these clubs formed, at least in part, to rid the city of pollution.⁴⁶²

Women’s groups around the United States were in the forefront of the movement to combat air pollution. Forest Service Chief Gifford Pinchot “praised the women of the progressive era for their substantial contribution to conservation.” The General

⁴⁶⁰ Church, “Smoke Farming,” 207-214.

⁴⁶¹ “Salt Lake Smoke,” *The Outlook*, March 17, 1915, 652.

⁴⁶² Alexander, “Cooperation,” 9-10, 15.

Federation of Women's Clubs promoted healthy forests.⁴⁶³ Women undertook a forceful smoke-abatement campaign in Pittsburgh, which spread to other industrial cities.

Progressive women spoke of an "unending ineffectual struggle" to keep their children and homes clean in the midst of a polluted atmosphere.⁴⁶⁴

In response, enforcement of pollution ordinances steadily increased in the 1920s, but then the city council decided to take a more business-friendly approach to the smoke problem.⁴⁶⁵ The rate of enforcement fell considerably towards the end of the decade. In 1923, city inspectors recorded forty-five smoke violations per week, but by 1928, the city had all but eliminated funding for smoke abatement. From 1921 to 1929, the city handed out eighty-three police-court citations, but manufacturers, who were responsible for forty-four percent of the pollution, received only eleven citations. Railroads produced roughly nineteen percent of the smoke but were never cited. Instead, residential homes and apartments bore the brunt of the enforcement. While residents did use the most coal, they were responsible for only twenty-two percent of the pollution.⁴⁶⁶

In 1929, the women of the city once again came together to tackle the problem and formed the Smokeless Fuel Federation. Led by art patron Alice Merrill Horne, the group consisted of some of the most prominent women of Salt Lake including Emma Ray McKay, wife of Mormon apostle David O., and Leah Dunford, wife of John Widtsoe.⁴⁶⁷

⁴⁶³ Carolyn Merchant, "Women of the Progressive Conservation Movement, 1900-1916," *Environmental Review* 8, no. 1 (Spring 1984): 57.

⁴⁶⁴ Angela Gugliotta, "Class, Gender, and Coal Smoke: Gender Ideology and Environmental Injustice in Pittsburgh, 1868-1914," *Environmental History* 5, no. 2 (April 2000): 166.

⁴⁶⁵ Ted Moore, "Democratizing the Air: The Salt Lake Women's Chamber of Commerce, and Air Pollution, 1936-1945," *Environmental History* 12, no. 1 (January 2007): 86.

⁴⁶⁶ *Ibid.*, 89.

⁴⁶⁷ Murphy, "Great Smoke Nuisance," 22.

Leah, granddaughter of Brigham Young, had a long history of civic engagement and activism. She had led a fight for covered garbage cans and trucks in the 1920s in an effort to clean up the city's streets. An advocate for women's rights, she helped found the Utah League of Women Voters. She was also a prolific scholar, having completed degrees at Brigham Young University and the University of Utah and summer classes at Harvard.⁴⁶⁸ Joining the federation was the Salt Lake City Women's Chamber of Commerce, which charged that city officials had hampered the adoption of smokeless fuels and demanded an investigation into the matter.⁴⁶⁹ They called for ridding the city of "death-dealing coal smoke" to slow the exodus of people from the city, enhance the city's reputation, increase the general welfare of residents, and "advance the financial security of the people."⁴⁷⁰ They put together demonstrations, staged public hearings, and held radio broadcasts with varied levels of success. Many Utah engineers and scientists came forward to support the idea of a processed coal fuel.⁴⁷¹

However, the women's appeals led to only half-hearted efforts at control. Local governments worried about the financial impact of bridling the big polluters and didn't seem to think the problem was that bad. "Problems associated with smoke were not acute," explains environmental historian David Stradling. "Smoke caused no epidemics, no brief, intense crises. The problems associated with smoke were endemic, not epidemic, and therefore controlling smoke was less likely to receive the political energy

⁴⁶⁸ "Summary Description," Widtsoe Family Papers, Utah State Historical Society.

⁴⁶⁹ Murphy, "Great Smoke Nuisance," 22.

⁴⁷⁰ "Constitution of the Salt Lake City Women's Chamber of Commerce," Preamble, 1929, in Moore, "Democratizing the Air."

⁴⁷¹ Moore, "Democratizing the Air," 92-93.

and the public willingness to sacrifice which were required for its success.”⁴⁷²

Furthermore, women’s concerns were easily dismissed as trivial. Despite the women’s case that the smoke was harmful to citizens’ health, leading men felt that the women were focused on “prettiness” rather than economic power. Industrial might was tied up with masculinity. The steel city of Pittsburgh, for example, was pictured as “a Vulcan or Hades, ‘naked to the waist, with hairy chest and brawny arms, doing tremendous things with molten iron.’” The city’s extreme pollution was a sign of “the manly industriousness of its men.”⁴⁷³ Stradling agrees that powerful interests had little interest in “feminine” preoccupations with visual appeal: “Probably one of the chief reasons for the indifference to the reform of the smoke nuisance is that most people think of the matter not as one of health but of esthetics. . . . Most could endure ugliness in the pursuit of economic progress.”⁴⁷⁴

So, the men who governed Salt Lake were slow to accept the women’s arguments and ultimately decided to maintain the status quo. Additionally, the coal companies fought back hard, not so much to prove that coal was a clean fuel, but to show what the coal industry meant to the state’s economy. They depicted themselves as central to the state’s financial well-being, predicting predicting that if they suffered, everyone would suffer.⁴⁷⁵ The fight for a smokeless fuel plant continued into the 1940s, when a smokeless fuel plant was finally built. But by then, it was obsolete. Natural gas had taken over as the

⁴⁷² David Stradling, *Smokestacks and Progressives: Environmentalists, Engineers, and Air Quality in American, 1881-1951* (Baltimore: The Johns Hopkins University Press, 2002), 35.

⁴⁷³ Gugliotta, “Class, Gender, and Coal Smoke,” 168.

⁴⁷⁴ Stradling, *Smokestacks*, 35-36.

⁴⁷⁵ Moore, “Democratizing the Air,” 94.

city's primary fuel. By the 1960s most homes in Salt Lake had natural gas as their primary heat source.⁴⁷⁶ Natural gas, however, did not solve the problem of poor air quality. While the presence of smelters and coal plants had diminished in Salt Lake City, new sources of pollution would reframe the debate between clean air and economic concerns along the Wasatch Front, and the progressive consciousness faded during the Harding-Coolidge years.

What is striking about these controversies is the absence of a religious discourse. Mormons constituted a majority on both sides of the debate. Although mining and smelting operations were begun by "Gentile" entrepreneurs, Latter-day Saints eventually became not only laborers but in many cases owners and managers of the mills. As the biggest employers in the valley, manufacturers had the support of thousands of families. The opposition of the agricultural community was based entirely on crop damage and losses attributed to air pollution. Economics ruled both parties, not the values associated with the doctrine of stewardship. Finally, the smoke-abatement campaign was led mostly by women influenced by Progressive initiatives in public health that were growing across the country. Although the majority of Mormon Salt Lake women's groups viewed air pollution as a moral issue, they did not frame it in the context of Mormon theology. No one did, which is puzzling in light of the quasi-doctrinal emphasis on maintaining a "pure" environment that was so prevalent among early Mormon leaders. William Clayton may have left behind the "dark satanic mills" of England, but the next generation of Mormons welcomed them to Zion.

⁴⁷⁶ Murphy, "Great Smoke Nuisance," 22.

What happened? The incursion of the mainstream economy into Utah re-shaped the Mormon mindset to align more with the objectification and desacralization of the environment typical of the rest of America. Thomas Alexander points out that under the pressure of “patterns of secularization” in the broader culture, the Latter-day Saints came to “forget or neglect” the religious content of Joseph Smith’s teachings on the environment.⁴⁷⁷ The Protestant theology that “denatures” humanity from nature—viewing the earth purely as an object, a material collection of resources—facilitated the adoption of the exploitative mindset of American capitalism and positivistic science.⁴⁷⁸

Trained in this scientific worldview, apostle John A. Widtsoe radically disconnected his science from the Mormon stewardship ideology in his report on industrial pollution, which was based solely on economic values without regard to the Mormon tradition that sacralized air, water, and the earth. Widtsoe saw himself as the “progressive man” who summed up his religion as “all knowledge,” a set of propositions to be tested and verified. Revealingly, Widtsoe held up as his model of truth-seeking not Joseph Smith the Prophet, but the explorer Roald Amundsen: “He experiments, he records and analyses...Amundsen informed himself as few men have done. . . It was upon such a preparation that he built his immortal career.”⁴⁷⁹ For Widtsoe, physical

⁴⁷⁷ Alexander, “Stewardship and Enterprise,” 363-364.

⁴⁷⁸ Protestant theologian Rudolf Bultmann said, “Man, if he rightly understands himself, differentiates himself from nature.” See Bultmann’s “View-Point and Method” in *The Historical Jesus in Recent Research*, James D.G. Dunn and Scott McKnight, eds. (University Park, PA: Penn State University Press, 2005). See also Harold H. Oliver, “The Neglect and Recovery of Nature in Twentieth-Century Protestant Thought,” *Journal of the American Academy of Religion* 60, no. 2 (Autumn 1992): 380.

⁴⁷⁹ John A. Widtsoe, *In Search of Truth*, Salt Lake City: Deseret Book, 1930, 8, 116.

science and economics were indistinguishable from his religion; therefore, cost/benefit analysis became a primary measure of value.

The three-sided conflict between economic value, public health, and traditional Mormon stewardship values came to its apex with the advent of the Geneva Steel Mill in the Utah Valley. In early 1941, the wartime Lend-Lease act increased the demand for steel. New factories and steel mills sprouted up across the country. The Wasatch Oasis, far from the vulnerable Pacific Coast and endowed with mineral riches and the fresh-water Utah Lake, was a prime location for a steel mill.⁴⁸⁰ Utah county officials jumped at the chance, offering as a mill site an old resort on the banks of Utah Lake ironically called Geneva because the site had reminded early settlers of the beautiful vistas of Lake Geneva in Switzerland.⁴⁸¹ By now locals considered the lake a “big sludge lagoon” — decades of sewage disposal had taken a toll on its ecology—so they were excited at the prospect of using the site to bring in . new capital and employment.⁴⁸²

Two weeks before the attack on Pearl Harbor, the Defense Plant Corporation announced they had accepted the Utah county proposal and had awarded a \$91 million contract to Columbia Steel to manufacture a steel plant. The deal was almost too good to be true. The government agreed to fund the construction of the plant, while a private company, U.S. Steel, would do the actual building and operating. They estimated annual

⁴⁸⁰ Craig Loal Whetten, “The Strange Enterprise: Geneva Steel and the American West,” MA thesis, University of Utah, 2011, 21.

⁴⁸¹ *Ibid.*, 22-23.

⁴⁸² “Writer Recalls History of Geneva, Favorite Old Resort of Utah Lake,” *Provo Sunday Herald*, March 27, 1949.

plant production at 1.45 million tons of pig iron, 840 thousand tons of open-hearth ingots, and 500 thousand tons of plates with an estimated value of \$126 million.⁴⁸³

Having suffered through the Great Depression, many residents were elated at the prospect of bringing this grand infusion of revenue to the area. Prominent Utahns both political and religious supported the development of the plant, including Utah Senators Elbert D. Thomas and Abe Murdock, Governor Herbert Maw, and Mormon Apostle David O. McKay (all Mormons). But not everyone was pleased. Some Utah county residents pushed back, expressing concern that a steel mill would lead to even more development and a loss of farmland in the county. When news of some dissatisfaction reached the ears of the Defense Plant Corporation officials, they made it known that other locations would do just as well and that they were happy to take their business elsewhere.⁴⁸⁴ Residents blinked first and by 1943, the steel mill was complete. With the creation of a new subsidiary of U.S. Steel to operate the mill, the Geneva Steel Company was born.⁴⁸⁵

The mill had an immediate effect on the dynamics and makeup of Utah county. During the war, the mill enjoyed its heyday. The city of Orem, near the plant, saw its population nearly triple from 2,919 to 8,351.⁴⁸⁶ A resident newspaper delivery boy at the time gained hundreds of new customers “camped out in trailer homes, as there wasn’t enough permanent housing available to accommodate the dramatic influx of families to

⁴⁸³ “Award for Steel Plant,” *New York Times*, November 26, 1941.

⁴⁸⁴ Anderson, “Between Mountain and Lake,” 131.

⁴⁸⁵ Whetten, “Strange Enterprise,” 31

⁴⁸⁶ *Ibid.*, 31, 49.

the valley.”⁴⁸⁷ At the end of the war, workers panicked, thinking the mill would close; but in April 1946, the federal government put the plant up for auction, and U.S. Steel bought the property and all its assets, relieving a lot of tension in the community.⁴⁸⁸ Soon Geneva became the largest employer in Utah as Orem grew by another 10,000 residents.⁴⁸⁹ The arrival of the steel plant effectively changed the economic makeup of Utah county from an agricultural hub to an industrial center. Local Latter-day Saints no longer focused on maintaining an “Edenic” identity; instead, the formerly pastoral community embraced a new, more modern identity as the profits from steel poured in and the air turned opaque from smoke.

It was no secret that Geneva was a huge source of air and water pollution (Utah Lake became far more degraded than before). The war effort gave Geneva something of a free pass when it came to pollution. It became clear in the post-war years, however, that in order to continue successfully, smoky Geneva would have to maintain the support of the community, especially the farmers. As they had a half-century earlier in Salt Lake county, Utah Valley farmers complained about the fumes pouring out of the mill’s smokestacks. In June 1952, Geneva began paying costly damages to farmers when their livestock was harmed from fluorine emissions from the mill.⁴⁹⁰ The company’s manager, Loren J. Westhaver, claimed that the plant managers were doing everything “to the best of their ability” to promote an air pollution control program. This effort included not only

⁴⁸⁷ Aubrey Glazier, “United States Geneva Works,” *Intermountain Histories*, 2019, <https://www.intermountainhistories.org/items/show/82>

⁴⁸⁸ “Utah opinion favors WAA,” *New York Times*, May 25, 1946.

⁴⁸⁹ Whetten, “Strange Enterprise,” 46, 48.

⁴⁹⁰ “Steel Firm to Pay Damage Claims,” *Salt Lake Telegram*, June 17, 1952.

the payment of claims, but also new corrective measures to limit air pollution.⁴⁹¹ For example, Geneva announced a three-phase plan to eliminate fluorine from their emissions by the following year.⁴⁹² Furthermore, management employed the old strategy of using experimental farms to test the effects of fluorine and other pollutants on over 150 varieties of plants.⁴⁹³ The experiments worked out well for Geneva, as little toxicity showed up in the crops.

For decades, Geneva enjoyed the support of not only the immediate Utah Valley community but also many prominent Utahns. The state's establishment, including LDS Church leaders, unequivocally supported the mill as doing incalculable good for the entire region. Recognizing that Mormons composed most of their labor pool, Geneva management worked hard to win the church's approval, and they did. When Walther Mathesius, Geneva Steel's first president, left the company in 1951, five LDS apostles, including the church's prophet-president David O. McKay, celebrated his legacy over a sumptuous dinner at the exclusive Alta Club in Salt Lake. Church leaders would attend and speak at Geneva events and facilitated company growth and employee satisfaction.⁴⁹⁴ The church created two new congregations near the mill and in 1954 constructed a new church building to accommodate them.⁴⁹⁵ Geneva demonstrated the transformation of the Mormon ethos of stewardship into an ethos of accumulation, with a toxic red cloud as the

⁴⁹¹ "Fluorine Elimination to Cost Geneva \$2,250,00 for First Two Phases," *Provo Sunday Herald*, April 12, 1953, 1.

⁴⁹² *Ibid.*, 1.

⁴⁹³ Whetten, "Strange Enterprise," 64.

⁴⁹⁴ *Ibid.*, 54, 55, 64

⁴⁹⁵ "Dedication of Geneva and Geneva Second Wards Chapel," July 25, 1954. Archives, Church Historical Department.

new symbol of a “blossoming” culture. Utah Mormons had shifted into a belief system that held nature as a resource to be exploited for wealth. As they became more like other Euro-Americans, many Mormons began to interpret economic freedom as “a license to savage the physical environment in their quest for wealth,” in the words of Mormon historian Thomas Alexander.⁴⁹⁶ Air, water, and earth existed primarily to be made into commodities rather than to serve as a sacramental medium for making saints.

Still, by the end of the 1950s, Geneva’s best days were over. Poor management choices, a failing steel market, and mounting concern over the negative effects of mill emissions began to erode the mill’s profits and its perceived role in the community. Although Geneva had brought jobs and wealth to Utah County, it was an undeniable blight on the landscape. Some felt ambivalent about the plant, but found the smoke and pollution unsettling. This ambivalence gradually turned into downright disdain. One resident remembers, “In that maelstrom of dust, noise and menacing machinery it was like standing at the gates of hell.”⁴⁹⁷ Meanwhile, concern about industrial pollution was spreading across the country. In 1955, a federal Air Pollution Control Act funded research, and acts of 1963 and 1967 began the process of controlling sources of pollution with interstate implications.⁴⁹⁸ In 1962 the immensely influential book *Silent Spring*, in which ecologist Rachel Carson described the poisonous effects of chemicals in the atmosphere, sold two million copies and generated outrage especially among American

⁴⁹⁶ Alexander, “Sylvester Q. Cannon,” 490.

⁴⁹⁷ Glazier, “United States Geneva Works,” op. cit.

⁴⁹⁸ “Evolution of the Clean Air Act,” United States Environmental Protection Agency, <https://www.epa.gov/clean-air-act-overview/evolution-clean-air-act>

women.⁴⁹⁹ In 1967, the liberal-leaning Utah Legislature passed the first measure to “abate and prevent” air pollution—the Utah Air Conservation Act, which provided for an air conservation committee to set and enforce standards. However, skepticism over the makeup of the committee (two members represented fossil-fuel companies and one represented Geneva) turned out to be justified. Initially, the committee came up with a fairly lenient set of regulations: small fines for violations, long appeal times, injunctions only as a last resort.⁵⁰⁰

Then in 1970 came the U.S. Clean Air Act, motivated by a nationwide awakening to the dangers of pollution (millions participated in the first Earth Day on April 22, 1970). The Act created the Environmental Protection Agency to set and enforce standards for industrial emissions. The EPA soon found that Salt Lake was one of the ten most polluted cities in America, breathing in a load of nearly 400 tons of SO² per day. A public furor grew, especially as local media dramatically reported on the dangers of SO².⁵⁰¹ The EPA findings directly contradicted Geneva’s claim that their SO² emissions were so low as to be harmless, and that proposed visual contaminant standards could not be met.⁵⁰²

The community crowded into the public hearings of the state Air Conservation Committee. Many protested that they were being too soft on polluters. Officials from Kennecott Copper, which had dug in the Oquirrh Mountains one of the largest open-pit mines in the world, argued that the Air Conservation Committee’s standards were too

⁴⁹⁹ Eliza Griswold, “How *Silent Spring* Ignited the Environmental Movement,” *New York Times Magazine*, September 21, 2012.

⁵⁰⁰ Symposium, 26-27.

⁵⁰¹ “Air Pollution Hearing,” *The Daily Utah Chronicle*, Jan 8, 1970, 1.

⁵⁰² “Pollution Approach Endorsed,” *Provo Daily Herald*, January 9, 1970. 1.

strict. When Kennecott's general manager J.P. O'Keefe claimed in a Salt Lake hearing that the mine and its smelters were not a major polluter, he "caused an outbreak of laughter." E.V. Boorman, an attorney for U.S. Steel, represented Geneva at the hearing and repeated his claim that while Geneva did not emit harmful quantities of sulfur dioxide, the mill could not comply with more stringent standards. Witnesses counter-charged that the committee was in cahoots with polluting industries and that Geneva's representative on the committee, one Lloyd G. Transtrum, had devised the sulfur dioxide standard himself.⁵⁰³

By 1972, the committee could not deny that industrial point sources were emitting 947 tons of particulate within Utah county per year, but only 600 in Salt Lake county. This meant that nearly a thousand tons of air pollution particulates could be traced to specific locations, like factories or industrial plants. However, Utah county produced 6,735 tons of total particulate emissions, 4,068 of which came from metallurgical industries.⁵⁰⁴ The largest concentration of particulate concentration was found in Provo, and 90 percent of the particulate emissions in Utah county came from "industrial processes," along with electrical power generation: Geneva was thus the major culprit. By 1972, the Conservation Committee's implementation plan was complete. They reported that technologies to limit emissions were insufficient and found no just reasons for delaying the installation of such technologies.⁵⁰⁵ Still, the company stalled on making

⁵⁰³ "Kennecott Target at Air Pollution Hearing," *Provo Sunday Herald*, January 11, 1970, 8.

⁵⁰⁴ "Utah Implementation Plan: Encompassing a Mechanism and Schedule for Achieving Ambient Air Quality Standards Throughout the State of Utah Pursuant to Section 110 of the Federal Clean Air Act," Division of Health, Utah Department of Social Services, January 20, 1972. Appendix C.

⁵⁰⁵ "Utah Implementation Plan," 12.

the investments. Then, in 1978, the EPA labelled Utah county as a nonattainment area and in violation of the Clean Air Act. Particulate and carbon monoxide levels in the atmosphere exceeded EPA standards.⁵⁰⁶ Geneva started a public-relations campaign in response, publishing a booklet “Geneva and Our Environment,” claiming that Geneva’s managers had always sought to maintain optimum environmental conditions.⁵⁰⁷

Geneva’s response was typical of industrial pushback on the new tide of environmental regulation across the nation. Local residents and governments, concerned about the loss of jobs and revenue, often joined the pushback.

The tension over Geneva represented the growing battle between industry and the environment waged in communities all over the United States and particularly the Southwest during this period. But in Utah, the conflict took on a religious dimension. In 1975, LDS prophet-president Spencer W. Kimball gave a landmark sermon in which he decried the environmental degradation that had become so prevalent. “When I fly over the vast and beautiful . . . I have the feeling that the good earth can hardly bear our presence upon it.” heInIn a familiar argument, he then connected pollution to immorality: “[Church leaders] constantly cry out against . . . pollution of mind, body, and our surroundings.”⁵⁰⁸ Kimball and other church leaders, however, did not publicly name Geneva or any of Utah’s other polluters. The church’s public relations stayed relatively

⁵⁰⁶ C. Arden Pope, “Respiratory Disease Associated with Community Air Pollution and a Steel Mill,” *American Journal of Public Health* 79, no. 5 (May 1989), 624. See also C. Arden Pope, “Respiratory Hospital Admissions Associated with PM10 Pollution in Utah, Salt Lake, and Cache Valleys,” *Archives of Environmental Health* 46, no. 2 (March-April 1991), 90-97.

⁵⁰⁷ Whetten, “Strange Enterprise,” 64.

⁵⁰⁸ Spencer W. Kimball, “The False Gods We Worship,” *Ensign*, June 1976, <https://www.churchofjesuschrist.org/study/ensign/1976/06/the-false-gods-we-worship?lang=eng>

neutral on the air quality issue. Mormon leaders recognized the problem but remained vague about it.

Geneva continued to pump particulates into the air over Utah county for the next decade. However, cracks did begin to appear in their ability to keep up with changing industry standards. In the mid-1980s, United States steel manufacturing began to decline. Foreign industries in countries like China, and South Korea had begun eating into America's share of the global economy. As energy costs rose, the American car production declined, and electronic manufacturing grew, the American steel industry suffered.⁵⁰⁹ Rumors of Geneva's failure floated around Utah county. Many believed the plant would be bought out by a Korean manufacturer, but U.S. Steel guaranteed its Geneva employees and the state they would remain open for at least another five years.⁵¹⁰ Geneva did shut down in 1986, but only temporarily. Workers remained skeptical the plant would last much longer, while others hoped it would die much sooner.

The conflict over air quality reached an inflection point when Brigham Young University held a Clean Air Symposium in February 1989. Featured speakers included C. Arden Pope, an energetic young BYU economist; Linda Clark, president of the Utah County League of Women Voters; Hugh W. Nibley, a religion scholar from BYU; and Joseph Cannon, the CEO of Geneva.⁵¹¹ The symposium set up something of a showdown between clean air advocates and Geneva—and set off a firestorm in the community. Linda Clark spoke about community efforts to clean up the air. She claimed that when she approached Geneva about cooperating with her group's efforts, they accused her of

⁵⁰⁹ Vaclav Smil, *Made in America: The Rise and Retreat of American Manufacturing*, Cambridge, MA: The MIT Press, 114-115.

⁵¹⁰ J.J. Jackson, "Geneva Workers Try to Cope," *Provo Daily Herald*, Dec. 17, 1985, 1.

⁵¹¹ "Clean Air Symposium Draws Experts," *Orem-Geneva Times*, February 15, 1989, 1.

trying to shut down the plant. She also blamed Geneva for stoking conflict between clean air advocates and Geneva supporters. “We all want clean air,” she said, “and good jobs for everyone.”⁵¹²

C. Arden Pope reported on his research linking air pollution to hospital admissions in a paper that came under severe scrutiny during a question-and-answer period.⁵¹³ Pope had conducted the bulk of his research during and after a 1987 hiatus in Geneva’s operations. He found that when PM10 levels exceeded the 150 per million-mark, average hospital admissions for children nearly tripled and increased forty-four percent for adults. Children’s admissions were “two to three times higher” and PM10 levels were double what they were than when the plant was closed. The study also raised questions about the EPA’s standards, as the rate of child admissions was still high even when PM10 levels fell below the 150 mark—implying that 150 may not be a safe threshold. Pope conceded that winter cold might have something to do with the higher admissions, but he also pointed out that the seasonal winter inversions were unusually mild during the two winters that Geneva was shut down. In any case, PM10 levels in the area nearly doubled once the plant was re-opened, and child admissions soared by 200 to 300 percent.⁵¹⁴

The last speaker, Joseph Cannon, had been an environmental lawyer and administrator of air-pollution enforcement at EPA in the Reagan Administration. During his tenure there, EPA had come under widespread attack for soft treatment of polluting

⁵¹² Patrick Christian, “State, Industry Both Resisting Air Efforts,” *Provo Daily Herald*, February 17, 1989, 7.

⁵¹³ “Unity Sought in Fight to Rid Utah of Polluted Air,” *Provo Daily Herald*, February 17, 1989, 2.

⁵¹⁴ Pope, “Respiratory Disease,” 623, 625, 628.

industries, “slow-walking” regulation of pollutants, and “hiding behind complexity and a lack of time” in enforcing the law. Cannon’s main priority was campaigning against second-hand tobacco smoke rather than industrial pollution. He advocated turning over most standard-setting and enforcement to states and localities with an “oversight” role for EPA, which critics argued would create inequities and massive interstate conflicts.⁵¹⁵ At one air pollution seminar he had asked the surprising question, “Is there a public health need to control toxic air pollutants?”⁵¹⁶ In later years, Cannon, a member of a prominent Mormon family, became chair of the Utah Republican party and a Republican candidate for the U.S. Senate. In the meantime, this former manager of air pollution control at EPA led a consortium of investors to purchase Geneva from USX in 1987.

As a college student, Cannon interned with the ultra-conservative Fund for American Studies in Washington, D.C., an experience he says was “really transformative in my life.” There he was exposed to the writings of libertarian/conservative philosopher Frank Meyer, who defined freedom negatively as a lack of constraint by the social order. “Freedom and traditional order can exist only in tension,” Meyer taught, attacking “centralized regulation” as incompatible with freedom.⁵¹⁷ These ideas, according to Cannon himself, are “the heart of my life, my entire belief system, in addition to a huge [Mormon] religious component.”⁵¹⁸ Cannon’s creed has clear affinities with the mindset

⁵¹⁵ Joseph A. Cannon, “Closing Remarks,” *Journal of the Air Pollution Control Association* 36 (1986), issue:9, 996, DOI: 10.1080/00022470.1986.10466152

⁵¹⁶ Joseph A. Cannon, “The Regulation of Toxic Air Pollutants A Critical Review,” *Journal of the Air Pollution Control Association* 36 (1986), issue 5, 562-573.

⁵¹⁷ Frank S. Meyer, *In Defense of Freedom: A Conservative Credo*, Carmel, IN: Liberty Fund, 1962, 58.

⁵¹⁸ “From Beach Bum to Businessman, Joseph Cannon Is Making the Difference,” News, *The Fund for American Studies*, April 25, 2016.

of the “total frontier experience” (TFE), which is distrustful of government constraints on the freedom of the individual. The legacy of frontier settlement, according to TFE theory, “cuts across the urban-rural cultural divide” as a key influence on American conservatism.⁵¹⁹ Although he is no frontiersman, Cannon nevertheless exemplifies the persistent TFE belief system that rejects institutional limitations on freedom of action and predictably leads to environmental degradation. In Cannon, the mentality of the Western frontier and the mentality of the entrepreneur combine around an idea of nature as something to be “used.” Environmental historian Jason W. Moore says, “The frontier movement is absolutely central to understanding capitalism as an ecological regime.”⁵²⁰ The “total-frontier” mindset manages the environment as a short-term source of wealth while discounting the long-term effects of its exploitation. Thus, an untroubled entrepreneur like Joseph Cannon accumulates capital by degrading the environment. He was arguably the type of the “hunter-hero” of the frontier (Richard Slotkin’s phrase), whose life is lived for “individual exploit” with the “moral privilege to act on his own initiative . . . without being bound by the constraints of moral or civic order.”⁵²¹

Feeling under attack at the Clean Air symposium, Cannon claimed to be the victim of an “academic lynching.” He argued that Geneva was willing to make any adjustments necessary, but that EPA air-pollution standards were too much in flux and fraught with uncertainty. “Our intent, our desire, our commitment is to move as fast as

⁵¹⁹ Bazzi, et al., *Total Frontier Experience*, 2.

⁵²⁰ Jason W. Moore, “The Socio-Ecological Crises of Capitalism,” in *Capitalism and Its Discontents: Conversations with Radical Thinkers in a Time of Tumult*, Sasha Lilley, ed. (Oakland, CA: PM Press, 2011), 4.

⁵²¹ Richard Slotkin, *Gunfighter Nation: The Myth of the Frontier in Twentieth-Century America* (Norman, OK: University of Oklahoma Press, 1998), 34.

humanly possible once we know what the plan is.”⁵²² At that time, Congressional Democrats and Republicans were fighting over amendments to the Clean Air Act that would address the problem of “acid rain” produced by emissions from plants like Geneva. (Geneva’s ally Utah Republican Rep. Howard Nielson was watching out for Geneva’s interests in Congress.⁵²³) In addition, Utah regulators were reviewing their own standards. Cannon argued that Geneva had no reason to do any more: the blame lay with government, not with the plant. Geneva, he claimed, was necessary to the region and to the nation as a whole. “You *need* steel,” he emphasized—adding sarcastically, “The file cabinets used to store your ‘learned’ works are of steel.”⁵²⁴ With reference to Geneva’s violations of the Clean Air Act, Cannon congratulated himself and the firm for not disputing them; instead, they were trying to “reduce the red cloud.” He admitted that Geneva was a “larger part of the problem” than other pollution sources but insisted that the problem was not Geneva’s alone and needed to be solved by a “community approach.”⁵²⁵

Cannon’s defensiveness was due to the presentation that took place just before he took the podium. Hugh Nibley, a small, elderly BYU religion professor, gave what was probably the most devastating public attack ever made on Geneva. Nibley’s reputation bordered on the legendary in LDS religious education circles. Although he was never a high-profile leader in the church, his scholarship had earned him nearly the same level of

⁵²² Sharon Morrey, “Cannon Says He’s Frustrated and Doing All He Can,” *Provo Daily Herald*, February 17, 1989, 7.

⁵²³ “New Plans Don’t Satisfy Geneva Critics,” *DN*, May 15, 1988

⁵²⁴ Morrey, “Cannon,” 7. It is impossible to tell why Morrey used the quotes around “learned” in Cannon’s quote, but it seems likely that Cannon may have used air quotes to show his contempt.

⁵²⁵ *Ibid.*, 7.

respect among members. A specialist in Near Eastern languages and ancient religious symbolism, he was seen as a champion apologist for Mormonism. His books and essays on links between Mormon doctrines and early Christianity were too recondite for most, but he was witty and popular as a defender of the Church. Mormon periodicals and publishers enthusiastically peddled his writing, making him one of the most revered teachers in the community. To this day, many faithful Mormons proudly display Hugh Nibley's collected works on their bookshelves next to their Bible and Book of Mormon.

Nibley had spoken out against pollution periodically for years, often referencing Brigham Young's views on stewardship as a religious duty. He maintained he had moved to Utah from California in order to vacation in Utah's wilderness. Two years after the first Earth Day celebration, in 1972, he published an essay entitled "Brigham Young on the Environment" in which he called attention to Brigham Young's numerous teachings on environmental conservation, specifically Young's teachings on the importance of clean air and its role as the "greatest sustainer of life. He also poignantly illustrated how Mormon scripture spiritualized the earth, taught that it was a prototype of heaven, and stressed that environmental pollution was a consequence of moral pollution in a degraded, materialistic culture.⁵²⁶

Nibley's speech at the symposium was entitled "Stewardship of the Air." He reviewed ancient myths such as the rape of Persephone that associated foul air with evil forces. He put a modern spin on the tale: "Pluto, in his black *quadriga* or black stretch limousine sweeps out of his subterranean realm amidst choking clouds of sulphur

⁵²⁶ Hugh Nibley, "Brigham Young on the Environment," in *To the Glory of God: Mormon Essays on Great Issues* (Salt Lake City: Deseret Book Co., 1972), 4, 5, 6.

dioxide, carbon monoxide, and assorted particles” to take Persephone, the embodiment of “everything that is fresh, beautiful, green, young and growing” to the underworld.

Everyone knew what Nibley was talking about: Pluto, in raping the earth and poisoning the air with toxic fumes, stood for Geneva. He reviewed the history of mining throughout the ages, how it turned laborers into miserable slaves and the environment into a wasteland. Recalling Norse mythology, he told of the Nibelungs, “hideous dwarfs who mined, smelted, and forged deep within the earth.” He said, “The workers are not the culprits, but the pawns of owners, who use them to justify profitable pollution while hiring as few workers as possible and paying them as little as possible.” Updating the story, he pointed out that “the great fortunes that made America a world-class power were paid for by mill towns in which life was very near to hell.”⁵²⁷

Nibley criticized Geneva’s public relations efforts as lies and labeled their effort to self-identify as “part of the community” as cynical ploys to preserve their own interests. He quoted Shakespeare to denounce the materialism of the “pillars of society” who supported the plant: “Gold can make ‘black white, foul fair, wrong right, base noble, old young, coward valiant’ . . . it can turn scoundrels to senators; and, most to the point, it can transmute the foulest stench into the balms and spices of an April day.” He castigated Utah Senator Jake Garn, a devout Mormon, “who says that we should all learn to live with corporate pollution lest we jeopardize the profits of big business.”⁵²⁸ He also quoted some of Mormonism’s most revered leaders, including Brigham Young and Spencer W. Kimball, reciting Young’s decree to “strive to preserve the elements from being

⁵²⁷ Hugh Nibley, “Stewardship of the Air,” in *Brother Brigham Challenges the Saints*, Don E. Norton, Shirley S. Ricks, eds. (Salt Lake City: Deseret Book, 1994), 60-61.

⁵²⁸ Nibley gives no source for Garn’s comment.

contaminated by the filthy, wicked conduct and sayings of those who pervert the intelligence God has bestowed upon the human family.”⁵²⁹ He referenced Kimball’s 1975 sermon on the importance of conservation and the earth’s increasing inability to “bear our presence upon it” and reiterated Kimball’s teaching that pollution was “intolerable in the sight of the Lord.” Nibley even panned Geneva’s renowned support for local charities: “A far better gift than cash handouts to our nature-loving Boy Scouts . . . would be ‘the clear blue sky [arching] over the vales of the free.’”⁵³⁰ The only problem, Nibley noted, was that “clear blue skies cost much more than highly publicized handouts.”⁵³¹

At the heart of Nibley’s speech was a critique of the mentality that kept Geneva alive. Nibley was not attacking the work of the mill itself, or even its owner’s reluctance to rein in its emissions. He was attacking the obsession of his own Mormon people with prosperity at any price. “The mill is not beautiful and for most of us, has precious little utility,” he flatly remarked. What can justify turning Utah Valley into a “receptacle for tons of industrial filth, that must be inhaled by 250,000 people with every breath?” He answered his own question: “The one and only thing which is not good of itself and not useful of itself but is prized above all else—it is money.”⁵³² Someone had finally said it. Nibley had called out not only Geneva, but all of Utah county and the culture of the Wasatch Front. Essentially, he asserted that the Saints had abandoned their identity and their covenants in favor of a pecuniary identity and commitment. He implied that the

⁵²⁹ Nibley, “Stewardship of the Air,” 56, 59, 64.

⁵³⁰ A quotation from a well-known Mormon hymn, “O Ye Mountains High.”

⁵³¹ Nibley, “Stewardship of the Air,” 56, 70.

⁵³² *Ibid.*, 64-65, 68.

community, the vast majority of which claimed to be faithful members of the LDS faith, were selfish to the point of self-destruction.

And their unhealthy obsession with Geneva was not the only example of this selfishness, Nibley pointed out. He also condemned the highway billboards that ruined the county's once-bucolic landscape and an "anti-wilderness league" that fought against the preservation of natural spaces. The Saints, Nibley implied quite strongly, had betrayed themselves by abandoning the "stewardship of the air" for "smoke-blackened skies joyfully hailed as the sign of prosperity and progress."⁵³³

The blowback on Nibley's speech was intense. Letters and comments poured in denouncing the speech—so much so, that the scholar felt the need to offer a public response. He apologized to Cannon personally and then published a public apology in the local newspaper just days after the symposium. While he was sorry that Geneva workers thought he had depicted them as "hideous and deformed dwarves" (unintended, he said), he also made it clear that he was not sorry at all for his attack on the mentality that kept Geneva alive. "Recently, indignant citizens have been reminding me of 'what made this country great.' Unfortunately, they can only tell me what has made it rich—a very different thing."⁵³⁴

The symposium did nothing to change Cannon's mind: "Our position is what it's always been. We're willing to do our part" and "I was surprised at Hugh Nibley's indictment."⁵³⁵ At a town meeting two months after the symposium, Utah's Republican

⁵³³ *Ibid.*, 62, 68-9.

⁵³⁴ "Hugh Nibley Explains Comments," *Provo Daily Herald*, February 23, 1989, 16.

⁵³⁵ "Reaction," *Provo Daily Herald*, February 17, 1989, A2.

Senator Orrin Hatch, a devout Mormon, stood up for the plant. After an attendee angrily blamed Geneva emissions for making his family sick, Hatch responded unsympathetically. “Let’s not be penny wise and pound foolish and start demagoguing against an industry that annually brings in \$1 billion to the valley,” he said.⁵³⁶ “If Geneva doesn’t last,” he charged, “it will affect this whole country,” making the West Coast a “sieve” for foreign steel imports. He went on to accuse local politicians, including Utah County Commissioner Brent Morris, also a devout Mormon and an advocate for improved air quality, of using the Geneva issue as a “launchpad” to run for higher office. He praised Geneva for attempting to meet EPA standards and praised himself for his role in re-opening the plant in 1987, “one of the most important” of his accomplishments.⁵³⁷ Hatch was a reliable vote in the Senate to defend generators of acid rain and other pollutants against regulation.⁵³⁸

Editorials and letters to newspapers came pouring in, mostly supporting Hatch and his stance on Geneva. One such editorial claimed that Geneva was doing all it could “in good faith.”⁵³⁹ Then another letter answered on the side of air quality, claiming Hatch was ignoring Pope’s study and in cahoots with CEO Joe Cannon, who had made significant contributions to Hatch’s 1988 reelection campaign. Hatch had never even met with clean air advocates, the writer charged, getting all his information from his “good friends at Geneva Steel.”⁵⁴⁰ A group of women who called themselves “Geneva wives”

⁵³⁶ “Crowd Attends Hatch Town Meeting,” *Orem-Geneva Times*, April 26, 1989, 1.

⁵³⁷ “Sen. Hatch Says Geneva Needs Community Support,” *Provo Daily Herald*, April 25, 1989, 1.

⁵³⁸ See “Orrin Hatch: National Environmental Scorecard,” League of Conservation Voters, <https://scorecard.lcv.org/moc/orrin-g-hatch>

⁵³⁹ “Clean air—It Will Take More Than Talk,” *Orem-Geneva Times*, May 31, 1989, 2.

⁵⁴⁰ “Senator Hatch’s Motives Questioned,” *Provo Daily Herald*, June 6, 1989, 10.

responded, calling Hatch courageous and dismissing the criticisms from a “minority of citizens.” The Geneva wives also criticized Pope’s study itself, claiming that his information was incomplete. They cited no data in support of this claim, instead pointing to findings of the Bureau of Economic and Business Research that Geneva contributed 6,900 jobs and \$216 million to the local economy.⁵⁴¹ The battle over Geneva steel had “reached a stalemate,” Nibley said. “Each side accuses the other of being insufficiently informed, and both are right.” As for himself, he said, “I no longer worry much about Geneva. The only time it really gets to me is on those sweet spring nights when every breath from the west reminds me of what I am missing. Unfortunately, breathing is not optional.”⁵⁴²

The great irony was that Geneva was actually becoming less and less important to the local economy. The troubles that had begun during the 1980s never completely went away. From 1990 to 1993, the plant dove head first into a pile of debt to finance \$287 million worth of improvements.⁵⁴³ In July of 1992, Geneva stock fell to \$9.13, just slightly above its all time low of \$7.86 and well below where it had been just a few months earlier at \$21 per share.⁵⁴⁴ Disputes with labor unions also hindered Geneva’s production.⁵⁴⁵

⁵⁴¹ “Hatch Showed Courage by Supporting Geneva,” *Provo Daily Herald*, June 13, 1989, 10.

⁵⁴² “Hugh Nibley Explains Comments,” op. cit.

⁵⁴³ Utah’s Geneva Steel. Congressional Record Daily Edition, 1991.

⁵⁴⁴ Steven Oberbeck, “Recession Gets Blame as Geneva Steel Stock Takes Tumble; Recession Blamed as Geneva Steel Stock Takes Dive,” *The Salt Lake Tribune*, July 24, 1992, B9.
<http://login.ezproxy1.lib.asu.edu/login?url=https://www-proquest-com.ezproxy1.lib.asu.edu/newspapers/recession-gets-blame-as-genevas-steel-stock-takes/docview/288485681/se-2?accountid=4485>.

⁵⁴⁵ “Geneva Steel Co.” *Wall Street Journal*, August 27, 1993 <https://www-proquest-com.ezproxy1.lib.asu.edu/docview/398474125?accountid=4485>.

Geneva continued to wage a public relation's war into the 1990s in an effort to stay relevant. A 1990 study that claimed the plant's 1986 shutdown had not affected retail sales nor hindered new construction in Utah County and that air pollution from Geneva was deterring economic growth.⁵⁴⁶ Geneva responded by publishing a pamphlet called "A Brief History of Geneva Steel." The widely distributed pamphlet laid out all the improvements management had made to clean up their emissions and blamed cars for the unhealthy air in the valley, a claim which was certainly in part true.⁵⁴⁷

Geneva represented an ideological battle between stewardship and entrepreneurialism. While the plant certainly had its detractors, many households and businesses depended financially on Geneva. Cannon was personally popular due to his image as savior of Geneva. He came close to winning the Republican nomination for U.S. Senator in 1992. But the controversy was also ideological, ultimately based in broader arguments over secular entrepreneurialism versus a sacred stewardship of the air. Hugh Nibley again gave voice to the latter:

Where the Saints once converted the plain into a garden, blossoming as the rose. . . smelters, refineries, and mills go on impudently pouring foul industrial wastes into the air space of the valleys—obscuring the 'mountains high and the clear blue sky' with foul, choking, miasmatic fumes, and claiming immunity from all restraints on the grounds that attempts to limit the pollution cut into profits.⁵⁴⁸

Geneva helped make the air in over Utah Valley the worst in the state, regularly doubling that of Salt Lake Valley to the north. Due to the peculiar topography of Utah Valley, southern breezes trapped the "chemical soup" of pollutants against the bowl

⁵⁴⁶ Whetten, "Strange Enterprise," 69.

⁵⁴⁷ "Geneva Steel Timeline," *Provo Daily Herald*, November 10, 2001.

⁵⁴⁸ Hugh Nibley, *Approaching Zion* (Salt Lake City: Deseret Book, 1989), 161, 163.

formed by the surrounding mountains.⁵⁴⁹ Despite the omnipresent red cloud, Geneva kept gasping along through the 1990s as air quality continued to worsen. In 1990 the company went public, returning to Cannon's consortium 133 percent of their investment.⁵⁵⁰ No mention was made of the air-pollution issue in the public-offering documents, other than the need to meet EPA standards.⁵⁵¹ In 1996, the Utah Division of Air Quality reported that the major Wasatch Front counties were violating the standards for sulfur dioxide, PM10, and ozone. This meant that 77 percent of Utahns were breathing overly polluted air. Geneva was by far the most important source of carbon monoxide, pumping 25,323 tons of it into the air, along with 1,043 tons of PM10 in 1994.⁵⁵²

After more than a decade of financial struggle, Joe Cannon stepped down as CEO in April 2001 and idled the plant. Orrin Hatch once again tried to resurrect it; along with Cannon's brother, Congressman Chris Cannon, the two fiscal conservatives pushed for federal aid to assist the mill.⁵⁵³ It was too late. Geneva was dead, and in 2002 bulldozers and explosives finally brought it down. David Bigler, a public relations officer for Geneva, would later claim that air pollution had ended Geneva.⁵⁵⁴ Many lamented the

⁵⁴⁹ C. Arden Pope, "Particulate pollution and health: a review of the Utah valley experience," *Journal of Exposure Analysis and Environmental Epidemiology* 6, no. 1 (Jan-Mar 1996): 23; Caleb Warnock, "Why Is Provo Air Pollution So Much Worse than Salt Lake?" *Provo Herald*, March 6, 2014.

⁵⁵⁰ "Geneva Steel History," *Funding Universe*, <http://www.fundinguniverse.com/company-histories/gen\eva-steel-history/#:~:text=On%20March%2027%2C%201990%2C%20Geneva,York%20and%20Pacific%20Stock%20Exchanges>

⁵⁵¹ Grant R. McQueen, Brent D. Wilson, "Geneva Steel: Initial Public Offering," *Journal of Financial Education* 22 (Spring 1996): 84.

⁵⁵² 1994 Utah Air Emission Inventory, Utah Division of Air Quality, Department of Environmental Quality, 1996, 73.

⁵⁵³ "Hatch, Cannon Seek Help for the Industry," *Provo Daily Herald*, November 10, 2001, 5.

⁵⁵⁴ Whetten, "Strange Enterprise," 65.

loss of jobs that had helped define Utah county culture for decades, but for the most part, Utahns were breathing easier.

In the six months after Geneva closed, air quality improved substantially even during the seasonal inversion.⁵⁵⁵ Emissions from industrial combustion dropped dramatically after Geneva closed. The plant had processed coal into coke for steel manufacturing, but when this processing ended, industrial pollution fell from 5.1 million metric tons of CO₂ to 1.4 million from 2000 to 2005. The Center for Climate strategies attributed this decrease to the closing of Geneva.⁵⁵⁶ The mill's closing did not damage Utah valley's economy nearly as much as many expected. In fact, in the decades since the closing of Geneva, Utah Valley has remade itself into a high-tech center. Major tech companies such as Microsoft, Adobe, and Oracle, have opened offices in the valley, earning it the the nickname "Silicon Slopes" as an alternative to tech hubs in northern California and Washington state. Of course, the result is more sprawl, heavier traffic, and more air pollution from vehicles—Utah County grew by nearly 30 percent between 2010 and 2020.⁵⁵⁷

Geneva still looms large over the valley. In 2004, Geneva and US Steel agreed to clean up the site, which was polluted with "lead, nickel, zinc, arsenic, various organic solvents and hazardous petroleum products, as well as acids and other byproducts," at a

⁵⁵⁵ Jared Cowley, "Study Reveals Mill's Impact on Air Quality," *Provo Daily Herald*, July 11, 2002, 1.

⁵⁵⁶ Stephen Roe, Randy Strait, Alison Bailie, Holly Lindquist, Alison Jamison, "Utah Greenhouse Gas Inventory and Reference Case Projections, 1990-2002," Center for Climate Strategies, 2007, 5.

⁵⁵⁷ Connor Richards, "Utah County Leads State Population Growth," *Ogden Standard-Examiner*, December 6, 2020.

cost of \$30-42 million.⁵⁵⁸ Geneva was to pay \$12 million and US Steel up to 75 percent of the “remaining cost” to reclaim the site. The project was to be completed within “two to three years”; nevertheless, it took seven years to remove the mill itself, and cleanup of toxic waste continues at this writing, eighteen years after demolition of the mill.⁵⁵⁹ In November 2019, the Utah Department of Environmental Quality ordered a break in the clean-up efforts to give residents a respite from carcinogens and nauseating smells produced as workers stirred up smelly and toxic plumes of naphthalene and benzene. When ingested, naphthalene can cause kidney and liver damage and benzene is a known carcinogen.⁵⁶⁰ Workers were required to wear air-monitoring badges to ensure their safety. In December 2019, further clean-up work was indefinitely postponed.⁵⁶¹

Despite the reduction of coal power plants, smelters, and the steel mill, air quality remains a major issue along the Wasatch Front. In 2013, Salt Lake City made national headlines when a toxic inversion engulfed the city. Air quality reached the poorest levels in the entire country with 130 micrograms of particulate per cubic meter. The “safe” level according to the EPA was 35.⁵⁶² As in the 1990s, headlines regarding poor air quality

⁵⁵⁸ N.S. Nokkentved, “A Toxic Legacy of 58 Years of Steel Making May Be Seeping Toward Lake,” *Provo Daily Herald*, September 21, 2003, A1.

⁵⁵⁹ Dave Anderton, “Geneva Cleanup Plan Ok’D,” *DN*, July 8, 2004; Genelle Pugmire, Karissa Neely, “Growth of Vineyard Necessitates Cleanups, Adjustments,” *Provo Daily Herald*, August 24, 2018.

⁵⁶⁰ Naphthalene, National Pesticide Information Center <http://npic.orst.edu/factsheets/naphgen.html#body>; “Public Health Statement on Benzene,” Agency for Toxic Substances & Disease Registry, <https://www.atsdr.cdc.gov/phs/phs.asp?id=37&tid=14>.

⁵⁶¹ “Cleanup at Old Geneva Steel Mill Will Shut Down until After the Holiday Because of a Bad Smell,” *Salt Lake Tribune*, November 13, 2019; Amy Joi O’Donoghue, “Utah Regulators Ask Remediation Work at Former Geneva Site to Cease,” *DN*, December 20, 2019.

⁵⁶² “Salt Lake City Being Smothered by Smog: What It Could Mean for City,” CBS News, January 25, 2013.

frequently pop up.⁵⁶³ Refineries still dot the landscape just north of Salt Lake City, but automobile commuting is now the major offender. PM2.5, a smaller particulate than the PM10 that Geneva was known for, is the primary and most concerning pollutant in Utah's inversions. Roughly thirteen percent of the PM2.5 in Wasatch inversions comes from point sources—industrial or commercial facilities. Forty-eight percent however comes from non-stationary sources like planes, trains, and of course cars. Automobiles, along with other “non-road vehicles and industrial sources, contribute to high Nitrogen levels, which contribute to PM2.5. Cars are also the primary source of carbon monoxide, which have measurable effects on human health if large enough amounts enter the lungs and blood stream.⁵⁶⁴ Current efforts to clean the air include moderate improvements to public transportation and a state incentive to encourage drivers to use Tier 3 gasoline, which lowers sulfur content from 30 ppm to 10 ppm and is thought to produce cleaner emissions.⁵⁶⁵ However, Utah recently imposed a highway user fee on hybrid and electric vehicles, which seems a disincentive to clean air. Already upset at the expiration of a tax break on clean-fuel vehicles, owners are nonplussed. One owner spoke of the fee as “a huge slap in the face to me, who out of a sense of civic duty, am trying to make decisions to help clean up the air.”⁵⁶⁶ While some legislators contribute to moderate improvements,

⁵⁶³ See for example Dan Frosch, “Seen as Nature Lover’s Paradise, Utah Struggles with Air Quality,” *New York Times*, February 23, 2013.

⁵⁶⁴ “Understanding Utah’s Air Quality,” Utah Department of Environmental Quality Division of Air Quality, <https://deq.utah.gov/communication/news/featured/understanding-utahs-air-quality>, accessed 5/25/2021.

⁵⁶⁵ Lee Davidson, “Herbert Urges Utahns to Buy Only Less-Polluting Tier 3 Gas,” *Salt Lake Tribune*, January 10, 2020.

⁵⁶⁶ Art Raymond, “Advocates Fume as New Fee on Clean Fuel Vehicles in Utah Kicks In January 1,” *DN*, December 16, 2018.

others seem to back-pedal on air-quality issues. The largest donors to political campaigns for politicians in the Utah Legislature are now commercial property developers, the billboard companies, and the automobile-dealers association, interests who are not likely to have air-pollution control at heart.⁵⁶⁷

The tension in the culture of the Wasatch Oasis over air pollution arises from three sources. First, the religiously inflected, Euro-American narrative of entrepreneurialism; second, the morally motivated narrative of environmentalism; and third, a distinctively Mormon narrative of “stewardship.” The first narrative arises from the Protestant prosperity ethic, associated with political conservatism, that dominates much American thinking about the environment. According to that narrative, the God-given dominion over the earth licenses human beings to exploit it, leaving the remediation of externalities such as air pollution to divine providence.⁵⁶⁸ A related narrative is the frontier mentality that valorizes individual effort unconstrained by artificial institutional limits imposed by the social order. The thinking of many devout Mormons in the region is shaped by this narrative, which explains why Joe Cannon, Jake Garn, and Orrin Hatch were relatively unconcerned about air pollution. For them, “secular entrepreneurial energy replace[s] sacred stewardship,” in the words of writer-naturalist Stephen Trimble.⁵⁶⁹

⁵⁶⁷ Lee Davidson, “Who Funds Utah Legislators’ Campaigns?” *Salt Lake Tribune*, January 28, 2019.

⁵⁶⁸ See George B. Handley, “Climate Scepticism and Christian Conservatism in the United States,” in *Climate Change Scepticism: A Transnational Ecocritical Analysis*, Greg Garrard, Axel Goodbody, eds. (London: Bloomsbury Academic, 2019), 137.

⁵⁶⁹ Stephen Trimble, *Bargaining for Eden: The Fight for the Last Open Spaces in America* (Oakland: University of California, Press, 2009), 41.

The energy behind “secular entrepreneurialism” drives the “destructive and shortsighted culture of the modern age, which has precipitated the greatest environmental crisis in human existence,” according to eco-theologian Thomas Berry.⁵⁷⁰ Though modeling predicts improvement in Wasatch Front air quality through 2035, emissions will afterward increase “as population growth overtakes technological and regulatory advancements.”⁵⁷¹ When by 2060 six-and-a-half million people are jammed between the mountains and the lakes, air pollution coupled with increasing wildfires may degrade living conditions, leading to the very result the growth advocates don’t want—a deteriorating environment. Inevitably, the crisis will come, and the climate of the Wasatch Oasis will impose its own limits to growth.

The environmentalist narrative starts with a moral obligation to preserve and care for the natural world with the long term in view. The secular foundations of the conservation movement in the early 1900s enabled Protestant and Mormon women to join in campaigning for clean air in the valleys. However, the dominant business ethic led to general enthusiasm over industries like Geneva, and even the “wives of Geneva” disregarded the impact of chemical smoke as long as the revenue stream flowed. Associated with political liberalism, the secular environmental movement has only modest influence within the Wasatch Front community. Still, there are some indications

⁵⁷⁰ Jason M. Brown, “Whither Mormon Environmental Theology?” *Dialogue: A Journal of Mormon Thought* 44, no. 2 (Summer 2011): 67.

⁵⁷¹ “What’s the Future of Utah’s Air Quality?” ABC4News, September 5, 2018. <https://www.abc4.com/news/local-news/whats-the-future-of-utahs-air-quality/>

of change: a 2020 poll shows fifty-six percent of Utahns say air pollution concerns them most, an increase from forty percent in 2011.⁵⁷²

Now, the ecology movement of the late twentieth century has led to a fragile local revival of the stewardship narrative. Its most articulate storyteller, Hugh Nibley, clashed head on with Geneva. His landmark book *Approaching Zion* (Deseret Book, 1989), appearing in the middle of the highly polarized debate over Geneva, charged the Mormon community with abandoning the ideal of Zion for an ideal of “Babylon.” Nibley’s notorious and well-distributed writings have stirred up a memory among many Church members of a theology of sacred stewardship. Nibley framed the problem of pollution simply: “[There are] two opposing concepts of dominion—God’s versus Satan’s. God’s command to have dominion over every living is a call to service, a test of responsibility . . . whereas Satan’s use of force for the sake of getting gain renders the earth uninhabitable.”⁵⁷³ For Brigham Young, the Wasatch Oasis was “the right place” for saint-making, as Nibley put it, “a test of responsibility.” Saints were to demonstrate that they could be responsible for creation in order to become creators themselves. “Stewardship of the air” was their first responsibility; however, the degrading of the air demonstrates a shift in Mormon self-concept from steward to “entrepreneur.” The fact that the Salt Lake Valley often has “the worst air quality in the nation” is an ironic comment on that shift in mindset.⁵⁷⁴

⁵⁷² Kyle Dunphey, “Colorado College Poll Shows Utahns Are Increasingly Concerned with Environment,” *DN*, March 8, 2020.

⁵⁷³ Nibley, *Brother Brigham*, xi.

⁵⁷⁴ Cimaron Neugebauer, “Salt Lake City Has the Worst Air Quality in the Nation,” KUTV News, January 31, 2017, <https://kutv.com/news/local/salt-lake-city-has-the-worst-air-quality-in-the-nation>; AirNow.gov, January 30, 2017, U.S. Environmental Protection Agency.

While the marriage of rationalism and religion in Widtsoe subjugates nature as an object to be analyzed and exploited, Nibley recaptures that theology of responsible stewardship. His work has given rise to a cottage industry of scholars and activists and lent legitimacy within the LDS Church to Young’s project “to improve and make beautiful everything around you.”⁵⁷⁵ A fragmentary network of professors, scientists and lay members, there is a small but forceful group of voices attempting to re-form what it means to be a Latter-day Saint.⁵⁷⁶

For now, these tensions persist in the culture of the Wasatch Oasis, signifying a Mormon self-concept in flux as climate change advances up the social agenda. Although still politically conservative and resistant to checks on secular entrepreneurialism, the culture now seems more amenable to a narrative of stewardship over the air between lake and mountains.

⁵⁷⁵ Nibley, *Brother Brigham*, 319.

⁵⁷⁶ Trent Nelson, “‘Mormon Land’: Eco-Activist Explains Why She and Fellow Mormons Can—and Should—Be Environmentalists,” *Salt Lake Tribune*, November 28, 2018.

Chapter 6

“A Heck of a Way to Run a Desert”

In 1862 Mormons in the Wasatch Oasis endured five months of seemingly never-ending rainstorms. Floods plagued Utah territory from north to south. Raging waters covered streets, washed out bridges, and drowned crops. The floods were no surprise to the settlers, as Brigham Young had urged them to prepare for what was sure to be a wet spring, or “the first we know, some of the people may be washed down into the river.”⁵⁷⁷ The *Deseret News* had warned that snow accumulation in the mountains was “greater than has been known in the last fifteen years,” and that the warm temperatures of late spring mixed with rain could produce a “super-abundance of water.” The *News* continued, “The spring flood may be expected to surpass those of former years and do much damage along the streams” and “those most in danger of being thus visited should lose no time in making every necessary preparation that they may not be overtaken as a ‘thief in the night.’”⁵⁷⁸ Salt Lake City heeded the warnings and residents went to work. They dug ditches along important roads to keep them dry and repaired other ditches and canals to keep water flowing into the Jordan River, the outlet to the Great Salt Lake. They worked especially hard to keep North Temple Street, one of the critical arteries through the city, from washing out.⁵⁷⁹

Three major streams flow down from the mountains through Salt Lake City—Red Butte, Parley’s, and City Creeks. These three streams provided essential irrigation water

⁵⁷⁷ Brigham Young, “Power Given to Man to Create,” March 16, 1862, *JD* 9: 258.

⁵⁷⁸ “A Flood in Perspective,” *DN*, March 19, 1862.

⁵⁷⁹ “Preparing for the Flood,” *DN*, March 26, 1862.

for the Mormons' crops. Even before Brigham Young set foot in the valley, a scouting party of Mormon settlers had dammed City Creek to water their freshly planted potatoes. The efforts to control these streams had begun what Marc Reisner calls "the most ambitious desert civilization the world has seen."⁵⁸⁰ By 1862, Utahns were no strangers to floods. In early June 1852, the spring runoff along the Wasatch Front had swelled the canyon streams to unprecedented levels. Such was the speed and height of the water that mail carriers could not get out of the valley to deliver the mail. A bridge over the Provo River had washed away.⁵⁸¹

The floods of 1862 arrived with a fury that no white person on the Wasatch had ever seen before. By May 7, floods had already caused substantial damage, with more expected. The *News* reported that the Jordan was already eight feet higher than normal, pouring over its banks, and in some places resembled a lake more than a river. The main road north of Ogden to Box Elder County on the northern edge of the Wasatch Front was completely washed out. The Provo River, which fed Utah Lake in the south, destroyed farmland and threatened downtown Provo.⁵⁸² More than a month later Utahns were still dealing with the floods. "It will be fortunate if all the bridges across the principal streams in Great Salt Lake Valley...be not swept away before the flood shall subside," the *News* reported. Despite the constant flow of water into the valley, the tops of the Wasatch were still white with snow, indicating that there was even more to come.⁵⁸³

⁵⁸⁰ Marc Reisner, *Cadillac Desert*, 2.

⁵⁸¹ Journal History of the Church, June 5, 1852.

⁵⁸² "The Spring Floods," *DN*, May 7, 1862.

⁵⁸³ "More Concerning the Flood," *DN*, June 11, 1862.

Sure enough, two weeks later, nearly all bridges were either swept away or underwater. Those that had been spared were saved at great expense. Workers had preserved a critical bridge on the newly completed state road stretching from Ogden to Provo by raising it three feet. Still, damage to the territory's infrastructure made travel between counties almost impossible.⁵⁸⁴ The Jordan River was still rising "two to four inches per day" in late June. Utah Lake was "four or five feet higher than can be shown by the diary of the oldest settler in the valley," drowning crucial farmland. In Davis County, just north of Salt Lake City, floods had damaged farms on some of the "most fertile lands in Deseret." Weber County also suffered considerable damage. The total cost of the destruction from the overflowing streams, the raging Jordan, and the rising lakes was "incalculable."⁵⁸⁵

The rainstorms of 1861-1862 covered the entire western United States. Washington, Oregon, California, and Nevada also experienced unprecedented floods. Weather experts have theorized that a "series of atmospheric rivers" of wet air originating in the tropics (possibly an El Nino event) were responsible for the heavy rains.⁵⁸⁶ Although rare, the wet weather underscored a peculiar danger to residents of the mountainous, semi-arid Wasatch Front: because of landslides and the relative sparseness of vegetation to anchor the soil, debris floods can be ruinous.

⁵⁸⁴ "Destruction of Roads and Bridges," *DN*, June 25, 1862.

⁵⁸⁵ "Continuation and Extent of the Flood," *DN*, June 25, 1862.

⁵⁸⁶ B. Lynn Ingram, "California Megaflood: Lessons from a Forgotten Catastrophe," *Scientific American*, January 21, 2013, <https://www.scientificamerican.com/article/atmospheric-rivers-california-megaflood-lessons-from-forgotten-catastrophe/>

Yet, according to news reports, Utahns did not seem very put out by the floods. The *Deseret News* commented, “The flood of eighteen hundred and sixty-two,” it said, “which will eventually, in all probability, be more beneficial than otherwise to the country, will be measurably forgotten.”⁵⁸⁷ Desert dwellers, as Richard V. Francaviglia points out, “are surprisingly ambivalent about water. Life-giving on one hand, water has a menacing side.”⁵⁸⁸ The early Mormons took floods in stride. Every so often, floods would wreak havoc on farms and homes; but the settlers regarded them as “acts of God,” an inevitable feature of the divine test to which God was putting them in this difficult climate.⁵⁸⁹ The ancient Fremont people apparently looked on flash floods as deadly but also essential to their agriculture; they even worshiped the floods as embodiments of Awanyu, the serpent god of fertility.⁵⁹⁰ The Paiutes told stories about a great flood that had wiped out an evil race of giant cannibals. Similarly, for the Mormons, flood had religious resonances; Francaviglia notes, “The great flood as recounted in Genesis . . . has a moral purpose: it rids the world of iniquity.”⁵⁹¹

The Mormon leaders continually stressed the spiritual purpose of the Wasatch Oasis project. Today, the institutional church proclaims that “all are stewards—not owners—over this earth and its bounty and will be accountable before God for what they

⁵⁸⁷ “Destruction of Roads and Bridges,” *DN*, June 25, 1862.

⁵⁸⁸ Francaviglia, 46.

⁵⁸⁹ Brigham Young, “The Holy Ghost Necessary,” August 17, 1856, *JD* 4: 32.

⁵⁹⁰ Patterson and Hadden, “Mu:kwitsi/Hope Abandonment,” *op. cit.*

⁵⁹¹ Francaviglia, 46.

do with His creations.”⁵⁹² The practice of stewardship was a means of demonstrating an eternal perspective, a sense of responsibility for the creation rather than a propensity to exploit it. True stewardship was preparation for godhood.

The hunger for as much rangeland as possible to maximize private herds was the impulse behind the deterioration of rangelands in the region, which in turn led to more destructive floods. Between 1860 and 1880, free forage on the unmanaged public lands of the West attracted ranchers and their vast herds of cattle and sheep; cattle “baronies” sprang up all over the Western territories. Mormon settlers were not immune to the pull of this apparent source of wealth. The Mormon mayor of Salt Lake, William Jennings, became Utah’s first millionaire in part through cattle breeding.⁵⁹³ However, the narrative of the West as a place to be conquered was very much counter to Young’s narrative of the land as ground for saint-making. Young’s lieutenant Heber C. Kimball described that project as learning to imitate the creator God: “Father Adam was instructed to multiply and replenish the earth, to make it beautiful and glorious, to make it, in short, like unto the garden from which the seeds were brought to plant the garden of Eden . . . and if we are the Lords of this creation under Adam, ought we not to take a course to imitate our Father in heaven?”⁵⁹⁴

The Latter-day Saint concept of selfhood was to be an embryonic “lord of creation,” that is, a creator with godlike power in the eternities. Those who intentionally

⁵⁹² “Environmental Stewardship and Conservation,” The Church of Jesus Christ of Latter-day Saints, <https://www.churchofjesuschrist.org/study/manual/gospel-topics/environmental-stewardship-and-conservation?lang=eng>

⁵⁹³ Don D. Walker, “The Cattle Industry of Utah: An Historical Profile,” *UHQ* 32, no. 3 (Summer 1964): 4.

⁵⁹⁴ Heber C. Kimball, “Advancement of the Saints,” Jun 27, 1863, *JD* 10: 235.

practice stewardship rather than ownership of the earth, according to Latter-day Saint doctrine, are to be blessed with an “everlasting dominion, and without compulsory means it shall flow unto [them] forever.”⁵⁹⁵

By contrast, the aspiration to be “lord of all I survey” was a different kind of selfhood tied up with the impulse to materialism and imperialism, what Mormon doctrine condemns as “unrighteous dominion.”⁵⁹⁶ This aspiration among Mormons as well as other Westerners was sharpened by the rugged individualism and antipathy to external constraints typical of the “total frontier experience.” What Walter P. Cottam would later call “selfish exploitation” became the rule among the wealthy stockmen. In 1885, *the Salt Lake Herald* observed, “Every stockman has been for himself . . . in too many instances the individuals have been arrayed against each other to such an extent that one would not put himself out to assist, accommodate, or protect the other.”⁵⁹⁷ The Zion culture of selfless cooperation had given way to the ethic of the “total frontier experience.” The consequences of “unrighteous dominion” would be disastrous, Heber C. Kimball warned, as the earth would not tolerate that kind of rapacity. “I will tell you what I am afraid of, brethren, if you do not wake up to a sense of your true position, the Lord will send a flood and wash you out of those bottoms.”⁵⁹⁸

Heedless of these warnings, Mormons, like other ranchers in the West, sent more and more stock onto the mountain slopes and into crucial watersheds to graze. After a

⁵⁹⁵ Doctrine and Covenants 121:46.

⁵⁹⁶ Doctrine and Covenants 121:39-46.

⁵⁹⁷ Cited in Don D. Walker, “From Self-Reliance to Cooperation: The Early Development of the Cattlemen’s Associations in Utah,” *UHQ* 35 (1967), no. 3, 5.

⁵⁹⁸ Kimball, “Advancement of the Saints,” 238.

relatively short time, the damage became obvious. “Early settlers crowded too many animals on confined range in the 1850s,” says historian Jeff Nichols “and resulted in a landscape devastated by too many livestock.”⁵⁹⁹ By the 1860s, Mormon authorities were responding with alarm. Recall that Orson Hyde protested to the Saints’ destruction of the ranges in 1865 when he said that grazing and the trampling from livestock had turned the rangelands to waste: “where the grass once grew luxuriantly, there is now nothing but desert weed.”⁶⁰⁰

Invasive weeds were succeeding good grass, Hyde pointed out, leaving poor forage for stock. “There is no profit in this,” he said. It was ironic but inevitable that some Saints would abuse the land in the name of profit and derive so little. “Neither is it pleasing in the sight of God our Heavenly Father that we should continue a course of life like unto this.” It was not just the damage to the range that bothered Hyde but also the spiritual damage to the Saints of such a rapacious lifestyle. “A man’s life consisteth not in the abundance of the things that he possesses,” Hyde said, quoting the New Testament, “nor upon the vast amount he extends his jurisdiction over.”⁶⁰¹

Protesting the destruction, in 1865 Brigham Young pleaded with the Mormons to limit their herds. “Do not keep so many cattle, or, in other words, more than you can well provide for and make profitable to yourselves and to the kingdom of God.”⁶⁰² He also instructed the Mormons to revitalize the grasslands through irrigation if possible:

⁵⁹⁹ Nichols, “Before the Boom,” 156, 157.

⁶⁰⁰ Hyde, “Instructions,” 149.

⁶⁰¹ *Ibid.*, 150.

⁶⁰² Brigham Young, “Home Manufacturing, Merchandising, and General Economy,” October 9, 1865, *JD* 11:146.

I say to the people of this neighborhood, and every other neighborhood in the Territory, that we cannot keep the grass on our ranges; it is eaten off; and the roots are died out, and weeds spring up in stead [sic]; let us bring out the waters of our large streams, and fence in our meadows and ranges, and produce abundance of rich and nutritious grasses, by watering the land, and judiciously grazing it, and keep our cattle within our own fields; and in this way people will gain wealth faster, than by having their cattle running wild, in the valleys and on the hills.⁶⁰³

This idea was apparently ignored except by smallholders; no large-scale communal attempt to irrigate the ranges ever materialized. In any case, sheep and cattle continued to erode the ranges and gradually moved up the benchlands and the steeper slopes of the mountains. By 1900, the southern Wasatch was “suffering regular floods, and mountain ranges . . . were washing away.”⁶⁰⁴

Not only over-grazing but also excessive logging would contribute to debris-laden flooding. Trees were already sparse in the semi-arid canyons of the Wasatch Mountains; and although the pioneers made efforts managing to manage it, logging soon overwhelmed what forest there was. “Stands of ponderosas, lodgepoles, and Douglas firs were drawn down quickly by the steady increase in population,” says historian Dan L. Flores. “Within less than a decade of settlement, most of the timber in the vicinity of Salt Lake City was gone.”⁶⁰⁵ The mining-smelting industry added to the problem: loggers sold fallen trees as charcoal to smelters, burned the undergrowth, then harvested the best trees and left the rest to dry out and die. Utah’s timber industry hit its peak in the 1870s and then entered a phase of slow decline.⁶⁰⁶

⁶⁰³ Brigham Young, “Temporal and Spiritual Duties of the Saints,” November 6, 1864, *JD* 10: 363.

⁶⁰⁴ Charles S. Peterson, “Grazing in Utah: A Historical Perspective,” *UHQ* 57, no. 4 (Fall 1989), 300-320.

⁶⁰⁵ Flores, *Natural West*, 133.

⁶⁰⁶ Cited in Andrew M. Honker, “’There haint no danger’: Human action, human perception, the environment, and Utah flooding, 1847-1983,” MA thesis, Utah State University, 1994, 36.

The result was bare hills ready to flow down and choke the streams with sediment. A 1938 study determined that the Wasatch Mountains were “especially liable” to dangerous storms: “Here the conditions of topography and temperature appear to promote the formation of cloudburst storms, and the steepness of the slopes and their lack of sufficient vegetation to form a sod permit quick surface runoff and heavy erosion,” wrote Nathan C. Grover, chief hydraulic engineer of the U.S. Geological Survey.⁶⁰⁷

Gradually, the problem of flood control passed from the Church to the civil authorities. In 1884, another heavy water year, the Jordan overflowed its banks and flooded homes in the valley, which prompted discussion of digging a channel to drain the Jordan during future high-water events; but nothing was done.⁶⁰⁸ (A surplus canal was finally built in the 1950s.) Nine years later, in 1893, with larger-than-normal spring snows indicating a potential flood event, the *Deseret News* criticized the Salt Lake City Council for not working to prevent disaster. “Whoever thinks there is no danger to the whole southern and southwestern parts of Salt Lake City... simply does not understand the situation.”⁶⁰⁹ Strapped for resources to deal with flooding, city authorities tried to dismiss the warnings and the community lampooned them for it.⁶¹⁰

Flooding did come, drowning the streets of eastern Salt Lake in four to five inches of water.⁶¹¹ Although the damage was minor, the city’s lack of preparation contrasted with what had been done to prepare for the floods of 1862. Salt Lake officials did very

⁶⁰⁷ Nathan C. Grover, Foreword to Ralf R. Woolley, *Cloudburst Floods in Utah 1850-1938* (Department of the Interior, United States Government Printing Office, 1946), 1.

⁶⁰⁸ “A Preventive Project,” *DN*, July 30, 1884.

⁶⁰⁹ “The Waters are Threatening,” *DN*, April 25, 1893.

⁶¹⁰ “Now Let Something Be Done,” *DN*, May 1, 1893.

⁶¹¹ “Flooded by the Thaw,” *Salt Lake Herald-Republican*, February 12, 1893.

little to prepare for the floods of 1893.⁶¹² Whereas Brigham Young had directed a community-wide effort to ready the city for catastrophe in 1862, Church officials said nothing to prepare members in 1893. Whether intentionally or not, the Church had acquiesced in its separation from governance of the valley.

Flooding in nineteenth-century Utah was exacerbated by overgrazing, mining, smelting, fire, and deforestation. All these activities destroyed vegetation, decreasing decreased rain infiltration and increasing increased both runoff and soil erosion in mountain lands susceptible to cloudbursts. From then on, Utahns would struggle with the consequences of this largely unregulated environmental exploitation. By the turn of the twentieth century, the Mormon Church had withdrawn from attempting to manage the environment, leaving the civil government to deal with the problem.

Why did the Mormon leaders of this period back away from management of the land? The Church was undergoing what Thomas Alexander calls a massive paradigm shift from a sacralized communitarian mentality to accommodation with the mainstream culture—a shift that would help the Church survive and prosper in its broader mission. “The previous paradigm necessitated the integration of religion, politics, society, and the economy into a single non-pluralistic community.” This paradigm had grown untenable under American political pressure to disentangle the Church from the state and the economy. The shift required a “revised definition of obligations,” including the assumption that the Church was steward of the Wasatch environment.⁶¹³ The ethic of

⁶¹² "Are They Asleep or Insane?" *DN*, April 26, 1893, 24.

⁶¹³ Alexander, *Mormonism in Transition*, 14.

stewardship receded from the culture along with the outdated paradigm of a sacral community.

With more people settling in and along flood plains, floods grew more disastrous and harmful in the twentieth century. In the first few weeks of June 1908, floods tore through downtown Salt Lake City, and the Jordan once again overflowed. Utah Lake also expanded its borders as huge quantities of water poured into it from the canyons. The floods were devastating. They washed out bridges and streets and even killed a six-year-old boy who fell off a temporary bridge. Too-narrow canals soon became clogged with debris so that water overflowed into homes and properties. A year later, the same thing happened again. The same canals filled with silt and sediment, blocking water from flowing freely and once again drowning homes.⁶¹⁴ *The Deseret News* continued its tradition of calling on local officials to do something. “Of course they are full of plans,” one article read. “The flooded inhabitants are thus invited to forget this year’s distress in the contemplation of next year’s promise.”⁶¹⁵ Salt Lake City officials did try to make some adjustments. They diverted City Creek, a constant source of flooding for decades, to an underground conduit that would take it straight to the Jordan.⁶¹⁶ The conduit immediately proved nearly useless. Debris clogged the conduit on April 25, 1917, and sent overflowing water bursting out into city streets.⁶¹⁷ The *News* also astutely observed that reforestation of “canyons and all of the mountain slopes” was necessary to mitigate

⁶¹⁴ Honker, “Haint no danger,” 45-46, 47.

⁶¹⁵ “South West Portion Flooded by Jordan,” *DN*, June 5, 1909.

⁶¹⁶ “Flood Plain Information: Jordan River Complex. Salt Lake City, Utah” U.S. Army Corps of Engineers, Sacramento District, 1969, 9.

⁶¹⁷ “Flood Waters Ruin Gardens and Lawns,” *Salt Lake Tribune*, 26 April 1917, 14.

future catastrophe.⁶¹⁸ Utah County residents, concerned about the danger of flooding from the mountains, petitioned for a forest reserve in the Uinta Mountains to the east. President Cleveland created the Uinta forest reserve in 1897 “to secure favorable conditions for water flow.”⁶¹⁹

With this news, the old “tensions between sustainability and the market” became acute.⁶²⁰ Forgotten were the appeals of church leaders to limit stock-raising and to nurture the land. New fees and permitting requirements angered stockmen who had been grazing sheep in the mountains their entire lives. They appealed to Utah’s Senator Joseph Rawlins, who called the forest reserve “as gross an outrage almost as was committed by William the Conqueror, who, for the purpose of making a hunting reserve, drove out and destroyed the means of livelihood of hundreds of thousands of people.”⁶²¹

The most influential spokesman for the stockmen was Representative John Calder MacKay of the Utah Legislature. At the Denver convention of the National Livestock Convention on January 26, 1899, MacKay was a keynote speaker. He denounced the forest reserve policy as motivated by an “august body” of Easterners from New York and Washington who made assertions “so erroneous and misleading, that one would not think possible. The plan they suggest is wrong, and detrimental to the citizens of the Western States. [They] allege that . . . stock being permitted to graze, eating the grass and

⁶¹⁸ “Lesson of the Floods,” *DN*, June 9, 1909.

⁶¹⁹ *A History of the Uinta National Forest: A Century of Stewardship*, Shaun R. Nelson, ed. (Uinta National Forest, 1997), 27.

⁶²⁰ Nichols, “Before the Boom,” 157.

⁶²¹ Cited in Thomas G. Alexander, *The Rise of Multiple-Use Management in the Intermountain West: A History of Region 4 of the U.S. Forest Service* (U.S. Department of Agriculture, 1988), 18.

underbrush, destroys our water supply... recommend[ing] the exclusion of sheep from the pasturage within these reservations, as destroyers of the forests.”

MacKay answered the Easterners with assertions of his own. In response to the charge that the sheep were destroying vegetation that holds back snowmelt, he asserted the opposite. “My observation and experience in the mountains for over twenty years teaches the snow melts first in belts of timber or brush.” He went on to deny that vegetation prevents erosion and flooding. He charged the Easterners with trying to “establish a feudal system in America; [to] have large tracts of land set apart for reserves so that some idealistic, scientific expert, or privileged person, might view dame nature in its primitive state—perhaps fish or hunt therein.” He called up the image of the “hardy pioneer, who has taken up a homestead adjacent to the reserve,” who will be “deprived and injured” by this unjust incursion on his livelihood.⁶²²

It would be hard to find a better example of the mentality of the “total frontier experience” than John MacKay. In him we have the resentment of science and Eastern power elites so characteristic of the TFE mindset. Additionally, he blatantly disregarded the fact that the petition for the Uinta reserve came from his own flood-alarmed neighbors. We see in him the contempt for “nature in its primitive state”: God provided the land to be farmed, mined, and grazed and the timber to be cut. We have the reverence for the “hardy pioneer,” the lone rugged individual who carves out a living on the edge of the frontier, only to be undermined by effete, power-hungry idealists. We have the assertion of rights against “feudal” oppressors that is woven into the American ideology

⁶²² “Cattlemen vs. the Sheepmen,” *DN*, January 26, 1899,

of personal liberty. But the facts contradicted McKay's denials that the children of the hardy pioneers were ruining the land.

In 1902, those facts were confirmed by the epic efforts of Albert Potter, the first "chief grazing officer" of the U.S. Forest Service. Potter, an Arizona sheep rancher, traveled on horseback over 2,000 miles through the Wasatch Mountains to document the effect of grazing on the ecosystem.⁶²³ He found "irreversible damage" had been done. The previous decades he labeled an era of "spoilation" [sic]: "In the absence of lawful regulation it was quite natural that the period from 1880 to 1900 should be one of spoilation. The pioneer stock grower, eager to reap the fruits of his early efforts, increased his herds to the full limit of his ranges" and then was "painfully slow" to comply with church and government regulation. Potter found the Wasatch Mountains to be "a vast dust bed, grazed, trampled and burned to the utmost... Cover was reduced, the brush thinned, the weeds and grass cropped to the roots, and such sod as existed was broken and worn."⁶²⁴ Ironically, the sheep he saw were starving for lack of forage: they "seemed to be living on fresh air and mountain scenery."⁶²⁵

Potter's own diary of the journey is filled with details of grazing conditions throughout the mountains, with a few hints as to how the people felt about the forest reserve. For example, in his report of a stop over in the small town of Levan, Potter

⁶²³ David Prevedel, Curtis Johnson, "Beginnings of Range Management: Albert F. Potter, First Chief of Grazing, U.S. Forest Service, and Photographic comparison of his 1902 Forest Service Survey in Utah with Conditions 100 Years Later," United States Department of Agriculture, Forest Service, Intermountain Region, Ogden, Utah, July 2005, 2.

⁶²⁴ Robert V.R. Reynolds, *Grazing and Floods: A Study of Conditions in the Manti National Forest, Utah*, Forest Service Bulletin No. 91 (Washington: Government Printing Office, 1911), 6.

⁶²⁵ *History of the Uinta National Forest*, 33.

noted, “People of Levan do not seem to be very much interested in the forest reserve.”⁶²⁶ Others however, were more receptive, including residents of Logan who feared that cattle were mucking up their water supply, but who were less concerned about the clear cutting that had taken place in the mountains above them.⁶²⁷ Throughout his report, Potter comments on the lack of timber and the severe damage from excessive grazing. He ultimately suggested certain areas be off limits to grazing and others left open, and the Forest Service followed suit. Unfortunately, Potter’s recommendation not to halt grazing on the mountains would lead to serious controversy later as abuse of the higher range continued to produce flooding and destruction in the downstream communities. In desperation, Utah authorities petitioned the Interior Department to close certain watersheds to “transient sheepherders” and logging.⁶²⁸

Reports of the destruction of the Wasatch mountain rangelands caught the attention of Church leaders. During the general conference of April 1902, a confidential priesthood leadership gathering voted “to support the withdrawal from the market of all public lands above Utah cities in order to protect them from damage.”⁶²⁹ And in 1903, Church President Joseph F. Smith called on the Saints to re-plant the decimated forests: “Our supply of timber suitable for manufactured lumber will not last thirty years . . . a

⁶²⁶ Albert J. Potter, *Diary of Albert J. Potter, July 1902 to November 22, 1902*, September 11, 1902. Utah State University Special Collections and Archives. <https://forestry.usu.edu/rural-forests/forest-facts-ecology/potter-diaries>.

⁶²⁷ Potter, July 3, 1902

⁶²⁸ David A. Prevedel, Curtis M. Johnson, “Beginnings of Range Management: Albert F. Potter, First Chief of Grazing, U.S. Forest Service,” 3.

⁶²⁹ Alexander, “Stewardship and Enterprise,” 344.

matter of alarming concern to the people of this country," he wrote in an epistle to local leaders.

The Latter-day Saints ought not to be governed by purely selfish motives in the use of their landed inheritances. The number among us who have converted a single acre of our farms into forestry must be extremely small, and yet it is a duty which we owe to ourselves. . . . We therefore suggest that one of the public duties which every Latter-day Saint owes to the Church and to his country is the extension of valuable timber forests upon both private and public domains.⁶³⁰

History shows these exhortations had little effect. There was no movement among Mormon stockmen to safeguard the land, but climatic disruptions would soon force a change.

On April 13, 1923, a cloudburst over the northern Wasatch buried the towns of Willard and Perry under six to eight feet of mud and debris, killing an elderly lady and ruining some of the most productive orchard country in Utah. But the worst flood to that point in the history of the state came in 1930. On July 10, summer cloudbursts washed away homes throughout Weber, Davis, and Salt Lake counties. Parrish Creek in Centerville received the worst of it: the torrent of water, mud, and rocks demolished homes, blocked roads, and deposited 300-ton boulders inside the town limits.⁶³¹ The debris flows averaged 8 feet deep. In Utah County, a mudslide dammed the Provo River, turning it into a temporary lake.⁶³²

The flood of 1930 motivated much study and discussion. Clearly, the periodic floods typical of the region were becoming more intense. Was it due to climate change or

⁶³⁰ Joseph F. Smith, "A Word to the Presiding Authorities," *Juvenile Instructor* 38, no. 15 (August 1, 1903): 466.

⁶³¹ Reed Warner Bailey, Raymond J. Becraft, Clarence Luther Forsling, *Floods and Accelerated Erosion in Northern Utah*, U.S. Department of Agriculture Miscellaneous Publication no. 196, 1934, 2.

⁶³² "Rehabilitation Underway in Storm Region," 12 July 1930, *DN*, 1-2.

anthropogenic impacts? Utah Governor George H. Dern appointed a special committee to look into the causes and find solutions to the frequent floods. The committee report, “Torrential Flooding in Northern Utah, 1930,” appeared in January 1931, with suggestions to mitigate the effects of heavy storms. The committee recommended setting aside overflow basins where debris could settle away from populated areas, along with barriers, dikes, and spillways to direct the water into the basins. Finally, something had to be done about overgrazing and the associated loss of vegetation. “Heavy floods are naturally of rather frequent occurrence in these semi-arid desert regions, although they have been intensified in degree by the depletion of cover.”⁶³³

The committee did not go so far as to recommend a ban on grazing, only a limitation: “The fact that the removal of cover by overgrazing is responsible in so great a measure for the present denudation of watersheds,” the committee stated, “should not be construed as implying that well managed grazing is injurious to watersheds.” To limit grazing, the committee recommended handing control of watersheds over to the state or federal government. Much of the mountain slope above Davis County belonged to private landowners who lacked the resources, and possibly the motivation, to rehabilitate the vegetation above the valleys. Additionally, the committee conceded that this kind of responsibility should not lie with private landowners. “Protection of property, life and commerce,” the report read “are a public responsibility.” The committee suggested that the federal or state governments should purchase bit by bit the watersheds above critical flood plains and commence revegetation and rehabilitation immediately.⁶³⁴ It was

⁶³³ *Torrential Floods in Northern Utah, 1930: Report of the Special Commission Appointed by Governor George H. Dern* (Logan, UT: Utah State Agricultural College, January 1931), 12-13, 17.

⁶³⁴ *Ibid.*, 18, 19

implicit in these findings that the Mormon colonies had made floods worse. “Rather than taking a Fallen desert and restoring it to the Garden of Eden,” Flores opines, “the Mormons had settled lushly grassed mountain benchlands that were now in danger of becoming overgrown with weeds and inundated in flood debris.”⁶³⁵ The culture had allowed short-term gain to overrule the original Mormon ethos of stewardship that would sustain existence in a fragile environment.

While recommending rehabilitation measures, the committee was careful to temper expectation. The program would take a number of years to yield results, and in the meantime the government should move ahead with “dams and basins” to keep flood waters at bay. They were confident however, that once revegetation had taken hold, “the danger of serious floods from rains like those of 1930 should be eliminated.”⁶³⁶ Partially as a result of the report, a portion of the Davis County Watershed became part of a rehabilitation program, which was quite effective and became a model for other impacted areas.⁶³⁷

Another report a year later confirmed the committee’s suspicion that floods were becoming more violent. Flood commission members Reed Bailey and R. J. Becraft, geologists from the Utah State Agricultural College, along with C.L. Forsling from the U.S. Forest Service, found that the 1923 and 1930 floods had cut channels of an unprecedented depth in Centerville Canyon: “practically equivalent to the total cutting in

⁶³⁵ Flores, *Natural West*, 135.

⁶³⁶ *Ibid.*, 22.

⁶³⁷ Andrew M. Honker, “‘Been Grazed Almost to Extinction’: The Environment, Human Action, and Utah Flooding, 1900-1940,” *UHQ* 67, no. 1 (Winter 1999): 45.

thousands of years.”⁶³⁸ The trio concluded that the floods were the most severe in the history of the area: “In depth of cutting, in quantity of material, and in size of boulders carried, these floods exceed any others that have taken place in this locality.”⁶³⁹ In a supplement to the report, Bailey testified to Congress, of a “75-foot or deeper channel cutting and the enormous amount of debris deposited by these recent floods were far in excess of any earlier flood action . . . since Lake Bonneville ceased to exist some 30,000 years ago.”⁶⁴⁰ The authors of the report suggested three possible reasons for the increased flood intensity: movement of the earth’s crust, climate change, and “destruction of plant cover.” Investigations showed no signs of enough geologic movement to shift stream flows, and the rainstorms that produced the flooding were not unprecedented.

The trio therefore concluded that the intense floods were due to the loss of vegetation on mountain slopes. “It was strikingly evident,” the report said, “that the floods originated in the barren or nearly barren areas of the upper zone” where livestock had been allowed to graze intensively. “It was apparent,” the report continued, “from the condition which existed when the area was examined in 1930 that the number of animals being grazed in both drainages was and for some years had been far in excess of what such range could be expected to support without severe overgrazing.” The report made no recommendations, focused as it was solely on identifying causes of the floods.⁶⁴¹

⁶³⁸ Bailey, *Floods and Accelerated Erosion*, 7.

⁶³⁹ *Ibid.*, 10.

⁶⁴⁰ Reed W. Bailey, Hearings Before the House Committee on the Public Lands on H.R. 11816, 72d Congress, 1st session, 1932.

⁶⁴¹ Bailey, *Floods and Accelerated Erosion*, 17, 19.

Then the Hoover Administration proposed in early 1932 to privatize the unreserved public lands in the watersheds along the Wasatch. Governor Dern rushed to Washington to plead against the proposal, arguing that privatization would create a calamity. “Citing environmental disasters caused by mismanagement of private land in his state, he contended that ‘private ownership is not the answer to this problem of overgrazing.’” Dern held that the lands should be managed in the public interest.⁶⁴² Back home, he worked with U.S. Representative from Utah Don B. Colton and the progressive head of the Utah Cattle and Horse Growers’ Association, John M. McFarlane, to draft federal legislation for managing grazing on unreserved public land. MacFarlane, a trained chemist and active rancher, worried that private owners would lock up the land against free-ranging cattle or charge exorbitant grazing fees, so he came to favor a modicum of federal ownership and control that would leave room on the range for the stockman. The Colton bill was defeated in the Republican-led Senate, but in 1934 Representative Edward T. Taylor of Colorado, the “dean of Western congressmen,” re-submitted the Colton bill and it passed. Known as the Taylor Grazing Act, it provided for federally managed grazing allotments within previously unreserved federal lands and created what was later known as the Bureau of Land Management. John MacFarlane was said to have written most of the act.⁶⁴³

In 1933, the Forest Service and the Civilian Conservation Corps (CCC) combined to form the Davis County Experimental Watershed program to improve vegetation cover and reduce flood danger. Investigators compared overgrazed areas with those where

⁶⁴² Benjamin Kiser, “Bucking the White Elephant: Utah’s Fight for Federal Management of the Public Domain, 1923-1934,” *UHQ* 88, no. 2 (Spring 2020): 1.

⁶⁴³ “Range and Mine Leader Dead,” *Salt Lake Telegram*, May 3, 1938.

vegetation still existed. They found that Parrish Creek above Centerville, which had suffered from overgrazing, moved 2,500 times more sediment down the mountain than a nearby watershed that had not been overgrazed.⁶⁴⁴ The CCC began mitigation efforts by digging sixty-five miles of contour trenches in the barren hillsides and seeding them with 45,000 Douglas firs to prevent erosion during snowmelt runoff and storms. (The trenches around Bountiful Peak can still be seen from the valley floor.) During the 1930s, catch basins, canals, and stone flumes were built that are still operating at this writing. In the 30-year continuance of the program, many studies and experiments were done to restore the watershed. Eventually, the work “became internationally known as an example of successful rehabilitation of abused land.”⁶⁴⁵

Efforts to reduce overgrazing were less successful. Clear into the 1950s, Bountiful residents could tell how many sheep were grazing on the mountains by “the size of the dust cloud.”⁶⁴⁶ Meanwhile, Utah’s most notable environmental scholar jumped into the fray. Walter P. Cottam did his doctoral work in botany at the University of Chicago, where he was no doubt involved in the discourse over environmental degradation with the eminent Paul Sears, author of a landmark 1935 work on desertification, *Deserts on the March*. Unlike other notable Utah scientists such as John Widtsoe or James Talmage, Cottam was not a church leader. Raised in a Mormon family, he grew up in the deserts of

⁶⁴⁴ Glen Leonard, *A History of Davis County*, Utah Centennial County History Series (Salt Lake City: Utah State Historical Society, 1999), 75.

⁶⁴⁵ Richard J. Klade, *Building a Research Legacy: The Intermountain Station 1911-1997*, General Technical Report RMRS-GTR-184 (U.S. Department of Agriculture, 2006), 67, 69.

⁶⁴⁶ Oral interview with Glenn B. Goodrich, August 2020, in author’s possession.

southern Utah where he learned to love the landscape and the plant life and returned to teach at the University of Utah.⁶⁴⁷

As we have seen, Cottam was invited to give the 1947 Frederick William Reynolds Lecture at the University of Utah, “Is Utah Sahara Bound?” Cottam began with the question, “Can this civilization of ours, situated as it is in a semi-arid land, look with complacency to a permanently productive future when history speak so repeatedly and so eloquently of the failures of Old World Civilizations nurtured in a similar desert environment?”⁶⁴⁸ After reviewing the different kinds of vegetation found along the Wasatch, Cottam pointed out that sagebrush was not as prevalent in the old days as it was in 1947. Referring to Orson Pratt’s account of his first view of the valley, Cottam notes that Pratt made no mention of sagebrush and instead marveled at the “great variety of green grass.” Since that time, those rich grasses had been “eaten off by the herds of the white man” and “in their place has sprung up a sparse growth of low bushes between which the ground is bare.” He listed the different causes of environmental degradation, including “fire, poisonous gasses [from the mining industry], unregulated grazing.” Utahns knew the risks, yet “like whimpering children [they] bewailed the cruel devastating floods that have followed these abuses.” “It seems incredible,” he railed, “that a full half century of intermittent but devastating floods has not taught an intelligent people the obvious relationships between vegetation, soil, and water.”⁶⁴⁹ The speech “aroused the ire of stockmen and sheepmen who had been over grazing and abusing the

⁶⁴⁷ “Dr. Walter Pace Cottam, Ecologist, Professor of Botany,” Washington County Historical Society, <https://wchsutah.org/people/walter-cottam.php>.

⁶⁴⁸ Cottam, “Is Utah Sahara Bound?” 6.

⁶⁴⁹ *Ibid.*, 11, 12, 21.

land.”⁶⁵⁰ It was a robust volley fired not only at stockmen but at his own Mormon people at large. He was implying that the Mormons had actually found an Eden in the Wasatch Oasis and, instead of causing it to “blossom as the rose,” had turned an already blossoming meadowland into a desert.

The conflict quickly assumed religious overtones. In Cottam’s criticism of the people of Utah, along with Hurst’s severe new regulations, many Utahns--particularly in rural areas--perceived a subversion of the traditional Mormon narrative of the virtuous pioneers who caused the desert to “blossom as the rose.” Counselor in the LDS First Presidency J. Reuben Clark attacked the direction of the Forest Service: “for him, the stockmen of Utah had ‘a moral right to the federal grazing lands by all considerations,’” that is, through conquest and use. While admitting that overgrazing had caused some problems, he believed that floods were due to a trend “toward greater annual precipitation”—the theory advanced by Talmage and other leading Mormons that divine influence was making the climate of the region more humid.⁶⁵¹ Clark was at least partially right. From May of 1946 to April of 1947, north central Utah hit 18.77 inches of precipitation, which was actually one inch less than the previous year, but was just over two inches more than the average amount from 1901 to 1950. 1947, however, was somewhat of an anomaly because within two years precipitation levels were down below the 16 inch average.⁶⁵²

⁶⁵⁰ “Dr. Walter P. Cottam, Ecologist, Professor Emeritus at U., Dies,” *DN*, December 24, 1988.

⁶⁵¹ Alexander, *The Rise of Multiple-Use Management*, 166.

⁶⁵² NOAA National Centers for Environmental information, Climate at a Glance: Divisional Time Series, published May 2021, retrieved on May 28, 2021 from <https://www.ncdc.noaa.gov/cag/>

To oppose Clark's claims, Walter Cottam tried to explain that rational management was not an exercise of independent judgment but the result of scientific research: "The lay citizen should come to realize that there must be the 'why' as well as the 'how' of land management. He must know the 'why' represents the results of carefully planned research on which the 'how' of our action program is based."⁶⁵³

Governor George D. Clyde, an expert on irrigation, agreed with Cottam. When in 1960 it became clear that ranchers had no legal right to graze stock in forest reserves, Ezra Taft Benson, Secretary of Agriculture and Mormon apostle, upheld the rulings of the Forest Service.⁶⁵⁴

Predictably, devout Mormons were on all sides of the controversy; their perspectives had fragmented considerably since the early days in Utah. For most, their religious convictions seemed less relevant than their political or academic views. For some, like William Hurst, the goal was simply to find the best way to prevent ruinous erosion and floods. For others, like J. Reuben Clark, the stockmen had a prior claim to a land they had sanctified with their labor: he was a man of the "total frontier experience." Walter Cottam adhered to a different narrative: The story of a land intended to be an Eden under the thoughtful stewardship of Saints, who had instead betrayed their own ideals in favor of an illusory dream of self-enrichment. By unleashing nearly 4 million sheep on the fragile land during the 1880s and 1890s, they had nearly destroyed their environment. "It is doubtful if a gold rush was ever marked by more wanton and disorganized exploitation of a natural resource," Cottam said in his memorable Reynolds

⁶⁵³ Walter P. Cottam, *Our Renewable Wild Lands: A Challenge* (Salt Lake: University of Utah Press, 1961), 171.[page # needed].

⁶⁵⁴ Klade, *Research Legacy*, 88.

lecture. “It is little wonder then that the early nineteen hundreds saw the beginning payoff for this extravagant exploitation. Floods descended . . . with the fury of a ravaged and defiled Nature.”⁶⁵⁵

For Cottam, the betrayal of the environment had been wanton, ravaging, defiling. These are not the words of dispassionate science but of moral outrage, directed not only at agriculture but also at industry:

The word ‘Oquirrh’ is of Indian origin and means ‘wooded mountain.’ A hundred years ago . . . Oquirrh mountain slopes supported a lush cover of vegetation.” Then the Garfield Smelter intruded. Poisonous gases soon destroyed almost every vestige of spruce, maple and oak, and the canyon stream began to flow black with the accumulated top soil of ages. The most hideous defacement of the profiles of Nature to be found in Utah now stands there in mock contrast to the green beauty of this mountain 50 years ago.⁶⁵⁶

Cottam told his fellow Mormons they were cheating themselves. The “wealth” they thought they were accumulating was illusory. They seemed unaware that “much of the vast mining wealth of our state flows to the pockets of capitalists residing elsewhere, and how ephemeral after all our mining wealth really is.” He predicted catastrophic depletion of both minerals and soil, asking, “Are the potentially renewable resources of agriculture being managed on a sustained yield basis, or are they also to be ‘mined’ of their perpetual productivity?” The Saints’ self-betrayal “will remain to posterity a cruel object lesson on the sin of mining biological resources.”⁶⁵⁷ For Cottam, “mining” organic life was evil, and the earth would “rebel” against it.

⁶⁵⁵ Cottam, “Sahara Bound,” 30.

⁶⁵⁶ *Ibid.*, 24.

⁶⁵⁷ *Ibid.*, 20, 24.

He was particularly unhappy that his co-religionists ignored evidence and resisted reform. “Floods seem to have taught us little and an apathetic public is still content to regard these disasters as mere ‘acts of God.’ In denying responsibility for the deterioration of their environment, they had abandoned the Mormon ideal of stewardship—a profound irony for “a public accustomed to the self-glorification expressed by the repeated boast that ‘we have made the desert blossom as the rose.’” Responsibility for the earth was supposed to be the very essence of stewardship in Mormon doctrine. In his conclusion, Cottam preached the resurrection of this ideal in straightforwardly religious terms readily accessible to his Latter-day Saint listeners:

Utah a hundred years ago, like Plymouth in 1620, was colonized by a people guided by religious motives. They practiced to the best of their understanding the Golden Rule. They answered affirmatively to the Biblical query “Am I my brother’s keeper?” What we need most at this beginning of a new century in Utah is not a new social philosophy but rather a return to the ethical ideal expressed in Leviticus 25:23, where the Lord says, “The land is mine, for ye are strangers and sojourners with me.” This bit of gospel, basic in the genesis of an ancient society, is fundamental in the perpetuation of our own. It implies the social wickedness of passing on to an unborn generation a land impaired by selfish exploitation.⁶⁵⁸

In this landmark lecture, Cottam urged Mormons to reclaim their identity as stewards rather than possessors of the earth, which belonged to God. To assume the identity of exploiter was “social wickedness” that already had and would continue to exact severe consequences, not only on themselves but on the future. “Truly the fathers’ sins against the land are visited upon their children for generations to come, especially when the children continue in the same transgressions.”⁶⁵⁹

⁶⁵⁸ Ibid., 33, 37, 38.

⁶⁵⁹ Ibid., 21. Cottam alludes to Deuteronomy 9:5, where God threatens to “visit the iniquity of the fathers upon the heads of the children unto the third and fourth generations.”

And they did continue, although the degradation of the environment took new forms. As work went ahead to mitigate erosion from over-grazing, a growing population demanded new housing. Between World War II and 1980, Utah's population tripled from half a million to 1.5 million, setting off a construction boom that began to fill the valleys with buildings and asphalt. Much of this construction took place in flood-prone areas. Trash and litter also became a problem with population growth. Excess trash inevitably made its way into city waterways, clogging them up and obstructing waterflow, as in a 1945 flood that left trash scattered through city streets and caused roughly \$500,000 in damage.⁶⁶⁰

The new growth was characteristically low density, gobbling up agricultural land as well as previously uncultivated land, with little attention to integrated land-use planning. Car travel greatly increased, spewing vast amounts of toxic exhaust and water-polluting spills and road dust. As the small Salt Lake Valley towns spread into one large urban sprawl, much of the land surface was covered with less capacity to absorb rainfall and snowmelt. Impermeable surfaces—roads, parking lots, concrete buildings—prevent infiltration of water into the ground and accelerate runoff into drainage systems, which can be quickly blocked with debris. Suburbs are not much better: thin ground covers produce heavy runoff because they saturate quickly.⁶⁶¹

Increasingly, the Wasatch valleys suffered from uncoordinated urban development, exacerbating the effects of heavy storms or snowmelt, overwhelming the streams and sewer systems. This became apparent in 1952 when Salt Lake suffered its

⁶⁶⁰ "Damage Mounts to \$500,000 in S. L. Storms," *Salt Lake Tribune*, 21 August 1945, 1, 10.

⁶⁶¹ C. P. Konrad, "Effects of Urban Development on Floods," Fact Sheet 076-03, U.S. Geological Survey, United States Department of the Interior, November 2003.

worst flood yet. That spring, temperatures rose fifteen degrees higher than normal over a snowpack of 120 inches—much higher than the average forty inches. The Jordan, again, unable to contain all the runoff, turned into a series of lakes, and homes along the low-lying areas of the valley were completely flooded. Then on April 14, a culvert under Salt Lake City overflowed where the three major streams, Red Butte, Emigration, and Parley’s converged.⁶⁶² A dike thrown up along 13th South Street gave way, resulting in a virtual lake that covered 400 of the city’s 600 blocks. In July, water began spilling over the top of Mountain Dell Dam in Parley’s Canyon east of the city, forcing officials to release water that flooded part of the city again. Sandbags lined the city to shepherd water into the Jordan. With the city essentially under water, kids took to their boats to race through streets-turned-canal. All told, water reached depths of two to eight feet and covered roughly 1,200 acres, over seventy-five city blocks, causing \$6 million in damages, and leaving three thousand people homeless.⁶⁶³

The 1952 floods were the most disastrous in Utah’s history to that point.⁶⁶⁴ They exposed a serious lack of coherent strategies for managing urban growth. “Engineers have told me,” lamented Salt Lake Mayor Earl J. Glade, “that the paving of additional streets in the residential areas in the north and east benches during the past few years is responsible for an additional 83 second feet [cubic feet per second] of water to the storm runoff for every inch of rainfall.” The mayor blamed much of the flood on rapid building

⁶⁶² Ellis L. Armstrong and Howard F. Rosen, *Effective Emergency Response: The Salt Lake Valley Floods of 1983, 1984 & 1985* (Chicago: Public Works Historical Society, 1986), 9.

⁶⁶³ “Salt Lake City Fighting Worst Flood in History,” *Salt Lake Tribune*, April 28, 1952; “Flash Flood Sweeps Over Salt Lake East Bench,” *DN*, July 31, 1952.

⁶⁶⁴ Armstrong, Rosen, *Effective Emergency Response*, 9.

that had taken place in a natural basin in the heart of downtown at 9th South and Main streets. Experts pointed out to authorities after the 1952 flood that a “historically absorptive region just below the old Lake Bonneville levels which was composed of sand gravel was replaced by cement and asphalt.”⁶⁶⁵ Apparently unable to manage city growth, Glade turned to the Army Corps of Engineers and asked them to build a dam in Parley’s Canyon above the city to hold back flood waters. (Tangled up in politics and financial problems, construction of the Little Dell Dam did not even begin until 1986.)

Three years after the 1952 flood, the University of Utah geology department reported that further development along the mountain benches increased flooding danger from cloudburst storms. Construction sites laid bare large patches of earth which would increase runoff just as overgrazed lands had done. Utah State engineer Wayne D. Criddle proposed that officials should zone off natural water courses to run down the mountains unimpeded. He also proposed that officials construct facilities to “slow and impound flood waters, and then feed this water back into natural underground reservoirs.” Unfortunately, there was no identifiable agency that could take on the project, and so his recommendations went unheeded for several years.⁶⁶⁶

It was obvious that unchecked growth had exacerbated the floods of 1952; nevertheless, building along the mountain benches accelerated anyway. Post-war prosperity led to construction of desirable homes “with a view of the valley”; retail centers and office buildings followed. The floods also exposed socio-economic

⁶⁶⁵ “Little Dell Lake, Salt Lake City Stream, Utah: Final Environmental Impact Statement,” U.S. Army Engineer District, Sacramento, CA, 1974, D-30.

⁶⁶⁶ “Engineer Proposes Bench Flood Control,” *Salt Lake Tribune*, 29 October 1959, p. B1; Honker, “Haint no danger,” 107.

discrepancies that were emerging along the Wasatch Front. More expensive homes built along the high benches and along the canyons channeled overflow into flood plains below, where people on the other end of the socio-economic ladder were left with the mess. The floods added to the inequitable impact of air pollution in the same neighborhoods. In sum, a lack of determination on the part of governments to control sprawl along the benches contributed to more frequent and severe floods, the worst of which was yet to come.

Salt Lake City unfortunately has a long history of environmental injustice, particularly when it comes to water rights and access. By the late nineteenth century, water-borne diseases in the city were rivaling those in the more industrialized urban areas like Chicago and Philadelphia. The massive Jordan Canal project, which aimed to carry water from Utah Lake north all the way to Salt Lake City, leaked badly and polluted water on the lower-income west side of the valley after its completion in 1882. Most water mains flowed on the east side of town, which meant that gravity pulled wastewater down to the western portions and polluted the Jordan River, where city ordinances and biases concentrated Chinese and other minority populations. In 1893, a newly completed sewer system not only carried waste to the western edges of town, but its inefficient design carried a significant portion of sewage to the Jordan River, where it decimated trout and duck populations. At the turn of the century, outbreaks of typhoid became commonplace in the city, particularly among minority populations on the west side. After one especially ferocious outbreak, the *Salt Lake Herald* asserted, “The great majority of

the people [in the Westside] pay no attention to sanitation.”⁶⁶⁷ While the affluent members of the community, most of whom were Mormons, could blame floods for carrying filth and waste to the more impoverished parts of the valley, they also designed the city’s infrastructure for that exact purpose.

The population explosion and the periodic floods came to a head in 1983. The story of these floods really begins in 1976 when Utah experienced one of the driest winters in history. The drought continued until 1980, drying out soils and setting the stage for heavy runoff.⁶⁶⁸ Then, in 1982, one of the most intense El Niño events in history sent rivers of atmospheric moisture off the Pacific Ocean and across the Great Basin.

Every five to seven years or so, a massive churning swath of the eastern Pacific Ocean changes temperature. Low pressure over the western Pacific pushes unusually warm water eastward producing heavy rainfall on the semi-arid coasts of North and South America. Called an “El Niño” event because it generally begins around Christmas in Peru and Ecuador, the phenomenon results in peak flooding and avalanches all along the continental margins.⁶⁶⁹ By September 1982, the storm pattern reached the Great Basin of North America, with a concentrated effect on the Wasatch Front and the Great Salt Lake. That month, a series of storms began that would force a twelve-foot rise in the lake level to a historic high of 4211.85 feet over the next four years.⁶⁷⁰

⁶⁶⁷ Ben Cater, “Segregating Sanitation in Salt Lake City, 1870-1915,” *UHQ* 82, no. 2, (Spring 2014): 94, 95-96, 102, 107, 110.

⁶⁶⁸ Honker, “Haint No Danger,” 121.

⁶⁶⁹ Donald V. Hansen, “Physical Aspects of the El Niño Event of 1982-1983,” *Elsevier Oceanography Series* 52 (1990): 1.

⁶⁷⁰ Peter M. Morrisette, “The Rising Levels of the Great Salt Lake: Impacts and Adjustments,” *Bulletin of the American Meteorological Society* 69, no. 9 (September 1988): 1034.

In 1985 the shallow lake expanded over its flood plain by six million-acre feet, or about 265 square miles. At a level of 4208 feet, it began flooding infrastructure around the lake, including Interstate Highway 80. If it reached 4220, it would drown the Salt Lake International Airport.⁶⁷¹ The resulting lake expansion caused an estimated \$157 million of damages to infrastructure, wildlife areas, and industrial facilities. The water year ending in September of 1982 was the wettest in over 100 years of record keeping. Precipitation reached 168 percent of normal. A total of 25.29 inches, 10 inches above average, fell at the Salt Lake International Airport. Snowfall levels were also off the charts. Ski resorts measured a snowpack of 800 to 900 inches, which was roughly twice the normal amount, and the snowfall water content was 170 to 250 percent than normal.⁶⁷²

Utah's Comprehensive Emergency Management (CEM) office knew in autumn 1982 that flooding was inevitable. The office made preparations, ordering 100,000 sandbags and 100 pumps and distributing booklets to raise awareness. It would all prove to be massively insufficient. Over the course of the flooding, the state would require 1.5 million sandbags.⁶⁷³ The next year was even worse: 1983 turned out to be wettest year on record for the North Central Region of Utah by far. Precipitation reached 13.32 inches above average (30.04 inches).⁶⁷⁴ By July 1, 1983, Great Salt Lake had risen 5.1 feet in 10

⁶⁷¹ Terry Tempest Williams, *Refuge: An Unnatural History of Family and Place* (New York: Vintage, 1992), 8.

⁶⁷² Armstrong and Rosen, *Effective Emergency Response*, 9, 11, 17.

⁶⁷³ Oneita Burnside Sumsion, *Thistle . . . Focus on Disaster* (Springville UT: Art City Publishing Company, 1983), 85.

⁶⁷⁴ NOAA National Centers for Environmental Information. Climate at a Glance: Divisional Time Series, May 2020. <https://www.ncdc.noaa.gov/cag/>

months, the fastest and highest increase ever recorded.⁶⁷⁵ The spring had been wet and cold. The snowpack remained in the Wasatch Mountains well into May, much later than usual. Unimaginably on May 19, another snowstorm swept through the Wasatch Front, presaging even greater danger.⁶⁷⁶

Meanwhile, city officials were confident that their preparations based on lessons learned in the 1952 flood would suffice to prevent serious flooding. Salt Lake's city manager Al Haines remarked, "Thanks to those lessons and advanced technology, damage to public and private property will be much lower than 30 years ago."⁶⁷⁷

Anticipating that the three city streams would overflow as in 1952, city workers lined 13th South Street with sandbags. One long-time resident who had experienced the 1952 floods watched the crews fortifying the street and remarked, "It seems like the city is more prepared this year. In 1952, the floods caught us by surprise. This year we have more snow, but it looks like they are watching it closer."⁶⁷⁸

The thaw finally came abruptly at the end of May when temperatures suddenly soared more than twenty degrees in less than two weeks: the high on May 15 was fifty-four degrees and on May 24 reached eighty-six.⁶⁷⁹ Trouble started almost immediately. Only one of the three city streams had reservoir control. Mountain Dell Reservoir, which held back Parley's Creek, was filling to the brim much faster than the drainage system could handle the flow. On May 28, Mountain Dell was draining water at 470 cubic feet

⁶⁷⁵ Tempest Williams, *Refuge*, 47.

⁶⁷⁶ Armstrong and Rosen, *Effective Emergency Response*, 11.

⁶⁷⁷ "Lessons From 1952 Helped S. L. Avert a Disaster," *Salt Lake Tribune*, May 9, 1983.

⁶⁷⁸ "13th South River Might Flow Again," *DN*, May 19, 1983, B1.

⁶⁷⁹ "Salt Lake City Weather History" Weather Underground
<https://www.wunderground.com/history/monthly/us/ut/salt-lake-city/KSLC/date/1983-5>

per second, the maximum possible. Lined with sandbags from State Street to the Jordan River, 13th South Street became a river as in 1952. Officials guessed that the storm-drain system could handle the other two creeks, Red Butte and City.⁶⁸⁰

They were wrong. The next day, City Creek unexpectedly discharged over 300 cubic feet of water per second, nearly double its previous record. The North Temple storm pipe, an 84-inch-diameter metal tube, was clogged with what was described as a “dense mass” of sand, gravel, and debris and shooting water up through manhole covers and storm drains onto the thoroughfares of the central business district. Major buildings downtown, including Mountain Bell Communications Systems and the LDS Church Office Building, were in danger of flooding. Residents along the east benches of the valley sprang out of their beds to the noise of boulders tumbling down stream beds. It sounded as if the mountains were collapsing. With so many streams overflowing their banks, it became apparent that Salt Lake City was in severe danger.

Crews quickly sandbagged North Temple Street before they realized that State Street—the city’s main north-south artery—would also have to be turned into a channel to the Jordan. Sunday morning, May 29, Mayor Ted Wilson telephoned President Gordon B. Hinckley, a counselor in the LDS Church’s First Presidency, who famously proclaimed, “The ox is in the mire.” By mid-afternoon, thousands of Mormons left their meeting houses to join non-Mormon volunteers in sandbagging State Street. Within hours, 6,000 volunteers had constrained the river for a mile and a half through a sandbag-lined channel. According to one account, when the water came flowing down the street,

⁶⁸⁰ Albert E. Haines, “The Flood of 1983: Salt Lake City’s Emergency Preparedness and Response.” In “Abstracts of specialty conference papers: delineation of landslide, flash flood and debris flow hazards in Utah, June 14-15, 1984.” Utah State University, paper 283, 24.

cheers erupted from crews and volunteers. Mayor Wilson called it “the biggest street festival ever.”⁶⁸¹ They had literally turned Salt Lake into a “Venice in the desert.” The crisis became a unifying event for the community. People fished in the streaming waters. Restaurants lining the newly formed river put out signs saying, “You catch ‘em, we’ll fry ‘em.” A couple exchanged wedding vows on a makeshift bridge, and guests threw rice as they made their way to the Alta Club for their wedding breakfast. Young kayakers took to the water to enjoy “class three rapids.”⁶⁸²

Efforts to clear the underground conduits took nearly two weeks and required dynamite to remove some of the debris. When the water began to recede, city and fire crews, along with nearly 4,000 volunteers, completed the biggest cleanup in the city’s history. By Monday June 13, except for the street rivers, downtown Salt Lake City was back to normal.⁶⁸³ The city had survived one of the most dramatic episodes in its history, but the cost was high. In the aftermath, the County Flood Control Division identified 1,500 damaged sites with an estimated cost of \$34 million. They also identified and created 42 projects to protect against future disasters with an estimated cost of \$22 million. By April 1984, most of the projects were completed and helped minimize damage during the flood seasons of 1984 and 1985.⁶⁸⁴

Much of the credit for Salt Lake’s survival must go to its citizens. All told, volunteers contributed an estimated 500,000 workdays and used 1.6 million sandbags to

⁶⁸¹ Leroy W. Hooton, “Memorial Day Weekend 1983: Streets to Rivers,” 3-4, <http://www.slcdocs.com/utilities/NewsEvents/news1999/news5281999.htm>. [4/3/2013].

⁶⁸² Tempest Williams, *Refuge*, 46-47.

⁶⁸³ Rosen and Armstrong, *Effective Emergency Response*, 11.

⁶⁸⁴ Hooton, “Memorial Day,” 4-5.

alleviate the floods throughout Salt Lake County with 1 million used in Salt Lake City alone. According to author Ellis Armstrong, most of the credit belonged to the residents themselves who organized to redirect the overflowing stream.⁶⁸⁵ In a sudden upwelling of the spirit of stewardship, Salt Lakers had saved their community and gained national attention. The *New York Times* lauded them for their efforts in creating Salt Lake City's "Venetian ambiance."⁶⁸⁶

However, the trouble was just beginning in the suburbs north of the city. Sandbagging began in Bountiful on May 29 and continued for two days. Most believed this would be sufficient to hold back any potential deluge that would come down the mountains.⁶⁸⁷ The next day temperatures reached between 85 and 95 degrees, far above the normal of 70 degrees. Weather forecasters predicted a cold front to come up early the following week to bring relief from the warm weather and hopefully slow down the flooding.⁶⁸⁸

Not much relief came—in fact, quite the opposite. On Memorial Day, May 30, a 20-foot wall of water and mud came crashing down out of Farmington Canyon, forcing 200 residents to flee from their homes. Farmington police officer Robert Child described the chaotic scene, "I saw all these trees come tumbling down the mountain. I drove down the canyon yelling for everybody to get out. I told them the canyon was coming."⁶⁸⁹ One home was pushed 60 feet off its foundation. The owner said, "My wife and I heard this

⁶⁸⁵ Rosen and Armstrong, *Effective Emergency Response*, 12.

⁶⁸⁶ "Flood Canal in Salt Lake City Is Turned Back into a Street," *New York Times*, June 12, 1983.

⁶⁸⁷ Kristin Fadel, *Flood Fighters, 1983-1984: An Account of the Mudslides and Flooding in Davis County* (Bountiful UT: Carr Printing Company, 1984), 27.

⁶⁸⁸ "Weather Report," *Provo Daily Herald*, May 30, 1983, 2.

⁶⁸⁹ "Floods Threaten Towns," *Provo Daily Herald*, May 31, 1983, 5.

rumbling noise like a bunch of rocks coming down the canyon, and we looked up over our house and we could see the trees all starting to fall down like dominoes, one after the other."⁶⁹⁰ Utah's largest theme park, Lagoon, which lies at the mouth of the canyon, was evacuated on its opening day. Seventy mph winds also complicated things as officials feared that the gusts would further weaken the eroding mountain.⁶⁹¹

To the south of Farmington, Bountiful city also experienced a major disaster. City officials suspected they were in for a hard time, especially after the devastation in Farmington. As the three streams that flow into Bountiful continued to rise, volunteers made an enormous effort to sandbag them and officials began to feel cautiously optimistic.⁶⁹² Then a massive landslide in the mountains blocked Stone Creek, which flows through the north part of the town, and formed a lake in the canyon. At around 11 p.m. on May 31, after residents had spent the day sandbagging their neighborhoods, a huge boom echoed out of the canyon: The Stone Creek lake had collapsed. A 30-foot wall of mud and debris gathered speed and force as it rushed down the canyon towards the city, sending hundreds of residents fleeing from their homes.⁶⁹³ The slide knocked power out of a large portion of the city. A police officer called to the scene watched the slide's progress in the dark by following the flashes of downed transformers on power lines.⁶⁹⁴

⁶⁹⁰ "Farmington Resident Remembers Losing House in '83," KSL.com, June 4, 2005. <https://www.ksl.com/article/104975>

⁶⁹¹ "Floods Threaten Towns" *Provo Daily Herald*, 5.

⁶⁹² Kristin Fadel, "Bountiful City's Dramatic Role," *Flood Fighters*, 65.

⁶⁹³ Paul Rolly, "Battle of Bountiful: Utah's Worst Flood?" June 5, 1983, UPI News Archives. <https://www.upi.com/Archives/1983/06/05/Battle-of-Bountiful-Utahs-worst-flood/4463625090383/>.

⁶⁹⁴ Jim Garner, "A Policeman's Story," *Flood Fighters*, 33.

A lone utility worker checking on a power substation suddenly felt and heard a “tremendous roar” and a “huge black wall of water and mud” came crashing toward him. He quickly jumped in his truck and threw it in reverse, but it was too late. The slide picked up his vehicle and slammed it into a control building 60 feet away. A powerful transformer next to him exploded, briefly flooding the area with light before everything plunged into darkness. Luckily, he was able to climb out of his window and find safety on top of the control building. To his astonishment, he found the 20-ton transformer that had exploded moments earlier ten feet from where it was supposed to be.⁶⁹⁵

Days after the flood, Bountiful Mayor Dean Stahle proclaimed it the worst disaster in the city’s history.⁶⁹⁶ Soon after, Governor Scott M. Matheson toured the city and remarked, “This is the worst property damage I’ve seen in Utah. It’s just unimaginable until you see it”⁶⁹⁷ and “It’s a heck of a way to run a desert.”⁶⁹⁸ After the slide stopped, Bountiful residents immediately went to work cleaning and rebuilding. For many, the legacy of the “Battle for Bountiful” was seeing the community coming together in the clean-up effort. “The first great miracle is that no lives were lost,” said one resident, Dale Roe. “The second was that so many volunteers were united in offering help in the emergency.”⁶⁹⁹ One survivor, Eleanor Wheelock, who was the leader of the women’s organization of her LDS congregation, recalled how citizens of all faiths teamed under LDS Church leadership to save the town. “Men and women were organized

⁶⁹⁵ Kent Servoss, “Electrifying Moment,” *Flood Fighters*, 40-41.

⁶⁹⁶ “Bountiful Hit by a Wall of Water and Mud,” *DN*, June 2, 1983, 1.
<https://news.google.com/newspapers?nid=Aul-kAQHnToC&dat=19830601&printsec=frontpage&hl=en>

⁶⁹⁷ Rolly, “Battle of Bountiful.”

⁶⁹⁸ Iver Peterson, “A Greater Salt Lake Might Not Be So Great,” *New York Times*, April 28, 1986.

⁶⁹⁹ Dale E. Roe, “Snow Melt and Soggy Hills,” *Flood Fighters*, 11.

into crews with supervisors responsible to the bishop so there was no overlap of time and effort,” she remembered. “I had adopted the slogan,” she continued, “‘Have you had your hug today?’” She particularly praised members of a local Baptist congregation who donated food and time to the cleanup. “We love having (them) here,” she remarked. Another survivor focused on the communal aspect of the flood. “The performance of the city and countless others in the case deserves a standing ovation,” she said. “It was a fantastic display of a community pulling together to help their neighbors by means of unselfish kindness that everyone can learn from and appreciate.”⁷⁰⁰ Again Mormons had come together in the face of disaster. As they had so many times before, they responded to a crisis by harking back to the communal tendencies that were so prevalent in the mid-nineteenth century. There was little thought, however, of how they could have better prepared for the catastrophe while they worked to dig out their neighbors.

The deluge of precipitation in the 1980s saturated the mountains and caused nearly 100 landslides along the Wasatch Front, some insignificant, some disastrous. The wall of mud that buried north Bountiful, estimated at 542 million cubic feet of debris, was dwarfed, however, by the landslide that buried the town of Thistle in Utah County. A small railroad town, Thistle sat near the mouth of Spanish Fork Canyon under a mountain that had been slowly moving for ages. On April 12, 1983, the land slipped, severing the Denver and Rio Grande railway and U.S. Highway 89. Fifteen million cubic meters of earth dammed up the Spanish Fork River, slowly inundating the town under a new lake. The slide, which is still visible nearly 40 years later, became a 200-foot-high dam that held back an estimated 65,000 acre-feet of water. The townspeople were evacuated, and

⁷⁰⁰ Fadel, “Bountiful City’s Dramatic Role,” 66.

no one was hurt; but according to a 2001 study, it was the costliest landslide in U.S. history. A University of Utah study calculated direct costs at \$200 million, adding indirect costs to local business and industry, the total came to \$400 million (in 2020 dollars, about \$1 billion).⁷⁰¹

It was not, however, the mountain streams and landslides that did the most damage. Instead, it was Great Salt Lake, which had reached historic depths and area, nearly engulfing surrounding communities. As the lake continued to spread through the additional wet years of 1984-1985 covering an unprecedented area of 2400 square miles, officials realized they had to do something to contain it.⁷⁰² (The average area of the lake fluctuates around 1700 square miles.) Because the lake was divided into two sections by a railway causeway, the southern two-thirds of the lake was over three feet higher than the northern third. Two 15-foot-wide openings in the causeway were insufficient to drain the overflow, so the Legislature approved a 300-foot opening in the causeway at a cost of \$3 million.⁷⁰³ It lowered the southern arm of the leg by a foot, which prevented considerable flood damage.⁷⁰⁴ The Union Pacific Line on the southern shore had always been something of a dike to protect I-80. The railroad had raised the tracks a number of times after 1983 at a cost of roughly \$24 million.⁷⁰⁵

⁷⁰¹ Robert L. Schuster, Lynn M. Highland, "Socioeconomic and Environmental Impacts of Landslides in the Western Hemisphere," U.S. Geological Survey Open File Report 01-0276, 2001. <https://pubs.usgs.gov/of/2001/ofr-01-0276/>

⁷⁰² *The Great Salt Lake West Desert Pumping Project: Its Design, Development, and Operation* (Utah Division of Water Resources, June 1999), 1-1.

⁷⁰³ *Ibid.*, 2-6.

⁷⁰⁴ *Ibid.*, 7-2.

⁷⁰⁵ *Ibid.*, 2-4.

As the lake continued to rise, a study by the State Division of Water Resources, the University of Utah, and Utah State University suggested that a series of enormous pumps draining water into the west desert would solve the problem. While the pumps would cost around \$78 million, a lake level above 4212 feet would cause far more costly damage than that. The state, desperate for a permanent solution, agreed to pay the bill.⁷⁰⁶ By 1987, the pumps were flushing water from the Great Salt Lake into the West Desert where Howard Stansbury and his crew had almost died of thirst almost 140 years before. The water flowed onto a landscape that had not seen that much moisture since the days of Lake Bonneville before it evaporated leaving a salt residue. The cost of the pumps stirred controversy among Utahns. Coming in under the estimated cost of \$78 million, the state still had to fork out \$60 million. Governor Norm Bangerter, who inherited the project from Matheson, was fully on board, insisting that the pumps would pay for themselves by protecting surrounding industries.

As if on cue, however, as soon as the pumps started working, the Great Salt Lake began to recede. The pumps continued to move water from the lake to the desert for 26 months before engineers shut them off. They have sat unused ever since. In the 30 years since the pumps went offline, the lake has dropped roughly 18 feet: experts agree that the pumps were responsible for 18 inches of that. Although the pumps are still maintained should another emergency arise, some believe they will never be used again. In 2011, Bangerter defended the project: “We saved, even at that late date, more than they cost by

⁷⁰⁶ Ibid., 5-6.

keeping some of those industries going.”⁷⁰⁷ By 1989, the overall cost of lake expansion was about \$1 billion (est. \$2.3 billion in 2020 dollars).⁷⁰⁸

The El Niño event of the early 1980s brought flooding to twenty-two of Utah’s twenty-nine counties. State disaster funds could not come close to covering the cost.⁷⁰⁹ Utahns have not seen such devastation since. Still, urban development continues at a rapid pace in the Valley, increasing the threat of another such disaster. For example, the city of Saratoga Springs in Utah Valley has grown by 33,000 people since 2000; much of the new construction lies in the Jordan River floodplain.⁷¹⁰ Bluffdale in south Salt Lake County, which has quadrupled its population since 2000 to 17,000 people and is expanding rapidly, is also at risk from Jordan River flooding as well as alluvial-fan flooding from mountain drainages.⁷¹¹ Almost all flood planning is based on the assumption that 1982-1983 was a “100-year flood” with little likelihood of recurrence. Officials thought the same of the 1952 floods, “the worst ever,” but then came 1982. And in 2012, “eighteen counties reported damage totaling \$12.7 million as a heavy snowpack, a rapid melt and rain caused flooding in many rivers. The upper branches of the Ogden River and the lower Weber River were among the hardest-hit areas.”⁷¹² Says John

⁷⁰⁷ John Hollenhorst, “Lake’s Pumps Still High and Dry,” *DN*, April 19, 2011.

⁷⁰⁸ *Great Salt Lake West Desert Pumping Project*, 2-4.

⁷⁰⁹ Sumsion, *Thistle*, 85.

⁷¹⁰ Saratoga Springs UT Flood Plain Maps, 2018. <https://www.saratogaspringscity.com/193/Flood-Plain-Maps>

⁷¹¹ *City of Bluffdale Flood Plain Management Plan*, 2018, 7. http://bluffdale.com/DocumentCenter/View/2590/DRAFT-Bluffdale-Flood-Management-Plan_public-review

⁷¹² “22 Major Floods That Devastated Communities in Utah History,” *Ogden Standard-Examiner*, May 7, 2019.

Mendenhall, a water commissioner for the state of Utah, “Those 100-year floods come like clockwork every 30 years.”⁷¹³

Flood damage in the Wasatch Oasis is to a great extent a consequence of a people’s choosing the dominant traditional Euro-American identity over a stewardship identity. The early Mormon leaders saw the volatility of the climate as a challenge to their ability to learn and create cooperatively. Responsibility for the welfare of the community was the essence of the stewardship ethic. To thrive in the region required thoughtful planning, preparation, and experimentation, activities essential to the “saint-making” project of the early Mormons. This ethic produced some 500 colonies, carefully irrigated and managed to that end.

The Euro-American narrative of conquest and self-aggrandizement fatally distracted the people from that stewardship narrative. They saw themselves as wealth producers disregarding the negative externalities of the wealth-making project. Growing indifferent to the doctrine of stewardship, they let their animals graze the mountains to dust and the toxic effluent of their industrial operations degrade the forests. They believed there was nobility in the TFE narrative that unrestrained enterprise “made America great.” As a result, they reaped costly, dangerous floods and dust storms. They overloaded the ranges, destroyed the native grasses, and put themselves out of business. They overbuilt the permeable earth with impermeable asphalt highways and cities on flood plains, then balked at paying the price for effective flood control.

The pattern of disregard for stewardship values continues. When Utah won the 2002 Winter Olympics, Robert Earl Holding, one of the wealthiest men in the state,

⁷¹³ Rodger L. Hardy, “Housing Along River a Flood Risk?” *DN*, June 8, 2004.

bought up an old ski resort near the top of Mt. Ogden and created a massive new development there. To make Snow Basin the site for Olympic downhill racing, a vast network of pipes and snowmaking machinery was installed. New roads and hundreds of acres of new ski runs were blasted out of the mountain—all this development exempt from environmental impact regulations because it was an Olympic project. Meanwhile, however, Holding’s showcase Needles ski lodge and the core of the resort lies directly in the path of millions of tons of unstable earth in two mountaintop slides that could give way any time—and probably will if conditions turn wet enough, as the example of Thistle, Utah, demonstrated.⁷¹⁴ Earl Holding represents the TFE mindset that discounts the future in favor of current profits but will likely encounter the stern reality of the climate of the Wasatch Mountains.

The mode of stewardship is investment in preparation, and investment takes time and money. A high future-time orientation is characteristic of the stewardship mentality; from the institutional perspective, the Latter-day Saint as steward feels a strong responsibility to the future, preferring to focus on long-range needs and concerns rather than the immediate ones (“We preserve resources and protect for future generations the spiritual and temporal blessings of nature”).⁷¹⁵ By contrast, the entrepreneurial mindset focuses on near-term profits: “As the temporal distance increases, risks in the future are mentally construed at a more abstract level compared to those in the present,” according to research into the effects of ideology on environment policy.⁷¹⁶ Exposure to future risk

⁷¹⁴ Trimble, *Bargaining for Eden*, 132-40.

⁷¹⁵ “Environmental Stewardship and Conservation.”

⁷¹⁶ Saiquan Hu, “How Political Ideology Affects Climate Perception.”

is disregarded. As Trimble observes, “American culture tells us we must develop. We must stay on deadline. We must make decisions—right now.”⁷¹⁷ Because of an orientation to short-term results, the Euro-American mode is crisis management, which, for the last century and a half, has been the operative mode of the Utah establishment in dealing with the capricious Great Salt Lake. Its ebbs and rises are a terrible inconvenience to people engaged in an impatient, near-sighted wealth-producing process. Dispassionate observers of this spectacle know how costly this kind of thinking can be:

The short-term crisis nature of the decision-making process for the Great Salt Lake has not been well suited to making rational long-term management decisions. While the state has been able to weather the current crisis [the 1982-1987 expansion of the lake], it has done little to prepare for lake-level rise problems in the future. Thus, despite the 3.66 m (12-ft) rise in the level of the lake and the extensive flooding of lakeshore facilities and property since 1982, Utah continues to remain vulnerable to the rising and fluctuating level of the Great Salt Lake.⁷¹⁸

That vulnerability is real. Today, the Legacy Parkway skirts the shores of the lake (it probably would have been underwater during the 1980s floods), and is gradually attracting urban sprawl—the massive residential-retail-office development called Station Park at the north end of the Parkway is only a beginning. Substantial housing developments have sprung up along Farmington Bay on lands that were submerged as recently as the 1980s. A vast inland port comprising six million square feet of warehouse space is under construction in the Great Salt Lake flood plain west of Salt Lake City. “No plans have been developed for...handling extra runoff from the inland port,” says one critic. The port will attract a tidal wave of long-haul trucks spewing pollution and fugitive dust. “They have not done any kind of impact study yet and have begun construction. . . .

⁷¹⁷ Trimble, *Bargaining for Eden*, 153.

⁷¹⁸ Morrisette, “The Rising Level,” 1040.

This is an ecological disaster,” says another critic.⁷¹⁹ Moreover, recurrence of the 1952 or 1982 storm patterns could mean inundation of the flood-prone lowlands around the lake; but the state of Utah has a long history of avoiding costly flood-control measures. The American Society of Civil Engineers recently issued a “report card” on Utah’s preparedness for flooding, giving the state a “D+” for the condition of its canals and a “D-“ for its levees. If these were to fail, the report says, flood damage and financial losses would “set new records.” “Given the historical impacts of an extended wet cycle, as seen in the early 80s, another such period could be financially devastating to the State of Utah, as a result of continued development along and near flood management resources.”⁷²⁰

It is a paradox that the Wasatch culture, so famous for controlling water through irrigation, should have created the conditions for out-of-control floods. In a real emergency, the stewardship ethic surfaces in impressive ways among the Mormons, as their response to the 1983 floods demonstrates. Still, more respect for a legacy of stewardship might have at least mitigated if not significantly reduced the risk of ruin by rampant flooding. Harold B. Lee, late president of the Mormon Church, once reminded his people, “The pioneers were driven into the desert; they were starving and they were unclad; they were cold. We are the inheritors of what they gave to us. But what are we doing with it?”⁷²¹

⁷¹⁹Lee Davidson, “Activists call for halt of construction on inland port until environmental effects are studied,” *Salt Lake Tribune*, October 17, 2019.

⁷²⁰ *2015 Report Card for Utah’s Infrastructure*, American Society of Civil Engineers, 2015, 2, 32.

⁷²¹ Harold B. Lee, “Christmas Devotional Address,” December 3, 1973, cited in Daniels, “Revitalizing Zion,” 299.

Chapter 7

Wind, Winter, and Wildfire

As we have seen, the vagaries of the Wasatch climate continue to influence the conflicting ideals of stewardship and entrepreneurialism and their role in the blossoming narrative. A pattern of forgetting and remembering characterizes the experience of the Saints. Climate extremes such as drought or flood tend to spur remembering of the stewardship ethos, which did not originate with Mormons, but which they vigorously embraced periodically, or the retrenchment of polluting industries and renewal of land ruined by agricultural excesses. The Saints' tendency to forget the ethos of consecration in favor of secular wealth-seeking was an early refrain in the admonitions of their leaders. "I know that many of us when we came to the valleys, conformed to this law of consecration," Apostle Lorenzo Snow preached in 1877:

We deeded our property, and many were willing, perhaps not all, that, if necessary, every part and portion of it should have been used as the servants of God should have directed. This was the kind of feeling that we *then* entertained, and just as long as we maintained this condition of mind, of willing obedience, it was all that was required. But I fear that this feeling, which gave us so much joy, which tended to increase our faith and confidence in God and in one another, has not continued to grow correspondingly with our general prosperity.⁷²²

Secular entrepreneurialism was the key to quick prosperity, and the Saints were not immune to the rewards of rapid economic growth. Even though their leaders pleaded with them to become "one" and to grow prosperous as a people rather than as competing individuals, the Mormon culture lost the fervor of consecration and adopted a short-term orientation that forgot preparation for the trials the Wasatch environment would inflict on them.

⁷²² Lorenzo Snow, "Necessity for Effort," April 5 1877, *JD* 18: 373.

For secular entrepreneurs, there is no immediate economic reward in mitigation or prevention of disaster: preparation costs money. Furthermore, in the face of hurricane-force winds, massive storms and fires, a highly interdependent economy stands helpless in its fragility. An orientation to the present works against investment in sustainability, which cuts into profits and blurs the focus of enterprise. “Sustainable development is based on long-term goals,” according to psychologists Marc Wittman and Anna Sircova. “It requires one to adopt anticipatory behaviors, to imagine the future, and consider the consequences of one's own behavior.”⁷²³ Exploitative behavior sets the community on an unsustainable path. The expansion of population on the Wasatch Front, a culture devoted to short-term economic growth, increases exposure to both sudden and gradual climate disaster, as we will see.

The sun heats the earth, and as Alfred Crosby puts it, different bands of air take that solar energy and scurry about, “as winds, swerving in obedience to the Earth’s rotation.”⁷²⁴ For the Latter-day Saints, the wind can be a symbol of God’s presence. At the dedication of the first Mormon temple at Kirtland, Ohio, Joseph Smith prayed, “Let thy house be filled, as with a rushing mighty wind, with thy glory.”⁷²⁵ They still tell the story that a Pentecostal manifestation took place there. According to Apostle George A. Smith, “There came a shock on the house like the sound of a mighty rushing wind, and

⁷²³ Marc Wittman and Anna Sircova. “Dispositional orientation to the present and future and its role in pro-environmental behavior and sustainability,” *Heliyon* 4, no.10 (26 October 2018). doi:10.1016/j.heliyon.2018.e00882.

⁷²⁴ Alfred Crosby, *Children of the Sun: A History of Humanity’s Unappeasable Appetite for Energy* (New York: W.W. Norton, 2007), 48.

⁷²⁵ Doctrine and Covenants 109:37.

almost every man in the house arose.”⁷²⁶ Joseph Smith said, “A voice was heard like the sound of a rushing mighty wind which filled the Temple and all the congregation simultaneously arose being moved upon by an invisible power.”⁷²⁷

For the Mormons, the wind is also a symbol of adversity, which paradoxically they view as a tool in the hands of God and a necessary feature of the preparation for godhood. They speak of the wind as an emblematic force to be resisted, and in that resistance, they gain moral and spiritual strength. Of course, the phrase “the wind of adversity” is proverbial, but for the Mormons it takes on a distinctive theological significance. Their scripture says, “All they who receive the oracles of God, let them beware how they hold them lest they are accounted as a light thing, and are brought under condemnation thereby, and stumble and fall when the storms descend, and the winds blow, and the rains descend, and beat upon their house.”⁷²⁸ The Saints are supposed to be strengthened for their ultimate divine destiny as they stand against the “wind of adversity.”

Brigham Young considered the wind of the Wasatch Oasis another useful feature of this ground of “saint-making.” Although average wind speed in Utah is only about half what it is on the Great Plains, windstorms along the mountains can be impressively

⁷²⁶ George A. Smith, “Historical Discourse,” November 15, 1864, *JD* 11: 10.

⁷²⁷ History, 1838–1856, Volume B-1 [1 September 1834–2 November 1838],” Addenda, Note J, March 27, 1836, JSP.

⁷²⁸ Doctrine and Covenants 90:5.

destructive, not only in themselves but as drivers of fire and blizzards. Young hoped that the Saints would be humbled as well as fortified by the force of the winds.⁷²⁹

We are but stewards over what our Father puts in our possession. We possess houses, farms, gardens, orchards, vineyards, and pleasant locations; but are they actually ours? No. Is there a foot or an inch of this earth that rightly belongs to us? No. God has put it in our possession, and has given us ability to take from the elements to make habitations to shelter ourselves; but are the elements ours? Suppose the Lord should cause a tornado to pass through here, as he has lately done in some places in the States, and destroy all we possess, can we say to the winds, Cease blowing? Or suppose he should cause lightning to destroy our buildings, can we stop it? No.⁷³⁰

For Young, God intended extreme weather to teach his people the true nature of stewardship. The climate was beyond their control, and the idea that they had “property rights” in the environment was an illusion. They were called to become “houses built on the rock of eternal truth,” gods in embryo able to withstand the wind of adversity.⁷³¹ The wind was there to teach them the duty of foresight and preparation. Heber C. Kimball made this point in a way that mingled the spiritual and the temporal: “Put the covering on your houses—bind on the cornices; for, if you don't, the Devil will raise a wind that will blow the tops off.”⁷³²

Although the mountains around the Great Basin typically form a natural barrier against tornadoes and hurricanes, violent windstorms do occur along the Wasatch Front. Utahns are most often victims of straight-line winds rather than circling cyclonic winds.

⁷²⁹ “U.S. Average Annual Wind Speed at 80 Meters,” <https://windexchange.energy.gov/maps-data/319#:~:text=U.S.%20Average%20Annual%20Wind%20Speed%20at%2080%20Meters,-More%20Maps%20and&text=Areas%20with%20annual%20average%20wind,resource%20suitable%20for%20wind%20development>.

⁷³⁰ Brigham Young, “Personal Sacrifices,” July 8, 1860, *JD* 8: 117.

⁷³¹ Brigham Young, “Light of the Spirit,” July 15, 1860, *JD* 8: 123.

⁷³² Heber C. Kimball, “Restoration of the Dead,” November 25, 1860, *JD* 8: 242

Northerlies follow in the wake of powerful cold fronts or low-pressure systems. These gusts can blow past mountain tops at hurricane speeds of over 100 miles per hour. Utah also experiences thunderstorm winds and occasionally tornadic winds.⁷³³

The most devastating winds along the Wasatch are the easterlies, which tend to occur during the late fall and early spring.⁷³⁴ When strong high-pressure forms over western Wyoming and collides with a deep low pressure from Nevada, the result is hurricane-force winds. Like a vigorous waterfall, the wind swoops down the mountain slopes and through the canyons with devastating speed and power. These gusts rip through the most populated areas of Utah. Easterly windstorms of the past have caused millions of dollars in damage.⁷³⁵

Particularly ferocious are the east winds of Davis County just north of Salt Lake City. Even in pioneer times, the east wind was notorious for blowing out windows, flattening crops, and moving giant snow drifts. They were even responsible for taking human life. John Rigby had been married to his wife Elizabeth for only two years when the east wind took the roof off their home in Farmington in 1864. With John away getting medicine for their young son, Elizabeth tried to get to get to the shelter of her neighbor's house when the wind apparently pinned her and the child up against a fence. Both she and the child froze to death.⁷³⁶ Such was the notoriety of the Wasatch winds that Charles

⁷³³ Utah's Winds, Utah Center for Climate and Weather, <http://www.utahweather.org/2015/02/utahs-winds.html>.

⁷³⁴ Leonard, *A History of Davis County*, 110.

⁷³⁵ "Utah's Winds."

⁷³⁶ Annie Call Carr, *East of Antelope Island* (Salt Lake City: Publishers Press, 1969), 238.

W. Penrose of Farmington, an apostle and lyricist, wrote the following lines while he was in England on a mission:

Blow gently, ye wild winds, with frost in your breath,
That smite the glad stream with the chill hand of death,
When shrieking and fierce o’re the mountains ye come,
Blow gently, I pray, on my loved ones at home.⁷³⁷

The Saints also believed that the wind was an instrument in the hands of God.

During the grasshopper plague of 1855, a giant gust from the east reportedly blew thousands of the insects out to drown in the Great Salt Lake, thus saving the crops of the Saints. The legend is that the grasshoppers washed back onto shore in piles several feet deep, causing a stench that flowed back up the valley “to furnish the substance for another pioneer memory.”⁷³⁸ According to another account, the grasshoppers simply flew west over the lake and eventually drowned.⁷³⁹

In November 1864, Wilford Woodruff recorded in his journal that he, Brigham Young, and others encountered a powerful snowstorm driven by a ferocious east wind while traveling from north Davis County to Salt Lake. The gusts nearly knocked over Woodruff’s carriage and blew out one of its windows. They found shelter for the night, “the worst I have experienced on land in my life,” said Woodruff. The next day, they woke up to devastation. Homes around the area, including the one Woodruff stayed in, suffered thousands of dollars in damage. Hay was thrown everywhere, and roofs had been blown off several substantial buildings, including the Bountiful meeting house.⁷⁴⁰

⁷³⁷ Glynn Bennion, “An Ill Wind,” *Improvement Era* 42, no. 8 (August 1939): 467.

⁷³⁸ *Ibid.*, 497.

⁷³⁹ Dale Morgan, *The Great Salt Lake*, 255.

⁷⁴⁰ Wilford Woodruff, Journal, November 16, 1864.

A local legend arose about this journey through Davis County, though Woodruff makes no mention of it. Its origins are a mystery. As the story goes, while suffering through the intolerable gusts, Brigham Young called upon the powers of heaven and rebuked the gale. According to the legend, the powerful east winds calmed and did not return for many decades.⁷⁴¹ An LDS youth magazine, while admitting the story was a legend, repeated it, adding the detail that the wind overturned Young's carriage. "When the Prophet arose and dusted off his clothes, he rebuked the evil wind so feelingly that it has never blown so boisterously since."⁷⁴²

The legend is an example of the "faith-promoting rumor" variety of folklore popular in Mormon culture. Such stories helped them cope with violent storms and reinforced the narrative that climate disruptions were manifestations of divine power.⁷⁴³

Young's rebuke did not put an end to the power of the easterlies, especially in Davis County. "Back in 1906, they had just built the Layton First National Bank," says the Layton city historian. "They built the building in 1905 and in 1906 an east wind with winds clocked over 150 miles per hour blew the building down and then they rebuilt in 1907." (No official record exists of a 150-mph wind at that time—it was probably an exaggeration.) The same storm destroyed a new city hall that had just been built in Kaysville. "They had a bell tower, and the wind blew the bell tower into the building,

⁷⁴¹ Matthias F. Cowley, *Wilford Woodruff: History of His Life and Labors as Recorded in His Daily Journals* (Salt Lake City: Deseret Evening News Press, 1909), ebook location 6820.

⁷⁴² Bennion, "An Ill Wind," 467.

⁷⁴³ "[Mormon storytellers] know that if they are to encourage the righteous or reform sinners, they must make their stories artful—that is, they must imbue them with power." William A. Wilson, "What's True in Mormon Folklore? The Contribution of Folklore to Mormon Studies," Arrington Annual Lecture. Paper 12, Utah State University, September 27, 2007, https://digitalcommons.usu.edu/arrington_lecture/12

so they demolished it and never rebuilt."⁷⁴⁴ Officially, Utah recorded its strongest wind gust ever on the Bountiful bench on November 11, 1978—at 120 miles per hour, it was the equivalent of a Category 3 hurricane. Such ferocious windstorms occur about once every two or three years. The wet weather that brought floods to the Wasatch in 1983 also brought winds clocked at over 100 miles per hour at Hill Air Force Base in northern Davis County.⁷⁴⁵

Although the mountainous terrain discourages the formation of cyclonic winds, a rare tornado rating a strong F2 on the Fujita scale ripped through the business district of Salt Lake City on August 26, 1999. The 115-mph funnel cloud traveled from western downtown to the northeast, terminating near Memory Grove Park where the mountain slope begins. It wrought tremendous damage over a 4.25-mile path, killing one man and tearing out old-growth trees around the State Capitol and Memory Grove.⁷⁴⁶

Another intense easterly belt swept over Davis County on December 1, 2011, causing some \$20 million in damaged buildings and thousands of downed trees.⁷⁴⁷ On Sunday, December 4, Mormon Church leaders canceled meetings in affected areas and directed Latter-day Saints to help clean up the debris. “There was something extraordinarily touching about thousands of people, Mormons and their neighbors of other faiths or no faiths at all, working side by side in a unified display of mutual caring

⁷⁴⁴ Charles F. Trentelman, “Davis History of Destructive Winds,” *Ogden Standard-Examiner*, December 4, 2011.

⁷⁴⁵ “Utah’s Winds.”

⁷⁴⁶ “Tornado Was Too Fast for Warning,” *DN*, August 27, 1999; see also “National Weather Service—NWS Salt Lake City,” wrh.noaa.gov.

⁷⁴⁷ Pat Reavy, Ami Joi O’Donoghue, “Hurricane [Force Winds Wreak Havoc](#) in Davis County, [Cleanup Could Take Days](#),” *DN*, December 1, 2011.

and sharing, even though we normally all get along well,” said Church spokesman Michael Otterson in his *Washington Post* blog “On Faith.” “Something special comes from serving together.”⁷⁴⁸ Within this narrative, the wind was an act of God that served to unify the people and recall for them stewardship values of selflessness and charity.

Wind in Utah is most powerfully felt in its effects on blizzards and wildfires. Wasatch Front dwellers dread the prospect of the ferocious east wind driving a massive snowstorm or, even worse, a range fire. Most families have their legends about ancestors who had to make their way through blinding snows or dig themselves out of titanic drifts.

Probably the most recognizable climate feature of the Wasatch Front is the winters, due to the ski industry and the 2002 Winter Olympics. One legend blames winter for the lack of bison in northern Utah. As the story goes, bison were plentiful around the Great Salt Lake until the winter of 1830, when heavy snowfall froze them all to death. Jim Bridger reportedly said that he had to “tumble ‘em all into the lake” to preserve the meat.⁷⁴⁹ How Bridger was able to drag countless half-ton animals into the shallow lake will always remain a mystery, but the value in the story is in how it depicts Utah winters.

As late as the turn of the twentieth century, Mormon leaders were still teaching that God was calming the natural elements for the good of the Saints. In a 1904 sermon, a leading elder named William Budge addressed the Church’s general conference and spoke of the change in climate he had seen since he settled in the Bear Lake Valley on the Idaho border. When he first arrived, he said, the winters were terrible, mostly because of the winds (though he makes a point to mention that they were not so powerful as the

⁷⁴⁸ Sammy Hislop, “‘Pure Religion’ in Wake of Windstorm,” December 14, 2011. <https://newsroom.churchofjesuschrist.org/article/-on-faith-blog-wind-storm-pure-religion>

⁷⁴⁹ Carr, *East of Antelope Island*, 19-20.

winds of Davis County), which would blow snow down the mountains, covering fences and making travel difficult.

Yet after a time we did observe that the winds ceased, and now we have no such winds to contend with. These winds were a great hardship to the people and productive of much labor, the roads being filled up in a few hours, and people much inconvenienced by the snow being piled up against their houses. And now that these winds have actually ceased, how shall we account for it? We may admit the cultivation theory in reference to the changing of the climate, but what shall we say about the cessation of winds? Why, the Lord has done this as he has done other things for his people.⁷⁵⁰

Another elder confirmed Budge's account. "We ranched there for fourteen years," recalled Ephraim Kimball "and we became inured to the windstorms that occurred continuously through the winter in that country." But now, Kimball insisted, those winds were gone: "It is a rare thing to have a severe windstorm, and the climate has become moderated and more desirable for the people."⁷⁵¹ Budge and Kimball believed that God had tamed the climate for the Saints in Bear Lake Valley, and he would continue to do it for the obedient Saints elsewhere in the region. Average annual temperature in Utah has risen 2.7°F, which could explain the moderating of the weather; of course, among the public the reasons for that trend are controversial.⁷⁵²

Still, fierce snowstorms unpredictably disrupted the Wasatch community from time to time. In the severe winter of 1855, herdsman tried to save 3,000 cows grazing in Cache Valley by herding them over Sardine Pass toward the Great Salt Lake Valley; most

⁷⁵⁰ William Budge, *75th Semi-Annual Conference Report*, October 7, 1904, 20.

⁷⁵¹ Ephraim Kimball, *74th Annual Conference Report*, April 6, 1904, 49.

⁷⁵² "Utah," *State Climate Summaries*, NOAA National Centers for Environmental Information, 2019. <https://statesummaries.ncics.org/chapter/ut/>

of the cattle starved or froze.⁷⁵³ The livestock industry again suffered unusual losses in the winter of 1887 when a storm pattern blanketed the West. By that time, cattle could yield “tremendous profits.” Herds had grown and annual trail drives in Utah doubled in size between 1882 and 1886. But the “Siberian-like winter” of 1887 caused an extraordinary “die-up,” and over the next few years ranchers reduced herds to more manageable sizes.⁷⁵⁴

As an arid country, Utah does not experience many high-cost snowstorms. Only twice since 1949 have snowstorms produced more than \$25 million in damage.⁷⁵⁵ One major exception was the heavy snowstorm pattern known as the blizzard of 1949, which blasted much of the region from the middle Rockies across the northern Great Plains. An Arctic air mass encountered warm, wet air from the Gulf of Mexico and stalled. The resulting series of storms covered entire states—Nebraska and the Dakotas in particular—in several feet of snow. Beginning on January 2, a three-day snowstorm began a pattern that would continue until early March. Deep snowdrifts buried highways and railroads making travel virtually impossible. Before the storms ended, 76 Americans and more than a million livestock had died due to the heavy snow and bitter cold.⁷⁵⁶ Because of a dry growing season and poor harvests, Great Basin ranchers lacked normal quantities of feed and hoped to depend heavily on winter grazing.⁷⁵⁷ The winter started

⁷⁵³ Bradley Paul Hansen, “An Environmental History of the Bear River Range, 1860-1910,” MA thesis, Utah State University, 2013, 62.

⁷⁵⁴ Dwan Green, “The Hard Winter of 1886-1887,” *Fairmont Folio: Journal of History* 10 (2008): 20-21.

⁷⁵⁵ Stanley Changnon and David Changnon, “A Spatial and Temporal Analysis of Damaging Snowstorms in the United States,” *Natural Hazards* 37 (March 2006), 373.

⁷⁵⁶ “January, 1949 Blizzard,” Rapid City SD Forecast Office, National Weather Service.

⁷⁵⁷ James A. Young, “Operation Hay Lift: the Winter of 1949,” *Rangelands* 6 no. 3 (June 1984): 117.

off mild enough. A report from October 29, 1948, indicates that there still was not enough snow to open the local resorts to skiers.⁷⁵⁸ That same day however, the small town of Soldier Summit, a train stop on the southern end of the Wasatch, was buried under nine inches of snow.⁷⁵⁹ Another heavy storm hit on November 20. Farmers were grateful for the precipitation after a drought summer.⁷⁶⁰

In Salt Lake, a weather forecaster predicted that a three-inch storm on December 1 would be the worst of the season.⁷⁶¹ However, that month 39 inches fell on the Salt Lake airport—more than double the average for an entire year.⁷⁶² And it did not let up. January was even worse. The new year started off mild, at 34 degrees on New Year's Day.⁷⁶³ This mild condition, however, quickly gave way to increasingly intense storms. The first week of 1949 brought the coldest temperatures in decades. On January 4, the mercury set a new low record at -11 Fahrenheit and the next night at -15 in Utah Valley, the coldest recorded temperature since 1910.⁷⁶⁴ January only had eight days without any snowfall. The National Weather Service map for January 2 and 3, 1949, shows a well-

⁷⁵⁸ "No skiing as yet at Alta resort," *Salt Lake Telegram*, October 29, 1948.

⁷⁵⁹ "Soldier's Summit Reports Fall of Nine Inches Snow," *Provo Daily Herald*, October 19, 1948.

⁷⁶⁰ "Beneficial Snow Covers Entire Mountain Area," *Lehi Sun*, November 25, 1948; "Crop Outlook Bettered," *Nephi Times-News*, November 25, 1948.

⁷⁶¹ "Snow Storm Breaks Loose Over the State," *Provo Sunday Herald*, December 5, 1948.

⁷⁶² "Recalling the infamous Utah winter of 1948-49," *Standard Examiner*, Jan 2, 2014; "Climate in Salt Lake City," https://www.bestplaces.net/climate/city/utah/salt_lake_city. Accessed on 1/9/2019.

⁷⁶³ "1949 Starts Off Warmer," *DN*, January 1, 1949, A6.

⁷⁶⁴ "Temperatures hit 15 below in Provo Area," *Provo Daily Herald*, January 5, 1949, 1, 2; "Diving Mercury Paralyzes Utah Industries," *DN*, January 5, 1949, 1.

defined plume of lake-effect snow coming off the Great Salt Lake toward the most populated areas of the Wasatch Front.⁷⁶⁵

Eventually, the news media were calling the harsh storms “the Great Blizzard.” While airlines were able to operate without much interruption, trains were stranded and many smaller communities in the West were left isolated. On January 3, the Chicago and Northwestern Railway, the main line from Chicago to Lander, Wyoming, canceled all passenger services to any destination west of Omaha for 13 days. The storms stranded 3,000 passengers in 17 trains in Utah and Idaho.⁷⁶⁶ Meanwhile, in Wyoming, 2,000 passengers were stranded, and whiskey supplies ran low before relief trains arrived from Cheyenne. News reporters called “the three-day siege . . . the worst in the memory of old-time westerners.”⁷⁶⁷

In Utah, the police and highway crews battled high winds and snow to rescue stranded motorists.⁷⁶⁸ There was a pause in the storm for a few days, but on January 8 the snow returned with a vengeance. The day started out deceptively warm, an indication that another storm was coming. It hit around 4 p.m. Rescuers of a stranded family in Lehi reported that the storm was “filling snow as fast as we can dig it out,” so supplies were delivered via sled.⁷⁶⁹ Buses struggled against high winds and blowing snow, and Logan police reported that roads across the Idaho state line were impassable.

⁷⁶⁵ “January, 1949 Blizzard.”

⁷⁶⁶ “3,000 Marooned by Storm in Utah and Idaho,” *Provo Daily Herald*, January 5, 1949, 1.

⁷⁶⁷ “Worst Blizzard in 20 Years Subsides; Travelers Stranded,” *Provo Daily Herald*, January 5, 1949, 1.

⁷⁶⁸ “Lehi Road Official Aids Stranded Motorists Sunday,” *Lehi Sun*, January 6, 1949.

⁷⁶⁹ “New Cold Wave, Storm Strike West,” *DN*, January 9, 1949, A1.

High winds made things worse. Gusts up to 50 miles an hour blew fresh snow into drift six feet across roads in southern Salt Lake County. Motorists abandoned roughly 200 cars along the streets. One public bus making its way east from Salt Lake City became stranded for nearly 12 hours before crews were able to dig it out.⁷⁷⁰ Schools across the city reported sparse attendance as school buses either failed to show up or struggled to negotiate the intense winds and the snow-covered streets.⁷⁷¹

On January 15, another blizzard hit—the third one in two weeks. Again, this one had nation-wide consequences. Two transcontinental highways were blocked west of the Rockies, while a third was only barely able to stay open.⁷⁷² The Wasatch Front was one of the most severely affected regions of the country. This blizzard was especially devastating as it came just as Utah was beginning to dig itself out of the previous one. Exhausted snow-removal crews battled wind, frozen rain, and even avalanches. At 4 A.M. on Saturday January 15 an avalanche covered 60 feet of a highway in Provo Canyon under four feet of snow. Luckily, only one motorist, one Lloyd Ford, was caught, but it took crews four hours to dig his car out. Ford dramatically recalled hearing the low rumble of the rushing avalanche and, in a mad panic, ditching his car and reaching safety only moments before the road was buried in rocks and snow. (Apparently he was exaggerating—witnesses said he drove into the slide, where his car stalled.)⁷⁷³

On January 20, the same day Harry Truman began his second term, another six inches of snow fell in Provo, bringing the total to 52 ½ inches for the season, a near-

⁷⁷⁰ “Freezing Rain New Hazard to Utah’s Traffic,” *Provo Daily Herald*, January 13, 1949.

⁷⁷¹ “Blizzard Paralyzes Southeast S.L. Area,” *DN*, January 10, 1949.

⁷⁷² “Third Blizzard in Two Weeks Hits West,” *Provo Sunday Herald*, January 16, 1949.

⁷⁷³ “Blizzard Slugs at Utah in New Fury,” *Salt Lake Telegram*, January 15, 1949.

record. The nearby town of Springville received 56 inches. The storm shut down roads that crews had opened just days earlier, including Weber Canyon.⁷⁷⁴ Just as roads were cleared, another blizzard dropped eight inches of new snow, bringing the cumulative snow depth in Provo to 62 ½ inches—eight inches above the yearly average. Schools closed all over the state. By now, snow-removal crews were leaving residential areas uncleared as they tried to keep mail routes open. Snow piles grew so immense not even heavy equipment could move them. In Salt Lake homeowners were told to clear their roofs, as garages collapsed under the immense weight of the snow.⁷⁷⁵ Some even suggested using flame throwers to remove the snowpack, though that idea was quickly dismissed.⁷⁷⁶

In some cases, the extreme weather brought out the best in people. A front-page *Deseret News* report told of the Glauser family, who were buried behind a ten-foot snow pile blocking the door of their house. According to the report, sixteen of Mr. Glauser's friends from his Mormon mission days came to his aid. They went at the snow piles with pickaxes and shovels and soon cleared not only the Glauser home, but the neighboring homes as well.⁷⁷⁷

In light of the crisis, Willard A. Day, the newly appointed chairman of the Utah State Road Commission, made an urgent request to Governor J. Bracken Lee for \$900,000 worth of new road equipment. Day had learned that a good portion of the

⁷⁷⁴ "Snowfall Total Reaches 52 ½ Inches Locally," *Provo Daily Herald*, January 20, 1949.

⁷⁷⁵ "Record Snow Buries Utah County Area," *Provo Daily Herald*, January 24, 1949.

⁷⁷⁶ "Use of Flame Throwers for Snow Clearing Purposes Impractical," *Provo Daily Herald*, January 25, 1949, p. 2.

⁷⁷⁷ "Fierce Winter's Fury Yields to Cooperation," *DN*, January 17, 1949.

state's equipment was too old and worn down to be effective, and that replacing the machinery would be cheaper than making repairs. Forty-six of the 420 trucks were between eight to ten years old. Twenty power graders and a tractor were also a decade old or more. In addition to that, Day reported that "fifteen trucks, thirty-two power graders and twenty-seven tractors have had more than eleven years of service and most likely are sitting in storage yards." At the time the state owned 420 trucks, 99 power graders, and 50 tractors; but old equipment hampered other machines and slowed the snow removal process.⁷⁷⁸ Clearly, the state was not ready to deal with a storm of such magnitude. Fortunately, the U.S. Senate Interior Committee, which had already approved \$500,000 for relief, bumped the amount to \$750,000 to help in what they termed the "worst blizzard in the history of man."⁷⁷⁹ President Truman dedicated all but \$50,000 of his disaster relief funds to helping western states.⁷⁸⁰

On January 9, the state conservation committee notified the public of the risky position of the state's wildlife. They urged Utahns to do "all in their power to assist in efforts to save deer and other wildlife of the state." They asked for access to all kinds of feed "suitable for deer," including discarded Christmas trees. They also urged Boy Scouts and other groups to help distribute the food, and for restaurants to save food waste for starving quail and other fowl. Officials at Hill Air Force Base also volunteered to make air drops in areas where deer and elk were starving.⁷⁸¹ Unfortunately the airlifts were not

⁷⁷⁸ "Road Unit Tells Machinery Needed," *DN*, January 18, 1949

⁷⁷⁹ "Emergency Aid Bill Boosted to \$750,000," *Provo Daily Herald*, January 25, 1949.

⁷⁸⁰ "Truman Allocates \$200,000 More for Disaster Relief in Winter-Locked States," *Provo Daily Herald*, January 26, 1949.

⁷⁸¹ "Utahns Urged to Assist Starving Deer," *DN*, January 9, 1949.

as successful as many had hoped as the new storm made it difficult for the starving deer to access the feed.⁷⁸²

The strategy backfired somewhat in Salt Lake City. January 13th saw the commencement of what the Deseret News dubbed, “The Battle of the Deer.” At some point in early January, hay feed had been placed around the east foothills of the city to help sustain healthy deer populations. The feed eventually ran out, however, and because high winds were blowing snow drifts, the roads were impassable, and trucks were unable to replenish the feed. The deer descended on the city in search of food. Police and newspaper switchboards were flooded with angry reports of large deer herds flooding into the eastern hills of the city. One exasperated woman reported to the police that four deer were “munching rose bushes on her property.” The police tried their best to round up the deer and herd them back into the foothills. Some police even went so far as to handcuff a few deer and carry them out of the city. So ended the War of the Deer.

Deer were not the only wildlife to struggle through the winter. The State Fish and Game office tried mightily to also help starving fowl. They distributed grain to feeding areas and encouraged residents to do the same. Some of the birds were quite resourceful and did well for themselves. Pheasants for example were able to follow cattle around and dig behind their tracks to find food. Quail however, were not so lucky. Unable to dig into the snow, many starved.⁷⁸³

As the snow grew deeper and the temperatures colder, many farmers feared their livestock would be decimated—and they were. On January 9, Don Clyde, president of the

⁷⁸² “Weather,” *DN*, January 9, 1949, A2.

⁷⁸³ “Police, State Winning S. L. Battle of the Deer,” *DN*, January 13, 1949.

Utah Wool Growers Association, called for an emergency meeting on January 10 to assess the situation. Because snow was typically light and transient on the west desert where the sheep spent the winter, herdsman kept no stockpiles of feed; they counted on the available vegetation to feed the sheep. But now, one herdsman later reported, the starving sheep were “ready to die” because they had started eating each other’s wool.⁷⁸⁴ Close to one million sheep became stranded as the blizzard and high winds stormed through western Utah, prompting panic from the Association: “The Utah sheep situation is no longer merely serious—it has reached calamitous proportions.”⁷⁸⁵ Many ranchers feared losses of up to 50 percent of the stranded animals.

Utah State Senator Elias Day urged the state to approve emergency appropriation for the state’s herders. “The Legislature should pass an emergency measure immediately to save the sheep,” he declared. “It would be disastrous to the state’s economy if this industry were wiped out.” He went on to describe the situation as the “worst the state has ever known.” Hugh Bryan, a conservationist for the Bureau of Land Management, supported Day’s claim and asserted that some herders had been stranded for as much as 11 days. Snowplows had tried to reach the sheep and their herders, but frozen drifts many feet deep were almost impenetrable for some of the equipment. One large road grader broke down after an hour of trying to break through the heavy drifts.⁷⁸⁶

Representatives from every agency met in an emergency meeting January 17, including the State Road Commission, U.S. Forest Service, and the U.S. Army and Air

⁷⁸⁴ Young, “Operation Hay Lift,” 117.

⁷⁸⁵ “Snowed in Sheep on West Desert,” *Provo Daily Herald*, January 17, 1949.

⁷⁸⁶ “Legislature Asked to Save Herders,” *DN*, January 17, 1949.

Force. Together they drew up a plan for saving the sheep. The Wool Growers Association would head up the plan. Governor Lee asked that “all available equipment” be used for the operation.⁷⁸⁷

Up to this point, most people were worried about the stock, but now the 400 or so herdsmen on the range were also in danger. With no means of communicating with them, no one knew where they were or if they were still alive. Bryan fretted, “We will be lucky if we get out of this situation without loss of life—human life, I mean.” Marion Clawson, director of the BLM in Washington, declared that although parts of Wyoming and Nevada had deeper snow, the livestock crisis “is more serious in Utah than anywhere else in the West.” It was “impossible to exaggerate” the perilous situation of Utah’s sheep.⁷⁸⁸

Temperatures as low as -25°F and strong winds hampered crews as they cleared hundreds of miles of roads in search of isolated herds. Trucks loaded with feed rolled the newly cleared roads. On January 19, road crews finally reached a herd of 164,000 sheep in the west desert which had been isolated since January 2. While crews were relieved to have gained some ground, many more thousands of sheep were still beyond their reach in the west desert.⁷⁸⁹ The victory was short-lived. Two days after crews had reached the sheep, 35 mile-per-hour winds blew snow drifts back on to the roads, clogging them once again. The wind and new snow “covered up the roads as quickly as they were plowed.”⁷⁹⁰

⁷⁸⁷ “Relief Due for Snowed in Sheep on West Desert,” *Provo Daily Herald*, January 17, 1949.

⁷⁸⁸ “Legislature Asked to Save Herders,” *DN*, January 17, 1949.

⁷⁸⁹ “Crews Reach Stranded Sheep,” *DN*, January 19, 1949.

⁷⁹⁰ “Lee Declares Emergency State in Utah,” *DN*, January 22, 1949.

Clearly, the effort on the ground to save the stock was not going to be enough. Although airplanes had already been shuttling supplies to sheep camps, the Air Force got officially involved on January 19 with the commencement of Operation Hay Lift.⁷⁹¹ Beginning in Nevada and later extending to Utah, C-47 bombers flew air missions to drop hay and feed over stranded herds of cattle and sheep. The same strategy had already been used to help wildlife with some success.⁷⁹² In one instance, Col. Alma Winn, a World War II pilot and future commandant of Hill Air Force Base, flew a C-47 out to starving sheep, their owner, and his hands. Two of the owner's sons accompanied Winn on the flight to locate their father. Hampered by deep snow, the sheep managed to swarm the hay bundles that the flight crew dropped from two hundred feet above them.⁷⁹³

Operation Hay Lift had mixed results. Pilots flew a total of 325 sorties throughout the Great Basin region delivering 1,400 tons of hay to over 2 million cattle and sheep. Pilots spent the equivalent of fifty-four 24-hour days in the air—enough to circle the globe eight times.⁷⁹⁴ But a few ranchers still protested that the airlifts were not enough or that wildlife were beating their stock to the feed. Some complaints seemed outlandish—in Nevada, a group of herdsmen complained that ducks were eating the feed before the livestock could get to it.⁷⁹⁵ The famously self-reliant sheepherders found themselves utterly dependent on government help.

⁷⁹¹ "Crews Reach Stranded Sheep," *DN*, January 19, 1949.

⁷⁹² "Starving Deer," *DN*.

⁷⁹³ "Crews Reach Stranded Sheep," *DN*, January 19, 1949.

⁷⁹⁴ Young, "Operation Hay Lift," 118.

⁷⁹⁵ "Planes to Bomb Western Ranges with Feed for Stock," *Provo Daily Herald*, January 24, 1949; "Ducks Devour Feed Meant for Livestock," January 25, 1949.

Despite all these efforts, the loss of livestock was substantial. Some estimates put the total losses at 25 percent of the herds.⁷⁹⁶ “In historical perspective,” wrote James A. Young, a historian for the Department of Agriculture, “we should view the winter of 1949 as a grim reminder of what can be expected under extreme conditions.”⁷⁹⁷ It may not be possible to prepare for a storm of that magnitude, but Mormon leaders used the storm to prod the people back into a stewardship mindset. One of the top authorities of the Church, Clifford E. Young, spoke in the fall 1949 General Conference about what happened to him the previous winter:

Last winter some of us had a rather unusual experience. We were coming from the East on a train of luxury. We had left Chicago in the afternoon, having all the comforts that one could desire, in fact, more than one needed—warmth, plenty food; the train was almost a palace, and we were riding at ease, feeling so secure. The next morning we found ourselves in the throes of a blizzard, snowbound. That night the heat was off in the train, and by the next morning there was no food... The blizzard continued until the third day when it eased enough so that the railroad company could procure planes from Fort Warren, the military base near Cheyenne, and food could be brought in by airplanes. Even then we did not get much of it because the gale was so severe that the food was scattered to the four winds. But it brought home this realization we may be secure today and yet suddenly be placed in a position of want. These things can happen so suddenly that it behooves us to be on our guard constantly, to be always in a position to follow those who counsel us as to what we should do in these important matters.⁷⁹⁸

Thus, Clifford E. Young framed the winter disaster inside the Mormon saint-making narrative. “It brought home the realization” of the true “position” of the Saints with regard to the vagaries of the climate. Within that narrative, fearful climatic disruptions are not random at all, but part of the design of God to make Saints. In an 1860

⁷⁹⁶ Lynn Arave, “Recalling the Infamous Winter of 1948-49,” *Standard-Examiner*, January 2, 2014.

⁷⁹⁷ Young, “Operation Hay Lift,” 119.

⁷⁹⁸ Clifford E. Young, *120th Semiannual Conference Report*, October 1, 1949, 65-66.

address, after listing all the sufferings God had inflicted on the Latter-day Saints,

Brigham Young explained the theodicy underlying that narrative:

You may ask what his design is. You all know that the Saints must be made pure, to enter into the celestial kingdom. It is recorded that Jesus was made perfect through suffering. If he was made perfect through suffering, why should we imagine for one moment that we can be prepared to enter into the kingdom of rest with him and the Father, without passing through similar ordeals?⁷⁹⁹

According to this narrative, a crushing winter like 1949 was not a random horror, but a divinely decreed “ordeal” intended to help “perfect” the Saints. The hand of God was in the wind. Although such ordeals could strike at any time, a crucial aspect of the Saint-making narrative was to learn the value of being prepared for those ordeals, a key characteristic of the wise steward. Young interrogated his followers on this point:

How many of you have had wisdom enough to procure and lay up for yourselves produce enough to last until harvest? You may call this a small matter. How many of you have wheat or flour to last you a year? If you are without bread, how much wisdom can you boast, and of what real utility are your talents, if you cannot procure for yourselves and save against a day of scarcity those substances designed to sustain your natural lives? . . . I wish you would try to learn how to sustain yourselves in your present existence, and at the same time learn the things of God—the things that await you, that you may begin to prepare to dwell to all eternity—not merely to dwell today, tomorrow, this week, next week, and next year, but how to secure salvation in your present organization.⁸⁰⁰

To prepare for godhood, wise stewards must learn how to sustain their “natural lives.” They “learn the things of God” by securing life in their “present organization,” that is, to demonstrate the characteristics of a successful steward. To fulfill this stewardship, Young held up preparedness as a key practice. His successors in the presidency of the Church have repeated the practical application of his counsel to this

⁷⁹⁹ Brigham Young, “Confidence and Influence of the Saints,” June 30, 1860, *JD* 8: 66.

⁸⁰⁰ *Ibid.*, 68.

day: to store up enough produce to last a year. During the Great Depression, J. Reuben Clark reinforced this theme: “Let every head of every household see to it that he has on hand enough food and clothing, and, where possible, fuel also, for at least a year ahead.”⁸⁰¹ As a result, the Mormon culture highly values being prepared for emergencies—it is implicit in the doctrine of saint-making.

Not surprisingly, a recent national survey on disaster preparedness found that “Utah, a Western state with the largest Mormon population in the country, stands out as the state with the highest estimated rate of preparedness, reflecting similar findings about high rates of preparedness among Mormons individually.”⁸⁰² Local congregations conduct surveys on how well prepared members are for emergencies, and “preparedness fairs” are common in the meetinghouses. In current Mormon thinking, “stewardship” usually translates into “emergency preparedness,” a far narrower concept than the nineteenth-century totalizing view of the Saint as steward.

On the other hand, the calamity of 1949 also exposed a lack of preparedness. Clearly, government had not invested in the structures and equipment necessary to sustain life in a calamity. Much snow-removal machinery was useless or unequal to the emergency. The individual herders had also failed to prepare adequately for such a storm. In a press release at the end of the year, Governor Lee warned the state’s stockmen that they had to begin preparations for another harsh winter regardless of predictions. He reminded them that their lack of preparation had cost state and federal agencies in excess of \$50,000 per day during the disaster. “Much of this money would have been saved,” he

⁸⁰¹ J. Reuben Clark, Jr., *107th Annual Conference Report*, April 1937, 26

⁸⁰² Peter D. Howe, “Geographic Variation in Disaster Preparedness Across U.S. States and Metropolitan Areas,” *Social Science Research Network*, August 26, 2016. <https://ssrn.com/abstract=2830690>

said, “if producers had stocked up on feed and had kept their livestock in areas that were not in danger of becoming snowbound.”⁸⁰³

The livestock business suffered huge losses in great part due to a risk-taking mindset that encouraged isolation and a lack of foresight. Too many animals died because their minders made no provision for emergencies—no stockpiles of feed, no means of communication or transportation under crisis conditions. The beliefs of the stockmen persisted in the “naïve perfection of the pre-modern past,” in the self-sufficiency of the frontiersman in the face of nature.⁸⁰⁴ The result was disastrous.

Just as the wind drives deadly blizzards, it can also compound the destructive force of wildfires. The Wasatch has a long history of fires. Fire-scar studies throughout the northern Rocky Mountain region show a varied pattern of fires before the advent of Euro-Americans. Major fires would cause replacement of whole stands of timber, where other fires burned at varying intensities, “creating a mosaic of stands differing in composition and structure.”⁸⁰⁵ In this region, the natural cycle of fire in pine stands is about 15 years long. Generally, fire cleans out undergrowth without spreading to the canopies, thus preserving larger, healthy trees.⁸⁰⁶ Prior to colonization, natural fires in the Great Basin tended to burn in relatively small patches of between 100 and 200 acres.⁸⁰⁷

⁸⁰³ Governor J. Bracken Lee Press Release, undated but late 1949, Governor J. Bracken Lee Press Release, Utah State Archives, series 215, reel 1.

⁸⁰⁴ Slotkin, 34.

⁸⁰⁵ Stephen F. Arno, “Forest Fire History in the Northern Rockies,” *Journal of Forestry* 78 (1980), no. 8: 465.

⁸⁰⁶ “Fire in the Forest: Friend or Foe?” Uinta-Cache-Wasatch National Forest, U.S. Department of Agriculture, n.d.

⁸⁰⁷ Emily K. Heyerdahl, Peter M. Brown, Stanley G. Kitchen, Mark H. Weber, eds. *Multicentury Fire and Forest Histories at 19 Sites in Utah and Eastern Nevada* (Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, 2011), 186.

Native Americans used fire in limited areas to improve grass for big game, but Euro-American settlement heralded the onset of big forest and range fires.⁸⁰⁸

Soon after the 1847 arrival of the Mormon pioneers, large, destructive fires began to burn along the Wasatch Front. The drought of 1855 saw fires burn through almost every canyon in Salt Lake and Davis Counties. “Almost all of our kanyons [sic],” wrote Heber C. Kimball, “north, and south, have been burned, some by the Indians, and some by the carelessness of the whites.”⁸⁰⁹ Of course, the arid climate lends itself to fire, as John Wesley Powell observed: “Fires obtain their destructive force through climatic conditions, so that directly and remotely climate determines the growth of all forests.” Powell concluded that fire was the primary reason for the lack of timber in Utah. In his *Report on Lands of the Arid Region of the United States*, Powell reported seeing at least three wildfires in Utah that had destroyed more forest than the Mormons had harvested since their arrival. He theorized that the Indians had started the fires, nonchalantly concluding that removal of the region’s indigenous populations would reduce the incidence of fire.⁸¹⁰

Brigham Young was conscious of the threat of forest fire and made a point of exemplifying the stewardship ethic himself. The Mormons traditionally celebrated the “24th of July,” the anniversary of their arrival in the Salt Lake Valley, at a festival held at Brighton in Big Cottonwood Canyon. All attendees were “forbidden to make or kindle fires at any place in the kanyon, except on the camp ground.” Young would end his 24th

⁸⁰⁸ Gerald W. Williams, “References on the American Indian Use of Fire in Ecosystems,” U.S. Forest Service, June 12, 2003, 3.

⁸⁰⁹ Heber C. Kimball to Franklin D. Richards in *Journal History*, August 31, 1855.

⁸¹⁰ Powell, *Report on Lands of the Arid Region*, 16, 18.

of July speech “with a ritual admonition 'to put out their fires and vacate this ground, for I intend to tarry . . . until the rest are gone, and see that the fires are all well put out.’”

According to a *New York Herald* reporter who observed the festivities in 1860, “By nine o’clock the last team had left the camping-ground; but the prophet remained behind to see that all fires were extinguished.”⁸¹¹

In the parts of the Great Basin where sagebrush dominates the landscape, fire is somewhat rare. According to Stephen Trimble, fire decimates sagebrush. The only way for it to return is from seed, not from roots like grasses and some other shrubs. Where sagebrush dominates, fire could not occur more than every few decades; otherwise, root grass would be much more prominent. This situation changed however, in regions where grazing took hold and cheatgrass moved in.

Downy Brome, commonly known as cheatgrass, arrived in the Great Basin just after 1900. A native of the steppes of Central Asia, cheatgrass came like many other immigrants to the West—on the railroad. Tagging along in the fur of livestock and hay, cheatgrass made its way through the United States, eventually contaminating wheat seed and leaving farmers feeling “cheated” when they noticed the new plant invading their fields. Cheatgrass also invaded the land of the sagebrush, sprouting up in the empty spots between the native plants. The immigrant plants would then dry out in the summer, allowing fire to take hold in a way it never had before.⁸¹² The introduction of cheatgrass allowed fire to change the landscape in novel ways. Sites heavy with cheatgrass are at

⁸¹¹ Nibley, “Brigham Young on the Environment,” 19.

⁸¹² Stephen Trimble, *The Sagebrush Ocean: A Natural History of the Great Basin* (Reno: University of Nevada Press, 1989), 107, 108.

higher risk for large fires. Strong precipitation over a period of years actually makes the threat of fire worse, as abundant cheatgrass increases fire intensity.⁸¹³

So, a key consequence of Euro-American colonization was an increase in large-scale fires. One of the earliest major fires reported took place in 1878 in Blacksmith Fork Canyon “in the heavy slash areas” (“slash” is debris left behind by logging operations). Three years later, the Logan newspaper reported a massive conflagration in the mountains east of Cache Valley:

For over two weeks a terrible fire has been raging in . . . Logan Canyon, which is destroying precious stores of timber. This fire is doing damage to the United Order of thousands of dollars. Its origin is unknown, but is supposed to have started from fire lighted by some careless person. It is estimated that there are 10 acres of timber destroyed by fire in those mountains, to every acre that is cut down with the axe. There are numerous and extensive tracts of timber in the mountains east of Cache Valley where the trees have been killed by fires that have swept through there within the last few years, since careless campers began to traverse them.⁸¹⁴

The destroyed timber belonged to the “United Order,” a scheme of planned communities instituted by Brigham Young in which the Saints, like early Christians in the Bible, would “have all things in common.” Under the Mormon plan, members consecrated their property to the Order but retained it as a stewardship. Part of Young’s objective to “make Saints,” one purpose of the United Order was to inculcate in the people the mindset of stewardship, i.e., that caring for the earth and the needs of future generations prepare the saints for an eternity governed by those values. Consequently, says LDS environmental scholar Gary Bryner, “materialism and overconsumption are

⁸¹³ Anne F. Bradley, Nonan V. Noste, William C. Fischer, “Fire Ecology of Forests and Woodlands in Utah,” Technical Report INT-287, Intermountain Research Station, U.S. Dept. of Agriculture, June 1992, 38.

⁸¹⁴ “Burning Timbers,” *Logan Leader*, August 12, 1881.

threats to environmental and spiritual well-being.”⁸¹⁵ The fact that Church members would carelessly burn down a key asset of the Order was a major irony.

The United Order scheme did not last long. According to historian Andrew Karl Larson, “The habits of an acquisitive society were too strongly forged to be broken without the utmost devotion and selflessness to the cause, and rugged individualism triumphed over the abortive attempt at communal ownership and communal living here.”⁸¹⁶ Although Larson’s study focuses on United Orders in southern Utah, the orders in the north suffered the same fate, as the example of Logan demonstrates. Stewardship practices would have mitigated destructive fire, as the example of Brigham Young demonstrates in his treatment of the canyons. Continued intense fires in the forests and on the ranges testified to the subversion of the professed values of stewardship in the culture of the Wasatch region.

That cultural indifference was documented in the first decade of the twentieth century. When Albert Potter surveyed the northern Wasatch in 1902, he found burned-out forests everywhere, attributing them to the expansion of livestock into the mountains during the previous three decades.⁸¹⁷ Loggers had left quantities of slash, which stock owners had burned to clear areas for grazing. The result was destruction of the forest floor, exposing bare soil that led to erosion and floods. Potter noted that the mountain landscape east of Logan had been transformed into a “dustbowl,” reporting that “the number, intensity, and area of forested and rangelands burned during the 1870s and

⁸¹⁵ Gary C. Bryner, "Theology and Ecology: Religious Belief and Environmental Stewardship," *BYU Studies* 49 (2010), no. 4: 19.

⁸¹⁶ Andrew Karl Larson, *I Was Called to Dixie* (St. George UT: Dixie College Foundation, 1992).

⁸¹⁷ See Rowley, *U.S. Forest Service Grazing and Rangelands and History of the Uinta National Forest*, 33.

1880s far exceeded anything in the range's recent past or since."⁸¹⁸ According to another survey made in 1906, "It can be safely stated that three-fourths of the timbered areas of this [Bear River] Reserve has been burnt over in the past 20 years . . . mostly through the carelessness of sheep herders in leaving campfires unextinguished." The same survey concluded that "the mountains had already been exploited to their fullest extent."⁸¹⁹

Of course, destructive fires must be seen in the context of the larger Western culture. Industrial activities—railroads, mining, logging—in addition to simple carelessness created the "Great Fire of 1910" that burned over parts of Washington, Idaho, Western Montana, and Utah in a firestorm "of unprecedented size." The 1910 fire was actually a merging of some 3,000 fires caused by drought, lightning, and human activity; the result was three million acres of lost timber valued at about a billion dollars. In the aftermath, fire suppression became top priority for the Forest Service and Congress doubled the firefighting budget.⁸²⁰

The summer of 1940 in the Great Basin was dry and hot, the second warmest on record behind 1934.⁸²¹ Many feared fire danger, and on July 31 officials put restrictions on campfires and all types of burning in the Wasatch mountains and canyons.⁸²² Almost on cue, however, a fire broke out in Parley's Canyon just east of Salt Lake City the

⁸¹⁸ Hansen, "An Environmental History," 63.

⁸¹⁹ L.L. White, "Report on the Timber Condition of the New Extension, Bear River Reserve, 1906" cited in Bird, "A History," 47, 51.

⁸²⁰ Stephen Pyne, *Year of the Fires: The Story of the Great Fires of 1910*, New York: Viking, 2008, 201; *When the Mountains Roared: Stories of the 1910 Fire*, Idaho Panhandle National Forest, U.S. Forest Service, pub. R1-78-30.

⁸²¹ 1940 remained the second warmest year on record for Utah until 2014. NOAA, "Climate at a Glance," op. cit.

⁸²² "City Places All S.L. Watershed in Fire Zone," *Salt Lake Telegram*, July 31, 1940.

following day. Around 12:30 in the afternoon, a woman apparently threw hot ash into some dry grass behind her cabin in the canyon. High winds drove the fire at high speed. Within an hour, dark clouds billowed up over the mountains as the fire spread through the canyon, engulfing over three hundred acres.⁸²³ A crew of one hundred men rushed to the scene, but they were helpless as the flames grew closer to government buildings and summer homes. The city was not ready for such massive canyon fires.

In the last century, this scenario has become common in the region, where the arid climate, warming summers, and high winds (typically between 30 and 50 miles per hour) combine to turn sparks into conflagrations. Common human sources of fire are semi-trucks, trains, fireworks, unattended campfires, and guns. For example, a target shooter's stray bullet set off a 4,000-acre blaze that caused the evacuation of 1,500 residents of Saratoga Springs in 2012. "High winds helped fan the flames onto tinder-dry grasslands"—a typical recipe for wildfire. The Saratoga Springs fire was only one of 20 fires ignited in Utah by target shooters that year.⁸²⁴ However, drought and lightning were the biggest factors in the largest wildfire in Utah history, the Pole Creek-Bald Mountain Fire, which burned through nearly 100,000 acres in the Wasatch forests in September 2018.⁸²⁵

In summer and fall, Utah residents are accustomed to hearing this announcement: "The National Weather Service has issued a red-flag warning for wind and low relative

⁸²³ "High Winds Spread Forest Fire in Parley's Canyon," *Salt Lake Telegram*, August 1, 1940.

⁸²⁴ Lynn LeBruin, "Dump Fire Forces 1,500 Homes Evacuated Near Saratoga Springs," *Ogden Standard-Examiner*, June 22, 2012.

⁸²⁵ "Fire Updates: Pole Creek and Bald Mountain Fires Burn Over 90,000 Acres Combined," KSL.com, September 18, 2018. <https://www.ksl.com/article/46392740/fire-updates-pole-creek-and-bald-mountain-fires-burn-over-90k-acres-combined>

humidity. Fire danger extreme.” Now they are hearing the announcement even in winter and spring. On May 27, 2020, Utahns were already dealing with 237 wildfires, nearly all human caused, a nearly four-fold increase over the number of fires the previous year.⁸²⁶ By the end of November, 2020, 1,547 wildfires had burned 316,364 acres costing the state over \$60 million making it the busiest fire year yet. Although lightning storms still ignite some fires, humans caused 78 percent of the conflagrations. People have become the main cause of wildfire along the Wasatch Front.⁸²⁷

Even as temperatures trend upwards, industrial and recreational interests continue to violate fire precautions. Recent wildfires in the region have pushed the level of particulate-matter pollution more than six times higher than allowed by national air quality standards during the fire season.⁸²⁸ Suppression of human-caused fire has become a critical problem for authorities. On the other hand, managed fire benefits wildlands in many ways. Fires kill off diseased trees and remove undergrowth that can build up and result in larger, more intense fires. Ashes add to the soil nutrients for feeding fresh growth. “Overall,” researchers say, “fire is a catalyst for promoting biological diversity and healthy ecosystems.”⁸²⁹ In attempting to balance the ecological benefits with the disadvantages of wildfire, the Forest Service works with other agencies to conduct

⁸²⁶ “Utah Is Off to a Scary Start for Fire Season Due to a Dry Spring and Careless Campers,” *Salt Lake Tribune*, May 27, 2020.

⁸²⁷ Jed Boal, “Utah Sees Record Number of Human-Caused Wildfires in 2020,” KSL-TV, October 20, 2020. <https://www.ksl.com/article/50034277/utah-sees-record-number-of-human-caused-wildfires-in-2020#:~:text=According%20to%20state%20data%2C%201%2C108,human%2Dcaused%20fires%20was%20937.>

⁸²⁸ Colleen E. Reid, Elinor M. Considine, et al., “Associations Between Respiratory Health and Ozone and Fine Particulate Matter in a Wildfire Event,” *Environment International* 129 (2019): 291.

⁸²⁹ *Fire Ecology*, Pacific Biodiversity Institute, http://www.pacificbio.org/initiatives/fire/fire_ecology.html

“managed burns” in places where fire would be more helpful than harmful. But the prospect of catastrophic wildfire remains all along the densely populated Wasatch Front. According to a 1998 Salt Lake City Watershed Management Plan, the city was to have in place “a comprehensive wildfire management plan by January 1, 2001.”⁸³⁰ Salt Lake finally created “Community Wildfire Protection Plan” in 2017, but it is far from comprehensive: it is not coordinated with adjacent communities nor does it cover the canyons where the worst fire danger exists.⁸³¹

The Wasatch Oasis lacks the systemic preparedness for climate disruptions that a thorough “stewardship approach” would provide. A recent survey of the fifty states ranks Utah thirtieth in disaster preparedness—an ironic finding for a people supposedly renowned for their preparedness ethic.⁸³² This mediocre ranking is in part due to a lack of investment in mitigation strategies. Although the local culture is legendary for dealing with recovery from disaster, a stewardship approach would put priority on mitigation and prevention. The value of mitigation strategies was demonstrated in 2018 when two wildfires broke out near Tooele. The Ellerback Fire rapidly burned through nearly 4,000 acres. Ten miles to the south, the Bunch Fire seemed threatening, but was kept to only 16

⁸³⁰ *Salt Lake City Watershed Management Plan '98*, Salt Lake City Department of Public Utilities, March 1999, 73. <http://www.slcdocs.com/utilities/PDF%20Files/slcwatershedmgtplan.pdf>

⁸³¹ Jennifer Hansen, Brianna Binnebose, “How Salt Lake City’s Community Wildfire Protection Plan Generated Action in Less Than a Year,” Fire-Adapted Communities Network, October 24, 2017. <https://fireadaptednetwork.org>. See also Wildfire Risk Assessment Portal. Utah Division of Natural Resources. <https://wildfirerisk.utah.gov>

⁸³² Amy Joy O’Donoghue, “Natural Disasters: How Prepared Is Utah?” *DN*, July 22, 2018.

acres because the Bureau of Land Management had conducted mitigation efforts in the area the year before.⁸³³

A mixed story comes out of severe tests such as the fire crisis of the 1880s and the winter of 1949. The Mormons paid a heavy economic price for neglecting the stewardship values underlying the United Order as they lost a most valuable asset—the forests of the Bear River Range—to fire. Then a lack of preparation coupled with too much “self-reliance” led to a huge die-off of livestock in the 1949 blizzards. The range-sheep industry lost 10 to 25 percent of its stock, and some observers credit the winter of 1949 as the beginning of the end for the industry.⁸³⁴ Thus the mindset of the independent entrepreneur that will not admit limits to the field of enterprise runs up against the stern reality of the environment.

The early Mormon narrative of saint-making takes place in an environment that is in constant motion, breaking down and rebuilding itself—where climatic disruption presents novel challenges against which saints must struggle. The struggle both fortifies the saints and teaches them the value of preparation for severe trials. The purpose of such events is to stimulate remembering of dependence on God. Sudden calamities—floods, hurricane winds, avalanches, and wildfires—play a substantial role in the formation of saints by testing their fortitude and adaptability. In a way, it is a familiar narrative—the subject can arrive at an integrated, fulfilled identity only by successfully navigating the forces that would fragment selfhood. There is a “sifting” going on: Through the jarring

⁸³³ “A Tale of Two Wildfires,” U.S. Department of the Interior, Bureau of Land Management, July 2018. http://utahfireinfo.com/wp-content/uploads/2018/07/A-Tale-of-Two-Wildfires-Final-20-Jul-18_FINAL.pdf

⁸³⁴ Young, “Operation Hay Lift,” 119.

stresses of a winnowing process, the Saints are tried, purified, and selected. The Apostle George A. Smith saw the unpredictably demanding environment of the region as a “sieve” to filter the vanity out of the Saints:

The fact is, God has planned for us the best sieve that could be imagined. He is determined to sift the nations with the sieve of vanity, and he has placed us here on the edge of the mountains, where a little shaking of the winds will cause everything without weight easily to slide off to the diggings; and in this way the work of sifting is going on daily, and hourly, and yearly, from time to time, according to the nature of the materials that happen to be thrown upon the sieve.⁸³⁵

In this land, Smith saw the hand of God performing “a little shaking of the wind” on the mountains’ edge that would enable the Saints to rid themselves of vanities and impurities. Of course, this narrative was in constant tension with the narrative of secular entrepreneurialism—what Brigham Young called “the American tradition”—that constitutes selfhood through competition, acquisition, and the achievement of independence. The future of this ecosystem depends on the directions these narratives take. At stake is the durability of the culture of the Wasatch Oasis, a culture that may be forced by the actualities of the climate to remember earlier, more sustainable values.

⁸³⁵ George A. Smith, “Responsibilities of the Priesthood,” August 28, 1852, *JD* 6: 257.

Conclusion

“Awaiting the Popular Will”

On June 23, 1988, James Hansen, the director of NASA’s Goddard Institute for Space Studies, shared with Congress his research on the greenhouse effect in the atmosphere. He declared the earth was experiencing an “unnatural” warming trend caused by increased emissions of greenhouse gases from fossil fuels. He also predicted the warming would cause more violent storms. Global warming “does increase the intensity of the droughts and heat waves . . . the other extreme of the hydrological cycle.”⁸³⁶ “In my opinion,” he stated, the greenhouse effect has been detected, and it is changing our climate now.”⁸³⁷

Hansen’s testimony helped initiate a global climate movement. Governments began promoting a decrease in greenhouse gas emissions, some calling for a reduction of as much as 80 percent by the year 2005. The World Conference on the Changing Atmosphere expanded on Hansen’s findings, predicting global sea-level rise, ozone depletion, and “severe economic and social dislocation for present and future generations.”⁸³⁸ The conference concluded their statement with the ominous warning: “It is imperative to act now.” Potentially, the lengthy droughts, harsh winters, and

⁸³⁶ James Hansen, *Storms of my Grandchildren: The Truth About the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, New York: Bloomsbury, 2009, xv.

⁸³⁷ “Statement of James Hansen,” in Hearing Before the Committee on Energy and Natural Resources, United States Senate, June 23, 1988. https://www.sealevel.info/1988_Hansen_Senate_Testimony.html.

⁸³⁸ Hare, F. Kenneth. “World Conference on the Changing Atmosphere: Implications for Security, Held at the Toronto Convention Centre, Toronto, Ontario, Canada, during 27–30 June 1988.” *Environmental Conservation* 15, no. 3 (1988): 282–283., doi:10.1017/S0376892900029635; Conference Statement Summary, “The Changing Atmosphere: Implications for Global Security,” 292, <http://cmosarchives.ca/History/ChangingAtmosphere1988e.pdf>.

devastating floods that had historically ravaged the Wasatch Front would become not only more common, but more intense.

The temperature on the Wasatch Front in July 1988, the month after Hansen's testimony, averaged 75.6 degrees, the warmest month in history since July 1933. From 1900 to 1988, the average temperature increased by only 0.1 degree, but in the 32 years since 1988, the average yearly temperature has risen 0.4 degrees over the 88-year average.⁸³⁹ Eight of the ten warmest months on record have occurred since then; the warmest being July of 2003. And while 1934 still holds the record for the Wasatch's warmest year since 1900, seven of the ten warmest years on record have occurred after 2000.⁸⁴⁰ The world initiatives begun in 1988 have made little headway in stopping the warming trend on the Wasatch Front.

In the time since Hansen's testimony, the Wasatch Front has endured three significant droughts and has had a mean PDSI of -0.58. The first drought began in late 1986 when the PDSI dropped into the negative territory and stayed there until April of 1991. Then in September 1999, drought conditions once again hit the Wasatch Front and lasted until 2004 at which time the PDSI averaged -1.42. Since then, however, drought conditions have not improved that much. The average PDSI since 2004 is -0.71. The longest period of drought conditions lasted from September of 2011 until August of 2016. In September of 2018, the PDSI dipped down to -5.55, the lowest since 1977.⁸⁴¹

⁸³⁹ July 1933 averaged 75.7 degrees, NOAA, "Climate at a Glance," op. cit.

⁸⁴⁰ Ibid.

⁸⁴¹ NOAA National Centers for Environmental information, Climate at a Glance: Divisional Time Series, published September 2020, retrieved on September 15, 2020 from <https://www.ncdc.noaa.gov/cag/>

Despite James’s warning thirty-three years ago, Utahns have ambivalently continued with harmful environmental practices and behaviors. Essentially, they have followed the pattern that they have always followed—irresponsible resource management and community planning. This will mostly likely continue until the physical manifestations of the crisis appear on the doorstep of the Wasatch.

Despite ample warning, Utahns have paid little attention to global warming. Just over forty years before Hansen’s testimony, in his address *Is Utah Sahara Bound?* Walter Cottam insisted that the general population must take responsibility for instigating conservation efforts. “In a democracy such as ours,” he said, “these desperately needed remedial measures must await the popular will.”⁸⁴²

That “popular will” has moved slowly. Growth has been the biggest preoccupation with Wasatch Front leaders over the last 50 years. From 1980 to 2000, the Wasatch Front population rose at an explosive rate. Davis County saw an increase from over 146,540 to almost 240,994, while Salt Lake County grew from 619,066 to 898,387, and Utah County from 218,106 to 368,536. Weber, Cache, and Tooele Counties also saw high growth rates.⁸⁴³ With a booming population came demand for more housing and more highways. In the eyes of some, the blossoming rose has become a nightmare thicket of problems induced by unmanaged growth, including bad air, urban sprawl, and polluted bodies of water.

Concerned that extensive land development was proceeding haphazardly, the state legislature passed the Utah Land Use Act in 1974, granting the state “a more positive role

⁸⁴² Cottam, *Is Utah Sahara Bound?* 37.

⁸⁴³ Total Population: County, 1850-2010, Census Bureau Resources, Kem C. Gardner Policy Institute, University of Utah. <https://gardner.utah.edu/demographics/user-data/>.

in encouraging, assisting, and coordinating land use planning within local jurisdictions.” The Act created a land-use commission responsible for formulating a “comprehensive state land use plan” to manage “areas of greater than local concern,” including watersheds and “areas of major development potential.”⁸⁴⁴ The new law, however, did not even survive the year. In a dramatic display of a persistent frontier ideology favoring unabated growth, Utahns repealed the law in a November 1974 referendum.⁸⁴⁵ Recalls Alan Matheson, a former director of the Utah Department of Environment Quality, “There was a lot of resistance, especially from those who thought centralized planning was synonymous with communism.”⁸⁴⁶ Morris K. Udall, a Mormon Congressman from Arizona with Utah roots, lamented the loss of the Utah Land Use Act: “It is therefore unfortunate that Utah, a state facing many of these energy-related land use problems in the next decade, rejected the land use referendum last November.”⁸⁴⁷

Highway travel along the Wasatch Front grew even faster than population rates. From 1980 to 1990, vehicle miles increased by 44 percent from roughly 12.3 million miles per weekday to almost 17.75 million miles, while the population grew 18 percent. Clearly, the growth in traffic came not so much from the rise in population but from the spread of low-density housing into suburban areas.⁸⁴⁸

⁸⁴⁴ Utah 40th Legislature, Budget Session: 1974, 102, 104.

⁸⁴⁵ Utah Referendum 1, Land Use Act, 1974.
[https://ballotpedia.org/Utah_Referendum_1,_Land_Use_Act_\(1974\)](https://ballotpedia.org/Utah_Referendum_1,_Land_Use_Act_(1974)).

⁸⁴⁶ Cited in Caroline Cournoyer, “Utah’s Secret Weapon for Long-Range Planning,” *Governing.com*, March 2015. <https://www.governing.com/topics/transportation-infrastructure/gov-utah-secret-weapon-growth-planning.html>

⁸⁴⁷ Morris K. Udall, “Land Use: Why We Need Federal Legislation,” *BYU Law Review* 1975, no. 1: 7.

⁸⁴⁸ “Issue Paper #4 for Transportation Breakout Group,” 1, QGET Databook, Nina Dougherty Papers, Box 60, Folder 1, Envision Utah—Transportation and Air Quality, 1998.

In 1995, a study by Texas A&M identified Salt Lake City as having the fastest growing traffic-congestion rate of the country's 50 largest metropolitan areas. As the Wasatch Front population grew, residents moved further and further to the peripheries of city centers, forcing longer commute times, more congestion, and worse air quality. That year Governor Michael Leavitt held a "growth summit" that failed to produce meaningful change: Participants found community planning unpalatable. Leavitt, a Republican, was himself resistant to land-use planning. Utah County Commissioner (later Governor) Gary Herbert said, "That's the problem with government: Political leaders are supposed to reflect the will of the people, but the will of the people is sometimes a little shortsighted."⁸⁴⁹ Cottam's observation about awaiting the "public will" was still true over half a century later.

The Wasatch culture of today exhibits in its shortsightedness the present-time orientation of secular entrepreneurialism that has all but crowded out memories of the historic stewardship ethos of the early Latter-day Saints. The locals line up with the broader culture that "treats the future as a distant colonial outpost where we dump ecological degradation," in the words of Australian philosopher Roman Krznaric.⁸⁵⁰ To some, the Wasatch culture is guilty of "ecological apostasy" from the "sacred truths about the spirituality of the earth" taught by Joseph Smith.⁸⁵¹ The far-sighted stewardship tradition is only rarely mentioned in the discourse of Latter-day Saints today. If

⁸⁴⁹ Linda Fantin, "Feeling Crowded? Coalition Tackles Wasatch Front Sprawl; Coalition to Get Handle on Utah Growth," *Salt Lake Tribune*, January 14, 1997, A1.

⁸⁵⁰ Roman Krznaric, *The Good Ancestor: A Radical Prescription for Long-Term Thinking*, New York: The Experiment, 2020, 5.

⁸⁵¹ Brown, "Whither Mormon Environmental Theology?" 83.

“associations between future time perspective and pro-environmental behaviors are strong and nontrivial,” the opposite is also true: shortness of sight is also associated in strong and substantial ways with anti-environmental thinking.⁸⁵² Now the question is, will memory of that stewardship tradition resurface in the face of climate realities that threaten a continued way of life?

Two years after Leavitt’s dead-end summit, prominent community members were still wringing their hands over uncontrolled blossoming of the state’s population and the associated environmental challenges. The legislature showed no interest in the issue, so a group of prominent Wasatch Front businessmen formed a Quality Growth steering committee on their own initiative. Taking the lead of the committee was Robert J. Grow, a former executive of Geneva Steel, who, ironically, was considered an expert on air quality. He was thought to be a leader acceptable to all sides.⁸⁵³ On January 14, 1997, Grow, Leavitt, businessman and philanthropist Larry H. Miller and others introduced the new committee at a Salt Lake press conference.⁸⁵⁴

Brigham Young was also in attendance—or rather, an actor portraying him. In what was meant as a nod to Utah’s heritage of urban planning, Brigham Young reenactor James Arrington recalled some of Young’s hopes for Salt Lake City. He spoke of open spaces, a community approach to resource management, and environmental stewardship.⁸⁵⁵ The committee hoped this appeal to the majority culture would garner

⁸⁵² Taciano L. Milfont, Jessie Wilson, Pollyane Diniz, (2012). Time perspective and environmental engagement: A meta-analysis,” *International Journal of Psychology*, 47 (2012).

⁸⁵³ *The History of Envision Utah: A Partnership for Quality Growth*, 2001, Salt Lake City: Envision Utah, 2. https://www.epa.gov/sites/production/files/2014-07/documents/envision_utah.pdf

⁸⁵⁴ Fantin, “Feeling Crowded.”

⁸⁵⁵ *History of Envision Utah*, 9.

more support for land-use management and community planning. After all, urban planning was rooted in Utah’s heritage; they pointed out that Joseph Smith’s 1833 planning scheme known as “the Plat of the City of Zion” won the urban design award from the American Planning Association in 1996—163 years later.⁸⁵⁶ Gene Moser, head of the Utah chapter of the association, noted that the City of Zion plan “was remarkable in that it contained significant planning innovations that, had they been followed, would have mitigated many of the problems being faced today in the Mountain West.” Among those problems Moser listed “sprawl control, preservation of agricultural lands, aesthetic controls, design standards, and dedicated land for public buildings.”⁸⁵⁷ Brigham Young had followed the City of Zion plan in founding more than three hundred settlements.

Former Salt Lake Planning Commissioner and steering committee member Craig D. Galli sees in the City of Zion Plat a “precursor to smart growth.”

Most planners agree that the size and configuration of the ideal “urban village” is more environmentally sustainable and socially beneficial compared to modern urban sprawl. . . . The City of Zion Plat included virtually all of the smart-growth components: relatively high density, mixed commercial and residential development, community facilities and common areas, extensive landscaping, small urban gardens, and surrounding open space.⁸⁵⁸

To get more community support, the Quality Growth steering committee brought together in a forum prominent political leaders from across the Front as well as housing

⁸⁵⁶ Cournoyer, “Utah’s Secret Plan.”

⁸⁵⁷ Sean Dolan, “Plat of Zion: 180-Year-Old Legacy Still Visible in Utah Cities,” *HJNews*, December 16, 2017.

⁸⁵⁸ Galli, 128, 129.

and environmental experts. They involved Brad Barber, a member of the governor's Office of Budget and Planning, who introduced them to a program called Quality Growth Efficiency Tools (QGET) that would enable them to create models of growth for the valley.⁸⁵⁹ Inputting factors such as water supply, air quality, and open space, they came up with four growth "scenarios" that ranged from maintaining the status quo to heavily managed planning. Recognizing the need to change the thinking of Utahns, the group then initiated an ambitious public relations plan. They rebranded themselves as "Envision Utah" and invited the public to express their opinions about the four scenarios. With that input, the committee adopted what was known as Scenario C, which was something of a compromise: Scenario C proposed more walkable communities with a variety of housing types. Under this scenario, committee members anticipated greater public-transit ridership and better air quality for the Wasatch Front.⁸⁶⁰

Although Utahns generally favored it, the proposed scenario did meet some resistance. Officials in localities around the valley exhibited their TFE mindset in resisting the plan. The mayor of Layton, Jerry Stevenson, resented Envision Utah as an encroachment on local self-determination and accused the group of forcing "Salt Lake City values" on his town (for Stevenson, "Salt Lake City values" bespoke the more cooperative, collectivized approach to city planning that he associated with the politically progressive capital city). "As an elected official," Stevenson said, "when a

⁸⁵⁹ *Ibid.*, 5.

⁸⁶⁰ "Information Brief: QGET Databook," 6, 10, Nina Dougherty Papers, Box 60, Folder 1. Marriott Library Special Collections, University of Utah.

group like that comes in, the first thing you think is, ‘This is regional planning.’”

Stevenson later changed his mind and actually joined the project.⁸⁶¹

One of the more controversial elements of the Envision Utah plan was the Legacy Parkway, a proposed four-lane road stretching from Salt Lake City to Farmington. Officials meant it to alleviate congestion on Interstate 15 and thus reduce air pollution. Unsurprisingly, however, when Legacy Highway was built, traffic increased. Without Legacy, commuters would by 2020 be making 1,000 fewer car trips per day and transit ridership would have increased by 1,500. Envision Utah claimed that increased ridership on public transportation would have a negligible effect on air quality, an assertion that Michael Replogle, an expert with the Environmental Defense Fund, seriously questioned. “I strongly suspect this analysis has failed to consider comprehensive alternatives for land-use patterns and transportation. Studies in a number of other metropolitan areas suggest it is possible to reduce the vehicle miles traveled on the order of 10 percent if you seriously pursue alternative community design strategies.”⁸⁶²

Legacy was part of an overall transportation project called the Transportation Improvement Program (TIP), which was meant to make improvements to I-15 and I-80 from 1999-2003. The local Sierra Club protested the highway to the EPA offices of Air and Radiation in Washington D.C. and the regional EPA offices, claiming that the state failed to allow adequate public input and used incomplete models for measuring impact

⁸⁶¹ Tony Semerad, “Over 20 years ago, Utah aimed for ‘quality growth’ as its population boomed. How has that turned out?” *Salt Lake Tribune*, July 11, 2020. <https://www.sltrib.com/news/2020/07/11/over-years-ago-utah/>.

⁸⁶² Linda Fantin, “Legacy Highway: Even Without It Air Worsens,” *Salt Lake Tribune* December 8, 1998, found in Nina Dougherty Papers, box 60, folder 1, Marriott Library Special Collections, University of Utah.

on air quality.⁸⁶³ They pointed out that the EPA had established a direct correlation between highway miles and vehicle miles travelled; in short, the EPA knew that more highways induced more traffic.⁸⁶⁴ The EPA then raised these concerns with Federal Highway Administrator Michael G. Ritchie, noting that the Wasatch Front had a history of exceeding ozone and PM2.5 standards. “EPA is concerned that construction of the many roadway improvements in the plan and TIP could lead to increases in vehicle miles travelled that in turn may make it more difficult for the Wasatch Front to achieve compliance with these new air quality standards.”⁸⁶⁵ However, these environmental concerns only delayed construction on Legacy; in 2008, the new parkway was complete.

More than twenty years after the genesis of Envision Utah, Leavitt reflected on the project. “I look back on this and, first of all, I can’t believe we tried it,” he remarked before concluding triumphantly, “I can’t believe that it worked.”⁸⁶⁶ In some ways, Envision Utah did achieve some successes. According to their own study, housing has increased but single-family homes fell below projections. They saved about 140 square miles of farmland, which they claim has saved the state more than \$4.5 billion. Water use per capita has also decreased from 319 gallons per day to 225, which is 42 gallons below 1997 projections thanks to better metering and public-awareness campaigns. Utahns also spend a bit less time in their cars. In 1999, Wasatch Front residents drove average 22.3

⁸⁶³ Robert. W. Adler to Bob Perciasepe November 10, 1998, Nina Dougherty Papers, Box 60, Folder 2, Marriott Library Special Collections, University of Utah.

⁸⁶⁴ Robert B. Noland, “Relationships Between Highway Capacity and Induced Vehicle Travel,” U.S. Environmental Protection Agency, Paper no. 991069, Nina Dougherty Papers, Box 60, Folder 2. Marriott Library Special Collections, University of Utah.

⁸⁶⁵ Richard R. Long to Michael G. Ritchie, 12/8/1998, Nina Dougherty Papers, Box 60, Folder 2. Marriott Library Special Collections, University of Utah.

⁸⁶⁶ Semerad, “Over 20 Years Ago.”

miles per day. That average has dropped to 22, though speeds have also dropped, meaning most commuters spend those miles in congested traffic. The air is also cleaner. In 1998 daily emissions of CO, NOx, VOC, PM10, and SO2 averaged roughly 2,000 ppm, which has dropped to 934. This change, however, is most likely due to cleaner cars and fuels mandated by the federal government.⁸⁶⁷ Smaller communities of high-density housing like Daybreak now cluster along the Wasatch Front. Daybreak's shared open spaces, public transit, and mixed housing embody what Envision Utah sought to achieve; still, the distance from Daybreak to business centers means longer commutes.⁸⁶⁸

Despite these successes the Legacy Highway simply creates more traffic. Still suffering from congestion at both the north and south ends of the valley, the Wasatch Front is now experiencing a housing crisis. Soaring prices and dwindling open space have made constructing new homes difficult. One member of the Salt Lake Chamber recently claimed that if current trends continue, the Wasatch Front housing market could resemble San Francisco's.⁸⁶⁹ Another factor in the housing crisis is the stagnation of wage growth. Since 1991, annual wage increases have held at 0.36 percent, while home prices have increased annually by 3.3 percent.⁸⁷⁰ Many are excluded from housing in the Wasatch Front.

⁸⁶⁷ "Quality Growth Strategy Update," Envision Utah, <https://envisionutah.org/quality-growth-strategy>.

⁸⁶⁸ Semerad, "Over 20 Years Ago."

⁸⁶⁹ "Study shows UT housing could soon be out of control, impacting economic growth," ABC4 news, April 28, 2018. <https://www.abc4.com/news/local-news/study-shows-ut-housing-could-soon-be-out-of-control-impacting-economic-growth/>

⁸⁷⁰ James Wood, Dekan Eskic, "Housing Prices and the Threat to Affordability: Research Brief," Kem C. Gardner Policy Institute, March 2018. <https://gardner.utah.edu/wp-content/uploads/HousingBrief.pdf>

While air quality has improved, Wasatch Front communities still suffer from bad air. Cars are now the primary source of air pollution on the Wasatch Front at 48 percent. A study drawing from EPA data named Salt Lake City the seventh most polluted large metro area. The city met EPA clean-air standards for only 138 days in 2018.⁸⁷¹ According to a 2018 study by the Salt Lake Tribune and the University of Utah’s Hinckley Institute of Politics, 33 percent of Utah voters worked at home during bad air events such as winter inversions. Only 26 percent have ever used public transportation while 34 percent have carpooled. Many experts believe that changes will come slowly if new behaviors are not properly incentivized.⁸⁷² The historical record indicates that it is more likely these changes will not happen until a severe crisis forces change.

Perhaps the Wasatch Front’s greatest victims of climate change have been its two natural lakes. As recently as September 3, 2020, the Utah Department of Environmental Quality has recorded toxic algal blooms in Utah Lake. These blooms occur in warm waters with high concentrates of nitrogen and phosphorus causing cyanobacteria, a naturally occurring organism, to multiply rapidly and create a slimy green layer over the water. (The pressure of population has truly made the desert “bloom,” although this kind of blooming was not what the early settlers had in mind.) Experts believe that as global temperatures continue to climb, these blooms will become more common. In recent years, algal blooms have devastated the Utah Lake ecology and closed the lake to

⁸⁷¹ Brian Maffly, “Salt Lake City’s air quality is nation’s 7th worst among large metro areas,” *Salt Lake Tribune*, January 31, 2020. <https://www.sltrib.com/news/environment/2020/01/28/salt-lake-citys-air/>

⁸⁷² Brian Maffly, “Utahns hate bad air, but poll finds few adopt changes that would make it better,” *Salt Lake Tribune*, February 4, 2019.

recreation.⁸⁷³ As the lake shrinks, some short-sighted individuals have argued that it would be better to simply put the lake out of its misery and build a city over it.⁸⁷⁴

Great Salt Lake has also shrunk dramatically since 1987. Decades of water diversion from the Jordan and Weber rivers, and a megadrought that has developed over the last 20 years have taken a toll on the Lake. In July 2020, the Great Salt Lake Advisory Council (GSLAC) reported that “human development and use of water in its water shed . . . [and] most recently accentuated by the recent drought of the 2000s,” has caused an historic decline of eleven feet in Great Salt Lake water levels. The report further indicated that if current trends remain the lake will continue to recede another three to four feet by 2030. Great Salt Lake is not only an essential resting place for migratory birds, but a crucial element of Utah’s economy and global agriculture. It generates \$1.3 billion in revenue and supports some 7,000 jobs for Utahns who make products “globally critical to agriculture, industry, and the food supply.” The shrinking of the Lake also poses serious health hazards to Wasatch Front residents. Dust from the increasingly exposed lakebed escapes into the atmosphere, contributing to air pollution. Dust particles also cover watershed snowpack, encouraging earlier and faster snow melt and a degraded water supply. In other words, “The importance of Great Salt Lake cannot be overstated.”⁸⁷⁵

⁸⁷³ Utah Lake Algal Bloom Monitoring 2020, Utah Department of Environmental Quality. <https://deq.utah.gov/water-quality/utah-lake-algal-bloom-monitoring-2020>.

⁸⁷⁴ Courtney Tanner, “Known for toxic algae, Utah Lake could become a housing development for half a million people,” *Salt Lake Tribune*, January 22, 2018. <https://www.sltrib.com/news/politics/2018/01/20/why-this-developer-believes-it-makes-sense-to-build-a-city-in-the-middle-of-utah-lake/>.

⁸⁷⁵ “Water Strategies for Great Salt Lake: Legal Analysis and Review of Select Strategies for Great Salt Lake,” Great Salt Lake Advisory Council, Utah Department of Natural Resources and Utah Department of Environmental Quality, July 17, 2020, ES-1, Introduction 1.1.

The GSLAC made several recommendations to slow the lake's decline, including shepherding water, which would grant water rights to the lake and ensure that water users do not take instream flows intended for the lake. Other strategies included better groundwater management practices, municipal and industrial water conservation, split-season leasing, efficient metering. However, GSLAC admits that these measures face serious obstacles, particularly from the State's political culture.⁸⁷⁶

Among the obstacles to saving the Great Salt Lake and mitigating the other climate challenges to the culture of the region, the persistent frontier mentality of the culture is primary. That mentality is nowhere more evident than in the Utah Legislature. The long-standing "cowboy caucus" in the Legislature has about 30 members who meet weekly; ironically, most of them are urban legislators.⁸⁷⁷ They have a reputation for "firing off their verbal six-shooters at a variety of targets, including wildlife management, environmentalists, government regulation, private property rights and gun control." They say, "It's about being free to do what the Constitution allows and enjoying the things we always have." Although "the Frontier was no longer a geographical place," in the words of Richard Slotkin, for these legislators "it was becoming a set of symbols . . . seen through a distorting lens of mythic illusion."⁸⁷⁸ Up against the Cowboys, traditional environmental advocates like the Audubon Society and the Sierra Club are forced "to keep a low profile" in Utah.⁸⁷⁹

⁸⁷⁶ Ibid., ES-3, 4-3.

⁸⁷⁷ Maren McInnes, "Utah's 'Cowboy Caucus' Powerful Voice for Rural Concerns," *Provo Daily Herald*, February 23, 2015.

⁸⁷⁸ Slotkin, 61.

⁸⁷⁹ Jerry Spangler, Bob Bernick, "'Cowboy Caucus' Runs Roughshod Through Utah's Legislature," *DN*, February 21, 1993.

In keeping with that mentality, the state legislature has historically been hostile to regional growth plans and environmental conservation. As we have seen, an example is the 1991 Bear River Development Act, intended to keep inexpensive water flowing to farms and housing developments in northern Utah.⁸⁸⁰ The proposed Bear River project will divert 20 percent of the Great Salt Lake’s largest tributary and “significantly lower the level of the lake, destroying large sections of Utah wetlands and impacting millions of migratory birds. . . . Dust from the vast areas of exposed wetlands will contribute to even lower air quality in the Wasatch Front.”⁸⁸¹ Ironically, the 2020 GSLAC report made no mention of this ongoing project, which is the largest current threat to lake levels.

The Legislature has historically been on the side of climate-change denial. In 2010, state representative Kerry Gibson sponsored a resolution to urge the “United States Environmental Protection Agency to cease its carbon dioxide reduction policies, programs, and regulations until climate data and global warming science are substantiated.” The resolution, which passed the Legislature by an overwhelming vote, came 22 years after Hansen asserted that he was “99 percent certain” humans were causing the earth to warm.⁸⁸² The resolution asserted that the Clean Air Act was based on “questionable climate data.” Finally, the resolution claimed that “emails and other communications between climate researchers around the globe . . . indicate a well-organized and ongoing effort to manipulate global temperature data in order to produce a

⁸⁸⁰ *Bear River Development*, Utah Division of Natural Resources, <https://water.utah.gov/bear-river/>

⁸⁸¹ “The Bear River Diversion,” Utah Rivers Council, <https://utahrivers.org/bear-river-water-diversion>

⁸⁸² Amy Joi O’Donoghue, “Utah Legislature: Climate Change Resolution Advances,” *DN*, March 1, 2010.

global warming outcome.”⁸⁸³ In short, the Legislature “resolved” that climate change was unproven and possibly even a hoax. At a committee hearing on the resolution, Representative Mike Noel led a heated exchange with University of Utah bioengineering professor Joseph Andrade, demanding that the scientist admit that CO² was “not a pollutant.”⁸⁸⁴

Eventually, Utah’s kids pushed back. In 2018, a group of twenty high school students approached the Legislature with a resolution to “encourage responsible stewardship of natural resources and reduction of emissions.” At the hearing, one student commented, “It’s forward thinking policies like this one that will allow us to stay ahead of the curve.” Rep. Rebecca Edwards (and current U.S. Senate candidate) claimed the students had inspired her to sponsor the bill. Not all were pleased, including Noel, who claimed the climate-change issue was a scheme by shadowy forces to control the lives of ordinary people.⁸⁸⁵ “One thing I do know,” Noel asserted, “is that there is someone who is in charge of the climate, and I believe in that, so I won’t be voting for this bill.”⁸⁸⁶ The resolution passed anyway.

A long-time member of the Utah House, Noel was born in the Wasatch Front, but represented the rural southern Utah district of Kane County—the regional heart of the

⁸⁸³ H.J.R. 12 Climate Change Joint Resolution, 2010 General Session. <https://le.utah.gov/~2010/bills/static/HJR012.html>.

⁸⁸⁴ “Utah House Passes Resolution Implying Climate Change Conspiracy,” *Inside Climate News*, February 10, 2010. <https://insideclimatenews.org/blog/20100210/utah-house-passes-resolution-implying-climate-change-conspiracy>.

⁸⁸⁵ “Fact Sheet: Mike Noel,” <https://exxonsecrets.org/html/personfactsheet.php?id=1340>

⁸⁸⁶ Emma Penrod, “Some Utah lawmakers deny climate change, but OK a bill recognizing its impacts after hearing pleas from students,” *Salt Lake Tribune*, February 15, 2018. <https://www.sltrib.com/news/environment/2018/02/15/some-utah-lawmakers-deny-climate-change-but-ok-a-bill-recognizing-its-impacts-after-hearing-pleas-from-students/>.

Sagebrush Rebellion. Before his election, Noel worked for the Bureau of Land Management. He left in the late 1990s only to become one of their most ardent opponents and made state control over federal lands his primary political objective.⁸⁸⁷ Noel's passion was on display when he blamed a wildfire in southern Utah on restrictive federal regulations and environmentalists, "the bird- and bunny-lovers and the treehuggers and the rock-lickers."⁸⁸⁸ Meanwhile, the Cowboy Caucus voice of people like Noel has become a national movement, as the "Congressional Western Caucus" carries the same nickname. All three Republican representatives of Utah belong, and former Utah Representative Rob Bishop has chaired the caucus.⁸⁸⁹

Historically, one entity has been able to influence broad and immediate change in Utah. The Church of Jesus Christ of Latter-day Saints is not only the major religion in the state, but it also wields extensive political clout. If real environmental-policy change is to occur, the Church could make it happen. Such a solution does not seem unlikely, as memories of the stewardship ethic are stirring among Mormon leaders. In April 2013, Elder Marcus B. Nash, a member of the Church's governing body, gave an address to the Stegner Symposium at the University of Utah entitled "Righteous Dominion and Compassion for the Earth." Nash expounded a doctrinal basis for environmental stewardship in Mormon theology. "LDS doctrine is clear," he said, "all humankind are

⁸⁸⁷ Courtney Tanner, "Utah Rep. Mike Noel, the powerful, polarizing and anti-federal government rural voice, won't seek re-election, report says," *Salt Lake Tribune*, March 12, 2018. <https://www.sltrib.com/news/politics/2018/03/09/rep-mike-noel-is-retiring-report-says/>; "Mike Noel's Biography," <https://justfacts.votesmart.org/candidate/biography/50302/michael-noel>.

⁸⁸⁸ Nick Visser, "Utah Lawmaker Blames 'Treehuggers' and 'Rock-Lickers' for Wildfires," June 29, 2017, https://www.huffpost.com/entry/mike-noel-utah-wildfire_n_5954a8ebe4b05c37bb7bf1ee

⁸⁸⁹ See "Membership," Congressional Western Caucus, <https://westerncaucus.house.gov/about/membership.htm>

stewards over this earth and its bounty—not owners—and will be accountable to God for what we do with regard to his creation.”⁸⁹⁰ By publicly reasserting the doctrine of environmental stewardship of the earth, Nash indicated that it was on the minds of Church leaders.

Another institutional statement came from Elder Steven E. Snow, a member of the Presidency of the Quorum of Seventy and until recently the church historian, at a conference on religion and the environment in 2018. Snow cited Mormon founder Joseph Smith, who, he said, “looked on the works of nature and was moved to find God. . . Our religion and our environment are fundamentally connected.” Snow, a former member of the board of directors for Grand Canyon Trust, lamented the hazy skies from forest fires and the algal blooms in Utah Lake. “Climate change is real, and it’s our responsibility as stewards to do what we can to limit the damage done to God’s creation.”⁸⁹¹ However, in a question-and-answer period, Snow was asked why the church did not do more to speak out on environmental issues. Snow responded that the church takes a political stance only on what its leaders consider to be “moral issues.”⁸⁹² While some church leaders clearly have an interest in environmental issues, Snow’s admission shows their hesitancy to label climate change a moral issue and to lead out substantively.

⁸⁹⁰ Marcus B. Nash, “Righteous Dominion and Compassion for the Earth,” Address, 18th Annual Stegner Center Symposium, University of Utah, April 12, 2013. <https://newsroom.churchofjesuschrist.org/article/elder-nash-stegner-symposium>

⁸⁹¹ Steven E. Snow, “The Moral Imperative of Environmental Stewardship,” address given at God and Smog: the Challenge of Preserving Our Planet, Utah State University Religious Studies Program, October 10, 2018; “We are accountable for how we treat the earth,” Newsroom for the Church of Jesus Christ of Latter-day Saints, October 10, 2018. <https://newsroom.churchofjesuschrist.org/article/we-are-accountable-god-how-we-treat-earth-elder-snow>.

⁸⁹² Author’s notes from Steven E. Snow, “The Moral Imperative of Environmental Stewardship,” address given at God and Smog: The Challenge of Preserving Our Planet, Utah State University Religious Studies Program, October 10, 2018.

A year later, a private group known as LDS Earth Stewardship hosted an address by Sharon Eubank, the first counselor in the Relief Society, the LDS women's organization. Her position makes her a leading voice in the Mormon Church. Eubank connected environmental stewardship to the call to "love one's neighbor." Eubank framed climate change and environmental within the context of an international humanitarian crisis. "People are leaving their homes because their survival as a family is threatened" in many cases because of environmental pressures. In referencing rising sea levels, Eubank said:

The populations at risk from rising sea levels are high density populations. For example, the Mekong Delta is one of the most populated places in the world and is at risk for major sea intrusion over the next 15 to 20 years. People all along the coast of India and across the South Pacific are already being affected by rising seas. In addition to saltwater intrusion and loss of farmland, droughts are getting more severe.⁸⁹³

Eubank claimed that droughts were becoming more severe, flooding more frequent, and hurricanes stronger, displacing populations from lower socio-economic regions, straining national economies, and creating a refugee crisis. "I ask you seriously, and thoughtfully to consider the question: What does Zion have to do with the stewardship of the earth?"⁸⁹⁴ By posing the question, Eubank reclaimed the early Mormon emphasis on environmental stewardship as a responsibility not only to manage the earth and its resources but to care for the less fortunate. For Eubank, at least, the historic stewardship ethic must be revived.

⁸⁹³ Sharon Eubank, "That We May Be One," LDS Earth Stewardship Fall Forum, October 10, 2019. <https://ldsearthstewardship.org/component/k2/tag/sharon%20eubank>

⁸⁹⁴ Ibid.

As climate concerns begin to draw the institutional Church’s attention, however, it is still not a priority for the culture. Among all fifty states, Utah has the smallest number of people who believe that anthropogenic climate change is occurring.⁸⁹⁵ When asked about the importance of the environment, 52.7 percent of Latter-day Saints say they have “somewhat high” or “very high” concern, while only 36.3 percent of Republicans express high concern. This contrast might indicate a slow breach forming up between conservative politics and the Mormon mind.⁸⁹⁶ “Our doctrine is enormously progressive as it relates to the environment,” observed the late progressive Mormon politician Wayne Owens, “but our cultural interpretation has not followed suit. Our theology has not translated politically into a powerful environmental ethic. Some hope is found, however, that the Mormon public is increasingly sensitive to things environmental.”⁸⁹⁷

In 2020, for the first time, a member of Utah’s congressional delegation advocated action against climate change—and within the context of the LDS theology of stewardship. At an online event for the conservative Sutherland Institute, Utah representative John Curtis declared himself a “climate conservative” and listed the reasons why he was concerned for the future of the planet. “The fear of climate change is not my motivation,” he said. “What does motivate me, a reverence for God’s creations, a

⁸⁹⁵ Jared McDonald, Bo MacInnis, and Jon A. Krosnick, “Climate Insights 2020: Opinions in the States,” Resources for the Future, October 26, 2020. <https://www.rff.org/publications/reports/climateinsights2020-opinion-in-the-states/>

⁸⁹⁶ Logan V. Studer, Ryan P. Burge, “Mormons and the Environment,” blog, *Religion in Public*, December 19, 2018, <https://religioninpublic.blog/2018/12/19/mormons-and-the-environment/>

⁸⁹⁷ “Study Guide: LDS Perspectives on Environmental Stewardship,” 9. <https://docsbay.net/study-guide-lds-perspectives-on-environmental-stewardship>

feeling of accountability for my stewardship on this Earth, and a hope that my grandchildren and their posterity will be able to stand on Kings Peak and glimpse the greatness of nature.” Curtis, a devout Mormon, cited texts from a variety of religious traditions, including Confucianism, Buddhism, and Hinduism. From Mormonism, Curtis takes three quotes—one each from past church presidents Joseph F. Smith and Ezra Taft Benson, and one from the church’s current website dedicated to environmental stewardship. While downplaying to his conservative audience the role of science, Curtis appeals to the Mormon tradition of stewardship of the earth, in part recuperating the Zion narrative of the pioneer leaders.⁸⁹⁸

Mike Noel, Rebecca Edwards, Sharon Eubank, and John Curtis, all leaders in the Utah establishment, are each devout Mormons. Their contrasting positions illustrate the fragmented environmental narratives characteristic of the Wasatch culture—even among co-religionists. Although deeply influenced by free-market entrepreneurialism and the frontier mindset, they are not unanimous in their attachment to climate change scepticism. Professor George B. Handley at Brigham Young University expresses an emerging Mormon environmental consciousness: “I believe it a desecration of religion itself to suppose that our God sanctions secular philosophies that justify indifference to the suffering of . . . the planet itself.”⁸⁹⁹ And in 2013 the Church published an institutional statement advocating “environmental stewardship and conservation,”

⁸⁹⁸ “Transcript: Sutherland’s 2020 Congressional Series event with Rep. John Curtis,” Sutherland Institute, August 25, 2020. <https://sutherlandinstitute.org/transcript-sutherlands-2020-congressional-series-event-with-rep-john-curtis/>

⁸⁹⁹ George B. Handley, “Heaven and Earth: Thinking Through Environmentalism,” in *Common Ground, Different Opinions: Latter-day Saints and Contemporary Issues*, Justin F. White, James Faulconer, eds., Salt Lake City: Greg Kofford Books, 2013, 278.

affirming that “we are stewards of the earth and its resources . . . accountable for the care and preservation of the earth.”⁹⁰⁰

The local culture is apparently awakening to the menace of local issues like air pollution, while remaining skeptical of global climate change. In a 2016 Utah Priorities survey, Wasatch Front voters listed air pollution as their top concern.⁹⁰¹ Inversions come every year. Fires have always burned the mountains, and floods have always poured down through the valleys. Winds have repeatedly wrought havoc on homes and landscapes, while periodic droughts are old news on the Wasatch Front. The level of the Great Salt Lake has gone up and down over and over again. But something is different now. These things are not supposed to happen as frequently or intensely as they do, and Utahns appear to be taking notice. The distinction between local issues and global problems may be disintegrating.

The most salient threat to the future of the region is the prospect of megadrought. Current research on long-term climate trends indicates a possible recurrence of the Medieval Drought Anomaly in the western United States due to temperature increase and natural oscillation of ocean currents. “Models project significantly drier conditions in the latter half of the 21st century compared to the 20th century and earlier paleoclimatic intervals,” argues a major Columbia University study from 2015. “Notably, future drought risk will likely exceed even the driest centuries of the Medieval Climate

⁹⁰⁰ “Environmental Stewardship and Conservation,” *op. cit.*

⁹⁰¹ “Utah Priorities 2016,” Utah Foundation, <http://www.utahfoundation.org/reports/utah-priorities-2016-issue-2-air-quality/>

Anomaly.”⁹⁰² Decades of dry conditions may have led to the collapse of the indigenous cultures of the thirteenth century—a cautionary tale indeed. Now, however, the West is home to more than 70 million people. If those conditions were to prevail again, the impact might be daunting as the blossoming desert withers. Megadrought essentially cleared the Wasatch Oasis of an entire culture once before when the Fremont people disappeared in the fourteenth century.

Fortunately, there are signs that the Wasatch Front establishment is moving toward an ideology of conservation. In May 2018, Governor Gary Herbert signed the high-school students’ resolution that Rebecca Edwards sponsored to officially recognize human-caused climate change; the resolution made Utah one of the first conservative states to take such an action.⁹⁰³ In 2020 Salt Lake City committed itself to the goal of reducing per-capita water consumption from 206 gallons per day to 183 by 2030, and a long-term goal of 160, a 22 percent decrease.⁹⁰⁴ Utah leaders have collaborated with other states on a “Drought Contingency Plan,” a web of agreements among upper Colorado River water users to manage demand for water. The agreement seems to be bearing fruit. Colorado River use peaked in 2003 and has declined even with population growth. The upper Colorado now feeds 1.7 million acre-feet of water into the Central Utah Project, a system of dams and canals that provides water to the populous southern

⁹⁰² Benjamin I. Cook, Toby R. Ault, and Jason E. Smerdon, “Unprecedented 21st century drought risk in the American Southwest and Central Plains,” *Science Advances* 1, no. 1 (February 12, 2015). DOI: 10.1126/sciadv.1400082

⁹⁰³ “Utah’s legislature is first among conservative states to officially recognize climate change,” *The Independent: A Voice for Southern Utah*, May 17, 2018. <http://suindependent.com/utah-legislature-hcr-007-climate-change/>.

⁹⁰⁴ “Water Conservation Plan 2020,” Salt Lake City Public Utilities. <https://www.slc.gov/utilities/water-conservation-plan-2020/>

Wasatch Front. This amount is only 57 percent of Utah’s allocation, so legally there is room for expansion. Practically, however, Utah may never be able to take it’s full share. Water storage along the river has dropped by 55 percent since the year 2000; the great reservoirs of Lake Mead and Lake Powell are declining. The Drought Contingency Plan may not be enough to offset the effects of megadrought.⁹⁰⁵

Still, the willingness of Utah leaders to collaborate on conservation measures shows that formerly clashing ideologies may be converging under the threat of climate change. For several years in the mid-2010s, progressive leaders of Salt Lake City and Park City discussed the prospect of transitioning completely to renewable sources of electric power. Cognizant of the conflicting narratives about climate change, these leaders privately approached officials of Rocky Mountain Power, the electrical utility that serves most of Utah, to express frustration that the Salt Lake area had persistently violated federal air-quality standards for over a decade. They asked the power company what could be done to mitigate pollution from the company’s gas- and coal-fired power plants.

Former mayor of Salt Lake Jackie Biskupski and her counterpart at the utility Cindy Crane met to tackle the issue. “The two women discussed a shared vision for the future of Salt Lake City—one that took a clean environment and the real threat from climate change into account.” Difficult negotiations followed. One problem was that the utility’s power plants were relatively new and heavily indebted. Eventually, the women agreed on a solution: If the cities involved would pay down the debts, then the utility

⁹⁰⁵ John Fleck, “Coping with Megadrought in the Colorado River Basin,” webinar, May 29, 2020. <http://www.inkstain.net/fleck/2020/05/coping-with-megadrought-in-the-colorado-river-basin>.

would work with them to achieve “100 percent clean energy” by 2032. Biskupski recalls, “Having women at both ends of the table opened up new opportunities for compromise. There’s less ego at the table. There’s less bullying. There’s more desire to listen.”⁹⁰⁶

One significant hurdle remained: to get the Legislature’s consent to the agreement. In 2016, the coalition presented to the legislature a bill called the “Community Renewable Energy Act” and lobbied heavily for it. Recognizing that many representatives questioned the science of climate change, the coalition wrote into the bill that it would apply only to participating communities and allow residents to opt out if they chose—“a move intended to placate conservatives who fret about big government taking away individual choice.” Remarkably, the bill passed on March 14, 2016, and Governor Gary Herbert signed it.⁹⁰⁷

The new law committed Salt Lake City and a number of other Utah entities to transition to renewable sources of electric power by 2032. The goal is to reduce greenhouse-gas emissions by 50 percent below 2009 levels by 2030 and 80 percent by 2050. The commitment, called Climate Positive SLC, reportedly makes Salt Lake City “one of only a handful of cities worldwide to pledge an 80% reduction in community wide greenhouse gas emissions by 2040.”⁹⁰⁸

⁹⁰⁶ Emma Penrod, “The Utah Way to Achieving 100 Percent Clean Energy: How a politically conservative state set aggressive goals for clean energy,” *Sierra*, July 1, 2019. <https://www.sierraclub.org/sierra/2019-4-july-august/feature/utah-way-achieving-100-percent-clean-energy>

⁹⁰⁷ *Ibid.*

⁹⁰⁸ “Salt Lake City Commits to Landmark Clean Energy and Climate Change Resolution,” news release, July 13, 2016. www.slc mayor.com/press-releases-archive/2016/7/13/salt-lake-city-commits-to-landmark-clean-energy-and-climate-change-resolution

The Community Renewable Energy Act possibly symbolizes a new era in which formerly conflicting narratives begin to come together. Before acting, the “Utah establishment” often waits for signals from the Mormon Church, so much high-level negotiation is done privately and without dramatics. As voices from the Church begin to speak out on environmental stewardship, the Legislature knows how to read those signals. “The Utah way is not protesting and shouting from the rooftops that this [the Renewable Energy Act] needs to happen,” says Michael Shea, a Utah clean-air advocate. “The Utah way, for better or worse, means you have to be collaborative on the inside. There is no way that this could have made it through both the utility and the legislature without some kind of collaboration on the cities' part.”⁹⁰⁹

Observers reacted to the Renewable Energy Act with surprise. The influential periodical *Utility Dive* commented that “Utah has done what some thought impossible, getting approval from an 80% Republican legislature to move more than one-third of the state’s population to 100% renewables by 2030.” It was the fruit of “unprecedented collaboration” among traditional antagonists: the entrenched utility industry, progressive local leaders, and conservative legislators.⁹¹⁰ This collaborative effort was said to represent the Utah Way of approaching problems.

State leaders make much of the Utah Way as a tendency to cooperation rooted in the communitarian tradition of the original Mormon settlers. Governor Gary Herbert, for example, identifies the Utah Way as marked by a “pioneering spirit, inclusive attitude,

⁹⁰⁹ Penrod, “The Utah Way.”

⁹¹⁰ Herman K. Trabish, “A red state template for 100% renewables? Utah bill unites Rocky Mountain Power, cities and activists,” *Utility Dive*, March 17, 2020. <https://www.utilitydive.com/news/a-red-state-template-for-100-renewables-utah-bill-unites-rocky-mountain-p/573692/>

dedication to innovation, efficiency, [and] compassion.”⁹¹¹ At the same time, for progressive voices in Utah discouraged by what they perceive as reactionary social legislation, the Utah Way is often “just an empty phrase, ready to be filled with whatever meaning or principles the speaker desires.”⁹¹²

Nevertheless, in 2019, the Legislature appropriated \$200,000 to study the effects of climate change on Utah. Using information provided by different organizations, including Envision Utah, the Kem C. Gardner Policy Institute at the University of Utah explored 200 policy options. Leading the effort was Natalie Gochnour, director of the Institute and former EPA administrator, another influential woman in Utah establishment circles. Gochnour brought together representatives from 37 interest groups, including utilities, clean-energy advocates, climate and medical scientists, and regulators. “The diverse balance of people at the table helps us get to recommendations that I think are much more likely to occur, that will have fewer unintended consequences,” she emphasized. This range of stakeholders comports with what she calls “the Utah Way.”⁹¹³

In January 2020, the Institute released a report entitled “The Utah Roadmap.” It recommended seven strategies, including carbon-cutting initiatives like becoming the market-leading state in electric vehicles, accelerating quality growth efforts, and assisting in transitioning rural communities that are heavily invested in fossil fuel production to renewable energy systems. The report concluded that Utah should set a goal to cut carbon

⁹¹¹ Gary R. Herbert, “The Utah Way,” <https://governor.utah.gov/issues/the-utah-way/>

⁹¹² Chase Thomas, “What is the Utah Way? It Depends on Who You Are,” *Salt Lake Tribune*, March 17, 2019.

⁹¹³ Judy Fahys, “How Utah may have found a model for bipartisan action on climate change,” *Salt Lake Tribune*, January 25, 2020. <https://www.sltrib.com/news/environment/2020/01/22/utah-climate-change-plan/>.

emissions by 80 percent by 2050.⁹¹⁴ Many have lauded the report as a “model for bipartisan action on climate change,” hailing Utah as one of the few “red” states in the fight against climate change.⁹¹⁵ As Utah legislators convened in January 2020, the Utah Roadmap, characterized as “an aggressive climate action plan for a Republican-led state,” awaited their action. One longtime observer of Utah climate politics has said “that the proposal even exists signals a major shift in thinking in a state where legislators for years have publicly questioned—and sometimes ridiculed—climate science.”⁹¹⁶

Does that “shift in thinking” represent a significant inflection point in the narrative that governs environmental policy in Utah? Gochnour believes that it does. However, on March 12, 2020, the legislature tabled a resolution in support of the Utah Roadmap, signaling that considerable uncertainty remains about the pathway ahead.⁹¹⁷ The study advocated as a core strategy a “national dialogue about market-based approaches to reduce carbon emissions.”⁹¹⁸ If Envision Utah’s history is any indication, free market solutions are often insufficient and slow to take shape. While Envision Utah was something of a hybrid between private business and government action, it fell far short of attaining quality growth efforts such as reducing congestion and commute times. According to author and climate activist Naomi Klein, free-market solutions to climate

⁹¹⁴ “The Utah Roadmap: Positive Solutions on Climate and Air Quality,” Kem C. Gardner Policy Institute University of Utah. <https://gardner.utah.edu/wp-content/uploads/TheUtahRoadmap-Feb2020.pdf>.

⁹¹⁵ Fahys, “Has conservative Utah turned a corner?” See also “Red-State Utah Embraces Plan to Tackle Climate Crisis in Surprising Shift,” *The Guardian*, February 19, 2020. <https://www.theguardian.com/environment/2020/feb/19/utah-republicans-climate-crisis-plan>.

⁹¹⁶ Fahys, “Has Conservative Utah Turned a Corner?” See also “The Utah Roadmap.”

⁹¹⁷ H.C.R. 11 Concurrent Resolution Supporting the Utah Roadmap for Positive Solutions and Leadership on Climate and Air Quality. <https://le.utah.gov/~2020/bills/static/HCR011.html>

⁹¹⁸ “The Utah Roadmap,” 1.

change typically come up short. They are too slow to implement, and they tend to leave out those who are on the bottom of the economic spectrum.⁹¹⁹ If Utah follows the pattern of action of Envision Utah, environmental change will come slowly and selectively. And if the Utah Roadmap remains tabled, not even a market-based discussion about climate change will take place.

The Utah Way of resolving environmental issues is difficult to define. Former Governor Herbert began the narrative this way: “In 1847, a group of Mormon Pioneers entered the Salt Lake Valley and Brigham Young, envisioning the future of their great settlement, famously declared ‘This is the right place.’” For Herbert, the essence of the Utah Way is “pioneering spirit, inclusivity, and compassion”: clearly, for Herbert anyway, it begins with a Mormon ideal of vision and stewardship.⁹²⁰ It partakes of what scholars have called a “Mormon emphasis on being . . . non-confrontational,” a tendency passed down through generations of a reverential and pious culture.⁹²¹ Others characterize the Utah Way in a more secular fashion as a “careful navigation of business and political interests.” Gochnour, a non-Mormon, says, “We find ways to listen, collaborate, address trade-offs, embrace markets, seek alignment, and act. It’s what many call ‘The Utah Way.’”⁹²² By any definition, many in Utah resist it. However, women of standing in the community and Utah’s young students want this to be the story of Utah, and they are leading out in ways they never have before. Perhaps within this “Utah Way”

⁹¹⁹ Naomi Klein, *On Fire: The (Burning) Case for a Green New Deal*, (New York: Simon and Schuster, 2019), 289-292.

⁹²⁰ Herbert, “The Utah Way,” op. cit.

⁹²¹ Al James, “Everyday Effects, Practices and Causal Mechanisms of ‘Cultural Embeddedness’: Learning from Utah’s High Tech Regional Economy,” *Geoforum* 38 (2007), 400.

⁹²² “The Utah Roadmap,” 1

narrative of a business-friendly community characterized by cooperation and compassion the local culture may move forward in an environmentally responsible way.

Or perhaps the historical cycle will spin on. James Hansen gave his climate-change warning in 1988, yet Utahns have only begun to recognize the crisis in the last decade. Despite warnings of impending disaster, Utahns have a history of refusing or neglecting to take mitigating measures. Utahns may continue to embrace unfettered growth and unsustainable policies until a crisis comes crashing down upon them.

That crisis may have actually already arrived. As of this writing, Utah Governor Spencer Cox has declared a drought emergency: Currently, 90 percent of the state suffers from “extreme drought conditions,” with the remaining 10 percent in “moderate drought conditions.”⁹²³ The governor put it succinctly: “It’s bad. It’s as bad as it’s been.”⁹²⁴ He is not exaggerating. Researchers have concluded that Utah now faces the most serious drought in 1200 years.⁹²⁵ Cox has urged Utahns to conserve water by taking small steps such as turning off the faucet while brushing teeth, using washing machines only for full loads, reducing shower times, and implementing “water-wise landscaping.”⁹²⁶ Cox is appealing to Utah’s communitarian history and in doing so echoing ideals of stewardship,

⁹²³ Taylor Stevens, “Gov. Cox Declares Drought Emergency for All of Utah,” *Salt Lake Tribune*, March 17, 2021. <https://www.sltrib.com/news/politics/2021/03/17/gov-cox-declares-drought/>.

⁹²⁴ Brian Maffley, “Worsening Drought Could Lead to Water-Use Restrictions,” *Salt Lake Tribune*, May 24, 2021. <https://www.sltrib.com/news/environment/2021/05/24/worsening-drought-could/>

⁹²⁵ David W. Stahle, “Anthropogenic Megadrought,” *Science* 368, no. 6488 (April 17, 2020): 238-239.

⁹²⁶ Stevens, “Gov. Cox Declares Drought Emergency.”

but obviously on a very limited scale: After all, nearly 90 percent of Utah’s water use is agricultural. Household water use is minuscule by comparison.⁹²⁷

Utahns may band together and actually conserve water. They may change their landscaping habits and move to xeriscaped yards. They may implement more water-saving agricultural techniques and come together to keep Great Salt Lake from receding any further. The ideals of communal stewardship, however, may also recede again if drought conditions improve.

Echoes of the stewardship ethic of the past are only faintly heard and even more faintly remembered. Still, political conditions and demographics have changed considerably. Women now have more political clout than their forebears did when they took on the fight to improve the state’s air quality. Young Utahns also appear to be turning away from environmental abuse and unfettered growth. Utah’s large millennial population is increasingly drawn to high-density living in the urban centers because of the “lower environmental footprint. . . . Clean air and sustainability are a large part of the decision to live and work downtown.”⁹²⁸ Could these two historically underrepresented populations make the difference in bringing a lasting embrace of a stewardship ethic?

The difficulties associated with implementing lasting ideological change are immense. The challenges in going beyond merely developing a narrative around stewardship and implementing policies that avoid disasters may be too much to overcome. Utahns have shown they would rather come to the rescue than prevent a

⁹²⁷ “Utah Major Watersheds,” Utah State University Extension, n.d. [https://extension.usu.edu/waterquality/learnaboutsurfacewater/watersheds/utahmajorwatersheds#:~:text=HOW%20DOES%20UTAH%20USE%20ITS.and%20industries%20\(about%204%25\).](https://extension.usu.edu/waterquality/learnaboutsurfacewater/watersheds/utahmajorwatersheds#:~:text=HOW%20DOES%20UTAH%20USE%20ITS.and%20industries%20(about%204%25).)

⁹²⁸ “Utah’s Millennials Are Moving Downtown,” Salt Lake Department of Economic Development, January 31, 2019. <https://slcecondev.com/2019/01/31/utahs-millennials-are-moving-downtown/>

disaster in the first place. The communal attributes that characterized the Mormon settlers are now only put on display when the damage has already been done. We can assume that as the climate continues to warm, Utahns will band together in some way in an attempt to provide relief for each other. But by then it may be too late.

The End

REFERENCES

Abbreviations

DN = *Deseret News*

JD = *Journal of Discourses by Brigham Young, President of the Church of Jesus Christ of Latter-day Saints, His Two Counsellors, the Twelve Apostles, and Others, Reported by G. D. Watt.* 26 vols. Liverpool, London: Latter-day Saints' Books Depot, 1854-1886.

UHQ = *Utah Historical Quarterly*

"13th South River Might Flow Again." *DN*, May 19, 1983.

"1949 Starts Off Warmer." *DN*, January 1, 1949.

"1994 Utah Air Emission Inventory." Utah Division of Air Quality, Department of Environmental Quality, 1996.

2015 Report Card for Utah's Infrastructure. American Society of Civil Engineers, 2015.

"22 Major Floods That Devastated Communities in Utah History." *Ogden Standard-Examiner*, May 7, 2019.

"3,000 Marooned by Storm in Utah and Idaho." *Provo Daily Herald*, January 5, 1949.

"A Flood in Perspective," *DN*, March 19, 1862.

"A Message Concerning Preparation for Relief Measures." Letter from the First Presidency to Stake Presidents, July 1933.

<https://www.Churchofjesuschrist.org/study/ensign/2003/03/the-road-to-financial-security?lang=eng>

"A Preventive Project." *DN*, July 30, 1884.

"A Tale of Two Wildfires." U.S. Department of the Interior, Bureau of Land Management, July 2018. http://utahfireinfo.com/wp-content/uploads/2018/07/A-Tale-of-Two-Wildfires-Final-20-Jul-18_FINAL.pdf

Addams, Jane. *Twenty Years at Hull House.* New York: Macmillan Company.

Aikens, Melvin C., and David B. Madsen. "Prehistory of the Eastern Area." *Handbook of North American Indians: Great Basin*, Washington: Smithsonian Institution, 11 (1986):150.

"Air Pollution Hearing." *The Daily Utah Chronicle*, January 8, 1970.

Alexander, Thomas G. "Sylvester Q. Cannon and the Revival of Environmental Consciousness in the Mormon Community." *Environmental History* 3, no. 4 (1998): 488-507.

Alexander, Thomas G. "Irrigating the Mormon Heartland: The Operation of the Irrigation Companies in Wasatch Oasis Communities, 1847-1880." *Agricultural History* 76, no. 2 (Spring 2002):182-187.

Alexander, Thomas G. "Lost Memory and Environmentalism: Mormons on the Wasatch Front, 1847-1930." In *The Earth Will Appear as the Garden of Eden: Essays on Mormon Environmental History*, Jedediah S. Rogers, Matthew Godfrey, eds., 47-70. Salt Lake City: University of Utah Press, 2019.

Alexander, Thomas G. "Stewardship and Enterprise: The LDS Church and the Wasatch Oasis Environment, 1847-1930." *Western Historical Quarterly* 25, no. 3 (Autumn 1994): 340-364.

Alexander, Thomas G. *Mormonism in Transition: A History of the Latter-Day Saints, 1890-1930*. Salt Lake City: Greg Kofford Books, 2012.

Alexander, Thomas G. *The Forest Service and the LDS Church in the Mid-Twentieth Century: Utah National Forests as a Test Case*. Dello G. Dayton Memorial Lecture. Ogden: Weber State College Press, 1987.

Alexander, Thomas G. *The Rise of Multiple-Use Management in the Intermountain West: A History of Region 4 of the U.S. Forest Service*, U.S. Department of Agriculture, 1988.

Alexander, Thomas G. *Utah: The Right Place*. Salt Lake City: Gibbs Smith, 1995.

Almanac for Grantsville 2W, UT, December 26, 1934.
<https://w2.weather.gov/climate/xmacis.php?wfo=slc>.

Anderson, Rebecca. "Between Mountain and Lake: An Urban Mormon Country," PhD diss., Arizona State University, 2015.

Anderson, Terry L., and Peter J. Hill. "Cowboys and Contracts." *The Journal of Legal Studies* 31, no. S2 (2002): S489-514. doi:10.1086/342026.

- Anderton, Dave. "Geneva Cleanup Plan Ok'D." *DN*, July 8, 2004.
- Annual Review of Environment and Resources* 43 (October 2018): 85-108.
<https://www.annualreviews.org/doi/full/10.1146/annurev-environ-102017-025855>.
- Arave, Lynn. "Recalling the Infamous Winter of 1948-49." *Ogden Standard-Examiner*, January 2, 2014.
- "Are They Asleep or Insane?" *DN*, April 26, 1893.
- Armstrong, Ellis L. and Howard F. Rosen. *Effective Emergency Response: The Salt Lake Valley Floods of 1983, 1984 & 1985*. Chicago: Public Works Historical Society, 1986.
- Arno, Stephen F. "Forest Fire History in the Northern Rockies." *Journal of Forestry* 78, no. 8 (August 1980):460-465.
- Arnow, Ted. "Water-Level and Water-Quality Changes in Great Salt Lake, Utah, 1847-1983." Geological Survey Circular 913, U.S. Department of the Interior, 1984.
- Arrington, Leonard J. "Utah and the Depression of the 1890s." *UHQ* 29, no. 1 (January 1961): 3-18.
- Arrington, Leonard J. and Wayne K. Hinton. "Origin of the Welfare Plan of the Church of Jesus Christ of Latter-day Saints." *BYU Studies* 5, no. 2 (April 1964): 67-85.
- Arrington, Leonard J. *Great Basin Kingdom: An Economic History of the Latter-day Saints*, Carbondale: University of Illinois Press, 2004.
- Arrington, Leonard J., Feramorz Y. Fox, and Dean L. May. *Building the City of God: Community & Cooperation Among the Mormons*. Salt Lake City: Deseret Book Company, 1976.
- Arrington, Leonard. "Utah's Great Drought of 1934." *UHQ* 54, no. 3 (Summer 1986): 246-264.
- "Award for Steel Plant." *New York Times*, November 26, 1941.
- Bailey, Reed W. Hearings Before the House Committee on the Public Lands on H.R. 11816, 72d Congress, 1st session, 1932.
- Bailey, Reed Warner, Raymond J. Becraft, and Clarence Luther Forsling. *Floods and Accelerated Erosion in Northern Utah*, U.S. Department of Agriculture Miscellaneous Publication no. 196, 1934.

Baptiste, Nathalie. "God Said to Make the Desert Bloom, and Mormons Are Using a Biblical Amount of Water to Do It," *Mother Jones*, May 9, 2018.

Baugh, Alexander L. "John C. Frémont's 1843-1844 Western Expedition and Its Influence on Mormon Settlement in Utah." *UHQ* 83, no. 4 (Fall 2015): 254-269.

Bazzi, Samuel, Martin Fiszbein, and Messay Gebresilasse. "Frontier Culture: The Roots and Persistence of 'Rugged Individualism' in the United States." *Econometrica*, 88, no. 6 (November 2020): 2-87.

Bear River Development. Utah Dept. of Natural Resources, n.d.
<https://water.utah.gov/bear-river-dev/>

Bedford, Daniel. "The Great Salt Lake: America's Aral Sea?" *Environment: Science and Policy for Sustainable Development* 51, no. 5 (August 7, 2010): 8-21.

Belk, Russell W. "Possessions and the Extended Self." *Journal of Consumer Research*, 15 (September 1988): 139-168. doi.org/10.1086/209154

"Beneficial Snow Covers Entire Mountain Area." *Lehi Sun*, November 25, 1948.

Bennion, Glynn. "A Pioneer Cattle Venture of the Bennion Family." *UHQ* 34 (Fall 1966): 315-325.

Bennion, Glynn. "An Ill Wind." *Improvement Era* 42, no. 8 (August 1939): 467-469.

Bennion, John. "Ideology of Land Ownership: Homesteading Practice and Frontier Narratives of Glynn Bennion." *ISLE: Interdisciplinary Studies in Literature and Environment* 27, no. 1 (Winter 2020): 159-178.

Benson, Emily. "Will Utah Dam the Bear River?" *High Country News*, September 4, 2017.

Bird, Douglas M. "A History of Timber Resource Use in the Development of Cache Valley, Utah." MA thesis, 1964. <https://digitalcommons.usu.edu/etd/527>

Blanthorn, Ouida. *A History of Tooele County*, Utah Centennial County History Series. Salt Lake City: Utah State Historical Society, 1998.

"Blizzard Paralyzes Southeast S.L. Area." *DN*, January 10, 1949.

"Blizzard Slugs at Utah in New Fury." *Salt Lake Telegram*, January 15, 1949.

Boal, Jed. "Utah Sees Record Number of Human-Caused Wildfires in 2020." KSL-TV, October 20, 2020. <https://www.ksl.com/article/50034277/utah-sees-record-number-of-human-caused-wildfires-in-2020#:~:text=According%20to%20state%20data%2C%201%2C108,human%2Dcaused%20fires%20was%20937>.

Boetzkes, Amanda. "Waste and the Sublime Landscape." *Canadian Art Review* 35, no. 1 (2010): 22-31.

Bolton, Herbert E. *Pageant in the Wilderness: The Story of the Escalante Expedition to the Interior Basin, 1776*. Salt Lake City: Utah State Historical Society, 1950.

Bonner, Jeremy. "State, Church and Moral Order: The Mormon Response to the New Deal, in Orem, Utah, 1933-40." *Journal of Mormon History* 28, no. 2 (2002): 81-103.

Bonwick, James. *The Mormons and the Silver Mines*, cited in J. R. Nichols, *Mineral Resources of Utah*. Pittsburgh: A.A. Anderson & Sons, 1872.

"Book of Commandments, 1833." The Joseph Smith Papers.

"Bountiful Hit by a Wall of Water and Mud." *DN*, June 2, 1983.

Bradley, Anne F., Nonan V. Noste, and William C. Fischer. "Fire Ecology of Forests and Woodlands in Utah/" Technical Report INT-287, Intermountain Research Station, U.S. Dept. of Agriculture, June 1992.

Brandon, William. "Wilson Price Hunt." In *Mountain Men & Fur Traders of the Far West*, LeRoy R. Hafen, ed. Lincoln: University of Nebraska Press, 1982: 57-79.

Brooks, George R. *The Southwest Expedition of Jedediah S. Smith: His Personal Account of the Journey to California, 1826-1827*, Lincoln: University of Nebraska Press, 1977.

Brotherton, Robert, Christopher C. French, and Alan D. Pickering. "Measuring Belief in Conspiracy Theories: The Generic Conspiracist Beliefs Scale." *Frontiers in Psychology*, May 21, 2013. |

Brough, R. Clayton and Dale J. Stevens. "Climatography of Salt Lake City, 1847-1988."

Brown, Jason M. "Whither Mormon Environmental Theology?" *Dialogue: A Journal of Mormon Thought* 44, no. 2 (Summer 2011): 67-86.

Bryner, Gary C. "Theology and Ecology: Religious Belief and Environmental Stewardship." *BYU Studies* 49, no. 3 (July 2010): 21-45.

Budge, William. *75th Semi-Annual Conference Report*, October 7, 1904, 19-21.

Bullock, Thomas. Journal, July 23, 1847. Salt Lake City: Church Historical Library. <https://history.churchofjesuschrist.org/overlandtravel/sources/4398/thomas-bullock-journals-1843-1849-journal-1847-april-june>.

Bultmann, Rudolf. "View-Point and Method." In *The Historical Jesus in Recent Research*, James D.G. Dunn and Scott McKnight, eds., University Park, PA: Penn State University Press, 2005.

Burton, Richard Francis. *The City of the Saints, and Across the Rocky Mountains to California*, London: Longman, Green, Longman, and Roberts, 1861.

Bushman, Richard. *Joseph Smith: Rough Stone Rolling*. New York: Alfred Knopf, 2005.

Cannon, Brian. "'There Are Millions of Acres in our State': Mormon Agrarianism and the Environmental Limits of Expansion." In *The Earth Will Appear as the Garden of Eden: Essays on Mormon Environmental History*. Jedediah S. Rogers and Matthew C. Godfrey, eds. Salt Lake City: University of Utah Press, 2019. 195-214.

Cannon, D. James, ed. *Centennial Caravan: Story of the 1947 Centennial Reenactment of the Original Mormon Trek*. Salt Lake City: Sons of the Utah Pioneers, 1948.

Cannon, Joseph A. "Closing Remarks." *Journal of the Air Pollution Control Association* 36 (1986), issue 9: 996. DOI: 10.1080/00022470.1986.10466152.

Cannon, Joseph A. "The Regulation of Toxic Air Pollutants A Critical Review." *Journal of the Air Pollution Control Association* 36 (1986), issue 5: 562-573.

Carlton, Jim. "A Booming Utah Searches for Water Solutions." *Wall Street Journal*, September 13, 2017.

Carr, Annie Call. *East of Antelope Island*. Salt Lake City: Publishers Press, 1969.

Cater, Ben. "Segregating Sanitation in Salt Lake City, 1870-1915." *UHQ* 82, no. 2 (Spring 2014): 7-28.

"Cattlemen vs. the Sheepmen." *Deseret Evening News*, January 26, 1899.

Chaffin, Tom. *Pathfinder: John Charles Frémont and the Course of American Empire*. Norman, OK: Univ. of Oklahoma Press, 2014.

Changnon, Stanley and David Changnon. "A Spatial and Temporal Analysis of Damaging Snowstorms in the United States." *Natural Hazards* 37 (March 2006): 373-389.

Christensen, Clayton M. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston: Harvard Business Review Press, 2016.

Christian, Patrick. "State, Industry Both Resisting Air Efforts." *Provo Daily Herald*, February 17, 1989.

Church, Michael A. "Smoke Farming: Smelting and Agricultural Reform in Utah, 1900-1945," *UHQ* 72, no. 3 (Summer 2004): 196-218.

City of Bluffdale Flood Plain Management Plan, 2018.
http://bluffdale.com/DocumentCenter/View/2590/DRAFT-Bluffdale-Flood-Management-Plan_public-review

"City Places All S.L. Watershed in Fire Zone." *Salt Lake Telegram*, July 31, 1940.

Clark, J. Reuben, Jr. *103rd Annual Conference Report*, April 9, 1933.

Clark, J. Reuben, Jr. *104th Semi-Annual Conference Report*, October 8, 1933.

Clark, J. Reuben, Jr. *108th Annual Conference Report*, April 3, 1938, 109.

Clark, J. Reuben, Jr. *109th Semi-Annual Conference Report*, October 1939, 109.

Clark, J. Reuben, Jr. *107th Annual Conference Report*, April 1937, 22-27.

Clark, Paul F. "Book Notes." *The Wisconsin Magazine of History* 29, no. 1 (1945): 103-05.

Clayton, William. *The Latter-day Saints' Emigrants' Guide*. St. Louis: Missouri Republican Steam Power Press—Chambers and Knapp, 1848.

Clayton, William. *William Clayton's Journal: A Daily Record of the Journey of the Original Company of "Mormon" Pioneers*, Salt Lake City: The Deseret News, 1921.

"Clean Air Symposium Draws Experts." *Orem-Geneva Times*, February 15, 1989.

“Clean Air—It Will Take More Than Talk.” *Orem-Geneva Times*, May 31, 1989.

“Cleanup at Old Geneva Steel Mill Will Shut Down until After the Holiday Because of a Bad Smell.” *Salt Lake Tribune*, November 13, 2019.

Climate at a Glance. Divisional Time Series, National Climatic Data Center, 2000. https://www.ncdc.noaa.gov/cag/divisional/time-series/4203/pdsi/1/1/1895-2019?base_prd=true&firstbaseyear=1901&lastbaseyear=2000.

“Climate in Salt Lake City.” Bestplaces.net. https://www.bestplaces.net/climate/city/utah/salt_lake_city.

Coats, Sloan, Jason E. Smerdon, Kristopher B. Karnauskas, and Richard Seager. “Occurrence of Megadrought Clustering in the American West During the Medieval Climate Anomaly.” *Environmental Research Letters* 11, no. 7 (July 2016). <http://dx.doi.org/10.1088/1748-9326/11/7/074025>

“Compact Near Division for Lake Flow.” *DN*, April 4, 1934.

“Continuation and Extent of the Flood.” *DN*, June 25, 1862.

Cook, Benjamin I., Toby R. Ault, and Jason E. Smerdon. “Unprecedented 21st Century Drought Risk in the American Southwest and Central Plains.” *Science Advances* 1, no. 1 (February 12, 2015). e1400082, DOI: 10.1126/sciadv.1400082

Cook, Edward R., Richard Seager, Richard R. Helm, Jr., Russell S. Vose, Celine Herweijer, Connie Woodhouse. “Megadroughts in North America: Placing IPCC Projections of Hydroclimatic Change in a Long-Term Palaeoclimate Context.” *Journal of Quaternary Science* 25 (December 2009): 48-61.

Cooley, Everett L. “The Robert Bliss Journal.” *UHQ* 27 (October 1959): 381-404.

Cottam, Walter P. “Is Utah Sahara Bound?” *Bulletin of the University of Utah* 37, no. 11 (February 19, 1947): 1-40.

Cottam, Walter P. “Is Utah Sahara Bound?” Eleventh Annual Frederick William Reynolds Lecture, University of Utah, Feb. 19, 1947.

Cottam, Walter P. *Our Renewable Wild Lands: A Challenge*, Salt Lake City: University of Utah Press, 1961.

“Coun. G. A. Smith, Monday September, 8 [9] 1845,” Joseph Smith Papers: Administrative Records, Council of Fifty Minutes, March 1844-January 1846, Ronald

Esplin, Matthew J. Grow, Matthew C. Godfrey, eds. Salt Lake City: Church Historian's Press, 2016.

Cournoyer, Caroline. "Utah's Secret Weapon for Long-Range Planning." *Governing.com*, March 2015. <https://www.governing.com/topics/transportation-infrastructure/gov-utah-secret-weapon-growth-planning.html>

Cowley, Jared. "Study Reveals Mill's Impact on Air Quality." *Provo Daily Herald*, July 11, 2002.

Cowley, Matthias F. *Wilford Woodruff: History of His Life and Labors as Recorded in His Daily Journals*. Salt Lake City: Deseret Evening News Press, 1909.

Craiutu, Aurelian, and Jeremy Jennings. "The Third 'Democracy': Tocqueville's Views of America after 1840." *The American Political Science Review* 98, no. 3 (2004): 391-404

"Crews Reach Stranded Sheep." *DN*, January 19, 1949.

Cronon, William. "The Uses of Environmental History," *Environmental History Review* 17, no. 3 (Fall 1993): 1-22.

"Crop Outlook Bettered." *Nephi Times-News*, November 25, 1948.

Crosby, Alfred. *Children of the Sun: A History of Humanity's Unappeasable Appetite for Energy*. New York: W.W. Norton, 2007.

"Crowd Attends Hatch Town Meeting." *Orem-Geneva Times*, April 26, 1989.

"Damage Mounts to \$500,000 in S. L. Storms." *Salt Lake Tribune*, August 21, 1945.

Daniels, Brigham. "Revitalizing Zion: Nineteenth-Century Mormonism and Today's Urban Sprawl." *Journal of Land, Resources, and Environmental Law* 28 (2008), issue 2: 257-300.

Dant, Sara. "The 'Lion of the Lord' and the Land." *The Earth Will Appear as the Garden of Eden: Essays on Mormon Environmental History*, Jedediah S. Rogers and Matthew C. Godfrey, eds. Salt Lake City: University of Utah Press, 2019, 29-46.

Darowski, Joseph F. "The WPA Versus the Utah Church." In *Utah in the Twentieth Century*, Brian Q. Cannon and Jessie L. Embry, eds. Boulder: University Press of Colorado, 2009, 167-185.

Davidson, Lee. "Activists Call for Halt of Construction on Inland Port until Environmental Effects Are Studied." *Salt Lake Tribune*, October 17, 2019.

Davidson, Lee. "Herbert Urges Utahns to Buy Only Less-Polluting Tier 3 Gas." *Salt Lake Tribune*, January 10, 2020.

Davidson, Lee. "Who Funds Utah Legislators' Campaigns?" *Salt Lake Tribune*, January 28, 2019.

Davis, Brandon. "The Desert Blossoms as a Wasteland: An Environmental History of Utah's West Desert," MA thesis, Simon Fraser University, 2007.

"Dedication of Geneva and Geneva Second Wards Chapel." July 25, 1954, Archives, Church Historical Department.

"Destruction of Roads and Bridges." *DN*, June 25, 1862.

"Diving Mercury Paralyzes Utah Industries." *DN*, January 5, 1949.

Doctrine and Covenants of the Church of Jesus Christ of Latter-day Saints.

Dolan, Sean. "Plat of Zion: 180-Year-Old Legacy Still Visible in Utah Cities." *HJNews*, December 16, 2017. https://www.hjnews.com/logan_hj/plat-of-zion-180-year-old-legacy-still-visible-in-utah-cities/article_fcd96dce-034b-5d64-a145-226b4a4d5541.html

Dowdle, Brett D. "We Seldom Find Either Garden, Cow, or Pig." In *The Earth Will Appear as the Garden of Eden: Essays on Mormon Environmental History*, Jedediah S. Rogers and Matthew C. Godfrey, eds. Salt Lake City: University of Utah Press, 2019, 85-106.

Dr. Walter P. Cottam, Ecologist, Professor Emeritus at U., Dies," *DN*, December 24, 1988.

Dr. Walter Pace Cottam, Ecologist, Professor of Botany." Washington County Historical Society, <https://wchsutah.org/people/walter-cottam.php>.

"Drought in Utah: Learning From the Past—Preparing for the Future." Utah Division of Water Resources, April, 2007.

Dunphey, Kyle. "Colorado College Poll Shows Utahns Are Increasingly Concerned with Environment." *DN*, March 8, 2020.

"Dust Storm Bill Passes House in 5 Minutes Time," *DN*, April 15, 1935.

- “Dust Storm Rages Over Utah.” *DN*, April 15, 1935.
- Dyal, Donald H. “Mormon Pursuit of the Agrarian Ideal.” *Agricultural History* 63, no. 4 (Autumn 1989): 19-35.
- “Early Spring Gets Setback by Late Snow.” *DN*, April 2, 1934.
- Ely, Richard T. “Economic Aspects of Mormonism.” *Harper’s Magazine*, April 1903, 667-669.
- “Emergency Aid Bill Boosted to \$750,000.” *Provo Daily Herald*, January 25, 1949.
- “Engineer Proposes Bench Flood Control.” *Salt Lake Tribune*, October 29, 1959.
- “Environmental Stewardship and Conservation.” The Church of Jesus Christ of Latter-day Saints, n.d. <https://www.churchofjesuschrist.org/study/manual/gospel-topics/environmental-stewardship-and-conservation?lang=eng>
- “EPA Reclassifies Denver Area to ‘Serious’ Non-attainment for Ozone.” News Release, United States Environmental Protection Agency, December 16, 2019. <https://www.epa.gov/newsreleases/epa-reclassifies-denver-area-serious-nonattainment-ozone>.
- Erdman, Jon. “How Does Fog Form?” The Weather Channel, October 14, 2013. <https://weather.com/science/news/how-does-fog-form-20131010>.
- Eubank, Sharon. “That We May Be One.” LDS Earth Stewardship Fall Forum, October 10, 2019. <https://ldsearthstewardship.org/component/k2/tag/sharon%20eubank>
- Everett, Dianna. “Sears, Paul Bigelow.” *The Encyclopedia of Oklahoma History and Culture*. <https://www.okhistory.org/publications/enc/entry.php?entry=SE001>.
- “Fact Sheet: Mike Noel.” <https://exxonsecrets.org/html/personfactsheet.php?id=1340>
- “Evolution of the Clean Air Act.” United States Environmental Protection Agency. <https://www.epa.gov/clean-air-act-overview/evolution-clean-air-act>
- Fadel, Kristin. *Flood Fighters, 1983-1984: An Account of the Mudslides and Flooding in Davis County*. Bountiful, UT: Carr Printing Company, 1984.
- Fahys, Judy. “Has Conservative Utah Turned a Corner on Climate Change?” *Inside Climate News*, January 22, 2020.

Fahys, Judy. "How Utah May Have Found a Model for Bipartisan Action on Climate Change." *Salt Lake Tribune*, January 25, 2020.

Fantin, Linda. "Feeling Crowded? Coalition Tackles Wasatch Front Sprawl; Coalition to Get Handle on Utah Growth." *Salt Lake Tribune*, January 14, 1997.

Fantin, Linda. "Legacy Highway: Even Without It Air Worsens." *Salt Lake Tribune* December 8, 1998.

Farmer, Jared. *On Zion's Mount: Mormons, Indians, and the American Landscape*. Cambridge: Harvard University Press, 2010.

"Farmington Resident Remembers Losing House in '83." KSL.com, June 4, 2005. <https://www.ksl.com/article/104975>.

"Federal Pension Insurer Moves to Protect Benefits at Geneva Steel." Pension Benefit Guaranty Corporation, November 25, 2002. <https://www.pbgc.gov/news/press/releases/pr03-05>.

Fenner, Erin. "Craig Station Ranks as No. 1 Carbon Polluting Power Plant." *Craig Colorado Press*, September 21, 2013.

"Fierce Winter's Fury Yields to Cooperation." *DN*, January 17, 1949.

"Fire Ecology." Winthrop WA: Pacific Biodiversity Institute, 2009. http://www.pacificbio.org/initiatives/fire/fire_ecology.html

"Fire in the Forest: Friend or Foe?" Uinta-Cache-Wasatch National Forest, U.S. Department of Agriculture, n.d.

"Fire Updates: Pole Creek and Bald Mountain Fires Burn Over 90,000 Acres Combined." KSL-TV, September 18, 2018. <https://www.ksl.com/article/46392740/fire-updates-pole-creek-and-bald-mountain-fires-burn-over-90k-acres-combined>

"Flash Flood Sweeps Over Salt Lake East Bench." *Deseret News*, July 31, 1952.

Fleck, John. "Coping with Megadrought in the Colorado River Basin" (webinar), May 29, 2020. <http://www.inkstain.net/fleck/2020/05/coping-with-megadrought-in-the-colorado-river-basin>.

"Flood Canal in Salt Lake City Is Turned Back into a Street." *New York Times*, June 12, 1983.

Flood Plain Information: Jordan River Complex. Salt Lake City, Utah." U.S. Army Corps of Engineers, Sacramento District, 1969.

"Flood Waters Ruin Gardens and Lawns." *Salt Lake Tribune*, April 26, 1917.

"Flooded by the Thaw." *Salt Lake Herald-Republican*, February 12, 1893.

"Floods Threaten Towns." *Provo Daily Herald*, May 31, 1983.

Flores, Dan L. *The Natural West: Environmental History in the Great Plains and Rocky Mountains*. Norman, OK: University of Oklahoma Press, 2003.

"Fluorine Elimination to Cost Geneva \$2,250,00 for First Two Phases." *Provo Sunday Herald*, April 12, 1953.

Francaviglia, Richard. *Believing in Place: A Spiritual Geography of the Great Basin*. Reno: University of Nevada Press, 2003.

"Freezing Rain New Hazard to Utah's Traffic." *Provo Daily Herald*, January 13, 1949.

Frémont, John Charles. *Report of the Exploring Expedition of the Rocky Mountains in the Year 1842: and to Oregon and North California in the Years 1843-'44*. Washington, D.C.: Blair and Rives, Printers, 1845.

"From Beach Bum to Businessman, Joseph Cannon Is Making the Difference." *The Fund for American Studies*, April 25, 2016. <https://tfas.org/news/beach-bum-businessman-joseph-cannon-icpes-72-making-difference/>

"From the Great Salt Lake Valley." *Latter-day Saints' Millennial Star* 13, no. 6 (March 15, 1851): 87.

Frosch, Dan. "Seen as Nature Lover's Paradise, Utah Struggles with Air Quality." *New York Times*, February 23, 2013.

Galli, Craig D. "Building Zion: The Latter-day Saint Legacy of Urban Planning." *BYU Studies* 44, no. 1 (Winter 2005): 111-136.

Gardiner, Alma A. *The Founding and Development of Grantsville, 1850-1950*. MA thesis, Brigham Young University, 1959.

General Epistle from the Council of Twelve Apostles, to the Church of Jesus Christ of Latter-day Saints abroad, Dispersed Throughout the Earth. Liverpool: R. James, 1848.

“Geneva Steel History.” *Funding Universe*. n.d.
<http://www.fundinguniverse.com/company-histories/geneva-steel-history/>

“Geneva Steel Timeline.” *Provo Daily Herald*, November 10, 2001.

Glantz, Michael H. “Drought Follows the Plow: Cultivating Marginal Areas.” In *Climate Variability, Climate Change, and Social Vulnerability*, Jesse C. Ribot, ed., Cambridge University Press, 2005.

Glantz, Michael H. *Drought Follows the Plow*. Cambridge University Press, 1993.

Glazier, Aubrey. “United States Geneva Works,” *Intermountain Histories*, 2019.
<https://www.intermountainhistories.org/items/show/82>

Götz, Friedrich M., Stefan Stieger, and Samuel Gosling. “Physical Topography Is Associated with Human Personality.” *Nature and Human Behavior* 4 (2020): 1135-1144.

Governor J. Bracken Lee Press Release, n.d. Utah State Archives, series 215, reel 1.

“Governor to Survey Dust Area.” *DN*, April 16, 1935.

Grant, Jedediah M. “Overcome the Powers of Darkness by Prayer.” *JD* 4 (October 12, 1856): 150-153.

Grant, Jedediah M. “Overcome the Powers of Darkness.” *JD* 4 (October 12, 1856): 150-153.

Grant, Jedediah M. “The Present Scarcity of Food.” *JD* 3 (January 27, 1856): 199-202.

Grant, Jedediah M. “The Present Scarcity.” *JD* 3 (January 27, 1856): 199-202.

“Great Salt Lake Annual Level Prediction.” Utah Climate Center.
<https://climate.usu.edu/GSL.php>.

Green, Dwan. “The Hard Winter of 1886-1887.” *Fairmont Folio: Journal of History* 10 (2008): 13-26.

Grimshaw, T.S., ed. “Verses by Alexander Selkirk.” *The Works of William Cowper*, Glasgow: Good Press, 2019.

Griswold, Eliza. "How *Silent Spring* Ignited the Environmental Movement." *New York Times Magazine*, September 21, 2012.

Gugliotta, Angela. "Class, Gender, and Coal Smoke: Gender Ideology and Environmental Injustice in Pittsburgh, 1868-1914." *Environmental History* 5, no. 2 (April 2000):165-193.

H.C.R. 11 Concurrent Resolution Supporting the Utah Roadmap for Positive Solutions and Leadership on Climate and Air Quality. Utah House of Representatives. <https://le.utah.gov/~2020/bills/static/HCR011.html>

H.J.R. 12 Climate Change Joint Resolution. Utah House of Representatives 2010 General Session. <https://le.utah.gov/~2010/bills/static/HJR012.html>.

Haines, Albert E. "The Flood of 1983: Salt Lake City's Emergency Preparedness and Response." In "Abstracts of Specialty Conference Papers: Delineation of Landslide, Flash Flood and Debris Flow Hazards in Utah, June 14-15, 1984." Paper 283. B. Kaliser, M. McCarter, R. Pack, and J. Newman, eds. Logan: Utah State University, 1984.

Hammond, F. Melvin. "Some Political Concepts of J. Reuben Clark, Jr." MA thesis, Brigham Young University, 1962. <https://scholarsarchive.byu.edu/etd/4747>

Handley, George B. "Climate Scepticism and Christian Conservatism in the United States." In *Climate Change Scepticism: A Transnational Ecocritical Analysis*. Greg Garrard, Axel Goodbody, George B. Handley, and Stephanie Postumus, eds. London: Bloomsbury Academic, 2019, 133-174.

Handley, George B. "Heaven and Earth: Thinking Through Environmentalism." In *Common Ground, Different Opinions: Latter-day Saints and Contemporary Issues*, Justin F. White, James Faulconer, eds., Salt Lake City: Greg Kofford Books, 2013, 269-284.

Hansen, Bradley Paul. "An Environmental History of the Bear River Range, 1860-1910." MA thesis, Utah State University, 2013.

Hansen, Donald V. "Physical Aspects of the El Niño Event of 1982-1983." *Elsevier Oceanography Series* 52 (1990). [https://doi.org/10.1016/S0422-9894\(08\)70031-X](https://doi.org/10.1016/S0422-9894(08)70031-X)

Hansen, James. *Storms of my Grandchildren: The Truth About the Coming Climate Catastrophe and Our Last Chance to Save Humanity*. New York: Bloomsbury, 2009.

Hansen, Jennifer, and Brianna Binnebose. "How Salt Lake City's Community Wildfire Protection Plan Generated Action in Less Than a Year." Fire-Adapted Communities Network, October 24, 2017. <https://fireadaptednetwork.org>.

Hardy, Rodger L. "Housing Along River a Flood Risk?" *DN*, June 8, 2004.

Hare, F. Kenneth. "World Conference on the Changing Atmosphere: Implications for Security, Held at the Toronto Convention Centre, Toronto, Ontario, Canada, during 27–30 June 1988." *Environmental Conservation* 15, no. 3 (Autumn 1988): 282-283.

Harker, Victoria. "Industry Facing \$250 Million Dollar Bill for Phoenix Metro's Auto Emissions." *Phoenix Chamber Business News*, February 3, 2020.

Hassibe, W.R., and W. G. Keck. "The Great Salt Lake." U.S. Department of the Interior, U.S. Geographical Survey, 1991.

"Hatch Showed Courage by Supporting Geneva." *Provo Daily Herald*, June 13, 1989.

"Hatch, Cannon Seek Help for the Industry." *Provo Daily Herald*, November 10, 2001.

Heber C. Kimball to Franklin D. Richards, August 31, 1855. Journal History of the Church of Jesus Christ of Latter-day Saints, Archives, Church Historical Department.

Heber C. Kimball to William Kimball, April 13, 1856." *Latter-day Saints' Millennial Star* 18, no. 30 (July 26, 1856): 476.

Hemphill, Brian E., and Clark Spencer Larsen. *Prehistoric Lifeways in the Great Basin Wetlands*. Salt Lake City: University of Utah Press, 1999.

Herbert, Gary R. "The Utah Way." <https://governor.utah.gov/issues/the-utah-way/>

Heyerdahl, Emily K., Peter M. Brown, Stanley G. Kitchen, and Mark H. Weber. *Multicentury Fire and Forest Histories at 19 Sites in Utah and Eastern Nevada*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, 2011.

Hickman, Martin B. and Ray C. Hillam. "J. Reuben Clark, Jr.: Political Isolationism Revisited." *BYU Studies* 13, no. 3 (Summer 1973): 426-440.

"High Winds Spread Forest Fire in Parley's Canyon." *Salt Lake Telegram*, August 1, 1940.

Hill, J. Brett, Jeffery J. Clark, William H. Doelle, and Patrick D. Lyons. "Prehistoric Demography in the Southwest: Migration, Coalescence, and Hohokam Population Decline." *American Antiquity* 69, no. 4 (2004): 689-716.

Hinton, Wayne K. "The Economics of Ambivalence: Utah's Depression Experience." *UHQ* 54, no. 3 (Summer 1986): 58-75.

Hirt, Paul. "The Transformation of a Landscape: Culture and Ecology in Southeastern Arizona." *Environmental Review* 13, no. 3/4 (Autumn-Winter 1989): 167-189.

Hislop, Sammy. "'Pure Religion' in Wake of Windstorm." Newsroom Blog, Church of Jesus Christ of Latter-day Saints, December 14, 2011. <https://newsroom.churchofjesuschrist.org/article/-on-faith-blog-wind-storm-pure-religion>

"History, 1838–1856." Joseph Smith Papers, B-1 [1 September 1834–2 November 1838]. Addenda, Note J, March 27, 1836.

Hollenhorst, John. "Lake's Pumps Still High and Dry." *DN*, April 19, 2011.

Honker, Andrew M. "'Been Grazed Almost to Extinction': The Environment, Human Action, and Utah Flooding, 1900-1940." *UHQ* 67, no. 1 (Winter 1999): 25-49.

Honker, Andrew M. "'There haint no danger': Human Action, Human Perception, the Environment, and Utah Flooding, 1847-1983." MA thesis, Utah State University, 1994.

Hooton, Leroy W. "Memorial Day Weekend 1983: Streets to Rivers." April 3, 2013. <http://www.slcdocs.com/utilities/NewsEvents/news1999/news5281999.htm>.

Hoover, Herbert. "Principles and Ideals of the United States Government," October 22, 1928. <https://millercenter.org/the-presidency/presidential-speeches/october-22-1928-principles-and-ideals-united-states-government>

Howard, Kelsey Ann. "A Late Pleistocene to Early Holocene Climate, Vegetation, and Fire History Record for the Bonneville Basin, Utah, US." MA thesis, University of Utah, 2016.

Howe, Peter D. "Geographic Variation in Disaster Preparedness Across U.S. States and Metropolitan Areas." Social Science Research Network, August 26, 2016. <https://ssrn.com/abstract=2830690>

Hu, Saiquan, Xiao Jia, Xiaojin Zhang, Xiaoying Zheng, and Junming Zhu. "How Political Ideology Affects Climate Perception: Moderation Effects of Time Orientation and Knowledge." *Resources, Conservation and Recycling* 127 (2017): 124-131.

"Hugh Nibley Explains Comments." *Provo Daily Herald*, February 23, 1989

Huntington, Ellsworth. *Civilization and Climate*. New Haven: Yale University Press, 1915.

Hyde, Orson. "Instructions Concerning Things Temporal and Spiritual." *JD* 11 (October 7, 1865): 147-154.

Hyde, Orson. "The Progressive Character of Mormonism." *JD* 7 (February 12, 1860): 149-154.

Ingram, B. Lynn. "California Megaflood: Lessons from a Forgotten Catastrophe." *Scientific American*, January 21, 2013.
<https://www.scientificamerican.com/article/atmospheric-rivers-california-megaflood-lessons-from-forgotten-catastrophe/>

Irving, Washington. *Astoria; or Anecdotes of an Enterprise Beyond the Rocky Mountains*, Paris: Baudry's European Library, 1836.

Irving, Washington. *The Sketch Book of Geoffrey Crayon, Gent.*, New York: G.P. Putnam, 1844.

Irving, Washington. *The Adventures of Captain Bonneville, and Scenes from the Rocky Mountains of the Far West*. Paris: Baudry's European Library, 1837.

Isidore, Chris. "When American Steel Was King." *CNN Business*, March 9, 2018.

Isom, Brian and Randy T. Simmons, "Dammed if We Do: Trouble on the Great Salt Lake." *Strata Policy*, October 18, 2016. <https://medium.com/@stratapolicy/dammed-if-we-do-trouble-on-the-great-salt-lake-720ab37b0484>

"Issue Paper #4 for Transportation Breakout Group." QGET Databook, Nina Dougherty Papers, Box 60, Folder 1. Marriott Library Special Collections, University of Utah.

Ivins, Antoine R. *105th Semi-Annual Conference Report*, October 1934, 41.

Jackson, Richard. "Mormon Perception and Settlement." *Annals of the Association of American Geographers* 68, no. 3 (1978). doi.org/10.1111/j.1467-8306.1978.tb01197.x

Jackson, Richard. "Mormon Perception and Settlement." *Annals of the Association of American Geographers* 68 (1978), no. 3: 317-334.

James, Al. "Everyday Effects, Practices, and Causal Mechanisms of 'Cultural Embeddedness': Learning from Utah's High Tech Regional Economy." *Geoforum* 38 (2007): 393-413.

Janecke, Susanne U., and Robert Q. Oak. "New Insights into the Outlet Conditions of Pleistocene Lake Bonneville." *Geosphere* 7, no. 6 (December 2011): 1369-1391. doi.org/10.1130/GES00587.1

"January, 1949 Blizzard." Rapid City SD Forecast Office, National Weather Service.

Jenkins, Willis, Evan Berry, and Luke Beck Kreider. "Religion and Climate Change."

Jenson, Andrew. "James E. Talmage." In *Latter-day Saint Biographical Encyclopedia: A Compilation of Biographical Sketches of Prominent Men and Women in the Church of Jesus Christ of Latter-day Saints*, vol. 3. Salt Lake City: Western Epics, 1971.

Jones, Terry L., Gary M. Brown, L. Mark Raab, Janet L. McVickar, W. Geoffrey Spaulding, Douglas J. Kennett, Andrew York, and Philip L. Walker. "Environmental Imperatives: Reconsidered Demographic Crises in Western North America During the Medieval Climatic Anomaly." *Current Anthropology* 40, no. 2 (April 1999), 137-170.

Joseph Smith Papers: Administrative Records, Council of Fifty Minutes, March 1844-January 1846. Matthew J. Grow, Ronald K. Esplin, Mark Ashurst-McGee, and Jeffrey D. Mahas, eds., Salt Lake City: Church Historian's Press, 2016.

Journal History of the Church of Jesus Christ of Latter-day Saints, 1839-circa 1882. Archives, Church Historical Department.

Kaestle, Frederika A., and David Glenn Smith, "Ancient Mitochondrial DNA Evidence for the Prehistoric Population Movement: The Numic Expansion." *American Journal of Physical Anthropology* 15, no. 1 (May 2001): 1-12. doi: 10.1002/ajpa.1051.

Kemp, Bill. "Illinois Once 'Emporium' of Malaria." *The Pantagraph*, June 21, 2008. https://www.pantagraph.com/news/illinois-once-emporium-of-malaria/article_4f275bad-9e66-5ff2-8746-fdeef95bd8de.html

“Kennecott Target at Air Pollution Hearing.” *Provo Sunday Herald*, January 11, 1970.

Kimball, Ephraim. *74th Annual Conference Report*, April 6, 1904, 47-49.

Kimball, Heber C. “Advancement of the Saints.” *JD* 10 (June 27, 1863): 233-238.

Kimball, Heber C. “Restoration of the Dead.” *JD* 8 (November 25, 1860):238-242.

Kimball, Spencer W. “The False Gods We Worship.” *Ensign of the Church of Jesus Christ of Latter-day Saints* 6, no. 6 (June 1976).

Kincer, J.B. “Data on the Drought.” *Science* 80, issue 2069 (August 24, 1934): 179.

Kiser, Benjamin. ”Bucking the White Elephant: Utah’s Fight for Federal Management of the Public Domain, 1923-1934.” *UHQ* 88, no. 2 (Spring 2020): 165-180.

Klade, Richard J. *Building a Research Legacy: The Intermountain Station 1911-1997*. General Technical Report RMRS-GTR-184, U.S. Department of Agriculture, 2006.

Klein, Naomi. *On Fire: The (Burning) Case for a Green New Deal*, New York: Simon and Schuster, 2019.

Konrad, C. P. “Effects of Urban Development on Floods.” Fact Sheet 076-03, U.S. Geological Survey, United States Department of the Interior, November 2003.

Krantz, David. “Shmita Revolution: The Reclamation and Reinvention of the Sabbatical Year.” *Religion*, August 8, 2016. <http://aytzim.org/DK-Shmita-ReligionsJournal.pdf>.

Krznicaric, Roman. *The Good Ancestor: A Radical Prescription for Long-Term Thinking*. New York: The Experiment, 2020.

Larson, Andrew Karl. *I Was Called to Dixie*. St. George UT: Dixie College Foundation, 1992.

LeBruin, Lynn. “Dump Fire Forces 1,500 Homes Evacuated Near Saratoga Springs.” *Ogden Standard-Examiner*, June 22, 2012.

“Lee Declares Emergency State in Utah.” *DN*, January 22, 1949.

“Legislature Asked to Save Herders.” *DN*, January 17, 1949.

- “Lehi Road Official Aids Stranded Motorists Sunday.” *Lehi Sun*, January 6, 1949.
- Leon, Grace. “Geneva Steel CEO Resigns.” *Provo Daily Herald*, April 1, 2005.
- Leonard, Glen. *A History of Davis County*. Utah Centennial County History Series. Salt Lake City: Utah State Historical Society, 1999.
- “Lesson of the Floods.” *DN*, June 9, 1909.
- “Lessons From 1952 Helped S. L. Avert a Disaster.” *Salt Lake Tribune*, May 9, 1983.
- “Little Dell Lake, Salt Lake City Stream, Utah: Final Environmental Impact Statement.” U.S. Army Engineer District, Sacramento, CA, 1974.
- Lockwood, Jeffery. *Locust: The Devastating Rise and Mysterious Disappearance of the Insect that Shaped the American Frontier*. New York: Basic Books, 2009.
- Lockwood, Jeffrey. “The Death of the Super Hopper.” *High Country News*, Feb. 3, 2003.
- Long, Jerrold A. “The Origins of a Rebellion: Religion, Land, and a Western Environmental Ethic.” *Social Science Research Network*, February 26, 2017. <http://dx.doi.org/10.2139/ssrn.2924231>
- Madsen, Brigham D. “General Patrick Edward Connor, Father of Utah Mining.” In *From the Ground Up*, Colleen K. Whitley, ed., Logan: Utah State University Press, 2006: 58-80.
- Maffly, Brian. “Salt Lake City’s Air Quality I Nation’s 7th Worst Among Large Metro Areas.” *Salt Lake Tribune*, January 31, 2020.
- Maffly, Brian. “Utahns Hate Bad Air, but Poll Finds Few Adopt Changes That Would Make It Better.” *Salt Lake Tribune*, February 4, 2019.
- Brian Maffley, “Worsening drought could lead to water-use restrictions,” *Salt Lake Tribune*, May 24, 2021. <https://www.sltrib.com/news/environment/2021/05/24/worsening-drought-could/>
- Martin, Thomas. “A Depleted Soil Means a Depleted Citizenship,” *The Improvement Era*, December 1928, 118-21.
- Marwitt, J.P. Median Village and Fremont Culture Regional Variation. Anthropological Papers no. 95, 1970. Marriott Library, University of Utah.

- May, Dean L. *Utah: A People's History*. Salt Lake City: Bonneville Books, 1987.
- McDonald, Jared, Bo MacInnis, and Jon A. Krosnick. "Climate Insights 2020: Opinions in the States." Resources for the Future, October 26, 2020.
<https://www.rff.org/publications/reports/climateinsights2020-opinion-in-the-states/>
- McGerr, Michael. *A Fierce Discontent: The Rise and Fall of the Progressive Movement in America*. Oxford University Press, 2003.
- McHugh, Laurence A. "The Four Corners Power Complex: Pollution on the Reservation." *Indiana Law Review* 47, no. 4 (Summer 1972): 704-724.
- McInnes, Maren. "Utah's 'Cowboy Caucus' Powerful Voice for Rural Concerns." *Provo Daily Herald*, February 23, 2015.
- McKay, David O. 79th *Annual Conference Report of the Church of Jesus Christ of Latter-day Saints*, April 1909, 62-68.
- McNeil, Lynda D., and David L. Shaul. "'We Will Arrive as Rain to You': Evidence of Historical Relationships Between Western Basketmaker, Fremont, and Hopi People." *Journal of Southwestern Anthropology and History* 86 (2020), no. 3, 245-273.
- McQueen, Grant R. and Brent D. Wilson. "Geneva Steel: Initial Public Offering." *Journal of Financial Education* 22 (Spring 1996): 82-99.
- Mehring, Peter J., Jr. "Prehistoric Environments." In *Handbook of North American Indians: Great Basin*, Warren L. D'Azevedo and William C. Sturtevant, eds. Washington: Smithsonian Institution, 1986.
- "Membership, Congressional Western Caucus."
<https://westerncaucus.house.gov/about/membership.htm>
- Memorial to the Congress of the United States from the National Irrigation Congress*. Chicago: Press of the Irrigation Age, 1892.
- Merchant, Carolyn. "Women of the Progressive Conservation Movement, 1900-1916." *Environmental Review* 8, no. 1 (Spring 1984): 57-85.
- Meyer, Frank S. *In Defense of Freedom: A Conservative Credo*. Carmel, IN: Liberty Fund, 1962.
- Milfont, Taciano L., Jessie Wilson, and Pollyane Diniz. "Time Perspective and Environmental Engagement: A Meta-Analysis." *International Journal of Psychology* 47, no. 5 (March 27, 2012): 325-334.

Miller, Char. "Tapping the Rockies: Resource Exploitation and Conservation in the Intermountain West." In *Reopening the American West*, Hal Rothman, ed., Tucson: University of Arizona Press, 1998.

Monthly Mean Average Temperature for Grantsville 2W, UT.
<https://w2.weather.gov/climate/xmacis.php?wfo=slc>.

Monthly Mean Precipitation for Grantsville 2W, UT.
<https://w2.weather.gov/climate/xmacis.php?wfo=slc>.

Monthly Mean Snowfall for Grantsville 2W, UT.
<https://w2.weather.gov/climate/xmacis.php?wfo=slc>.

Moore, Jason W. "The Socio-Ecological Crises of Capitalism." In *Capitalism and Its Discontents: Conversations with Radical Thinkers in a Time of Tumult*, Sasha Lilley, ed. Oakland, CA: PM Press, 2011.

Moore, Ted. "Democratizing the Air: The Salt Lake Women's Chamber of Commerce, and Air Pollution, 1936-1945." *Environmental History* 12, no. 1 (January 2007): 80-106.

"More Concerning the Flood." *DN*, June 11, 1862.

Morgan, Dale. *The Great Salt Lake*. Indianapolis: Bobbs-Merrill, 1947.

Morrey, Sharon. "Cannon Says He's Frustrated and Doing All He Can." *Provo Daily Herald*, February 17, 1989.

Morrey, Sharon. "Dirty Air May Be Harming Children." *Provo Daily Herald*, February 17, 1989.

Morrisette, Peter M. "The Rising Level of the Great Salt Lake: Impacts and Adjustments." *Bulletin of the American Meteorological Society* 69, no. 9 (September 1988): 1030-1040.

Morrison, Alexander B. "Our Deteriorating Environment." *Ensign of the Church of Jesus Christ of Latter-day Saints* 1, no. 8 (August 1971): 64-69.

Murphy, Miriam B. "The Great Smoke Nuisance." *Beehive History 9: The Utah Environment*, Utah State Historical Society, 1983: 18-22.

Naphthalene." National Pesticide Information Center. n.d.
<http://npic.orst.edu/factsheets/naphgen.html#body>.

Nash, Marcus B. "Righteous Dominion and Compassion for the Earth." 18th Annual Stegner Center Symposium, University of Utah, April 12, 2013. <https://newsroom.churchofjesuschrist.org/article/elder-nash-stegner-symposium>

"Navajo, Hopi Nations Oppose Possible Closure of Power Plant." Associated Press, Feb. 23, 2017. <https://www.knau.org/post/navajo-hopi-nations-oppose-possible-closure-power-plant>

Nelson, Shaun R., ed. *A History of the Uinta National Forest: A Century of Stewardship*. Uinta National Forest, 1997.

Nelson, Trent. "'Mormon Land': Eco-Activist Explains Why She and Fellow Mormons Can—and Should—Be Environmentalists." *Salt Lake Tribune*, November 28, 2018.

Neugebauer, Cimaron. "Salt Lake City Has the Worst Air Quality in the Nation." KUTV News, January 31, 2017. <https://kutv.com/news/local/salt-lake-city-has-the-worst-air-quality-in-the-nation>.

"New Cold Wave, Storm Strike West." *DN*, January 9, 1949.

"New Plans Don't Satisfy Geneva Critics." *DN*, May 15, 1988.

"New Pumping Plant Sought on Utah Lake." *Provo Evening Herald*, February 23, 1934.

Nibley, Hugh. "Brigham Young on the Environment." In *To the Glory of God: Mormon Essays on Great Issues*, Salt Lake City: Deseret Book Co., 1972, 3-32.

Nibley, Hugh. "Stewardship of the Air." In *Brother Brigham Challenges the Saints*, Don E. Norton and Shirley S. Ricks, eds. Salt Lake City: Deseret Book, 55-75.

Nibley, Hugh. *Approaching Zion*, Salt Lake City: Deseret Book.

Nichols, Jeff. "Before the Boom: Mormons, Livestock, and Stewardship, 1847-1870." In *The Earth Will Appear as the Garden of Eden: Essays on Mormon Environmental History*, Jedediah S. Rogers, Matthew Godfrey, eds., 47-70. Salt Lake City: University of Utah Press, 2019, 155-172.

"No Skiing as Yet at Alta Resort." *Salt Lake Telegram*, October 29, 1948.

Nokkentved, N.S. "A Toxic Legacy of 58 Years of Steel Making May Be Seeping Toward Lake." *Provo Daily Herald*, September 21, 2003.

Noland, Robert B. "Relationships Between Highway Capacity and Induced Vehicle Travel." U.S. Environmental Protection Agency, Paper no. 991069, Nina Dougherty Papers, Box 60, Folder 2. Marriott Library Special Collections, University of Utah.

"Now Let Something Be Done." *DN*, May 1, 1893.

O'Donoghue, Amy Joi. "Natural Disasters: How Prepared Is Utah?" *DN*, July 22, 2018.

O'Donoghue, Amy Joi. "Utah Legislature: Climate Change Resolution Advances." *DN*, March 1, 2010.

O'Donoghue, Amy Joi. "Utah Regulators Ask Remediation Work at Former Geneva Site to Cease." *DN*, December 20, 2019.

O'Sullivan, John L. "Annexation." In *United States Magazine and Democratic Review* 17, no. 85 (July-Aug. 1845): 5-10.

Oberbeck, Steven. "Geneva Goes Out with a Bang." *Salt Lake Tribune*, July 1, 2005.

Oliver, Harold H. "The Neglect and Recovery of Nature in Twentieth-Century Protestant Thought." *Journal of the American Academy of Religion*, 60, no. 2 (Autumn 1992): 379-404.

Orrin Hatch: National Environmental Scorecard." League of Conservation Voters. <https://scorecard.lcv.org/moc/orrin-g-hatch>.

Oviatt, Charles G. "Chronology of Lake Bonneville, 30,000 to 10,000 yr BP." *Quaternary Science Reviews* 110 (February 2015): 166-171.

Park, Benjamin E. *Kingdom of Nauvoo: The Rise and Fall of a Religious Empire on the American Frontier*. New York: Liveright Publishing, 2020. Kindle.

Parson, Robert E. "George Dewey Clyde and the Harvest of Snow." *UHQ* 84, no. 3 (Summer 2016): 237-253.

Patterson, Carol and Glade Hadden. "The Mu:kwitsi/Hopi (Fremont) Abandonment and Numic Immigrants into Nine Mile Canyon as Depicted in the Rock Art." Dominguez Archaeological Research Group, 2016: 3-6.
https://www.academia.edu/36439563/The_Mu_kwitsi_Hopi_Fremont_abandonment_and_Numic_Immigrants_into_Nine_Mile_Canyon_as_Depicted_in_the_Rock_Art.

Pedrioli, Carlo A. "The Controversy Over the Legacy Highway in Utah: An Opportunity for Invitational Rhetoric." In *Wilderness, Advocacy, and the Media: Proceedings of the Eighth Biennial Conference on Communication and Environment*, eds. Lisa Slawter Volkening, Dylan Wolfe, Emily Plec, William Griswold, Kevin Deluca. International Environmental Communication Association, 2007.

Penrod, Emma. "Some Utah Lawmakers Deny Climate Change, but OK a Bill Recognizing Its Impacts After Hearing Pleas from Students." *Salt Lake Tribune*, February 15, 2018.

Penrod, Emma. "The Utah Way to Achieving 100 Percent Clean Energy: How a Politically Conservative State Set Aggressive Goals for Clean Energy." *Sierra*, July 1, 2019. <https://www.sierraclub.org/sierra/2019-4-july-august/feature/utah-way-achieving-100-percent-clean-energy>

Peterson, Charles S. "Grazing in Utah: A Historical Perspective." *UHQ* 57, no. 4 (Fall 1989): 300-320.

Peterson, Iver. "A Greater Salt Lake Might Not Be So Great." *New York Times*, April 28, 1986.

Peterson, Paul H. "The Mormon Reformation of 1856-1857: The Rhetoric and the Reality." *Journal of Mormon History* 15 (1989): 59-87.

"Phoenix PM10 Non-attainment Area." Arizona Department of Environmental Quality, July 29, 2019. <https://azdeq.gov/phoenix-pm-10-nonattainment-area>

"Pieces of the Puzzle." *Archaeology Southwest*, 2020. <https://www.archaeologysouthwest.org/exhibit/online-exhibits/pieces-puzzle/>

"Pioneer Day." Mormon Lectionary Project. *By Common Consent* (blog). July 24, 2014. <https://bycommonconsent.com/2014/07/24/pioneer-day-2/>.

"Planes to Bomb Western Ranges with Feed for Stock." *Provo Daily Herald*, January 24, 1949.

"Police, State Winning S. L. Battle of the Deer." *DN*, January 13, 1949.

Poll, Richard, Thomas Alexander, Eugene Campbell, David Miller. *Utah's History*, Logan UT: Utah State University Press, 1989.

"Pollution Approach Endorsed." *Provo Daily Herald*, January 9, 1970.

Pope, C. Arden. "Particulate Pollution and Health: A Review of the Utah Valley Experience." *Journal of Exposure Analysis and Environmental Epidemiology* 6, no. 1(January-March 1996): 23-34.

Pope, C. Arden. "Respiratory Disease Associated with Community Air Pollution and a Steel Mill." *American Journal of Public Health* 79, no. 5 (May 1989): 623-628.

Pope, C. Arden. "Respiratory Hospital Admissions Associated with PM10 Pollution in Utah, Salt Lake, and Cache Valleys." *Archives of Environmental Health* 46, no. 2 (March-April 1991): 90-97.

Potter, Albert J. *Diary of Albert J. Potter, July 1902 to November 22, 1902*, Utah State University Special Collections and Archives. <https://forestry.usu.edu/rural-forests/forest-facts-ecology/potter-diaries>.

Powell, John Wesley. "Address to the North Dakota Constitutional Convention, August 5, 1889." In *Reclamation Era* 26 (January 1936): 201-202.

Powell, John Wesley. "Tree-Growth on Arid Lands." *Science* 12, no. 297 (Oct. 1888): 170-71.

Powell, John Wesley. *Report on the Arid Regions of the United States*, Washington: Gov't Printing Office, 1879.

Pratt, Orson. "Fulfillment of Prophecy." *JD* 18 (August 30, 1875): 144-155.

Pratt, Orson. "Progress of the Saints." *JD* 21 (November 1, 1879): 146-154.

Pratt, Orson. "Progress of the Saints." *JD* 21 (November 1, 1879):150.

Pratt, Orson. "Second Coming of Christ," *JD* 15 (December 18, 1870): 53-62.

Pratt, Orson. "Second Coming of Christ. *JD* 15 (December 18, 1870): 53-62.

Pratt, Orson. "The Salvation of the Soul," *JD* 3 (February 10, 1856): 291-298.

Pratt, Orson. *The Orson Pratt Journals*, Elden J. Watson, comp., 1975.

"Preparing for the Flood," *DN*, March 26, 1862.

Prevedel, David A. and Curtis M. Johnson. "Beginnings of Range Management: Albert F. Potter, First Chief of Grazing, U.S. Forest Service." Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Region, 2005. <https://www.fs.usda.gov/treesearch/pubs/29117>

“Public Health Statement on Benzene.” Agency for Toxic Substances & Disease Registry, Centers for Disease Control.
<https://www.atsdr.cdc.gov/phs/phs.asp?id=37&tid=14>.

Pugmire, Genelle and Karissa Neely. “Growth of Vineyard Necessitates Cleanups, Adjustments.” *Provo Daily Herald*, August 24, 2018.

Pyne, Stephen. *Year of the Fires: The Story of the Great Fires of 1910*. New York: Viking, 2008.

“Quality Growth Strategy Update.” Envision Utah,
<https://envisionutah.org/quality-growth-strategy>.

Quinn, Barbara. “Geneva Steel: From Dinosaur to Modern Mill.” *Pollution Engineering*, October 1996: 27-28.

Quinn, D. Michael. “Ezra Taft Benson and Mormon Political Conflicts.” *Dialogue: A Journal of Mormon Thought* 26, no. 2 (Summer 1993): 1-87.

Quinn, D. Michael. *Elder Statesman: A Biography of J. Reuben Clark, Jr.* Salt Lake City: Signature Books, 2002.

Raitz, Karl B. “Theology on the Landscape: A Comparison of Mormon and Amish-Mennonite Land Use.” *UHQ* 41, no. 1 (Winter 1973): 23-34.

“Range and Mine Leader Dead.” *Salt Lake Telegram*, May 3, 1938.

Raymond, Art. “Advocates Fume as New Fee on Clean Fuel Vehicles in Utah Kicks In January 1.” *DN*, Dec. 16, 2018.

“Reaction.” *Provo Daily Herald*, February 17, 1989.

Reavy, Pat and Ami Joi O'Donoghue. “Hurricane Force Winds Wreak Havoc in Davis County, Cleanup Could Take Days.” *DN*, December 1, 2011.

“Recalling the Infamous Utah Winter of 1948-49.” *Ogden Standard Examiner*, January 2, 2014.

“Reclaims Big Area in Utah Dust Bowl: Wind Erosion Project Restores 31,895 Barren Acres to Grass-Covered Land.” *New York Times*, August 24, 1936.

“Record Snow Buries Utah County Area.” *Provo Daily Herald*, January 24, 1949.

“Red-State Utah Embraces Plan to Tackle Climate Crisis in Surprising Shift.” *The Guardian*, February 19, 2020.

“Rehabilitation Underway in Storm Region.” *DN*, July 12, 1930.

Reid, Colleen E., Elinor M. Considine, Gregory L. Watson, and Donatello Tedesca. “Associations Between Respiratory Health and Ozone and Fine Particulate Matter in a Wildfire Event.” *Environment International* 129 (August 2019): 291-298.

Reisner, Marc. *Cadillac Desert: The American West and Its Disappearing Water*. New York: Penguin Books, 1993.

“Relief Due for Snowed in Sheep on West Desert.” *Provo Daily Herald*, January 17, 1949.

“Remedy for Drouth.” *The American Agriculturist* 29, no. 12 (December 1870): 457.

“Replenish the Earth,” *Latter-day Saints’ Millennial Star* 17, no. 22 (June 2, 1855): 337-38.

“Replenishing the Earth.” *The Latter-day Saints’ Millennial Star* 33, no. 22 (May 30, 1871): 340-342.

Reynolds, Robert V. R. *Grazing and Floods: A Study of Conditions in the Manti National Forest, Utah*, Forest Service Bulletin No. 91. Washington: Government Printing Office, 1911.

Richard R. Long to Michael G. Ritchie, December 8, 1998. Nina Dougherty Papers, Box 60, Folder 2. Marriott Library Special Collections, University of Utah.

Richards, Connor. “Utah County Leads State Population Growth,” *Ogden Standard-Examiner*, December 6, 2020.

Richards, Stephen L. *105th Semi-Annual Conference Report*, October 1934, 34.

Richards, Willard. Journals, 1836–1853. Willard Richards Papers, Salt Lake City, Church Historical Library.

“Road Unit Tells Machinery Needed.” *DN*, January 18, 1949.

Robert W. Adler to Bob Perciasepe, November 10, 1998. Nina Dougherty Papers, Box 60, Folder 2. Marriott Library Special Collections, University of Utah.

Roberts, Brent W., J.J. Jackson, Jenna V. Fayard, G. Edmonds, and J. Meints. "Conscientiousness." In *Handbook of Individual Differences in Social Behavior*, Mark R. Leary and R. H. Hoyle, eds., 369-382. New York: The Guilford Press, 2009.

Roe, Stephen, Randy Strait, Alison Bailie, Holly Lindquist, and Alison Jamison. "Utah Greenhouse Gas Inventory and Reference Case Projections, 1990-2002." Center for Climate Strategies, Utah Department of Environmental Quality, 2007.

Rogers, Jedediah S. *The Council of Fifty: A Documentary History*. Salt Lake City: Signature Books, 2014.

Rolly, Paul. "Battle of Bountiful: Utah's Worst Flood?" June 5, 1983, UPI News Archives. <https://www.upi.com/Archives/1983/06/05/Battle-of-Bountiful-Utahs-worst-flood/4463625090383/>.

Rowley, William D., *U.S. Forest Service Grazing and Rangelands: A History*. College Station TX: Texas A&M University Press, 1985.

"Salt Lake City Being Smothered by Smog: What It Could Mean for City." CBS News, January 25, 2013. <https://www.cbsnews.com/news/salt-lake-city-being-smothered-by-smog-what-it-could-mean-for-city/>

Salt Lake City Climate Book, Seasonal Snowfall by Year. National Weather Service. <https://www.weather.gov/slc/ClimateBook#>.

"Salt Lake City Commits to Landmark Clean Energy and Climate Change Resolution." July 13, 2016. <https://www.slc.gov/blog/2016/07/13/salt-lake-city-commits-to-landmark-clean-energy-and-climate-change-resolution/>

"Salt Lake City Fighting Worst Flood in History." *Salt Lake Tribune*, April 28, 1952.

Salt Lake City Watershed Management Plan '98. Salt Lake City Department of Public Utilities, March 1999. <http://www.slcdocs.com/utilities/PDF%20Files/slcwatershedmgtplan.pdf>

"Salt Lake City Weather History." Weather Underground (website). <https://www.wunderground.com/history/monthly/us/ut/salt-lake-city/KSLC/date/1983-5>

"Salt Lake Smoke." *The Outlook*. March 17, 1915.

Saratoga Springs UT Flood Plain Maps, 2018. <https://www.saratogaspringscity.com/193/Flood-Plain-Maps>

Scheer, Brenda. *The Utah Model: Lessons for Regional Planning*. Brookings Mountain West, December 2012. https://www.unlv.edu/sites/default/files/TheUtahModel_0.pdf

Schuster, Robert L. and Lynn M. Highland. "Socioeconomic and Environmental Impacts of Landslides in the Western Hemisphere." U.S. Geological Survey Open File Report 01-0276, 2001. <https://pubs.usgs.gov/of/2001/ofr-01-0276/>

Semerad, Tony. "Over 20 Years Ago, Utah Aimed for 'Quality Growth' as Its Population Boomed. How Has That Turned Out?" *Salt Lake Tribune*, July 11, 2020.

"Sen. Hatch Says Geneva Needs Community Support." *Provo Daily Herald*, April 25, 1989.

"Senator Hatch's Motives Questioned." *Provo Daily Herald*, June 6, 1989.

Sillitoe, Linda. *A History of Salt Lake County*. Utah Centennial County Histories Series, Utah State Historical Society, 1996.

Simms, Steven R. and Mark E. Stuart. "Ancient American Indian Life in the Great Salt Lake Wetlands." In *Great Salt Lake, Utah: 1980 Through 1998*, J. Wallace Gwynn, ed., Salt Lake City: Utah Geological Survey Publications, 2002.

Slotkin, Richard. *Gunfighter Nation: The Myth of the Frontier in Twentieth-Century America*. Norman, OK: University of Oklahoma Press, 1998.

Smith, George A. "Historical Discourse." *JD* 11 (November 15, 1864):1-12.

Smith, George A. "Liberty and Persecution." *JD* 1 (July 24, 1852): 42-45.

Smith, George A. "Responsibilities of the Priesthood." *JD* 6 (August 28, 1852): 256-258.

Smith, Joseph F. "A Word to the Presiding Authorities." *Juvenile Instructor* 38, no. 15 (August 1,1903): 466.

Smith, Joseph F. *59th Annual Conference Report of the Church of Jesus Christ of Latter-day Saints*, April 1889, 70.

Smith, Joseph. "History," 1838–1856." The Joseph Smith Papers. <https://www.josephsmithpapers.org/paper-summary/history-1838-1856>.

Smith, Joseph. "Journal, December 1842–June 1844; Book 2, 10 March 1843–14 July 1843." The Joseph Smith Papers.

- Smith, Joseph. "Character and Being of God," *JD* 6 (April 6, 1844): 1-11.
- Smythe, William Ellsworth. *The Conquest of Arid America*. New York: Harper & Brothers, 1900.
- "Snow Storm Breaks Loose Over the State." *Provo Sunday Herald*, December 5, 1948.
- Snow, Dean R. *The Archaeology of Native North America*. London: Routledge, 2019.
- Snow, Erastus. "Origin of Man." *JD* 19 (January 20, 1878): 322-329.
- Snow, Lorenzo. "Necessity for Effort." *JD* 18 (April 5, 1877):371-376.
- Snow, Steven E. "The Moral Imperative of Environmental Stewardship." Utah State University Religious Studies Program, October 10, 2018; "We are accountable for how we treat the earth." Newsroom, The Church of Jesus Christ of Latter-day Saints, October 10, 2018. <https://newsroom.churchofjesuschrist.org/article/we-are-accountable-god-how-we-treat-earth-elder-snow>.
- "Snowed in Sheep on West Desert." *Provo Daily Herald*, January 17, 1949.
- "Snowfall Total Reaches 52 ½ Inches Locally." *Provo Daily Herald*, January 20, 1949.
- "Soldier's Summit Reports Fall of Nine Inches Snow." *Provo Daily Herald*, October 19, 1948.
- "South West Portion Flooded by Jordan." *DN*, June 5, 1909.
- Spangler, Jerry and Bob Bernick. "'Cowboy Caucus' Runs Roughshod Through Utah's Legislature." *DN*, February 21, 1993.
- Spangler, Jerry. "Growth: Will Utah Rise to the Challenge?" *DN*, February 12, 1998.
- Stahle, David W. "Anthropogenic Megadrought." *Science* 368, no. 6488 (April 17, 2020): 238-239.
- Stansbury, Howard. *Exploration and Survey of the Valley of the Great Salt Lake of Utah, Including a Reconnoissance of a New Route Through the Rocky Mountains*. Philadelphia: Lippincott, Grambo, & Co., 1852.

“Statement of Douglas Owens,” Utahns for Better Transportation, June 2001. http://utahnsforbettertransportation.org/press_dougowens.html

“Statement of James Hansen.” In Hearing Before the Committee on Energy and Natural Resources, United States Senate, June 23, 1988.

“Statement of Joseph A. Cannon, Chairman and CEO, Geneva Steel Corporation, Vineyard, UT.” In Hearing Before the Committee on Finance, United States Senate, March 23, 1999: 36-37.

Stayner, Charles W. “Fate of the Ancient Apostles.” *JD* 20 (May 25, 1879): 206-211,

“Steel Firm to Pay Damage Claims.” *Salt Lake Telegram*, June 17, 1952.

Steenburgh, Jim. *Secrets of the Greatest Snow on Earth: Weather, Climate Change, and Finding Deep Powder in Utah’s Wasatch Mountains and Around the World*. Logan, UT: Utah State University Press, 2014.

Stevens, Taylor. “Gov. Cox Declares Drought Emergency for All of Utah.” *Salt Lake Tribune*, March 17, 2021. <https://www.sltrib.com/news/politics/2021/03/17/gov-cox-declares-drought/>.

Stradling, David. *Smokestacks and Progressives: Environmentalists, Engineers, and Air Quality in American, 1881-1951*. Baltimore: The Johns Hopkins University Press, 2002.

Studer, Logan V. and Ryan P. Burge. “Mormons and the Environment.” *Religion in Public* (blog), December 19, 2018. <https://religioninpublic.blog/2018/12/19/mormons-and-the-environment/>

Study Guide: LDS Perspectives on Environmental Stewardship.” <https://docsbay.net/study-guide-lds-perspectives-on-environmental-stewardship>

“Study Shows UT Housing Could Soon Be Out of Control, Impacting Economic Growth.” ABC4 News, April 28, 2018. <https://www.abc4.com/news/local-news/study-shows-ut-housing-could-soon-be-out-of-control-impacting-economic-growth/>

“Suggestions for Saving Water in Drouth Crisis Produce Quick Results.” *Salt Lake Telegram*, June 21, 1934.

“Summary Description.” Widtsoe Family Papers, 1866-1966. Utah State Historical Society.

“Summary of Population and Housing Characteristics.” United States Census of Population and Housing, 1900. census.gov.

Sumsion, Oneita Burnside. *Thistle . . . Focus on Disaster*. Springville UT: Art City Publishing Company, 1983.s

“Sutherland’s 2020 Congressional Series Event with Rep. John Curtis.” Sutherland Institute, August 25, 2020. <https://sutherlandinstitute.org/transcript-sutherlands-2020-congressional-series-event-with-rep-john-curtis/>

Symposium, 26-27.

Talmage, James E. *The Articles of Faith*. Salt Lake City: The Deseret News, 1919.

Talmage, James E. *The Great Salt Lake Present and Past*. Salt Lake City: The Deseret News, 1900.

Talmage, James E. *The Story of “Mormonism.”* Salt Lake City: The Deseret News, 1914.

Talmage, James E. *The Vitality of Mormonism*. Boston: Richard G. Badger, 1919.

Tanner, Courtney. “Known for Toxic Algae, Utah Lake Could Become a Housing Development for Half a Million People.” *Salt Lake Tribune*, January 22, 2018.

Tanner, Courtney. “Utah Rep. Mike Noel, the Powerful, Polarizing and Anti-Federal Government Rural Voice, Won’t Seek Re-election, Report Says.” *Salt Lake Tribune*, March 12, 2018.

Taylor, John. “The Gathering.” *JD* 26 (November 30, 1884): 66-76.

“Temperatures Hit 15 Below in Provo Area.” *Provo Daily Herald*, January 5, 1949.

“The Bear River Diversion.” Utah Rivers Council, n.d. <https://utahrivers.org/bear-river-water-diversion>

“The First Presidency on Church Security.” *Improvement Era*, January 1937, 3-6.

The Grantsville Dustbowl. Utah Agriculture in the Classroom documentary, KUTV News, n.d.

The Great Salt Lake West Desert Pumping Project: Its Design, Development, and Operation, Utah Division of Water Resources, June 1999.

The History of Envision Utah: A Partnership for Quality Growth. Salt Lake City: Envision Utah, 2001.

“The Ice Age in Utah.” *Wilderness USA*. n.d.

“The Spring Floods,” *DN*, May 7, 1862.

“The Utah Roadmap: Positive Solutions on Climate and Air Quality.” Kem C. Gardner Policy Institute, University of Utah. <https://gardner.utah.edu/wp-content/uploads/TheUtahRoadmap-Feb2020.pdf>.

“The Waters are Threatening.” *DN*, April 25, 1893.

“Third Blizzard in Two Weeks Hits West.” *Provo Sunday Herald*, January 16, 1949.

Thomas, Chase. “What is the Utah Way? It Depends on Who You Are.” *Salt Lake Tribune*, March 17, 2019.

Todd, Claire. “Effect of Pluvial Lake Changes on Regional Climate Sensitivity and Glacial Mass Balance in Central Utah.” *Quaternary International*, 279-280 (November 2012): 494-495. doi:[10.1016/j.quaint.2012.08.1687](https://doi.org/10.1016/j.quaint.2012.08.1687)

“Tornado Was Too Fast for Warning.” *DN*, August 27, 1999.

Torrential Floods in Northern Utah, 1930: Report of the Special Commission Appointed by Governor George H. Dern. Utah State Agricultural College, January 1931.

Trabish, Herman K. “A Red State Template for 100% Renewables? Utah Bill Unites Rocky Mountain Power, Cities and Activists.” *Utility Dive*, March 17, 2020. <https://www.utilitydive.com/news/a-red-state-template-for-100-renewables-utah-bill-unites-rocky-mountain-p/573692/>

Trentelman, Charles F. “Davis History of Destructive Winds.” *Ogden Standard-Examiner*, December 4, 2011.

Trimble, Stephen. *Bargaining for Eden: The Fight for the Last Open Spaces in America*. Oakland: University of California Press, 2009.

Trimble, Stephen. *The Sagebrush Ocean: A Natural History of the Great Basin*. Reno: University of Nevada Press, 1989.

“Truman Allocates \$200,000 More for Disaster Relief in Winter-Locked States.” *Provo Daily Herald*, January 26, 1949.

Udall, Morris K. “Land Use: Why We Need Federal Legislation.” *BYU Law Review* 1975, issue 1: 1-20.

“Unity Sought in Fight to Rid Utah of Polluted Air.” *Provo Daily Herald*, February 17, 1989.

“Use of Flame Throwers for Snow Clearing Purposes Impractical.” *Provo Daily Herald*, January 25, 1949.

“Understanding Utah’s Air Quality,” Utah Department of Environmental Quality, Division of Air Quality, <https://deq.utah.gov/communication/news/featured/understanding-utahs-air-quality>.

“Utah House Passes Resolution Implying Climate Change Conspiracy.” *Inside Climate News* (blog), February 10, 2010. <https://insideclimatenews.org/blog/20100210/utah-house-passes-resolution-implying-climate-change-conspiracy>.

“Utah Implementation Plan: Encompassing a Mechanism and Schedule for Achieving Ambient Air Quality Standards throughout the State of Utah Pursuant to Section 110 of the Federal Clean Air Act.” Division of Health, Utah Department of Social Services, January 20, 1972. Appendix C.

“Utah Is Off to a Scary Start for Fire Season Due to a Dry Spring and Careless Campers.” *Salt Lake Tribune*, May 27, 2020.

Utah Lake Algal Bloom Monitoring 2020. Utah Department of Environmental Quality. <https://deq.utah.gov/water-quality/utah-lake-algal-bloom-monitoring-2020>.

“Utah Major Watersheds.” Utah State University Extension, n.d. [https://extension.usu.edu/waterquality/learnaboutsurfacewater/watersheds/utahmajorwatersheds#:~:text=HOW%20DOES%20UTAH%20USE%20ITS,and%20industries%20\(about%204%25\)](https://extension.usu.edu/waterquality/learnaboutsurfacewater/watersheds/utahmajorwatersheds#:~:text=HOW%20DOES%20UTAH%20USE%20ITS,and%20industries%20(about%204%25)).

“Utah Opinion Favors WAA.” *New York Times*, May 25, 1946.

“Utah Priorities 2016.” Utah Foundation, <http://www.utahfoundation.org/reports/utah-priorities-2016-issue-2-air-quality/>

“Utah.” State Climate Summaries, NOAA National Centers for Environmental Information, 2019. <https://statesummaries.ncics.org/chapter/ut/>

“Utah’s Legislature Is First Among Conservative States to Officially Recognize Climate Change.” *The Independent: A Voice for Southern Utah* (blog), May 17, 2018. <http://suindependent.com/utah-legislature-hcr-007-climate-change/>

“Utah’s Millennials Are Moving Downtown.” Salt Lake Department of Economic Development, January 31, 2019. <https://slcecondev.com/2019/01/31/utahs-millennials-are-moving-downtown/>

“Utah’s Winds.” Utah Center for Climate and Weather, February 9, 2015. <http://www.utahweather.org/2015/02/utahs-winds.html>.

“Utahns Urged to Assist Starving Deer.” *DN*, January 9, 1949.

Visser, Nick. “Utah Lawmaker Blames ‘Treehuggers’ and ‘Rock-Lickers for Wildfires.” *Huffington Post*, June 29, 2017. https://www.huffpost.com/entry/mike-noel-utah-wildfire_n_5954a8ebe4b05c37bb7bf1ee

Wall Street Journal “Geneva Steel Co.” August 27, 1993 <https://www-proquest-com.ezproxy1.lib.asu.edu/docview/398474125?accountid=4485>.

Walker, Don D. “From Self-Reliance to Cooperation: The Early Development of the Cattlemen’s Associations in Utah.” *UHQ* 35, no. 3 (Summer 1967): 5-19.

Walker, Don D. “The Cattle Industry of Utah: An Historical Profile, 1850-1900.” *UHQ* 32, no. 3 (Summer 1964): 4, 8-23.

Wang, Shih-Yu, Robert R. Gillies, J. Jin, and L. E. Hipps, “Coherence Between the Great Salt Lake Level and the Pacific Quasi-Decadal Oscillation.” *Journal of Climate* **23** (2010): 2161-2177.

Warner, Ted J. *The Dominguez-Escalante Journal: Their Expedition Through Colorado, Utah, Arizona, and New Mexico in 1776*, Salt Lake City: University of Utah Press, 1995.

Warnock, Caleb. “Why Is Provo Air Pollution So Much Worse than Salt Lake?” *Provo Herald*, March 6, 2014.

“Water Conservation Plan 2020.” Salt Lake City Public Utilities. <https://www.slc.gov/utilities/water-conservation-plan-2020/>

“Water Strategies for Great Salt Lake: Legal Analysis and Review of Select Strategies for Great Salt Lake.” Great Salt Lake Advisory Council, Utah Department of Natural Resources and Utah Department of Environmental Quality, July 17, 2020.

“Water Use Restricted.” *Salt Lake Telegram*, June 2, 1934.

“Weather Report.” *Provo Daily Herald*, May 30, 1983.

Wells, Daniel H. “Persecutions, Duties, and Privileges of the Saints.” *JD* 2 (July 24, 1854): 25-28.

Wells, Daniel H. “The Gospel of Salvation.” *JD* 9 (April 14, 1861): 43-50.

“Western Mountains and Rivers on the Route to Oregon.” *Nauvoo Neighbor*, September 9, 17, 1845. The Joseph Smith Papers.

<https://www.josephsmithpapers.org/paper-summary/council-of-fifty-minutes-march-1844-january-1846-volume-3-6-may-1845-13-january-1846/26>

“What Legacy Will We Pass on to Future Generations?” Utahns for Better Transportation, June 2001. <http://utahnsforbettertransportation.org/docs.html>

“What’s the Future of Utah’s Air Quality?” ABC4News, September 5, 2018. <https://www.abc4.com/news/local-news/whats-the-future-of-utahs-air-quality/>

When the Mountains Roared: Stories of the 1910 Fire, Idaho Panhandle National Forest, U.S. Forest Service, pub. R1-78-30. n.d.

Whetten, Craig Loal. “The Strange Enterprise: Geneva Steel and the American West.” MA thesis, University of Utah, 2011.

Whitley, Colleen K., ed. *From the Ground Up: A History of Mining in Utah*. Logan: Utah State University Press, 2006.

Widtsoe, John A. “Bulletin No. 88 - The Relation of Smelter Smoke to Utah Agriculture.” *UAES Bulletins*, Paper 39, July 1903.

Widtsoe, John A. *A Rational Theology as Taught by the Church of Jesus Christ of Latter-day Saints*. General Priesthood Committee, Church of Jesus Christ of Latter-day Saints, 1915.

Widtsoe, John A. *In a Sunlit Land: The Autobiography of John A. Widtsoe*. Milton R. Hunter and G. Homer Durham, eds. Salt Lake City: Deseret News Press, 1952.

Widtsoe, John A. *In Search of Truth*. Salt Lake City: Deseret Book, 1930.

Wilber, Charles Dana Wilber. *The Great Valleys and Prairies of Nebraska and the Northwest*. Omaha: Daily Republican, 1881.

Wildfire Risk Assessment Portal. Utah Division of Natural Resources.
<https://wildfirerisk.utah.gov>

“William Clayton,” *Latter-day Saint Biographical Encyclopedia*. Andrew Jenson, ed., 1901, 1:717-718.

Williams, Gerald W. “References on the American Indian Use of Fire in Ecosystems.” U.S. Forest Service, June 12, 2003.

Williams, Stanley T. *The Life of Washington Irving*, Oxford University Press (1935), 2.

Williams, Terry Tempest. *Refuge: An Unnatural History of Family and Place*. New York: Vintage, 1992.

Wilson, William A. "What's True in Mormon Folklore? The Contribution of Folklore to Mormon Studies." Paper 12. Logan: Utah State University, September 27, 2007. https://digitalcommons.usu.edu/arrington_lecture/12

Wittman, Marc and Anna Sircova. “Dispositional Orientation to the Present and Future and Its Role in Pro-Environmental Behavior and Sustainability.” *Heliyon* 4, no.10 (October 26, 2018). doi:10.1016/j.heliyon.2018.e00882.

Wood, James and Dekan Eskic. “Housing Prices and the Threat to Affordability: Research Brief” Kem C. Gardner Policy Institute, March 2018.
<https://gardner.utah.edu/wp-content/uploads/HousingBrief.pdf>

Woodruff, Wilford. “Simplicity and Unchangeableness of the Gospel.” *JD* 18 (August 13, 1876): 217-222.

Woolley, Ralf R. *Cloudburst Floods in Utah 1850-1938*. Department of the Interior, United States Government Printing Office, 1946.

“Worst Blizzard in 20 Years Subsides; Travelers Stranded.” *Provo Daily Herald*, January 5, 1949.

Worster, Donald. *Rivers of Empire: Water, Aridity, and the Growth of the American West*. New York: Oxford University Press, 1985.

“Writer Recalls History of Geneva, Favorite Old Resort of Utah Lake.” *Provo Sunday Herald*, March 27, 1949.

- Young, Brigham. "Advice to California Emigrants." *JD* 10 (July 8, 1863): 229-232.
- Young, Brigham. "Confidence and Influence of the Saints." *JD* 8 (June 30, 1860):64-70.
- Young, Brigham. "Confidence." *JD* 1 (September 11, 1853): 74-79.
- Young, Brigham. "Consecration," *JD* 2 (June 3, 1855): 298-308.
- Young, Brigham. "Covetousness." *JD* 8 (September 16, 1860): 167-170.
- Young, Brigham. "Dependence on the Lord." *JD* 2 (May 27, 1855): 279-284,
- Young, Brigham. "Disinclination of Men to Learn." *JD* 3 (April 20, 1856): 316-327.
- Young, Brigham. "Eternal Existence of Man," *JD* 10 (September 28, 1862): 1-6.
- Young, Brigham. "Eternal Existence of Man." *JD* 10 (September 28, 1862): 1-6.
- Young, Brigham. "Fidelity of the Saints." *JD* 8 (June 10, 1860): 77-80.
- Young, Brigham. "Future State of Existence." *JD* 10 (Oct. 6, 1862): 24-25.
- Young, Brigham. "Good and Evil." *JD* 14 (May 17, 1871): 109-114.
- Young, Brigham. "Home Manufacturing, Merchandising, and General Economy." *JD* 11 (October 9, 1865): 137-143.
- Young, Brigham. "Indian Hostilities and Treachery." *JD* 1 (July 31, 1853) 162-172.
- Young, Brigham. "Indian Hostilities." *JD* 1 (July 31, 1853): 162-172.
- Young, Brigham. "Intelligence, Etc." *JD* 7 (October 9, 1859): 282
- Young, Brigham. "Light and Influence of the Spirit." *JD* 6 (June 19, 1859): 330-333.
- Young, Brigham. "Light of the Spirit." *JD* 8 (July 15, 1860):121-125.
- Young, Brigham. "Management of the Canyons." *JD* 1 (October 9, 1852): 209-220.

Young, Brigham. "Necessity of Home Missions." *JD* 3 (October 8, 1855): 115-123.

Young, Brigham. "Necessity of the Saints Living Up to the Light Which Has Been Given Them." *JD* 3 (March 2, 1856): 221-226.

Young, Brigham. "Obedience." *JD* 14 (May 21, 1871): 119-122.

Young, Brigham. "Personal Sacrifices." *JD* 8 (July 8, 1860): 117-119.

Young, Brigham. "Power Given to Man to Create." *JD* 9 (March 16, 1862): 254-258.

Young, Brigham. "Salvation and Condemnation." *JD* 8 (June 12, 1860): 293-297.

Young, Brigham. "Temporal and Spiritual Duties of the Saints." *JD* 10 (November 6, 1864): 358-365

Young, Brigham. "The Holy Ghost Necessary in Preaching." *JD* 4 (August 17, 1856): 20-32.

Young, Brigham. "The Work of the Priesthood." *JD* 19 (May 27, 1877): 45-50.

Young, Brigham. "Times for All Things." *JD* 3 (July 13, 1855): 51-65.

Young, Brigham. "Times for All Things." *JD* 3 (July 13, 1855): 54-57.

Young, Brigham. "Use and Abuse of Blessings." *JD* 1 (June 5, 1853): 248-256.

Young, Clara Decker. "A Woman's Experience with the Pioneer Band," *UHQ* 14 (1946): 212-216.

Young, Clifford E. *120th Semi-Annual Conference Report*, October 1, 1949, 65-68.

Young, Harriet Page Wheeler Decker. "Diary of Lorenzo Dow Young." *UHQ* 14 (1946): 163-209.

Young, James A. "Operation Hay Lift: The Winter of 1949." *Rangelands* 6, no. 3 (June 1984): 116-120.