

# STEWARDSHIP AND ENTERPRISE: THE LDS CHURCH AND THE WASATCH OASIS ENVIRONMENT, 1847–1930

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**F**or several decades—since Lynn White Jr. blamed environmental degradation on an incestuous marriage of Christianity and technology—scholars have debated the relationship of religion to the environment.<sup>1</sup> Some have argued that Evangelical Protestants are relatively less sensitive to environmental concerns than Catholics and liberal Christians, and others have faulted capitalism.<sup>2</sup> Still others have come to religion’s defense, arguing in various ways that the Bible and Christian tradition provide ample support for a beneficial environmental ethic.<sup>3</sup> Whatever the truth of the matter, both environmental problems and debates over who is at fault persist.

It is my belief that while the debates provide helpful insights, they fail to grapple sufficiently with the central problem that Western Christians have faced—*reconciling two often contradictory traditions*. These traditions are: (1) the Christian teaching of stewardship and reverence for life rooted in an ecological interpretation of the Bible and Christian tradition, which I call the *stewardship tradition*; and (2) the Euro-American tradition of secularized business enterprise based on changes in thought and practice spawned during the Renaissance, which I call the *entrepreneurial tradition*. I use the terms “often contradictory” advisedly since Protestants—especially Puritans—had originally grounded entrepreneurship in the religious concept of divine calling. By the late eighteenth century, however, business, like so much else, had been secularized in mainstream American culture.<sup>4</sup>

One way of approaching the relationship between the stewardship and entrepreneurial

traditions is to examine the ways in which they functioned in practice in a religious community. To address White's argument, which depends on the conjoining of science and technology, we would have to study a religious community that flourished after the industrial revolution had produced significant effects in the late eighteenth century. Many such communities—including the Shakers, Amish, and Mormons—come to mind. Since the Mormons proved one of the successful communities, it seems reasonable to examine their experience.

Some previous works provide a starting point. Wendell Berry, Susan Power Bratton, J. Baird Callicott, and Paul Santmire show that the biblical and Christian traditions can be read through an environmental hermeneutic. White is undoubtedly correct in arguing that the alliance of science and technology facilitated environmental damage. Donald Worster rightly argues that capitalism contributed to environmental degradation, in part because of single-minded devotion to enterprise, markets, and development. Any discussion must also play against the background of the argument over natural change and the degree of change by human agencies.<sup>5</sup>

Already some authors have begun to explore the relationship of Mormons and the environment. Hugh W. Nibley has rightly argued that early Mormon prophets preached an environmental ethic.<sup>6</sup> Richard H. Jackson pointed out that the Mormons expected the Lord to temper the climate and geography if they followed His commandments. Jeanne Kay and Craig J. Brown have extended Jackson's argument. Charles S. Peterson is undoubtedly right in believing that severe environmental damage occurred because neither the Mormons nor the Forest Service could reduce the numbers of sheep grazed on fragile watersheds by each of a large number of small farmers. John B. Wright argues that Mormon millennial theology and its alleged cultural results lie at the root of Utah's environmental degradation. In an excellent study of changing conditions, Dan L. Flores claimed that Mormon

“stockmen, possibly somewhat bewildered by the strangeness of the Mountain West, with its complicated life and water zonation [caused environmental damage because they had no] . . . empirical understanding of how mountain land worked.”<sup>7</sup>

Flores did excellent research, but a careful reading of his and other available evidence shows that before their livestock had seriously damaged mountain watersheds, the Mormons understood empirically the disastrous consequences of overgrazing. In a general conference sermon in October 1865, which Flores cited and which occurred twenty years before Mormons had undertaken any extensive grazing on mountain watersheds, Orson Hyde (at the time first in line to succeed Brigham Young as Church President) deplored the destruction of vegetation in the valleys. Pointing to the base of the problem, he chastised the people for the damage caused by overgrazing. Moreover, as Peterson and others have shown, the people of numerous settlements understood that to control flooding they had to prevent overgrazing on upland watersheds. Thus, the cause of Mormon damage to the environment must rest in something other than bewilderment.<sup>8</sup>

If we wish to understand Mormon intentions, we can best begin by exploring their beliefs and understandings of the relationship of human beings to the environment. In part, the Mormon heritage resembles that of other Euro-Americans. Several features of that heritage seem paramount, and a number seem contradictory. Like the Christians of Berry's, Bratton's, and Santmire's interpretations, the Mormons carried a theological disposition to live on earth as stewards with reverence for all things. At the same time, they also shouldered the Euro-American cultural baggage of secular business entrepreneurship.

The Mormons' heritage, however, differed from other Euro-American Christians in significant ways. Strongly communitarian, they sought to build the kingdom of God on earth; and, assuming both the Christian and Western belief in

linear progress, they expected to use science and technology to refashion the arid West both as a fit place for Christ's Second Coming and as an earthly home, like the familiar humid region they had fled.

To assist in accomplishing these goals, they attempted to subordinate the entrepreneurial tradition to the Church. Returning to the Puritan practice, they reenvisioned entrepreneurship as an aspect of the sacred—in a word they resacralized it.

At the same time, they extended the Christian environmental ethic, regrounding it in the teachings of men that they followed as living prophets. We should not confuse such utterances with rhetoric, since the words of these men came to the people as divine pronouncements. On the other hand, we know that, since biblical times, not even believers have followed invariably the revelations of prophets. Indeed, there is clear evidence that, whatever they were told, many Utah Mormons *acted* as if ecclesiastical pronouncements regarding the environment were, in fact, little more than rhetoric—either that or they forgot or declined to obey the counsel given.

Nevertheless, in prophetic utterances, Joseph Smith taught the sanctity and unity of all living things. From an outlook similar to that of many Native Americans and modern Gaians—and heretical to those nineteenth-century Christians caught in the web of the modern physics of Galileo, Kepler, and Newton—Smith taught that animals and plants, like humans, had eternal spirits.<sup>9</sup> Speaking for the Lord, Smith said that unlike the majority of humans, these creatures lived “in their destined order or sphere of creation, in the enjoyment of eternal felicity” (D&C 77:3), and the earth, the “mother of” all humans possessed a soul pained by “the wickedness of my children” (Moses 7:48).<sup>10</sup>

On the way west and after the Saints had arrived in Utah, other Church leaders elaborated on these teachings. Brigham Young rebuked members of the pioneer company for killing more animals than they could eat.<sup>11</sup> Elder Orson

Pratt—arguably the preeminent mid-nineteenth-century LDS theologian—taught that God had created “the spiritual part” of the earth and all earthly animals and plants in heaven “before their temporal existence” and that this creation sanctified them. Heber C. Kimball, a counselor to President Young in the Church's First Presidency, urged the Saints to extend mercy “to the brute creation,” since animals have spirits and God will resurrect them along with the earth and human beings. Only after the Saints had learned to live in harmony as stewards with one another and with the earth, Young said, could they expect to inherit it, presumably as exalted beings, from the Lord who owned it.<sup>12</sup>

As the Mormons settled Utah, Young and his associates restated and elaborated on these teachings.<sup>13</sup> Young told them that the earth belonged to the Lord and that humans could hold no title to the land and resources. Landholders might manage God's estates only as stewards. Nevertheless, in an explicit reference to the resacralized entrepreneurial tradition, Young said that if stewards did not oversee the land as good managers, the Lord required them to relinquish it to someone who would. Hyde chastened the Saints for their “inordinate desire for wealth and extensive possessions.”<sup>14</sup>

At the same time, Young proposed an unusual interpretation of the biblical injunction to multiply and replenish the earth. To accomplish this goal, he urged the Saints to conserve native plants and animals but also to increase the diversity of God's creations since they were “all designed to be preserved to all eternity.” In view of this belief, Young fostered the importation of large varieties of alien flora and fauna to the intermountain region, while he urged the people to protect the species already there.<sup>15</sup>

In addition to a belief in the spiritual unity of humans, the earth, and its nonhuman inhabitants under the fatherhood of God, early Church members drew upon a holistic concept of the relationship between the temporal and spiritual to regulate settlement and the utilization of

resources. In prophetic statements repeated by Brigham Young and other Church leaders, Joseph Smith had taught the unity of the temporal and the spiritual. Speaking for the Lord, he said that “all things unto me are spiritual, and not at any time have I given unto you a law which was temporal” (D&C 29:34). From a theological perspective, then, the Latter-day Saints lived in an undifferentiated temporal and spiritual world, building God’s kingdom on earth and in heaven under the leadership of divinely commissioned prophets. In the most profound sense, prophetic leaders expected the Mormons to reweave entrepreneurship and stewardship into a seamless garment.

Those who wore this garment carried a sacred obligation to build God’s kingdom on earth as they exercised their stewardship in an environmentally responsible way. The Mormon view—as taught by Joseph Smith and reinforced by Brigham Young and his colleagues—bore little relationship to classic American agrarianism or to nineteenth-century capitalism. The earth and its animal and vegetable inhabitants were living organisms with souls—not possessions, much less commodities. Every living thing occupied a place in God’s domain; and while each creation—the earth, the animals, the plants, and human beings—relied on one another, none owned the earth. As a living creation of God, the earth belonged only to Him, and it had an end in itself.

How did these principles function in practice? Before the arrival of the first Mormons in 1847, human incursions into the Wasatch Oasis by Native Americans, mountain men, and overland migrants had already changed the landscape. For example, before 1824, the Bear River Valley and other parts of northern Utah abounded with large mammals, including a limited number of buffalo; but as a result of indiscriminate killing, by 1835 mountain man Osbourne Russell found Cache Valley “entirely destitute of game,” and he and his party were forced to “live chiefly upon roots for ten days.” He also found game

shortages in Utah and Salt Lake valleys.<sup>16</sup> In the most thoroughly documented scientific expedition into the Wasatch Oasis during the pre-Mormon era, John C. Frémont found in the early 1840s that in the intervening years most of the large mammals remaining in the valleys had been exterminated. The Indians he met in Cache Valley subsisted almost entirely on roots and seeds supplemented by some small animals, insects, and worms. In the Bear River, Salt Lake, and Utah valleys, Frémont and his associates found an environment they believed would support herds and crops, but they had to eat plants and some small game since they found few animals except waterfowl, fish in streams and in Utah Lake, and antelope on Antelope Island in Great Salt Lake.<sup>17</sup>

Although members of the lead party of Mormons found deer, antelope, mountain goats, mountain sheep, and bear in the nearby mountains, they found none in the valleys as the earliest visitors had. The first Mormons also commented on the absence of buffalo, so numerous on the plains they had crossed several weeks before. They remarked, however, on the profuse watercourses flowing from the mountains into the valleys, rich soil, and plenty of tall grass.<sup>18</sup>

Mormon settlers developed an orderly landscape of wide streets, large blocks, and detached houses with barns, corrals, large gardens, and fruit trees inside the towns, and they cultivated farms, usually about twenty acres, outside the towns. In Salt Lake City, Governor Young expected irrigation ditches to run down the sides of each street, not only to water the gardens and orchards, but to carry any sewage and refuse to the lower Jordan River, which he seems to have conceived as a natural sewage treatment facility. In a pattern that Mormons would follow in community after community, surveyors apportioned lots of farms to the first settlers. These settlers paid only a small fee for their titles. They dug ditches and laterals, plowed and planted the land, sent parties into the mountains to cut

timber, and detailed volunteers to manufacture adobes, from which they constructed most of their early buildings.<sup>19</sup>

Following the patterns of the Indians and Hispanics, the Mormons departed from previous practices not in the plants they cultivated, but in the development of irrigation technology and institutions.<sup>20</sup> In the nineteenth century, their projects consisted of small dams or weirs across creeks and rivers built by cooperative irrigation companies that also dug canals to divert water onto farms and town lots. The settlers generally appointed a watermaster to apportion the water in rotating weekly turns. By 1900, although the Mormons had constructed some small reservoirs in the Wasatch Oasis, most irrigation consisted of these ditchworks.

Of great importance to the Mormon story, the Wasatch Oasis possesses an abundance of water and rich soil. It is truly a mountain and valley oasis, since all this abundance is concentrated in a relatively small area amid a vast desert badlands. Estimates of the available water by Groye Karl Gilbert—published in John Wesley Powell's *Lands of the Arid Region*—confirmed the Mormons' initial assessment. Gilbert estimated that the Bear River and its tributaries carried more than enough water to irrigate all arable land in Cache Valley, and that the Bear and Malad rivers could also irrigate the land in the lower Bear and Malad drainage in the Salt Lake Valley. Further, with the addition of surplus water from the Bear and Jordan rivers, he estimated that the settlers could water the Wasatch Front land in the Weber and Ogden river valleys susceptible to cultivation. Tributaries of the Jordan carried more than enough water, he said, to irrigate all of the land in the Salt Lake Valley, and unless settlers diverted too much for relatively inefficient agriculture in the Kamas and Heber Valleys on the upper Provo River, the drainage supplying Utah Lake carried enough to irrigate the lands of Utah Valley. Thus, as the early observers anticipated, instead of a water shortage, the Mormons found the Wasatch Oasis richly endowed with the precious fluid. In-

vestigations supervised by Elwood Mead a quarter century later supported Gilbert's analysis, though Mead included reclamation in the equation.<sup>21</sup>

On the other hand, although the settlers on the Wasatch Oasis found water relatively easy to obtain, they had difficulty obtaining lumber. Scarce tree stands, steep slopes, inefficient technology, and high transportation costs created obstacles in the construction of corrals, fences, framing, and roofing, and in getting fuel. Given the holistic heritage of stewardship and entrepreneurship, it is not surprising that, early on, settlers effected community and private action on the problem. At first, most seem to have logged as individuals.<sup>22</sup> Soon, following the philosophy of communal control and stewardship, the Church leadership, general conferences, the territorial legislature, and local religious and political bodies granted timbered canyons—and herd grounds and roads as well—to faithful business people. They expected the grantees to develop the resources and offer them to the community at a fair price. The granting bodies expected the entrepreneurs to take the initiative to introduce appropriate technology and skillful management and marketing techniques to the benefit of both themselves and the community. In so doing, they followed the medieval and Puritan practice of setting a just price.<sup>23</sup> That is, governing bodies set prices merchants and others might charge consumers.

Still, in spite of the paucity of timber in Utah's Wasatch Oasis and the inefficiency of the operations, Utah's lumber companies persisted in cutting a giant swath through accessible stands. The loggers caused environmental damage, and easily harvested timber was soon in short supply. By the mid-1850s, Wilford Woodruff had difficulty finding accessible timber in the lower canyons near Salt Lake City. In his trip into the Salt Lake Valley and visits to the nearby canyons in 1860, Sir Richard Burton noted the summit of Emigration Canyon pass "well nigh cleared of timber." He noted that in other canyons timber was not plentiful. Surveying the Wasatch Mountains

in 1902, Albert Potter found denuded slopes and extensive environmental damage throughout the Wasatch Oasis mountains.<sup>24</sup>

Stripping the slopes of trees seems to have resulted from a tendency to drive a wedge—perhaps inadvertently—between stewardship and entrepreneurship and to secularize the latter while forgetting the environmental component of the former. As Apostle Orson Hyde had observed, in the quest for wealth, the people forgot stewardship for the environment. The Mormon settlers' need for timber, which they satisfied by cutting free timber on the public lands, subverted doctrines of stewardship, the living earth, and the sanctity of life. Increasingly after the first decade, the prophets seemed unable to infuse the membership with the concepts of the unity of all living things that Joseph Smith and Brigham Young had taught, and Brigham Young seems to have become less conscious of it himself.

Increasingly, people in the community separated the temporal and spiritual. The apostasy of prominent business leaders, like the Walker brothers during the late 1850s and the Godbeites during the late 1860s and early 1870s, shows that secularized entrepreneurship had taken the front seat and that business people had shoved religiously motivated stewardship, the sanctity of all life, and environmental protection to the back of the bus.<sup>25</sup>

Examples from the logging industry illustrate the point as well. In one venture in Little Cottonwood Canyon, a speculator cut a million board feet of timber. Unable to sell the logs, he simply left them to rot on the ground. In other cases, logging in the upper valleys near the ridges left the canyon slopes vulnerable to avalanches. As ventures in mining and smelting expanded after the introduction of the railroad in 1869, responding to the market, loggers denuded the slopes of low-grade juniper and piñon to make charcoal.<sup>26</sup> Near Scofield, Mormon entrepreneur David Eccles's loggers burned the hillside to remove the undergrowth, then they highgraded the timber by harvesting "only the choicest trees," leaving the rest to rot.<sup>27</sup>

In spite of such improvident use of resources, and as improbable as it may seem, the secularized entrepreneurial tradition and the use of improved technology elsewhere in the nation saved the forests of the Wasatch Oasis from complete destruction. A dry climate and steep slopes had cursed the Wasatch Oasis with limited stands of spruce-fir and piñon-juniper, which were difficult to tap economically with modern transportation systems. The coming of the railroad in 1869 and its expansion along the Wasatch Front by the late 1870s left Utah's forest products industry vulnerable to competition from outside lumber operations. In the Mississippi Valley, the Great Lakes region, and the Pacific Coast, on the other hand, loggers had access to large stands, modern mills, and railroads.<sup>28</sup>

Pounded by competition from outside and suffering from a short supply, between 1880 and 1900 the relative volume and value of Utah's lumber declined rapidly.<sup>29</sup> In 1870 Utah had more mills and a higher value of timber production than any of the Mountain Western or West Coast states or territories except California and Oregon. By 1916, Utah mills supplied only about 10 percent of the 150 million board feet consumed annually, and while the Forest Service and others tried to encourage increased production, little occurred and, in general, the damage to Wasatch Oasis timber stands that Potter observed in 1902 healed themselves.<sup>30</sup>

As the experience with timber management showed, on balance, part of the Latter-day Saint philosophy wore well in practice and part of it fit poorly. In line with Brigham Young's teachings about stewardship and usufructuary occupation of the land, the first settlers paid only a small surveying fee for their lots and farms. Later, however, the separation of the entrepreneurial and stewardship traditions and the secularization of the former meant that immigrants seeking land (excepting those who could qualify under some federal land laws) found themselves at the mercy of the market. In 1854, for instance, Charles H. Oliphant paid \$250 for a lot in the Salt Lake City

Twelfth Ward that, just six years earlier, someone else—acting as a steward—had occupied for a small surveying fee. Moreover, although stewardship principles under priesthood direction theoretically excluded the unfaithful, virtually anyone with sufficient cash could purchase, rent, or lease property that Mormons had previously considered the Lord's land.<sup>31</sup> It seems probable that in the case of land tenure, secular Euro-American cultural attitudes cut a giant swath through religious teachings.

In the case of plant diversity, cultural attitudes—particularly previous farming practice and the belief in material cultural attitudes—ran parallel to prophetic teachings. Thus, while new settlers had to buy their land, the Latter-day Saints followed Brigham Young's admonition—usually without encouragement—to increase the diversity of plants and animals through the introduction of exotic species provided by nurseries that had opened in several towns. For example, Oliphant of Salt Lake City purchased sprouts for root stock. He began grafting buds from productive varieties of apples, peaches, cherries, and other fruit. He also purchased peach pits and secured cuttings and seeds from California and the South. So anxious was Young to increase the variety of fruits that he called Oliphant to operate the nursery as a religious duty. Joseph Ellis Johnson, Luther Hemenway, and others also operated nurseries. Following the pattern, community leaders like George Q. Cannon, Brigham Young, Albert Carrington, and William Staines also grafted extensively and imported numerous exotic plants.<sup>32</sup>

Similar businesses flourished in small communities as well. William Rigby, for instance, opened a nursery at Newton in Cache Valley, growing imported black and honey locusts, silver maples, and Lombardy poplars, as well as domestic trees like box elders.<sup>33</sup>

Wilford Woodruff, later Church President but then one of the Twelve Apostles, became a noted horticulturalist and agent of agricultural importation and improvement in the Wasatch

Oasis. As president of the Horticultural Society of Utah from its organization in 1855 and of the Deseret Agricultural and Manufacturing Society from 1862 to 1877, he and his associates imported plants and animals from the eastern United States, California, Australia, France, and England. Further, they brought in milk separators, McCormick reapers, and plows of the most modern design. During 1856 alone, Woodruff budded four hundred plants, including scores of varieties of apples, peaches, apricots, plums, and almonds. Some flourished in the Wasatch environment; others did not.<sup>34</sup>

Although the efforts to increase the diversity of plants and animals on the irrigated farms in the Wasatch Oasis proved ultimately successful, it was accompanied, particularly in the first few years, by starvation and plant and animal destruction. To some degree the hunger and devastation resulted from Euro-American cultural attitudes. For example, crickets periodically attacked both native and exotic plants. The Indians had turned such plagues to an advantage and ate these insects, but the Mormons were unable to overcome their cultural attitudes and follow the Native American example.<sup>35</sup> Instead, during famines the Mormons scrounged up antelope, hawks, crows, wolves, thistles, bark, roots, nettles, pigweed, redroot, and sego lily roots. As soon as familiar foods became available again, they reverted to their traditional diets.<sup>36</sup>

Had they carried different cultural baggage, the settlers might have followed the biblical model of John the Baptist, who had eaten locusts and wild honey, but Euro-American cultural patterns predominated, and Euro-Americans generally declined to consume the insects. This was not a transient problem, since though the devastating cricket invasion of 1848 is well known, recurring plagues reached Wasatch Oasis communities well into the 1870s. Young, himself, tried to feed the crickets, but he could not bring himself to eat them as he had his cattle.<sup>37</sup>

In another instance, although they still professed to believe in religious concepts of

stewardship and sacralized entrepreneurship, Mormons declared “a war of extermination against” wild animals. In December 1849, less than a year and a half after the Saints had reached the Wasatch Oasis, organized parties of settlers set out to kill predators and vermin including wolves, wildcats, bears, catamounts (probably bobcats), panthers (perhaps cougars), skunks, and minks, and raptors and scavengers like eagles, hawks, owls, crows, and magpies—animals they called “wasters & destroyers.” Bounties were offered for wolf and fox skins.<sup>38</sup>

Increasingly after 1870, cooperation and secular enterprise, rather than cooperation and sacred stewardship, seems to have driven Mormon agricultural activity. By the mid- to late-1870s, the Mormon settlers had killed off enough crickets and grasshoppers to change the Wasatch Oasis environment. These insects could no longer reproduce large hordes. Under these circumstances, the railroad provided transportation facilities for the products of irrigated farms, grazing herds, and eventually dry farms. Wheat production soared; output increased 109 percent between 1869 and 1879 and 512 percent by 1899. Oat production spurted ahead during the 1880s, potato output grew exponentially during the 1890s, and barley and hay yields took off and thrived during the 1920s.<sup>39</sup>

By replacing native vegetation with imported plants, Mormons altered the face of the Wasatch Oasis. Moreover, after 1891, the European sugar beet became a mainstay of irrigated farms in the Wasatch Oasis. From Bear River and Cache valleys on the north to Utah Valley on the south, families contracted with Utah-Idaho and Amalgamated Sugar companies to supply beets to factories from Garland to Spanish Fork.<sup>40</sup>

In general, however, although these farmers produced for the market they did not establish large monocultural enterprises. Between 1870 and 1900, the median-sized farm increased only from thirty to fifty acres.<sup>41</sup> In the Wasatch Oasis, people continued to work family farms, allotting certain valley fields to sugar beets, raising a large

variety of fruits and vegetables for home and market consumption, devoting upland fields to dryland wheat, and grazing milch cattle and work-horses in lowland pastures. In addition, many ran sheep or beef cattle on public lands in the mountains, driving them to the lowlands or the west desert in the winter.

In effect, they reached one of Brigham Young’s goals of multiplying and replenishing the earth by introducing a greater variety of plants and animals into the Wasatch Oasis than had lived there before. At the same time, they ignored his other goal by diminishing the native species. Moreover, some of the exotic plants were harmful. For instance, though wheat and sugar beets improved people’s lives, cheat grass and orchard grass created fire hazards and sapped the soil of nutrients.

In addition to these plants, with the extermination of predators, the Mormons safely turned their domestic animals to extensive grazing in the low valleys and foothills. In 1855 the territorial legislature granted herd grounds in the valleys to various entrepreneurs. Laws assigned parts of Cache Valley to Brigham Young; southern Weber Valley to Thomas J. Thurston, Jedediah M. Grant, and others; northern Weber Valley to John Stoker, William Smith, John Hess, and Abiah Wadsworth; and parts of Utah Valley to a party headed by George A. Smith.<sup>42</sup>

In the long run, however, production for market and home consumption replaced grazing in the valleys and continued to change the ecosystem. One dramatic example of the change in the ecosystem was the air pollution from smelting and from the use of coal for business enterprises and home heating.

Driven by secular markets to exploit available and unregulated mineral resources, the smelteries flooded the valleys with polluted air. Lodes of silver, gold, lead, copper, and zinc in the Wasatch and Oquirrh mountains created a demand for mills and smelters close to railroad lines in the Wasatch Oasis. Most were built in the central Salt Lake Valley towns of Midvale,

Murray, and Sandy, and in communities like Bingham and Garfield at the base of the Oquirrh on the west edge of the valley.<sup>43</sup>

As early as 1873, Mormon farmers in the Jordan area of south-central Salt Lake Valley began to complain about the smelter smokestacks that swirled sulphur dioxide and arsenic on their crops and livestock. Pressed by public opinion and the threat of lawsuits, the smelters paid reparations to the farmers for the destruction of crops and the death of livestock. By 1904, the disputes between the farmers and smelter owners had come to a head, and four hundred of the farmers sued four of the smelter companies in federal district court. Judge John A. Marshall of the U.S. District Court of Utah issued an injunction prohibiting the companies from smelting ore containing more than 10 percent sulphur or permitting the escape of arsenic into the air. Two of the smelters closed and the American Smelting & Refining Company and the United States Smelting Company remained open only after the court granted permission to contract with the farmers to continue operating if they installed pollution-control equipment to remove the bulk of the sulfuric acid and all of the arsenic from the smoke. Since some of the operations could not reopen, a large part of the smelting activity shifted to Garfield in the western Salt Lake Valley and to Tooele, west of the Oquirrh, where prevailing winds carried the poisonous smoke beyond the farms.<sup>44</sup>

Even as the farmers began to solve their problems with the smelters, residents of Wasatch Oasis cities—Mormons and those of other faiths—suffered even more from the smoke spewed forth by industry, the railroad, and homes. By the mid-teens, a letter to the *Outlook* magazine complained that Salt Lake City had become the rival of Pittsburgh, Cincinnati, Chicago, and St. Louis as a smoke-plagued sinkhole.<sup>45</sup>

In this complex ecosystem, some of the advantages the valley ecology gained from the small farms and towns in increased wealth and better lives it lost to air pollution, and, at the same time,

the shift of grazing to the mountains killed vegetation there as it had earlier in the valleys. By 1870, the small farmers had begun to practice transhumance. In their search for accessible grass and forbs, they drove their livestock to the canyons and slopes of the Wasatch and Oquirrh mountains during the summer and trailed their herds to the relatively snow-free desert west of the Wasatch Oasis during the winter.

At the same time, transient Euro-American herders from outside Utah invaded the region to compete with local stock raisers in a free-for-all on the unregulated mountain lands. Brute strength governed access to the unappropriated public lands. Wool, mutton, beef, and hides brought cash to herders from the markets in mid-western cities like Omaha, Kansas City, and Chicago.

By taking advantage of inexpensive feed and new technology provided by a nationwide transportation network, Wasatch Oasis and other Utah stock raisers rapidly increased the number of animals grazing on the public lands. The number of sheep and lambs grazing in Utah increased more than 6,300 percent between 1870 and 1900 from just under 60,000 to more than 3.8 million. In 1900 Utah reached its peak sheep population. Afterward, numbers fluctuated between 1.6 million and 2.4 million. Cattle and calves increased over the same period by 860 percent, from just under 36,000 to nearly 344,000, increasing an additional 47 percent to nearly 506,000 by 1920.<sup>46</sup>

Like nervous teenagers tugging at a loose piece of yarn, the herders disentangled the interwoven traditions of entrepreneurship and stewardship, neglecting the lessons of their experience in the valleys in an environmentally destructive rush for free and unregulated herd grounds in the mountains. Thus, though Brigham Young's philosophy of multiplying and replenishing the earth by the introduction of varieties of plants and animals worked well in the development of valley farms and towns, it proved destructive to mountain watersheds. Unregulated grazing combined, to a lesser extent, with excessive and destructive timber harvesting led to massive

devastation of the watersheds on hillsides and canyons in the Wasatch Oasis by the 1890s.

While the valleys lay under banks of murky air and hungry livestock devoured mountain plants, during the 1880s and early 1890s a series of changes took place in Mormon society that further secularized entrepreneurship. Pressure by the federal government and Evangelical Protestants eventually forced LDS Church leaders to restrain themselves in political and economic matters, since most others in the United States considered this a secular rather than a sacred domain. Although the Mormon prophets continued to exercise a declining, but nevertheless direct, influence in politics well into the twentieth century, increasingly they turned their attention to teachings about individual morality and piety rather than politics and business.<sup>47</sup>

Moreover, although the LDS Church continued to promote various types of business enterprise, leaders began to separate such matters from moral sanctions. In the 1890s, they stopped withholding tithing from business profits, and in 1922, they organized Zion's Securities Corporation to manage secular businesses.<sup>48</sup> Under those circumstances, none of the environmentally salutary concepts taught by Joseph Smith and Brigham Young carried sufficient moral force to deflect the siren call of national markets and the secular entrepreneurial tradition. Further, with the completion of the railroad, people of other faiths poured into Utah, carrying with them a thoroughly secularized Euro-American entrepreneurial tradition. Engaging in mining, smelting, stock-raising, and merchandizing, they abetted the Latter-day Saints, now largely freed by the mid-1880s of religious sanctions for most entrepreneurial decisions, in further environmental destruction.

Nevertheless, at the same time, forces emerged in American society and in the Wasatch Oasis that countered these destructive practices. As environmental damage spread throughout the West, national leaders of the progressive conservation movement began to worry. By the

1880s, the scientific community led by people like Franklin Hough of the Agriculture Department's Forestry Division, Charles S. Sargent of Harvard, and William H. Brewer of Yale, and the community of professional foresters (many European-trained) led by people like Bernhard Fernow, Filibert Roth, and Gifford Pinchot believed (erroneously, as it turned out) that the United States faced imminent timber famine.<sup>49</sup> The fear of lumber shortages led to the passage of the Forest Reserve Act in 1891. Legislation providing for management of the reserves under the Forestry Bureau of the General Land Office in 1897 and transfer of the reserves to the newly-created Forest Service in 1905 brought about the designation of national forests on much of the overgrazed and overlogged watersheds.

At the same time, a second generation of Mormons began to reemphasize some of Joseph Smith's and Brigham Young's teachings about environmental stewardship. LDS Church President Joseph F. Smith did not attempt to resubject already secularized entrepreneurship to religious dictation, but by emphasizing the religious principle of stewardship he provided tentative leadership. At the direction of Smith, who recognized the damage done to mountain watersheds by unrestricted logging and grazing, in a special general priesthood meeting on April 7, 1902, Mormons voted to support the withdrawal from the market of all public lands above Utah cities in order to protect them from damage.<sup>50</sup>

Relinking the wanton destruction of living things with personal morality, while relying explicitly on the theological position that animals had eternal souls, Smith condemned the needless destruction of fauna. In an article published in a magazine for young people in 1913, Smith denounced as "wicked" the destruction of "all animals." Recounting a visit to Yellowstone National Park in which he had seen birds, deer, and other animals "as fearless of the presence of men as any domestic animal," he said that it filled his "heart with a degree of peace and joy that seemed to be almost a foretaste of [the Millennium] . . .

when there shall be none to hurt and none to molest in all the land." Opposed to all killing for sport, he said that he thought it "wicked for men to thirst in their souls to kill almost everything which possesses animal life."<sup>51</sup>

Although Mormon leaders from this second generation shrank from trying to relocate entrepreneurship under religious control, some—reimbued with the ideals of environmental stewardship—supported aspects of the progressive conservation movement. These included Governor Heber M. Wells, Senator Reed Smoot, and prominent Church and civic leader Sylvester Q. Cannon. The list also included a second generation of women active in civic affairs, especially those associated with the Salt Lake City Council of Women and its constituent organizations. These included Leah Eudora Dunford Widtsoe, Susa Young Gates, and Emily L. Traub Merrill, who in addition to their civic affiliations were married to high-ranking Church leaders. Significantly, unlike the second generation in the progressive pattern chronicled by Robert Crunden, these men and women remained actively committed to Mormon Christianity rather than simply translating religious ideals into community service.

At the same time, some of those who worked to heal the environmental damage more closely fit Crunden's model. An example was George W. Snow, director of Salt Lake City's Mechanical Department. Others had no connection with the LDS Church, and they operated either from a sense of commitment to the community or from the ideals of the progressive conservation movement. Among those was member of the Chamber of Commerce and later Utah Governor George H. Dern. In Salt Lake City between 1910 and 1920, women of other faiths like Elizabeth M. Cohen, Anna M. Beless, and Maude Smith Gorham battled to correct environmental damage as well. Members of blanket organization like the Utah Federation of Women's Clubs and the Salt Lake Council of Women and of societies like the Ladies Literary Club (an association whose genteel name

masks the active lobbying the organization did to correct serious environmental problems), these women worked shoulder to shoulder with their Mormon sisters.<sup>52</sup>

Beginning in the 1890s, these leaders tried to mend critical environmental damage. After Utah achieved statehood in 1896, Governor Wells withdrew from the market all state lands enclosed in national forest reserves. In 1905 the state legislature, dominated by Mormons, authorized Governor John C. Cutler to establish a conservation commission to investigate environmental damage. Governor William Spry broadened the mandate of the conservation commission.

After his election to the Senate in 1903, as a business-minded conservationist, Reed Smoot bucked the anger of legislators from surrounding western states, like Weldon Heyburn of Idaho, who wanted to destroy the Forest Service. Supporting Theodore Roosevelt's and Gifford Pinchot's programs of utilitarian conservation, Smoot promoted the establishment of national forests to protect watersheds and to regulate grazing and logging. In addition, he helped sponsor the National Park Service Act in 1916.<sup>53</sup>

Even the cooperation between these Mormons, progressive conservationists, and the federal government did not immediately repair the destruction that two generations had inflicted on Wasatch Oasis watersheds. Although numbers of sheep decreased after 1900, they did not begin to decline to the carrying capacity of the steep ranges until after 1950, and some areas are still badly overgrazed.<sup>54</sup> The resultant overgrazing led to serious flooding in the Sanpete Valley as early as 1888 and in the Wasatch Oasis during summer storms, especially in 1923 and 1930.<sup>55</sup>

In September 1930, following disastrous summer floods in Davis County, Governor Dern appointed a commission chaired by Sylvester Cannon, by that time Presiding Bishop of the LDS Church, to investigate the causes of the damage. Not surprisingly, the Cannon Commission found that the floods resulted almost entirely from overgrazing. The mountain landscape now

reflects the drastic measures that have been necessary to save and protect these fragile and vital watersheds. The unnatural contours of elaborately terraced slopes are easily visible from the valley floors.

Turning to the problem of smoke pollution: in a pattern followed by others swept up by the progressive movement, people from various civic improvement organizations protested to the Salt Lake City Commission about the damages to health and property.<sup>56</sup> George W. Snow, women from the Federation of Women's Clubs like Cohen, Gorham, Widtsoe, Merrill, and Beless, some members of the Chamber of Commerce like Dern, Cannon, and others fought against air pollution but were hampered by inadequate legislation. Eventually, beginning in February 1914, the city commission, bowing to public pressure, enacted a series of ordinances that established a Bureau of Smoke Inspection and that dictated fines on residents and businesses that polluted the air.

Armed with legal authority, Snow and Cannon began fining polluters. Drawing on the services of consultants from the United States Bureau of Mines, the University of Utah College of Mines, and other institutions, Snow and Cannon began pressuring businesses to install pollution control equipment during the early 1920s. By 1928, most businesses had complied with the city ordinances, and most remaining pollution issued from railroad locomotives and private residences. The introduction of diesel electric engines and natural gas for home heating eliminated these sources after World War II, but industrial growth and the proliferation of automobiles has since reintroduced air pollution to the Wasatch Oasis. It remains one of the region's most serious problems today.<sup>57</sup>

At the same time, water pollution led to epidemics of typhoid and cholera—until underground water pipes and sewer systems replaced the open ditches that had served the Wasatch Oasis since its early years. Salt Lake City began constructing these improvements in 1884, but not

until the early twentieth century did the city have an adequate water and sewer system, largely through the efforts of engineers like George Snow, Sylvester Cannon, and their associates.<sup>58</sup>

Although these measure did not solve all the environmental problems that plagued the Wasatch Oasis, they did solve some. More to the point for this case study, they reveal a great deal about the effects of the heritage carried by the Mormons on their environmental perceptions and actions. In practice, Mormons seemed unable in many cases to follow the dictates of the most environmentally creative tenets of the prophetic teachings of Joseph Smith and Brigham Young: ecological stewardship, sacralized entrepreneurship, and the fellowship of all living things under the fatherhood of God. On the other hand, the commitment of the second generation to the values of stewardship that derived from these teachings, coupled with the progressive sentiment in the community, facilitated the attack on some of the worst damage.

It should not surprise us that the overlay of community values rather than the foundation of an environmentally friendly theology proved more enduring. In modern times, only a few exceptional Euro-Americans have spoken reverentially in explicitly theological terms about the earth, animals, and plants. More often, such statements appear as a generalized pantheism or reverence of nature, rather than as explicitly prophetic pronouncements.<sup>59</sup>

Sadly, the major opposition in the ecological battle came not from evil people bent on destroying the environment but rather from well-meaning citizens pursuing markets under a secularized entrepreneurial tradition. Many of those who ran the grazing herds, lumber mills, and smelters were also Latter-day Saints who forgot or ignored the teachings of Joseph Smith and Brigham Young in their quest for survival or wealth. In resisting environmentally sound proposals, often driven by market opportunities, they valued jobs and wealth more than the sanctity of life, stewardship, and reverence for the earth. In

practice they may not have thought of the theological implications of their actions except in terms of personal freedom (agency), which Mormons have often invoked in opposition to community regulation. For those of other faiths, at least since the late eighteenth century, entrepreneurship had generally not carried religious sanction; it had always been secular.

It seems clear, also, that some of the devastation was inadvertent. Destruction and control of predators, for instance, was a normal—if ultimately destructive—response to the need to protect livestock and crops. Some understood that overgrazing could cause environmental damage, but no nineteenth-century Mormon seems to have linked predator destruction with the excessive increase in both livestock and deer populations on fragile watersheds. Ignorance also resulted in the utter destruction of the economic base of Native Americans.

On balance, it seems clear that if we judge the Mormon occupation of the Wasatch Oasis by the standards they set for themselves, the results are mixed. On the one hand, they created thriving irrigated farms and bustling cities in the valleys. On the other, they unleashed air pollution, watershed damage, and plant and animal extermination.<sup>60</sup>

Nevertheless, even with the secularization of entrepreneurship, the sense of community and religious values associated with the concept of stewardship and desire to build the kingdom of God on earth helped in the long run to create a more environmentally responsible community than previously during the progressive era. As a result, people like Joseph F. Smith, Reed Smoot, Sylvester Cannon, Leah Widtsoe, and Emily Merrill arose in the second generation to work with progressives like George Dern, Elizabeth Cohen, Anna Beless, and Maude Gorham, and with lapsed Mormons like George Snow to help clean up the environment that their less-thoughtful neighbors had polluted or destroyed.

In the long run, then, perhaps the religious ideal of stewardship combined with community

sentiment and the progressive conservation movement had the greatest positive influence on the partially successful attempts to preserve and restore a healthy environment in the Wasatch Oasis. When people relied on the secular entrepreneurial tradition to appropriate public goods such as land, forage, and air, they often created excessive damage. In the absence of self-interested private ownership, public regulation, or self-regulatory mechanisms, such as the religious ideals of stewardship and sacralized entrepreneurship, these people degraded the environment with little immediate cost to themselves, but with serious injury to others.

At least since the late nineteenth- and early twentieth-century work of European sociologists Max Weber and Emile Durkheim, scholars have debated the relationship between religion and other aspects of culture.<sup>61</sup> Scholars today recognize that the patterns of secularization that sociologists identified in European culture are absent in the United States.<sup>62</sup> As we have seen in the experience of the Latter-day Saints, however, at least in the realm of environmental consciousness, the people tended to reassign certain environmental practices within their culture from the religious to the secular realm and to neglect or forget their religious content.

In this connection, another common feature of most—perhaps all—cultures operated in Mormon society. A cleft developed between the ideal and the actual group behavior. Far from constituting a paradox, such a cleft is a common feature of human life. Perhaps not recognizing the universality of this condition, historians have long used the divergence of the ideal and actual to glorify some cultures and bash others by comparing ideal behavior in one with actual behavior in another, generally to the detriment of the latter.<sup>63</sup>

At times, however, when faced with extraordinarily difficult problems, insightful and creative people within a cultural tradition may return to their roots to reappropriate or to reinterpret concepts and practices—religious or secular—forgotten in the contemporary society, which

seem to apply to current problems. Joseph F. Smith and some of the early twentieth-century Latter-day Saints seem to have done that with the theology of environmental stewardship, just as in recent years Santmire, Berry, Bratton, and others have done the same thing for Christianity in general.

In this connection, it seems clear that if the experience of the Latter-day Saints in the Wasatch Oasis is any indication, the argument that the triumph of western Christianity brought about our modern ecological crisis is seriously flawed. Lynn White is undoubtedly right that a combination of technology and science contributed to the damage. This occurred, however, in a culture that ignored or forgot the concepts of environmental stewardship, the sanctity of the earth, and the brotherhood of all creatures, while at the same time secularizing entrepreneurship. Thus, instead of religion, bewilderment over an unfamiliar region, or millennial theology or culture, secularized entrepreneurship aided by technology and science and by the omission of the religious component of stewardship lay behind the environmental damage. Later, the recovery of previous cultural memory assisted by those representing traditions such as the progressive conservation movement began to correct some—but by no means all—of the degradation.



## Notes

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1. See Lynn White Jr., “The Historical Roots of Our Ecologic Crisis,” *Science*, March 10, 1967, 1203–7.

2. Roderick Nash, *Wilderness and the American Mind* (1967; 3rd ed. rev., New Haven, 1982), 13–22; Andrew Greeley, “Religion and Attitudes toward the Environment,” *Journal for the Scientific Study of Religion* 32 (March 1993): 19–28; Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (New York, 1979), and *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York, 1985), esp. 48–60, 216–17.

3. Wendell Berry, “Religion and the Environment,” in *American Environmentalism: Readings in Conversation History*, ed. Roderick Frazier Nash (1968; 3rd ed. rev., New York, 1990), 275–79. Berry argued that the experience of Israel entering the promised land provides a better model than the book of Genesis. Both Callicott and Santmire argue that the question is really one of interpretation or hermeneutics, since the way people read the Bible or tradition affects the environmental message they see in it. J. Baird Callicott, “Genesis Revisited: Murian Musings on the Lynn White Jr. Debate,” *Environmental History Review* 14 (Spring/Summer 1990): 65–90. Santmire wrote: “An ecological hermeneutic of history . . . allow[s] us—if [it does] not indubitably require us—to develop [a positive] ecological reading of biblical faith.” H. Paul Santmire, *The Travail of Nature: The Ambiguous Ecological Promise of Christian Theology* (Philadelphia, 1985), 189. See also 189–218. Susan Power Bratton, “Christian Ecotheology and the Old Testament,” in *Religion and Environmental Crisis*, ed. Eugene C. Hargrove (Athens, GA, 1986), 53–75, draws on the Genesis accounts of the roles of God and Adam in the Creation.

4. See Max Weber, *The Protestant Ethic and the Spirit of Capitalism*, trans. Talcott Parsons (New York, 1930); John Opie, “Renaissance Origins of the Environmental Crisis,” *Environmental Review* 11 (Spring 1987): 2–17; and Richard L. Bushman, *From Puritan to Yankee: Character and the Social Order in Connecticut, 1690–1765* (Cambridge, MA, 1967), esp. 267–88.

5. In this connection, the debate over climax theory is also relevant. See Donald Worster, “Transformations of the Earth: Toward an Agroecological Perspective in History,” *Journal of American History* 76 (March 1990): 1087–1106, esp. 1092–93 and the literature cited in n. 11 on 1093. For an example, see Daniel B. Botkin, *Discordant Harmonies: A New Ecology for the Twenty-first Century* (New York, 1990), 60–62. For a discussion of chaos theory, see James Gleick, *Chaos: Making a New Science* (1987; New York, 1988). I realize that a number of scientists and historians still cling to Frederick E. Clements’s climax vegetation theories, but frankly, these seem untenable to me in the face of the chaos theorists’ arguments. For another discussion of Worster’s view, see “The Ecology of Order and Chaos,” *Environmental History Review* 14 (Spring/Summer 1990): 1–18.

6. Hugh W. Nibley, "Subduing the Earth," chap. in *Nibley on the Timely and Timeless: Classic Essays of Hugh W. Nibley*, Religious Studies Center Monograph series (Provo, UT, 1978), 85–99, and "Brigham Young on the Environment," in *To the Glory of God: Mormon Essays on Great Issues – Environment, Commitment, Love, Peace, Youth, Man*, ed. Truman G. Madsen and Charles D. Tate Jr. (Salt Lake City, 1972), 3–29.

7. Richard H. Jackson, "Righteousness and Environmental Change: The Mormons and the Environment," in *Essays on the American West, 1973–1974*, ed. Thomas G. Alexander, Charles Redd Monographs in Western History, no. 5 (Provo, UT, 1975); Jeanne Kay and Craig J. Brown, "Mormon Beliefs about Land and Natural Resources, 1847–1877," *Journal of Historical Geography* 11 (July 1985): 253–67; Charles S. Peterson, "Small Holding Land Patterns in Utah and the Problem of Forest Watershed Management," *Forest History* 17 (July 1973): 5–13; John B. Wright, *Rocky Mountain Divide: Selling and Saving the West* (Austin, 1993), 243–45; Dan L. Flores, "Agriculture, Mountain Ecology, and the Land Ethic: Phases of the Environmental History of Utah," in *Working on the Range: Essays on the History of Western Land Management and the Environment*, ed. John R. Wunder (Westport, CT, 1985), 164–65, 174.

8. Flores, "Agriculture, Mountain Ecology, and the Land Ethic," 168. For Hyde's speech, see Orson Hyde, "Instructions Concerning Things Temporal and Spiritual . . . October 7, 1865," in *Journal of Discourses*, ed. Brigham Young et al. (Liverpool, 1855–1886), 11:147–51. (Hereafter, the *Journal of Discourses* will be cited as *JD* with appropriate volume, pages, and date following.) Peterson, "Small Holding Land Patterns in Utah," 7; Thomas G. Alexander, *The Rise of Multiple-use Management in the Mountain West: A History of Region 4 of the Forest Service* (Washington DC, 1987), 1–32.

9. In a revelation of March 1832, Smith wrote, "That which is spiritual being in the likeness of that which is temporal; and that which is temporal in the likeness of that which is spiritual; the spirit of man in the likeness of his person as also the spirit of beast and every other creature which God has created." In a sermon on April 8, 1843, Smith taught that beasts have souls and that they would be saved in heaven. Joseph Smith, *History of the Church*, ed. B. H. Roberts, 2nd ed. rev. (Salt Lake City, 1967–69), 5:343–44. For the Native American point of view, see Catherine L. Albanese,

*Nature Religion From the Algonkian Indians to the New Age* (Chicago, 1990), esp. 19–33. See also William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York, 1983), for Native American attitudes toward resource use and their confrontation with Euro-Americans. For the pre-eighteenth-century attitudes and their breakdown, see Botkin, *Discordant Harmonies*, 91–99, 103–5. On the idea of Gaia, see J. E. Lovelock, *Gaia: A New Look at Life on Earth* (Oxford, ENG, 1979).

10. See also section 88 for a more complete elaboration. For a more thorough discussion of these matters, see Nibley, "Subduing the Earth" and "Brigham Young on the Environment."

11. Wilford Woodruff, *Wilford Woodruff's Journal, 1833–1898*, ed. Scott G. Kenney (Midvale, UT, 1983–85), 3:178.

12. Orson Pratt, "Sermon Delivered at Mount Pleasant, 12 November 1879," in *JD*, 21:200–1; Heber C. Kimball, "Discourse Delivered in Salt Lake City, August 2, 1857," in *JD*, 5:137–38; Woodruff, *Wilford Woodruff's Journal*, 3:203.

13. See Nibley, "Subduing the Earth" and "Brigham Young on the Environment"; Jackson, "Righteousness and Environmental Change"; and Kay and Brown, "Mormon Beliefs."

14. William Clayton, *An Intimate Chronicle: The Journals of William Clayton*, ed. George D. Smith (Salt Lake City, 1991), 375; Woodruff, *Wilford Woodruff's Journal*, 3:236; and Hyde, "Instructions Concerning Things Temporal and Spiritual," in *JD*, 11:150.

15. Brigham Young, "Remarks Made by Brigham Young, 4 March 1860," in *JD*, 8:8; "Remarks Made by Brigham Young, 17 May 1868," in *JD*, 12:218; Thomas G. Alexander, *Things in Heaven and Earth: The Life and Times of Wilford Woodruff, A Mormon Prophet* (Salt Lake City, 1991), 140.

16. Peter Skene Ogden, *Peter Skene Ogden's Snake Country Journals, 1824–26*, ed. E. E. Rich and A. M. Johnson, Publications of the Hudson's Bay Record Society (London, 1950), 18, 20–22, 24, 30, 42; Osborne Russell, *Journal of a Trapper*, ed. Aubrey L. Haines (Portland, OR, 1955), 9, 118–22, 123, 125.

17. John C. Frémont, *The Expeditions of John Charles Frémont*, ed. Donald Jackson and Mary Lee Spence (Urbana, 1973), 1:487, 491, 492, 502, 513, 514–15, 697, 702, 2:78.

18. Clayton, *Intimate Chronicle*, 362, 363; Journals of Howard Egan, July 24, 1847, *Western Americana*

Collection, Beinecke Library, Yale University, New Haven, CT; Levi Jackman Journal, July 22, 23, 1847, typescript, Special Collections, Harold B. Lee Library, Brigham Young University, Provo, UT (hereafter cited as "Lee Library"); Woodruff, *Wilford Woodruff's Journal*, 3:233-34, 239. On the Mormon expectations for the region, see Lewis Clark Christian, "A Study of the Mormon Westward Migration Between February 1846 and July 1847 with Emphasis on and Evaluation of the Factors that Led to the Mormons' Choice of the Salt Lake Valley as the Site of Their Initial Colony" (PhD diss., Brigham Young University, 1976).

19. For a discussion of Max Weber's ideas in connection with Salt Lake City, see Thomas G. Alexander and James B. Allen, *Mormons and Gentiles: A History of Salt Lake City* (Boulder, CO, 1984), 3-5. For a general discussion of settlement patterns and development, see Leonard J. Arrington, *Great Basin Kingdom: An Economic History of the Latter-day Saints, 1830-1900* (Cambridge, MA, 1958), esp. 39-63.

20. For a discussion of irrigation development, see George Thomas, *The Development of Institutions Under Irrigation with Special Reference to Early Utah Conditions*, Rural Science Series, ed. L. H. Bailey (New York, 1920). For one of the early reservoir projects, see Leonard J. Arrington and Thomas C. Anderson, "The 'First' Irrigation Reservoir in the United States: The Newton, Utah, Project," *Utah Historical Quarterly* 39 (Summer 1971): 207-23.

21. G. K. Gilbert, "Salt Lake Drainage System," in *Report on the Lands of the Arid Region of the United States, with a More Detailed Account of the Lands of Utah*, ed. John Wesley Powell (1878; reprint, Washington DC, 1879), 115-26; Elwood Mead, *Report of Irrigation Investigations in Utah* (Washington DC, 1904).

22. Hosea Stout, *On the Mormon Frontier: The Diary of Hosea Stout, 1844-1861* (Salt Lake City, 1964), 2:331, 332, 334, 340, 351, 352, 356, 369; John D. Lee, *A Mormon Chronicle: The Diaries of John D. Lee, 1848-1876* (1955; reprint, Salt Lake City, 1983), 1:109-10; Woodruff, *Wilford Woodruff's Journal*, 3:581, 582, 4:287; "Autobiographies of Pioneers," entry for John Haslam Clark, in *Our Pioneer Heritage*, comp. Kate B. Carter (Salt Lake City, 1958-77), 9:425; "George Morris Autobiography, 1823-1891," TMs, Lee Library, 59, 60, 65, 138; Ruth Savage Hilton, ed., "Lorenzo Hill Hatch Journal," mimeograph of TMs (Provo, UT, 1958), 62, 63, 64, 65.

23. For examples of the laws passed making such grants and for operations, see Stout, *Mormon Frontier*, 2:342, 414, 422; Delila Gardner Hughes, *The Life of Archibald Gardner* (West Jordan, UT, 1939), 43, 51-52, 99, 104, 106; Charles S. Peterson and Linda E. Speth, "A History of the Wasatch-Cache National Forest," typescript report for the Wasatch-Cache National Forest, 1980, copy in author's possession, 113, 120, 121, 130; "Heber Robert McBride Autobiography, 1843-1869," TMs, Lee Library, 27; "Walter Ackroyd Autobiography, 1846-1924," photocopy of holograph, Charles Redd Center for Western Studies, Brigham Young University, 48; Orson W. Israelsen, ed., *Utah Pioneering: An Autobiography by Andrew M. Israelsen* (Salt Lake City, 1938), 27, 41, 80, 167; Leonard J. Arrington, *David Eccles: Pioneer Western Industrialist* (Logan, UT, 1975), 58-59; *Utah's First Forest's First 78 Years* (Provo, UT, ca. 1972), 6; Arrington, *Great Basin Kingdom*, 48.

24. Alexander, *Things in Heaven and Earth*, 162; Woodruff, *Wilford Woodruff's Journal*, 4:287, 5:51; Richard F. Burton, *The City of the Saints and Across the Rocky Mountains to California*, ed. Fawn M. Brodie (1861; reprint, New York, 1963), 211, 315; "Diary of Albert F. Potter, 1 July 1902-22 November 1902," TMs, Historical Files, Supervisor's Office, Fishlake National Forest, Richfield, Utah. For an assessment of Potter's work, see Charles S. Peterson, "Albert F. Potter's Wasatch Survey, 1902: A Beginning for Public Management of National Resources in Utah," *Utah Historical Quarterly* 39 (Summer 1971): 238-53, esp. 243-46.

25. On the Walker brothers, see Jonathan Bliss, *Merchants and Miners in Utah: The Walker Brothers and Their Bank* (Salt Lake City, 1983). On the Godbeites, see Ronald W. Walker, "The Godbeite Protest in the Making of Modern Utah" (PhD diss., University of Utah, 1977).

26. Franklin B. Hough, *Report Upon Forestry . . .* [title varies by volume] (Washington DC, 1878-1880, 1882), 1: 594-95.

27. James L. Jacobs, interview by Thomas G. Alexander, 5 and 15 February 1984, TMs, Historical Files, Intermountain Regional Office, Ogden, UT, 39. See also L. J. to George L. Burnett, January 27, 1961, folder: 1-Reference File, Fiftieth Anniversary, Manti Division, 1953, Supervisor's Office, Manti-LaSal National Forest, Price, UT. Although fire can often benefit an ecosystem by clearing old growth, preparing seedbeds for planting, and opening the land to sunlight,

most nineteenth- and early twentieth-century observers criticized burning both by Euro-Americans and Native Americans. Indians had traditionally used fire to drive game and encourage seed bearing plants. In general, Euro-Americans opposed the use of fire, in part because careless travelers often failed to douse campfires and in part because of the destruction of economic values through practices such as those followed by Eccles. Hough, *Report on Forestry*, 2:8, 3:198. For a general study of the use of fire, see Stephen J. Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire* (Princeton, 1982).

28. Hough, *Report Upon Forestry*, 3:5.

29. In 1880 Utah produced 25.8 million board feet of lumber from 107 mills. In 1990 Utah had only 81 mills and produced only 12.1 million board feet. Bureau of the Census, *Compendium of the Tenth Census, 1880*, Part 2 (Washington DC, 1883), 1162–63; Bureau of the Census, *Twelfth Census of the United States, 1900*, Vol. 9: *Manufactures*, Part 3 (Washington DC, 1902), 808–10, 817.

30. Hough, *Report Upon Forestry*, 1:389; L. F. Kneipp, "Utah's Forest Resources: Their Administration, Development and Use," in *Third Report of the State Bureau of Immigration, Labor, and Statistics, 1915–1916* (Salt Lake City, 1917), 176–77.

31. "Charles H. Oliphant Autobiography, 1825–1856," TMs, Mormon Diaries, Lee Library, 10–11. Woodruff, for instance, vented his anger at these Gentile merchants and their relationship with the Mormons during 1856–57. Woodruff, *Wilford Woodruff's Journal*, 4:500–501.

32. Oliphant Autobiography, 10–11, 12–14.

33. "Excerpts from the Diary of William F. Rigby," in Carter, *Our Pioneer Heritage*, 4:257.

34. For an extended discussion of these matters, see Thomas G. Alexander, "Wilford Woodruff, Intellectual Progress, and the Growth of an Amateur Scientific and Technological Tradition in Early Territorial Utah," *Utah Historical Quarterly* 59 (Spring 1991): 164–88. For one example, see Woodruff, *Wilford Woodruff's Journal*, 4:440, 5:41.

35. David B. Madsen and Brigham D. Madsen, "One Man's Meat is Another Man's Poison: A Revisionist View of the Seagull 'Miracle,'" *Nevada Historical Society Quarterly* 30 (Fall 1987): 165–81.

36. David Bitton and Linda P. Wilcox, "Pestiferous Ironclads: The Grasshopper Problem in Pioneer

Utah," *Utah Historical Quarterly* 46 (Fall 1978): 351. Bitton and Wilcox believe that Young's comments about feeding the crickets came tongue in cheek, but given his attitude about the sanctity of life, there may have been at least a little seriousness behind it. At the same time, most Mormon leaders recognized the devastation of the crops and tried to eradicate the crickets and grasshoppers.

37. "Autobiographies of Pioneers," entry for Barbara Gowans Bowen, in Carter, *Our Pioneer Heritage*, 9:399–400; Arrington, *Great Basin Kingdom*, 48–49; "Autobiographies," entry for Charles Sperry, in *Our Pioneer Heritage*, ed. Carter, 9:445.

38. Lee, *Mormon Chronicle*, 1:80, 82, 99–100; Stout, *On the Mormon Frontier*, 2:337, 338.

39. For the statistical information, see "Measures of Economic Changes in Utah, 1847–1947," *Utah Economic and Business Review* 7 (December 1947): 49.

40. For a study of these companies, see Leonard J. Arrington, *Beet Sugar in the West: A History of the Utah-Idaho Sugar Company, 1891–1966* (Seattle, 1966); and J. R. Bachman, *Story of the Amalgamated Sugar Company, 1897–1961* (Caldwell, ID, 1962). For statistical information on the growth of beet sugar production, see "Measures of Economic Changes in Utah," 49.

41. See also Flores, "Agriculture, Mountain Ecology, and the Land Ethic," 172; and "Measures of Economic Changes in Utah," 47. The arithmetic mean increased to 212 acres, but this was skewed by some relatively large farms.

42. Stout, *Mormon Chronicle*, 2:577, 79; Arrington, *Great Basin Kingdom*, 150, esp. n. 73.

43. Charles E. Hughes, "An Investigation of Smelting in the Salt Lake Valley Prior to 1900," a packet prepared for the law firm of Parsons, Behle, and Latimer by Timpanogos Research Associates, January 18, 1990, copy in author's possession.

44. Charles H. Fulton, *Metallurgical Smoke*, Department of the Interior, Bureau of Mines, Bulletin 84 (Washington, DC, 1915), 82–83, reproduced in Hughes, "Investigation of Smelting."

45. Letter to Editor, *Outlook*, March 17, 1915, 652–53. See also George W. Snow, "Smoke Elimination in Salt Lake City," *American City*, September 1915, 196–97.

46. "Measures of Economic Changes in Utah," 51.

47. For a detailed discussion of this process, see Alexander, *Things in Heaven and Earth*, 235–87, 307–32.

48. For a discussion of the changes, see Thomas G. Alexander, *Mormonism in Transition: A History of the Latter-day Saints, 1890–1930* (Urbana, 1986).

49. For a discussion of this concept, see Sherry H. Olson, *The Depletion Myth: A History of Railroad Use of Timber* (Cambridge, MA, 1971); and Harold K. Steen, *The U.S. Forest Service: A History* (Seattle, 1976).

50. Thomas G. Alexander, "Senator Reed Smoot and Western Land Policy, 1905–1920," *Arizona and the West* 13 (Autumn 1971): 246.

51. Joseph F. Smith, *Gospel Doctrine: Sermons and Writings of Joseph F. Smith*, ed. John A. Widtsoe et al. (1919; 13th ed., Salt Lake City, 1963), 265–66.

52. For a more thorough treatment of activities of these women and men in Salt Lake City, see Thomas G. Alexander, "Women, Men, and the Environment in Salt Lake City, 1890–1930," Karl G. Maeser Distinguished Faculty Lecture, Brigham Young University, February 16, 1994, manuscript in author's possession.

53. Alexander, "Senator Reed Smoot," 246. After inspections such as those conducted by Albert Potter, the federal government set aside a number of small forest reserves, later consolidating them in the Wasatch Oasis into the Cache, Wasatch, and Uinta National Forests. Alexander, *Rise of Multiple-Use Management*, 18–20, 22–23.

54. Alexander, *Rise of Multiple-Use Management*, 24–25, 41–45, and 79–99.

55. For a discussion of this matter, see Stanford J. Layton, *To No Privileged Class: The Rationalization of Homesteading and Rural Life in the Early Twentieth Century American West* (Provo, UT, 1988), 84–87.

56. For a general treatment of the air pollution problem, see Walter E. Pittman Jr., "The Smoke Abatement Campaign in Salt Lake City, 1890–1925," *Locus* 2 (Fall 1989): 69–78.

57. Alexander and Allen, *Mormons and Gentiles*, 180–82.

58. Alexander and Allen, *Mormons and Gentiles*, 108–9.

59. Wendell Berry, *The Unsettling of America: Culture and Agriculture* (San Francisco, 1977). There is some controversy in the literature about the degree to which the thought of Henry David Thoreau, John Muir, and Aldo Leopold should be considered theological. See Dennis Christopher Williams, "The Range of Light: John Muir, Christianity and Nature in the Post Darwinian World" (PhD diss., Texas Tech University, 1992); Mark Richard Stoll, "Protestantism, Capitalism, and Nature in the United States" (PhD diss., University of Texas, 1993); and Gary Todd Brown, "From Walden Pond to the Desert Southwest: An Inquiry into the Similarities and Differences between Henry David Thoreau and Edward Abbey" (master's thesis, Brigham Young University, 1992).

60. By contrast, farmers in Montana were not so fortunate, since the courts there ruled in favor of polluting smelters instead of protecting the environment. See Gordon Morris Bakken, "Was There Arsenic in the Air? Anaconda Versus the Farms of Deer Lodge Valley," *Montana: The Magazine of Western History* 41 (Summer 1991): 30–41.

61. See, for instance, Max Weber, *From Max Weber: Essays in Sociology*, trans. and ed. H. H. Gerth and C. Wright Mills (New York, 1946), 303–13; Emile Durkheim, *Durkheim on Religion: A Selection of Readings with Bibliographies*, ed. W. S. F. Pickering, trans. Jacqueline Redding and W. S. F. Pickering (London, 1975).

62. Stan L. Albrecht and Tim B. Heaton, "Secularization, Higher Education, and Religiosity," *Review of Religious Research* 26 (September 1984): 43–58.

63. Robert F. Berkhofer Jr., *A Behavioral Approach to Historical Analysis* (New York, 1969), 98–117.