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The Desert Shall Blossom As the Rose : Pioneering Irrigation / John A. Widtsoe

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The Desert Shall Blossom as the Rose

Pioneering Irrigation

By J. Michael Hunter

On 24 July 1847, Brigham Young and the rear company of pioneers made their way along a road freshly cleared of underbrush to the mouth of Emigration Canyon. In his carriage, Wilford Woodruff drove an ailing Brigham Young to a point where they could view the entire Salt Lake Valley. Wilford Woodruff said, “While gazing upon the scene before us, he [Brigham Young] was enwrapped in vision for several minutes. He had seen the valley before in vision, and upon this occasion he saw the future glory of Zion and of Israel, as they would be, planted in the valleys of these mountains.” In his journal under that date, Wilford Woodruff wrote, “Thoughts of pleasing meditations ran in rapid succession through our minds while we contemplated that [in] not many years the House of God would stand upon the top of the mountains while the valleys would be converted into orchard, vineyard, gardens and fields by the inhabitants of Zion and the standard be unfurled for the nations to gather there to.”

When the vision had passed, Brigham Young said, “It is enough. This is the right place. Drive on.”

As the pioneers began to settle in this the “right place,” they discovered a new challenge—fulfilling the biblical prophecy of Isaiah, “The desert shall rejoice, and blossom as the rose” (Isaiah 35:1). Most of the Mormon pioneers had some experience with farming in more humid areas before moving into the Salt Lake Valley in 1847. However, growing crops in the dry climate of the Great Basin would be a challenge for them. Wilford Woodruff recalled: “We had a desire to try the soil to know that it could produce. Of course all this company—nearly the whole of us were born and raised in the New England States. . . Of course we had no experience in irrigation. We pitched our camp, put some teams onto our plows . . . and undertook to plow the earth, but found neither wood nor iron were strong enough to make furrows here in this hard soil. It was like adamant. Of course we had to turn water on it. We would have done anything. We went and turned out the City Creek. We turned it over our ground. Come to put our teams on it, of course they sank down to their bellies in the mud. We had to wait until this land dried enough to hold our teams up. We then plowed our land.”

Thus Wilford Woodruff described the first efforts of the Utah pioneers at irrigation. It consisted of building a diversion dam across the shallow and narrow (perhaps eight feet wide) City Creek. The pioneers then scratched a ditch a few hundred feet long to a spot selected for the planting of potatoes. George Q. Cannon said, “We went at it as best we could, and took the water out by the simplest means in our reach, and were successful in raising at least part of a crop.”

The pioneers of 1847 did not necessarily consider their new home in the Salt Lake Valley a desert. Concerning their first
When Brigham Young returned to the Salt Lake Valley, he realized that cooperative efforts would be necessary if the Saints were to survive. Constructing dams, digging ditches and canals, and distributing water were all tasks requiring a great deal of coordinated labor. He taught the Saints with vision of what their valley could become, “The Lord wished us to gather to this place,” Brigham Young said. “He wished us to cultivate the earth, and make these valleys like the Garden of Eden, and make all the improvements in our power, and build a temple as soon as circumstances would permit.” He also said: “I have promised the people South, that if they will cultivate the ground and ask for the blessings of God upon it, the desert shall blossom as a rose, and every water shall spring up on the ponded 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 you settle on these desert and parched plains, upon the sides of these rugged and sterile 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.”

Brigham Young realized that it would take more than physical exertion to survive their new location; it would also take spiritual fortitude. With so little water, pioneer Saints needed to put aside selfishness and greed and develop a sense of neighborly love and community effort. He said, “There shall be no private ownership of the streams that come out of the canyons, nor the timber that grows on the hills. These belong to the people: all the people.”

At first local bishops were often put in charge of distributing labor and resources for the building of canals and ditches. Bishops had also distributed water based on their judgment of the needs of the individual irrigator. In 1852 the territorial legislature granted authority to the county courts to control and distribute the use of water and other natural resources. In 1865 the territorial legislature granted individual irrigators the authority to organize into irrigation districts. Districts could then levy water or canal assessments on their members for the operation and maintenance of their canals. In 1867, irrigation districts were granted the power to form irrigation companies. Watermasters, who were appointed to coordinate the distribution of water, became highly respected in their communities.

The early Utah pioneers built their homes in a central village, with farming lands located outside of the settlement. Individual farms were small, 10 to 20 acres, and geared toward supporting individual families rather than the production of produce for the commercial market. The farming village increased the opportunities for social contact needed to plan and operate cooperative irrigation projects. During the early years, pioneer efforts at irrigation would consist of diversion dams and canals that could be built by a few men in a short time. Early canals had small carrying capacities and extended only two or three miles. While construction equipment generally consisted of teams and plows, the pioneers used a device called a “go-devil” for larger projects. The “go-devil” consisted of heavy planks or logs bolted together in the shape of an A. Pulled by a pair of draft animals, it dug deeply into the soil with its pointed end, throwing dirt up and out at the sides.

The Utah pioneers went through a period of trial and error as they learned how much water a given type of soil or seed would need. They experimented with corrugations and flooding in order to promote maximum yields. They experimented with slope, soil texture, and mineral content. They experimented with new varieties of field crops.

In 1880 the territorial legislature granted the county selectmen the power to adjudicate water disputes, and for the first time in Utah, irrigation rights became personal property. Farmers began to move from the small, self-sufficient farms to larger more productive farms for commercial gain. Many new canals were built during this period. The newer canals were higher up on the foothills; they were also longer and deeper with larger carrying capacities. Irrigation companies looked to the federal government and eastern entrepreneurs to finance large irrigation projects. However, the farmers of Wasatch and Sanpete counties constructed two tunnels and diversion canals to divert water from the Colorado River drainage system to the Great Basin drainage system without using outside resources.

All of this pioneer cooperative effort had significant results. By 1860, Utah had become the most prosperous western territory with improved farmlands valued at over $1 million, manufacturers valued at nearly $1 million, and its real and personal property at nearly $5.6 million. By 1865, the pioneers had dug 277 canals, and by 1895, the irrigated lands of Utah had increased to 417,000 acres.
The Utah pioneers did more than just survive in the dry climate of the Great Basin—they thrived, creating an oasis in an otherwise desolate wilderness.

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Notes

3. Quoted in “Pioneers’ Day,” 2.
5. Quoted in ibid.
9. “Pulp and Paper History of the Church of Jesus Christ of Latter-day Saints,” 9 September 1837, Church History Library, Family and Church History Department, The Church of Jesus Christ of Latter-day Saints, Salt Lake City, Utah.
15. Ibid., 9.
18. Arrington and May, 8.
21. Ibid.
22. Falls, 278.
23. Falls, 278.

Memories of Irrigation

By Jennifer Adams

Water means richness and new growth. Water means food. Water means power. Water, as it has from the beginning of time, means life.

If you have ever lived close to the land, you know the quiet thrill of open space, the rich wetness of pasture, the soft, pungent smell of new-mown hay. My great aunt Grace told my father from the time he was a boy that there is beauty in plowed ground, if you look for it.” My father must have taught me to see, for I always love to drive into west Layton in the late afternoon, when the warm, patterned sun soaks the lines of turned earth waiting to be planted. The texture and depth of color in the soil—the strength and richness of it—fills me with a peace and satisfaction that is hard to explain. Those of us whose ancestors walked the Plains and settled Utah and planted these fields have a connection to this land and a love for it that ties us to each other as well as to our past.

My great grandfather, Joseph Samuel Adams, helped settle Layton, Utah. My family still has thirty-four acres of beautiful pasture—what is left of his homestead. My father lives in the red brick Victorian home that Joseph Samuel built in 1889. This past summer my father helped his dad restore the log cabin that the family lived in while the main house was built. I loved growing up on that land.

I still remember the Saturdays my dad would irrigate when I was young. My brother and I would take off our shoes and socks and hike up on our pants to splash in the water. The water would run down the land, covering the whole lawn, covering our feet well over our ankles. We’d play tag, float sticks and goose feathers, have races. Our feet would get so cold in the wet, still grass, and we could smell the wild mint that grew on the ditch banks.

I understood even then the importance of the water, the significance of our family’s water shares. There would be occasional disputes with the city trying to buy out our shares, and my uncle Sherm and father would still get up four o’clock in the morning to go and put in the headgate to change the water. Once in a while someone would forget to take their turn at irrigating. They would find that the water and our ditches would overflow. You’d see the precious water spill down the end of the property and across the road. My brother and I loved the ditches on the property. My father built us a rope swing over the ditch in the north pasture. He tied knots in a green-and-white nylon rope so we could hold on, tied it to a tree on the lower bank, and put a strong anchor string from there. We would hold the rope tightly, close our eyes, and fling ourselves across the ditch from high up to a bank in a wide arc and back again. My dad had tied a cowbell in the top of the tree, and our weight on the rope pulleys made the bell chime softly.

We were not the only ones to enjoy the open irrigation ditch. For years now the Canadian geese have stopped to rest from their annual migration. They rest there about two weeks. Each year the number has grown—there is just not enough open space left anymore. About three years ago we counted eight hundred geese. They drink from the ditch and sleep in the pasture. Their call is a chirping beautiful. I love to watch them, and I always feel sad when they leave, for I feel I am losing something so beautiful and some small part of me worries that they will not come back again.

My family is selling the land. I ache with the loss of it. My aunt and uncle have lived there for seventy years. The issues of inheritance are complicated and they want to get it settled and get their affairs in order. I can understand that—I really can—and their thoughtful, measured approach to selling it, their careful consideration of each other’s feelings, has made me proud of them and made the loss somewhat easier to bear.

My dad will be keeping his portion of the land. His land will be around the red brick house. He will keep his water shares. And our irrigation ditches will remain open. My children will play there, floating toy sticks of sticks and feathers, swimming across the ditch, their feet dangling. The geese will still come. The water will still flow.
been named director of the Experiment Station, felt that Kerr’s aggressive style of leadership sacrificed the agricultural curriculum to the expansion of other fields of study. Widtsoe resigned, was hired at Brigham Young University in Provo, and convinced several of his fellow Agricultural College professors to follow him. He attacked Kerr’s activities, as well as the college itself, in the Utah Farmer. Other, more serious attacks followed. The result was that Governor Cutler proposed the restriction of teaching or training in certain academic areas at the Agricultural College that would compete with the University of Utah. A bill was signed into law on 20 March 1907, restricting the duplication of courses between the universities. Kerr resigned in 1907 and was succeeded by John A. Widtsoe himself. Widtsoe stuck to the restricted curriculum, but at the same time dedicated his efforts to the expansion of the agricultural studies of the college and its Experiment Station.

**THE EXPERIMENT STATION AND EXTENSION SERVICE**

As home to the Utah Agricultural Experiment Station, the university “was founded with the idea that it would take its discoveries from the campus to the people.”10

The college’s claim that the “state is our campus” emphasized the role the school intended to fill for the state. One of the first campus buildings for the college was the Agricultural Experiment Station Building, built between Old Main and the university president’s house. Not long after, the first experiment plots were created northwest of Old Main. In 1890, its first year in operation, the Experiment Station conducted thirty-six studies and published four bulletins.

The first focus of the Experiment Station was water, with the experiments on dry-farming, which is farming with low rainfall and no irrigation. John A. Widtsoe said, “We did not realize we were entering one of the least considered subjects in modern agriculture.”11 A greenhouse was built where water use was strictly monitored. The scientists discovered that the common way of irrigating wasted water and that excessive irrigating ruined crops and soils. By using water wisely, more land could be irrigated and farmed.12 In 1901, six branch and farm experiments were established throughout the state to “perfect dry-farm agriculture and to test the geographic limits of its applicability.”13

Widtsoe published, again through Macmillan, * Principles of Irrigation Practice*. The aim of the book was to provide farmers with a guide to modern irrigation practice written in simple language. The book became an important standard in irrigation farming.

Widtsoe became the first director of the Utah Experiment Station and president of Utah State Agricultural College (now Utah State University). He was appointed principal of agriculture at Brigham Young University and later became president of the University of Utah.

Having distinguished himself as a leading authority in the field of irrigation, he was appointed to the Hoover Commission, which was charged with management of the Colorado River. He spent two years in Washington, D.C., reorganizing the Federal Bureau of Reclamation.

Widtsoe’s unique contributions to irrigation and reclamation are honored today through the John A. Widtsoe Building, home to Brigham Young University’s Department of Biology and Agriculture, and the newly completed $28 million John A. Widtsoe Chemistry Building at Utah State University. Still standing today is the John Widtsoe Building, one of the very first buildings on the University of Utah campus. It is part of the President’s Circle in the heart of campus.

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**John A. Widtsoe**

By J. Michael Hunter

John A. Widtsoe was born 31 January 1872 on the tiny island of Froyen, Norway, to John A. Widtsoe and Anna Karine Daarden. When John was six years old, his father died, leaving a wife and two sons. After being taught by Latter-day Saint missionaries, John’s mother joined the Church and soon found herself ostracized from society. When John was eleven years old, his mother took the family to Utah hoping for better opportunities for her two sons.

John’s father had been a schoolmaster, and his mother Karine Widtsoe was dedicated to seeing that her children received an excellent education. John A. Widtsoe distinguished himself at Brigham Young University and graduated from Harvard University. He went on to receive master’s and Ph.D. degrees at one of the world’s highest rated universities: Goettingen in Germany.

John A. Widtsoe became an international authority on soil chemistry, irrigation, and dry-farming. In 1911, he published through Macmillan in New York his widely acclaimed *Dry Farming*. It was praised by the American Academy of Political and Social Science and by the journal Nature. In 1914, Dr. Widtsoe and Professor Lewis A. Merrill tested soils from many different locations in Utah and tallied with farmers. Test results led to publications, including Widtsoe’s classic *Dry Farming, A System of Agriculture for Countries under Low Rainfall*.

At first farmers resisted learning about agriculture from “book farmers,” Dr. Widtsoe wrote, but the research effectively established the parameters of dry-farming. In 1907 Utah had 93,799 acres of wheat that were mostly irrigated acres; but by 1915 there were mostly dry-farmed acres.

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**Bibliography**

