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The Development and Failure of
Historic Agricultural Communities of Utah
A Case Study of Johns Valley, Utah

A Thesis

Presented to the
Department of Geography
Brigham Young University

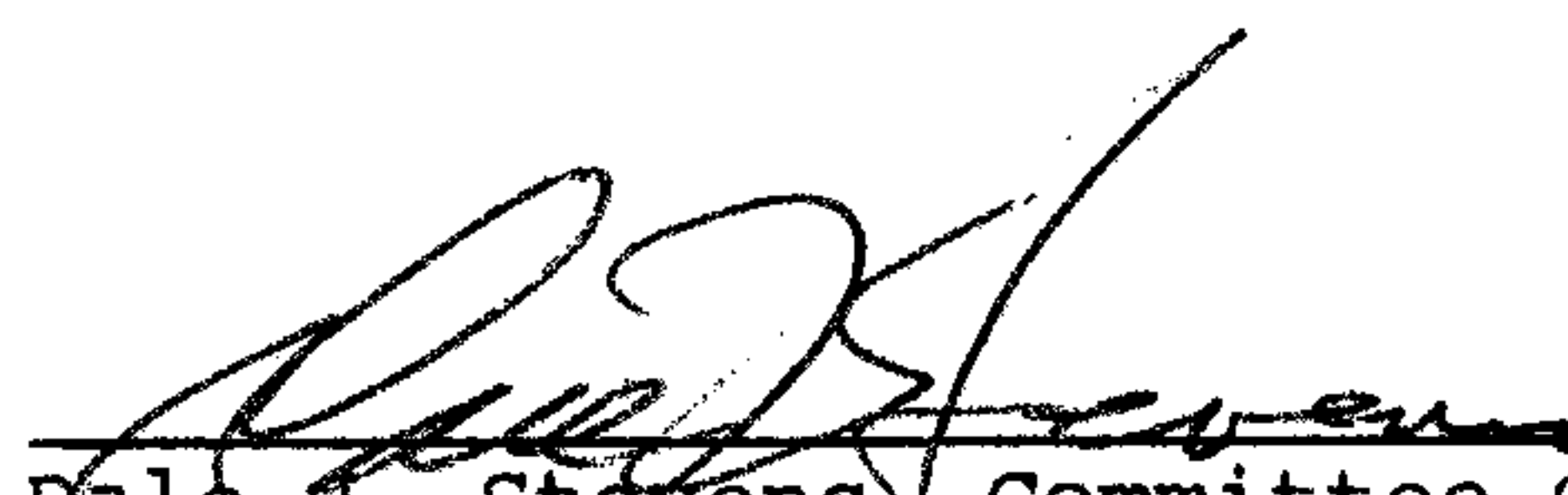
In Partial Fulfillment
of the Requirements for the Degree
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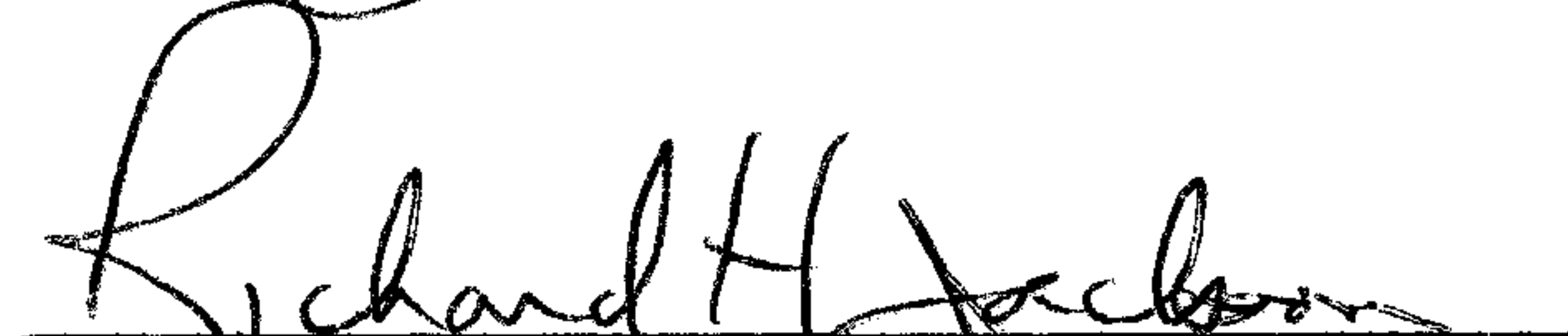
by

Wayne R. Shelley

August 1989

This thesis, by Wayne R. Shelley is accepted in its present form by the Department of Geography of Brigham Young University as satisfying the thesis requirement for the degree of Master of Science.


Dale J. Stevens, Committee Chairman


Richard H. Jackson, Committee Member

12th July 1989
Date



Dale J. Stevens, Department Chairman

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INTRODUCTION

Many agricultural communities have developed in Utah since the first settlement, but many no longer exist today. Some of these early communities experienced a "boom and bust," while others struggled for several years and were eventually abandoned. Johns Valley is a good example of these historic communities, as it experienced rapid growth and times of success and prosperity, yet it struggled and was eventually abandoned.

The situation in Johns Valley, from its early settlement to its demise, demonstrates the hope of the people who settled there and their efforts to make Johns Valley a productive and successful area. History also shows the growth of the area and the development of communities, with schools, churches, businesses, and other institutions--as was the case with most historic agricultural communities of Utah. Despite the hope and hard work, these agricultural communities could not overcome the environment, or other factors that led to their demise.

Dry farming was the main source of economic activity in Johns Valley and farmers had to rely upon adequate precipitation for crop growth. Dry farming is a technique often practiced in drier climates where irrigation is not readily available. Such areas do not have adequate precipitation in a single year, but in consecutive years there

is often sufficient moisture for crop production. The main objective in dry farming is to maintain the soil in such a way that the soil will absorb and retain as much water as possible. The primary technique of dry farming is to allow the soil to remain fallow every other year. This practice allows the soil to store up water for two years so that there will be sufficient water for one year of crops.

Regardless of the hope and efforts of the farmers in Johns Valley, they too could not overcome the environment. Annual precipitation was often insufficient for dry farming in Johns Valley. Also, the erratic nature of the precipitation added to the downfall of farming activity in the valley, as adequate precipitation could not be relied upon from year to year or from month to month. Additionally, with Johns Valley being located 7,500 feet above mean sea level, the growing season was often too short to adequately allow crops to mature and produce a good yield. Other factors perhaps added to the discouragement of the people of Johns Valley, but the insufficient and erratic nature of the precipitation, coupled with the short growing season, were major factors in the abandonment of the area. The people of the valley voted to leave the area and sell their land and farms to the federal government.

HISTORICAL AGRICULTURAL COMMUNITIES OF UTAH

During the early settlement of Utah, most towns were established around agricultural activities. Some also developed around mining and railroad functions, but not all these towns continue to exist today. It is easy to understand why mining and railroad towns developed and why they were abandoned, but for agricultural towns they were not all established for the same reason, nor were they abandoned for the same reason.

WHY AGRICULTURAL COMMUNITIES WERE SETTLED

One of the most direct, and most common, reason for settlement of many agricultural communities in Utah was the "call" by leaders of The Church of Jesus Christ of Latter-day Saints. The call was a request by Church leaders for several families to settle a new area. Eugene E. Campbell stated that "these calls were received as revelations from God, and even in some cases they were even designated as missions" (Poll 1978). These calls were a part of the Mormon expansion and were made from the time the Mormon Pioneers first settled in the Great Salt Lake Valley until Utah became a state in 1896.

Another important factor in the settlement of agricultural communities was the desire of the "Great American Dream" - the

opportunity to have freedom and equality. As Jacob Barney settled in a new area of southern Utah, he stated, "...many people went there with the hope of ...the chance to make a better living for themselves ..." (Ford 1971). Thus, it was the desire of many to obtain their own land and develop it as they wished, hoping to have success and provide a more comfortable life for themselves and their families.

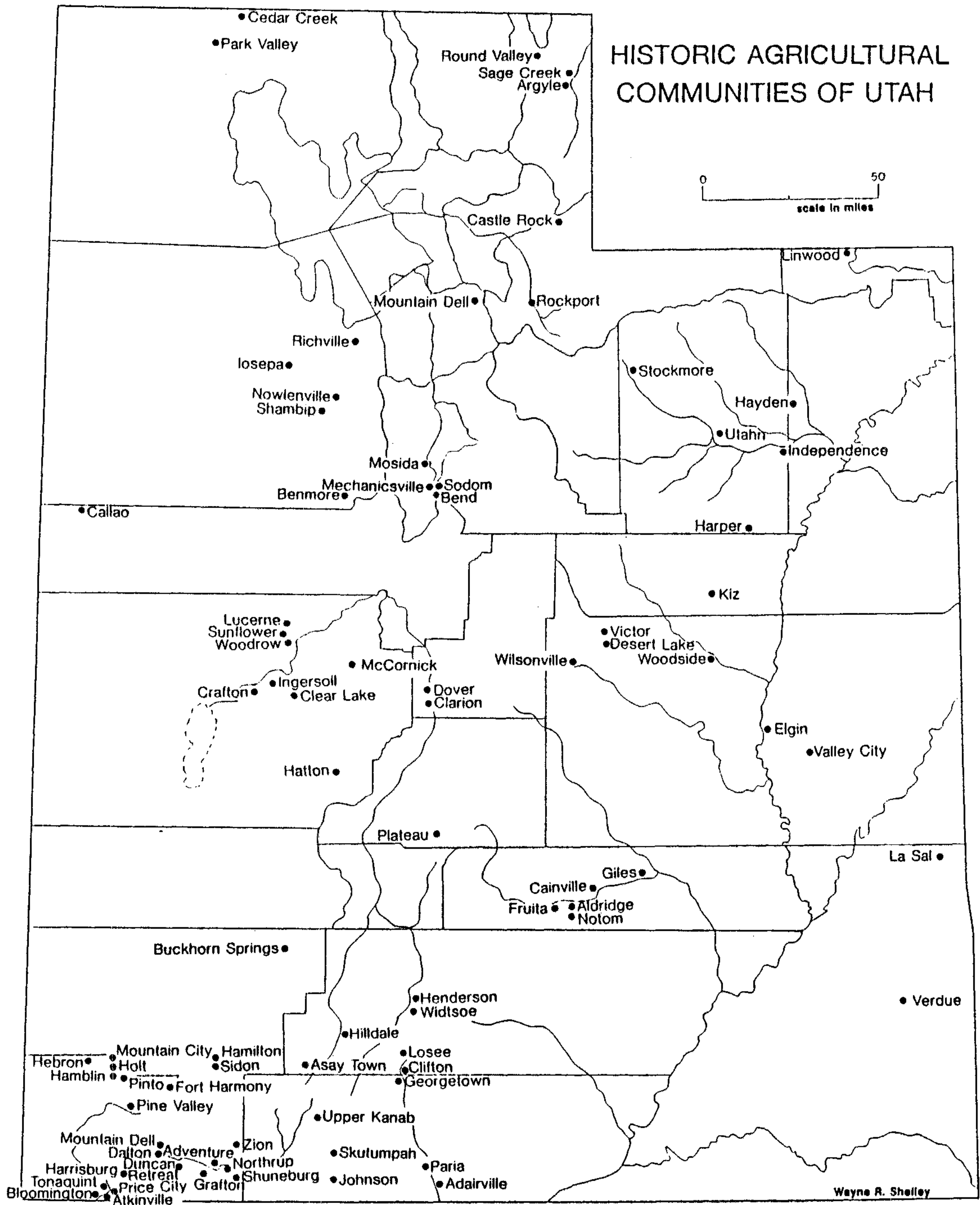
The government was also helpful in developing the uninhabited lands of the West through the Homestead Act of 1862. This act provided people the opportunity to obtain up to 160 acres of free or inexpensive land. To obtain this land, one had to be the head of a family, at least 21 years of age, and a citizen of the United States. Also, to obtain the land free, this individual had to live on the land and cultivate it for at least five years, or they could pay \$1.25 per acre. In 1909, this act was changed to the Enlarged Homestead Act. This change made it possible for an individual to obtain 320 acres of land, under the same conditions. Again, the act was modified in 1916, with the Stock-Raising Act. This new addition allowed one to obtain up to 640 acres of land to graze livestock. Often, though, this law was abused as farmers would obtain the land and grow fields of grain on part or all of the land. Finally, in 1934, with the Taylor Grazing Act, homesteading was discontinued (except in Alaska), and the remaining public lands were maintained by the government.

In 1877, the government also established the Desert Land Act. This act allowed an individual the opportunity to obtain an unlimited amount of land at the cost of \$1.25 per acre if they "would irrigate it within three years after filing" (Hibbard 1965). Due to misuse, the

act was changed in 1891 to where one could only obtain 320 acres. In 1894, the Carey Act again changed the Desert Land Act by granting land to specific states (Utah being one of them) with the charge for each state to direct the settlement, irrigation, and cultivation of the land. With the Reclamation Act of 1902, government took charge in reclaiming the land and no longer provided land for private use under the Desert Land Acts.

WHY HISTORICAL AGRICULTURAL COMMUNITIES FAILED

Over eighty agriculture communities in Utah failed from the time the first pioneers came into Utah until the early 1900's (see map 1). Many were established as part of the Mormon expansion, while others developed as a result of that "Great American Dream." The reason for their failure, though, is diverse. Each area of development had problems, such as flooding, poor soils, lack of water, too short of a growing season, isolation and transportation difficulties, insufficient forage for livestock, Indians troubles, and perhaps more. Examples of such problems occurred when several agriculture communities settled along rivers to use the water for irrigation. Too many times though, the rivers would flood as a result of spring run-off, or more particularly, flashfloods. This was the case with many of the communities that tried to settle along the Virgin River in Washington County or the towns along the Fremont River in Wayne County. Conversely, several small areas were settled in Millard County under the Desert Land Act that, despite years of hard work, failed because there just was not enough water to develop the land. Other examples



can be shown for each area and each town, for each settlement had its own reasons for being settled and its own reasons that caused the people to abandon the area.

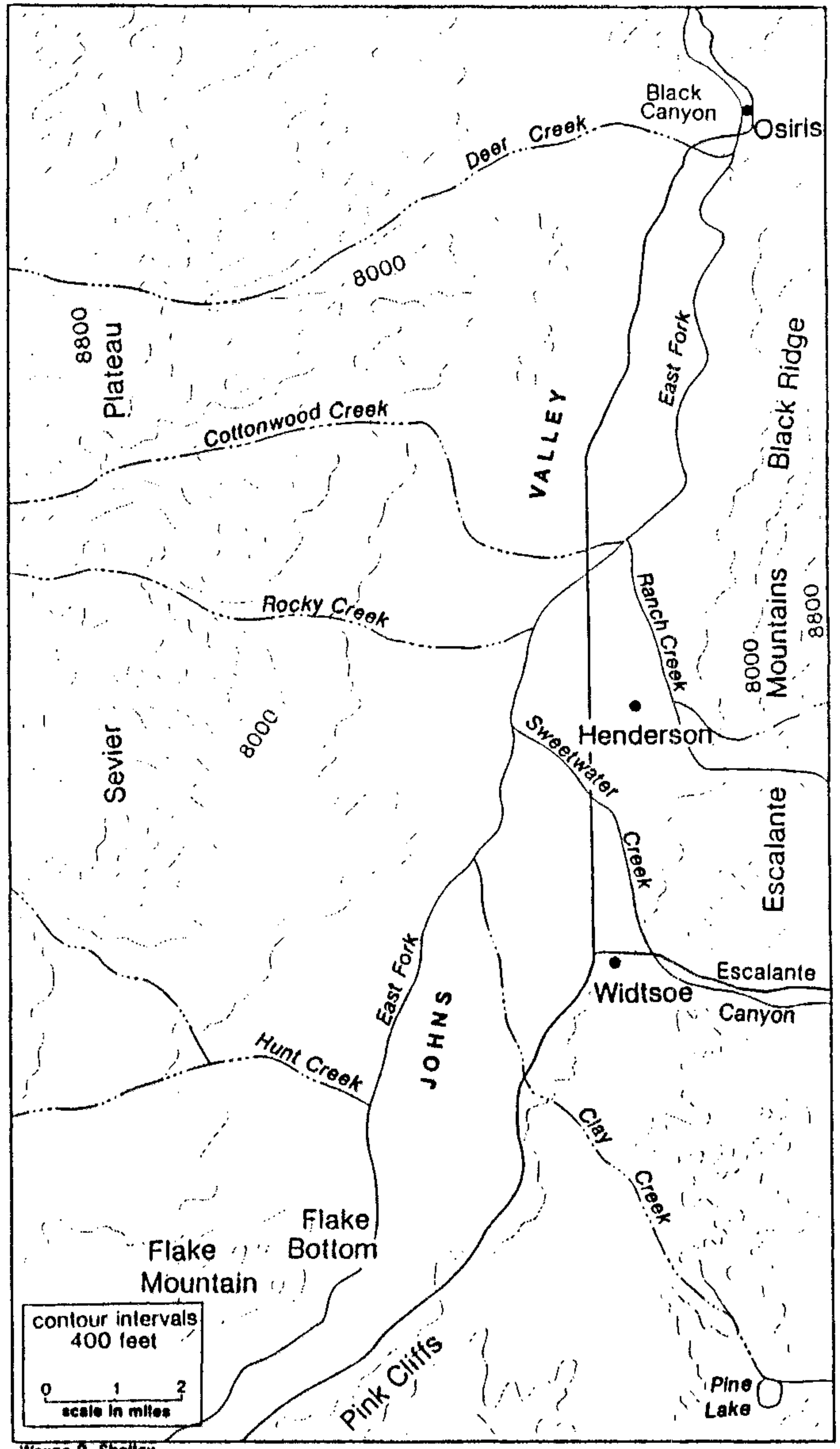
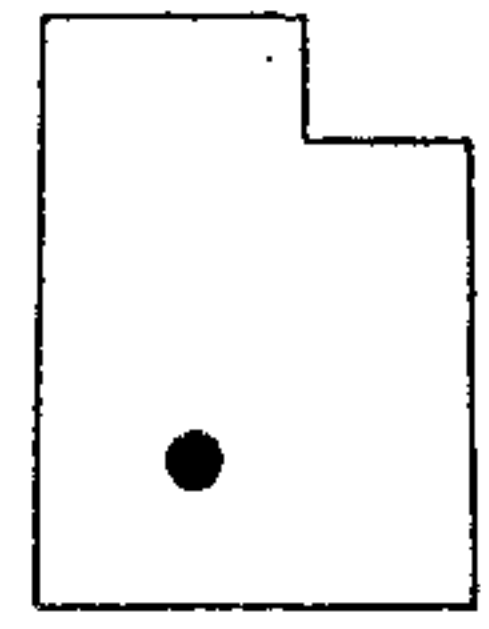
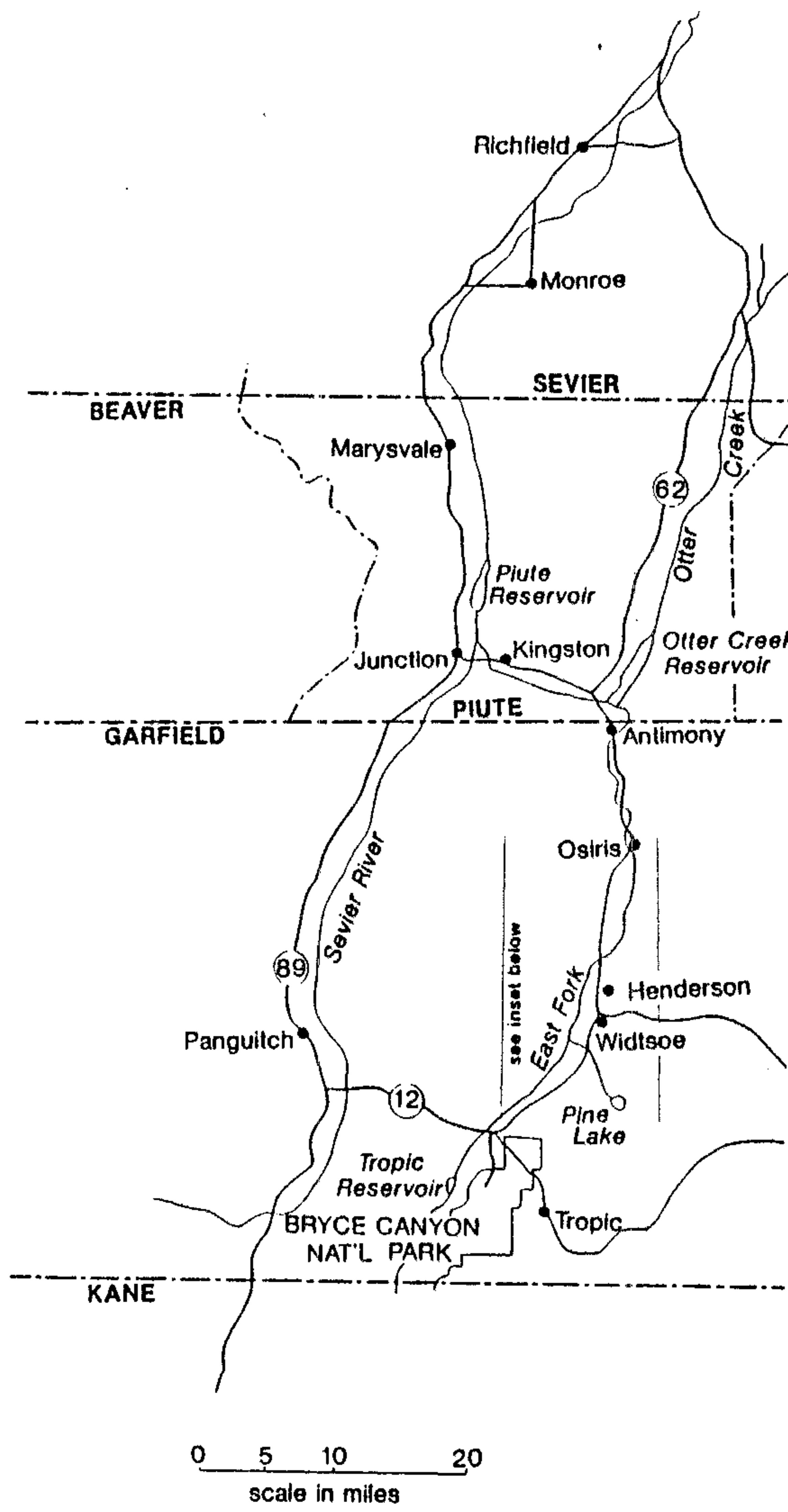
Johns Valley developed on its own, it was not a part of the Mormon expansion, but people came into Johns Valley with the hope of "making a better living." As with most historic agricultural communities, Johns Valley had its own unique problems that caused it to fail. Most unique about its demise was the way it ended, that is, the people took a vote to abandon the area - their farms and their houses. They voted to have the federal government buy up their property and help them resettle somewhere else.

DESCRIPTION OF JOHNS VALLEY

Johns Valley is located in Garfield County, just north of Bryce Canyon National Park (see map 2). The valley's elevation averages 7,500 feet above mean sea level. The valley extends in a north - south direction about twenty-one miles. From the Pansaugunt Plateau at the south, the valley gently slopes northward, with a grade of less than one-half of a percent, to where it narrows into Black Canyon; the valley's narrowest area. At the upper end of the valley, to the south, the valley is only one and one-half to two miles wide as it narrows between Flake Mountain on the east and the Pink Cliffs to the west. The rest of the valley is five to six miles wide.

Johns Valley is bound on the east by the Escalante Mountains, which rise over 10,000 feet and one peak, Barney Top, is 10,450 feet above sea level. On the west, the valley is bound by the Sevier Plateau, and has its highest peak, Mount Dutton, at 11,036 feet. From the base of these mountains, the valley floor gently slopes toward the center of the valley, at the East Fork River at a one to two percent grade. At the southern end of the valley, north of Flake Mountain, the valley slopes at a two percent grade from the Sevier Plateau, while the slope is only one percent from the Escalante Mountains. As the valley extends northward, the degree of slope reverses, with the slope from

LOCATION OF JOHNS VALLEY
IN SOUTH-CENTRAL UTAH



the Sevier Plateau being one percent, while the slope from the Escalante Mountains increases to two percent.

East Fork Sevier River (commonly referred to as just East Fork) flows the entire length of Johns Valley. The river has its headwaters on the Pansaugunt Plateau and flows northward through Johns Valley and Black Canyon and eventually joins the Sevier River near the location of Piute Reservoir. At the southern end of Johns Valley, East Fork flows at the base of Flake Mountain. It continues flowing through the middle of Johns Valley in a north-northeast direction. Near the south end of the valley the river flows along the base of the Black Ridge of the Escalante Mountains and into Black Canyon.

Various tributary streams, most intermittent, flow into East Fork from the Sevier Plateau and the Escalante Mountains. Some of the main streams that flow off the Sevier Plateau include Mud Spring Creek, Hunt Creek, Rocky Creek, Cottonwood Creek, and Deer Creek. Those flowing from the Escalante Mountains include Clay Creek, South Creek, Sweetwater Creek, Birch Creek, Horse Creek, and Ranch Creek.

The vegetation in Johns Valley today consists mainly of grasses and brush, such as june grass, Indian ricegrass, cheat grass, blue bunchgrass, dryland sedge, bitterbrush, rabbitbrush, sagebrush, shadscale, and Russian thistle, with an occasional juniper tree. Along the foothills of the Sevier Plateau and the Escalante Mountains, more juniper are found, along with gambel oak, chokecherry, serviceberry, and pinyon pine trees. At higher elevations in the mountains, ponderosa pine, yellow pine, Douglas fir, and some aspen are found.

Soils of the valley consist of mollisols and entisols. Mollisols

are often dark in color and contain a thick humus layer. The humus layer, which is made up of dead and decaying plant and animal matter, provides a natural fertilizer and helps in seed germination and plant growth. Mollisols, therefore, are considered the most productive and best developed soils. Entisols, on the other, are the least developed of all soils. They are found in various shades and colors and occur near rivers and streams, and along the foothills on alluvial fans.

The climate of Johns Valley is a steppe (BSk) climate, which is semi-arid and has cold winters. The annual average temperature is 43.9°F (see table 1). The summers are warm, with July being the warmest month, averaging 64.7°F. The extreme high temperature of 92°F occurred in July of 1931. The winters are quite cold, as the temperatures of December, January, and February all average below freezing, at 25.0°F, 23.1°F, and 27.4°F respectively. Each year, temperatures drop below 0°F during these winter months, with an extreme of -22°F in January of 1933.

Annual precipitation of Johns Valley averages 10.53 inches (see table 1). Most months average less than one inch of precipitation, with June being the driest month, averaging 0.39 inch. July, August, and September all average more than one inch, with July being the wettest month, averaging 1.65 inches. The extreme high precipitation month was August of 1924, when 4.06 inches fell. There are several months where no precipitation fell, and several more where only a trace of precipitation has been recorded (see Appendix).

With Utah (and Johns Valley) being located in the mid-latitudes, precipitation from late fall to spring is dominated by fronts and low

TABLE 1. Monthly precipitation averages and monthly temperature averages for Widtsoe, 1914 - 1935, with other climatological facts.

<u>MONTH</u>	<u>PRECIPITATION</u>	<u>TEMPERATURE</u>
JAN	0.70"	23.1°
FEB	0.87"	27.4°
MAR	0.67"	32.9°
APR	0.75"	39.9°
MAY	0.61"	48.7°
JUN	0.39"	58.3°
JUL	1.65"	64.7°
AUG	1.51"	62.9°
SEP	1.19"	54.3°
OCT	0.88"	45.3°
NOV	0.62"	37.2°
DEC	<u>0.69"</u>	<u>25.0°</u>
YEAR	<u>10.53"</u>	<u>43.9°</u>

Extreme High Temperature: 92°F - July, 1931
 Extreme Low Temperature: -22°F - January, 1933

Hottest Month: July at 64.7°F
 Coldest Month: January at 23.1°F

Frost Free Season: June 8 to September 11, a total of 95 days

Extreme Month of Precipitation: 4.06" - August, 1925

Wettest Month: July at 1.65"
 Driest Month: June at 0.39"

pressure cells moving across the area from the west. In summer, precipitation results from convective thunderstorm activity. As the sun heats the surface of the earth, the earth in turn heats the air directly above the surface, and thermals develop. The thermals often rise and develop in moist air that has moved into the area from the Gulf of California and the Gulf of Mexico. Often, this moist air does not invade south-central Utah (Johns Valley area) until early July. Thus, during the transition of frontal and low pressure activity to thunderstorm activity, Johns Valley has frequent dry spells, which is one of the reasons the area was eventually abandoned.

HISTORY OF JOHNS VALLEY

Johns Valley was used for some time during the mid to late 1800's for the grazing of cattle and sheep. It had several miles of open grassland, with a river (East Fork) that flowed throughout the year. There were also several streams that flowed from the nearby mountains into East Fork. The area was an ideal place to graze livestock.

EARLY SETTLEMENT

Johns Valley¹ was first occupied in May of 1875. Though the area was often used for summer grazing of cattle and sheep, Isaac Riddle is credited for being the first to occupy the valley (Jenson 1941).² He came into Johns Valley from Beaver, Utah, with eighteen head of cattle and thirty horses. He stated the area contained "abundant water and

¹Johns Valley has not always been known as Johns Valley, it was once called Emery Valley, and one reference called it the Panguitch Pasture. It is not known when it became commonly known as Johns Valley, or for whom it gets its name. In the book, Johns Valley the Way We Saw It, the authors state that several individuals with the name of John were important in the valley and could have had the valley named after them.

²Most books or papers that discuss Johns Valley and its early history give credit to Isaac Riddle as the first to occupy the valley. It should be noted that other men grazed cattle in the valley, but they did not build permanent structures, i.e., a cabin and corrals as Riddle did.

natural meadow" (Ford 1971).³ Riddle built a small cabin and several corrals at the mouth of Sweetwater Canyon (known today as Escalante Canyon), along Sweetwater Creek (see map 2, page 9). The creek had plenty of water for personal use and for use in watering livestock. After a successful summer of grazing his animals, he returned them to Beaver. The following summer, he again returned to Johns Valley bringing more livestock. Riddle used Johns Valley as a summer range for many years, bringing his animals into the valley during late spring and returning them to lower range at the end of the summer. In 1890, Isaac Riddle relocated his ranch five miles north of Sweetwater Creek, along Ranch Creek. Here, he built another cabin, more corrals, and a small dairy. Water from a nearby spring-fed stream was diverted to provide the dairy with cold water.

In 1902, Jedediah Adair brought his family from Tropic, Utah, into Johns Valley. He stated that the area contained "...a beautiful open valley with hundreds of acres of farm land. There was a green meadow in the mouth of a canyon that was called Sweetwater with a spring of clear water running out to the pasture" (Ford 1971). He and his family settled along Sweetwater Creek, near the mouth of Sweetwater Canyon. Jedediah Adair quickly filed for 320 acres of land through the Homestead Act, while his wife, Julia, filed for an additional 40 acres of adjacent land through the Desert Entry Act. Thus, the Adairs had obtained 360 acres of land which spread out into Johns Valley from the mouth of Sweetwater Canyon, as well as stretching up into the canyon.

³The book, Johns Valley The Way We Saw It, is a compilation by Audrie Cuyler Ford and Mabel Woodward Nielsen of the personal histories of 81 individuals who lived in Johns Valley.

Jedediah Adair not only grazed livestock, but successfully cultivated and harvested grain his first year in Johns Valley. Also, during this summer his wife, Julia, and her children, successfully cultivated a vegetable garden, as "...a few vegetables were raised by using water of Sweetwater for irrigation purposes" (Jenson 1941). With the success that the Adairs had people began realizing that Johns Valley had agricultural potential and began coming into the valley.

Though many had come into Johns Valley, no one had established a permanent home in the valley by living their throughout the entire year. In August of 1908, Horace Ephraim Zabriskie moved his family and his sawmill from Kingston, Utah, into Johns Valley. He obtained 320 acres of land, at \$1.25 per acre, under the Homestead Act. Zabriskie set up his sawmill near East Fork and at the base of Flake Mountain, at a place known as Flake Bottom, about eight miles southwest of the Adair's original settlement. Here, he and his family lived throughout the entire year. Thus, Horace Ephraim Zabriskie was the first to "winter" in Johns Valley (Carr 1972).⁴

With the success of Zabriskie in surviving the winter, others also began to stay throughout the winter. It was not long until two small settlements were maintained all year - one along Sweetwater Creek, known as Adairsville, and one along Ranch Creek, known as Mahonri.⁵

⁴Most books credit Horace Ephraim Zabriskie as being the first to stay throughout the winter in Johns Valley. There is one reference, though, that indicates Charles W. Snyder was the first to winter in Johns Valley.

⁵Adairsville was later renamed Winder, which in turn was renamed Widtsoe (see the section on Development of Widtsoe). Mahonri was later renamed Henderson (see the section on Development of Henderson).

REASONS FOR SETTLING IN JOHNS VALLEY

There is no one single reason why people came to Johns Valley. Early ranchers knew it was an ideal place for summer grazing of livestock as the valley offered plenty of water and forage. Perhaps the first factor that encouraged people to settle in Johns Valley was the success that Jedediah Adair had in growing grain; for it was not until Adair's success that people began coming into the valley to farm during the summers.

Another reason people came to Johns Valley was a result of the positive reports that came from the valley. For example, on his first trip to Johns Valley, John S. Baler said the valley contained:

"... wonderful meadows of tall bluegrass ...belly-deep on the horse, that unused water ran from several side canyons, that a small river flowed the entire length of the valley - cold, pure, and clear; ...it was a veritable Garden of Eden." (Ford 1971)

The Panguitch Progress, stated in their 20 June 1913 issue that Johns Valley was a "...very healthy place, one of the most so in the state. It is a growing place, improving all the time."

Perhaps a more important reason in bringing people into Johns Valley was that desire to own one's own land--a part of the "Great American Dream." Many came to Johns Valley to farm or graze livestock, and were able to obtain large tracts of land through the Homestead Acts. Jacob Barney best describes this situation when he stated:

"Our family joined in the movement to settle Johns Valley ...[during] the height of the Johns Valley fever when many people went there with the hope of getting a large tract of land and the chance to make a better living for themselves ..." (Ford 1971)

The establishment of towns in Johns Valley was an additional influence in bringing inhabitants to the valley. With the organization of the towns, supplies, schools, churches, and other functions became readily available. It was during "the height of the Johns Valley fever" that these towns were established.

Perhaps a final reason for the settlement of Johns Valley resulted from what was occurring at the time. Much of the prime agriculture land had already been developed and attempts at developing marginal land, such as Johns Valley, were being made. Also, during the 1910's and 1920's, farm families no longer were subsistence farmers, but earned money from selling their crops. Thus, as families came to Johns Valley, they obtained large tracts of land in an attempt to sell crops and make a living for themselves.

EARLY DEVELOPMENT IN JOHNS VALLEY

Most new settlers to Johns Valley came from nearby communities of southern Utah, such as Beaver, Junction, Antimony, and Tropic, while others came from various parts of the state. Many still came just for the summer, while others stayed throughout the year.

Development of Widtsoe. By 1910, several people had come into Johns Valley. By this time, Jedediah Adair recognized the need for an organized town. To help in the cause, his wife, Julia, donated 40 acres of her land toward the development of a town. On 19 September, 1910, the Board of County Commissioners of Garfield County approved the official map of this new town (previously known as Adairsville), now known as Winder. The town was named in honor of John R. Winder, a

member of the First Presidency of The Church of Jesus Christ of Latter-day Saints. This official map was Plat "A" of the Winder Town Survey, which contained 36 lots, and streets 5 rods in width (Ford 1971).

Now that the town was surveyed, and people were staying year round, Winder soon became an established community in southern Utah. Within a year, the United States Postal Service granted a post office at Winder, Utah, on 25 September, 1911. Prior to this time, mail was sent to Coyote (Antimony, Utah), twenty miles north of Winder, then it was generally delivered to Winder by anyone headed in that direction.

In addition to the cold winters, people initially did not stay year round in Winder because there were no schools established for their children. But, in 1911, the first schoolhouse was built, it was 25 feet by 40 feet. It also served as a place for church meetings and town meetings and socials. It was also in 1911 when the first church was established in Winder. On 30 August, the Winder Branch of The Church of Jesus Christ of Latter-day Saints was organized.

In 1914, another survey was completed. The new land was adjacent to the original Winder Town Survey and was made official on 13 April as Plat "B" of Winder Town. The blocks contained 4.20 acres and the streets were 5 rods wide. Winder was now twice as large in area and the town population also grew.

By the end of the following year, 1915, Winder had running water provided to the residences and businesses of the community. Water was piped through iron pipes into the town from a spring in Sweetwater Canyon. The Panguitch Progress stated that the water was the "...purest of all time" (15 May 1915).

In 1917, the Postal Service asked Winder to change its name because there already was a Winder, Utah near Salt Lake City. Thus, on 2 April, Winder was changed to Widtsoe, in honor of John A. Widtsoe, an Apostle of The Church of Jesus Christ of Latter-day Saints and a dry farming specialist who had advised the people of Johns Valley.

By the end of the decade, Widtsoe, once known as Adairsville and Winder, had grown from a small cluster of farmers to an active community of nearly 500 citizen. Widtsoe was the center of Johns Valley, as people no longer needed to travel outside the valley for supplies, school, church, or mail. Widtsoe now boasted a new enlarged schoolhouse, also used for church and town functions, a store, a two-story hotel, a confectionery, a blacksmith shop, an icehouse, a small flour mill, and a post office. Additionally, in 1919, the National Forest Service established a district office of the Powell National Forest in Widtsoe. Thus, Widtsoe had become a busy community and central place for Johns Valley.

The Development of Henderson. The development of Henderson, four miles north of Widtsoe, took place at a different pace. On 21 March, 1908, the first post office in Johns Valley was established at this settlement. This little town near Ranch Creek was first known as Mahonri, in honor of Mahonri Moriancumer Steele, Jr., the Postal Inspector at the time. The post office only lasted nineteen months, until 15 September, 1909.

Despite the unsuccessful attempt at supporting a post office, the town continued to go forward. In 1911, a school and a church were organized, with classes and meetings being held in homes until a

facility was completed in 1912. By the time the new school-church facility was completed, the town had changed its name to Henderson, in honor of William Jasper Henderson, Jr., the president of the Panguitch Stake to which residents of the town belonged.

In 1916, William Jasper Henderson, Jr., donated eighty acres of his land for the development of a town. He not only donated the land, but paid for the survey to have the town properly laid out in blocks and lots. On 13 April, 1916, Henderson's survey was approved by the County Commissioners of Garfield County as Plat "A" of Henderson Town Survey. Mr. Henderson also donated the pipe for water to be brought into the town from a spring in Horse Creek Canyon.

The town of Henderson did not grow and prosper as Widtsoe did, but it remained a small active community. By the end of the decade a second attempt was made in establishing a post office, but it only lasted eight months. The Church members now went to Widtsoe for meetings and functions, but, school continued to be held in Henderson, and the town also supported a store.

Economic Activity in Johns Valley. Agriculture was obviously the main source of economic activity in Johns Valley. By 1914, nearly 8,000 acres of land had been cleared and plowed for cultivation (Panguitch Progress, 8 May 1914). Much of the cultivated land was used in dry farming. Fields of alfalfa, hay, and grains, such as, wheat, oats, rye, and barley were grown. Additionally, some irrigation took place, as parts of East Fork were dammed and several streams that flowed from the mountains were also dammed. This irrigation water was used mostly for gardens to grow vegetables, fruit, and berries. Common

vegetables included potatoes, corn, peas, carrots, lettuce, and numerous other garden vegetables. The Panguitch Progress, stated that a "ruta baeger" was harvested that weighed fourteen pounds and measured 24 inches around, while a turnip measured 29 inches around (15 May 1914). Fruit trees included pears, plums, apples, and cherries.

Cattle and sheep were grazed in the nearby mountains during the summer and returned to Johns Valley during the winter. Various other farm animals were raised in the valley, such as pigs, chickens, horses, turkeys, goats, and milk cows.

Though agriculture was the main economic activity in Johns Valley, other industry existed. In addition to those businesses in the towns, several sawmills dotted the valley, particularly near mountain canyons. Timber harvest included yellow pine, ponderosa pine, Douglas fir, and juniper trees. The sawmills were located near the canyons to obtain needed water power for sawmills and to be near the timber supply. Also, a shingle mill, freighting service, and other small industries existed.

In spite of earlier reports claiming there was abundant water in Johns Valley, water was scarce. The town of Widtsoe obtained water for culinary purposes from a spring in Sweetwater Canyon. The town also had its own irrigation company--the Winder Irrigation Company--which provided water for the farms and gardens in and near town. Henderson also had culinary water from a spring in Horse Creek Canyon. Irrigation water for the town, though, was brought by a canal. A dam was built across East Fork, near Flake Bottom, and water was diverted into the canal and then to Henderson. Other irrigation water that was

available had been claimed by the earliest settlers to the valley.

To obtain water out in the valley, farmers and ranchers often had to dig wells, collect rain water, or fill barrels of water from nearby mountain streams. The depth of the wells varied at different locations throughout the valley, but those mentioned in records and histories include well depths of 45 to 90 feet. Those farmers not having wells filled barrels with water from mountain streams. During the spring, the streams often flowed nearby, as water from melted snow readily flowed down into the valley. In the summer, though, the streams were often dry. Therefore, the farmers had to haul water in wagons from farther upstream in the mountain canyons to their homesteads.

Water was perhaps the most vital commodity to the survival of Johns Valley. Water was used for culinary purposes, industrial purposes--such as the sawmills and shingle mills--and for garden and farm crops, as well as for livestock. It became apparent, though, that water was neither readily available to everyone nor enough for everyone's desires. Many knew of the inadequate water supply, but still had a desired to go to Johns Valley. They felt, "...dry land farming and stock raising would provide them with a satisfactory living" (Daughters of the Utah Pioneers 1949).

EARLY DIFFICULTIES WITH THE ENVIRONMENT

Toward the end of the 1910's, the seasonal peak population of Johns Valley had reached nearly 2,000 residents.⁶ Widtsoe and

⁶There is no accurate record that indicates the number of people living in Johns Valley. Most books and histories of the area state that as many as 2,200 people lived in the area, while a few others put

Henderson had become active communities and were able to supply most of the needs of the valley. In the last few years preceding 1920, though, Johns Valley was not as productive as it had been in earlier years, and the "fever" to come to Johns Valley began to die.

There are several reasons suggested for the decline in production, such as men leaving the valley to fight in World War I, an influenza epidemic in 1918 that took several lives, or the over abundance of rabbits that ate the new shoots of grain and vegetables. These reasons perhaps helped in creating a lack of manpower and helped cause discouragement, but perhaps most significant was the drought of the early 20th century.

The Drought. It is difficult to analyze the weather of Johns Valley for the latter part of the 1910's because of the inaccurate nature of the records (see Appendix for precipitation totals of 1916 through 1919). What is available though, indicates that 1916 was near normal, while 1917 and 1918 were below normal. Writings and histories indicate that the worst drought in Johns Valley since its settlement occurred during the summer of 1919. Weather records for 1919 were incomplete for some of the year, making it difficult to analyze, but other writings and histories help to give an indication of the conditions. According to J. Cecil Alter, state meteorologist, for the Weather Bureau, conditions were not good anywhere in the state. In the general summary for 1919, he wrote:

the figure more closer to 1,000. It should be noted that this estimate was for the peak time of year, i. e., during the summer when the valley had the most residents. (See footnote 6) The U. S. census of 1920 states that Widtsoe had a population of only 446. There is no census for Henderson.

"By the end of May the high temperatures and lack of important rainfall had already caused considerable deterioration in dry land crops ...Then followed the hot weather and very light rainfall of June and July ...The result was a quite unfavorable season agriculturally. Pastures, ranges, and dry land crops suffered severely...Considerable areas of dry land spring grains were abandoned or cut for hay" (Climatological Data Utah 1919).

Remembering the drought in Johns Valley, Fredricka Clinch stated, "...we had one of the most terrible summers - no rain and a total failure of crops ...The crops burned in the field ..." (Ford 1971). Thus, with the drought and crop failure, people became discouraged and several families left Johns Valley.⁷ (For further discussion on the environment, see the following chapter.)

EFFORTS TO MAKE JOHNS VALLEY PRODUCTIVE

Despite the drought and other hardships, many people were determined to make Johns Valley a success; one such individual was Quince K. Kimball. In 1922, Kimball went to California to persuade William F. Holt to come to Johns Valley and help develop the area. Mr. Holt had successfully developed an area in Imperial Valley, California, known as Holtville. It was hoped that he could also successfully develop Johns Valley into a productive agricultural area.

In 1923, Mr. Holt first came to Johns Valley. He first purchased the hotel in Widtsoe and then began making plans to develop the area.

⁷There is no yearly census to show this, but yearly membership records of The Church of Jesus Christ of Latter-day Saints helps to indicate this decline. The records show that in the 1918, Widtsoe Ward had a peak membership of 395. In 1920, membership had dropped 16.5%, and by 1921, an additional 4.5% had left. Thus, within three years, over one-fifth of membership had left.

His plans included buying approximately 4,000 acres of land in the valley and putting it under irrigation. The land would then be subdivided into large tracts and sold. Water would be obtained from Tropic Reservoir and Pine Lake. He also planned to build a power plant, creamery, and flour mill in Black Canyon.

By 1925, Mr. Holt was well underway with his plans. He purchased 4,000 acres of land and had ten houses built on part of this property. Conditions for the purchase of the houses and the surrounding property were established⁸ and soon sold. Irrigation water was brought into the area by expanding Pine Lake and obtaining water rights from the Tropic Reservoir. An earthen dam was built at Pine Lake increasing the capacity to over 1,800 acre feet. The Johns Valley Irrigation Company was created and the new company was able to "...take over all rights, titles, and interests of the Tropic Reservoir from the Tropic and East Fork Irrigation Company" (Garfield County News, 19 January 1923).

A creamery and a flour mill were built in Black Canyon, as well as a summer home for Mr. Holt and a home for his electrician; this area became known as Osiris.⁹ Power for the creamery and mill was provided by building "...a hydro-electric plant on the Sevier [East Fork] river [which] furnishes about fifty horsepower..." (Salt Lake Tribune, 6

⁸Buyers would undertake annual payment of seven percent of the price of their land and equipment, spread over a period of 35 years. Holt projected that during this 35 year period that the buyer would produce sufficiently enough to cover the principal plus six percent. (Garfield County News, 13 November, 1925)

⁹It is not known exactly why the name of Osiris was chosen for this area, but Osiris is the name of the Egyptian god of the underworld, or the dead. With his death and resurrection, Osiris was an important god in agrarian Egypt.

November 1925). It was also hoped that the "hydro-electric plant" could be expanded to produce 1,500 horsepower (Ibid.). After finishing all these projects, Mr. Holt had invested over \$300,000.

Prior to the development of the creamery and flour mill, farmers sold their wheat and cream in Marysvale, 60 miles northwest of Johns Valley, which was the nearest railroad terminal. Then it was shipped by rail to Salt Lake City for processing. The processed goods were returned to Marysvale and the farmers of Johns Valley would then purchase the processed grain and cream from Marysvale. Thus, the farmers ended up paying not only for the processing of their products, but the cost of freighting it to and from Marysvale and Salt Lake City. With the creamery and mill at Osiris, these costs were eliminated.

THE RESETTLEMENT

Despite the hopes and efforts of many people, Johns Valley was not able to be productive enough to support the populous of the area. After nearly three decades of hard work, people began to leave Johns Valley. At the beginning of 1935, the remaining people held a town meeting and voted to accept an offer by the federal government, under the direction of the Resettlement Administration, to sell their land. The Resettlement Administration would purchase their land and help the people of Johns Valley resettle somewhere else.

The Resettlement Administration. On 30 April, 1935, President Franklin D. Roosevelt established the Resettlement Administration under the Emergency Relief Appropriation Act of 1935. The Resettlement Administration, established several programs, one of which affected

Johns Valley--the Rural Resettlement Program. W. E. Packard, Director of the Rural Resettlement Program, stated its purpose:

"The primary object of resettlement activity is to give people an opportunity to move from poor land to good land and to establish themselves on farms where there is sufficient acreage to yield a satisfactory gross income" (Resettlement Administration 1935).

It was also the desire of the administration to provide adequate facilities for those being resettled, such as a good home and necessary barns. Also, it was hoped to provide modern conveniences, such as, "...inside toilets, baths, sinks, and stationary wash stands" (Ibid.).

To accomplish this resettlement, the administration would purchase land, houses, and out buildings from the farmer or rancher. The money from the purchase would first be used to pay off debts and taxes, then the remaining money would go toward the purchase of the new property. If it was necessary, low interest loans could be obtained from the administration to help in purchasing new farm land and buildings.

The Resettlements Affects on Johns Valley. Within two years, most of the residents and land owners of Johns Valley had sold out to the Resettlement Administration. There were 178 farms that were purchased by the administration; 44 of those farms were owned by permanent residents of Johns Valley. Many were helped to resettle in nearby areas, such as Circleville, Junction, Kingston, Richfield, and Monroe. Most were able to purchase new farms without additional financial help of the administration. The total cost to the federal government of purchasing the land and helping resettle residents of Johns Valley is estimated at \$87,894 (Resettlement Administration 1937). The total area purchased was 26,143 acres (Forrester 1937).

After the residents of Johns Valley were resettled, the area was maintained under the Taylor Grazing Act. There were several projects undertaken to rehabilitate the area, such projects included the filling in of wells and cellars, tearing down buildings and salvaging material, building fences to control grazing, providing watering areas for livestock, rejuvenating timber supplies, and upgrading bridges and roads for trucks hauling livestock.

SUMMARY

Johns Valley was used for summer grazing of livestock during the late 1800's. Jedediah Adair first came into the valley in 1902. He also grazed livestock, but, successfully planted and cultivated grain. It was not long until people began to see that Johns Valley had agriculture potential and they, too, came into the valley. Two small communities were soon established, Widtsoe and Henderson, and both provided supplies, schools, churches, businesses, and other functions. There was a lot of hope that the area would be highly productive. A report from Johns Valley stated:

"Geographical or other conditions may prevent our aspiring to the dignity of a great metropolitan city, but it is easily within the bounds of possibility for us to double, triple, and quadruple our present size, wealth and importance" (Panguitch Progress, 18 June 1915).

Many of the residents of Johns Valley were dry farmers, thus relying on adequate precipitation for crop production. Precipitation was not always reliable and some people left the area. Efforts, though, were made to make the area productive. William Holt invested over \$300,000 in developing the area, as he brought irrigation water

into the valley and began various industries. Other efforts were made to make the area a success, but to no avail--and again, people left.

In 1935, the remaining citizens of Johns Valley met at a town meeting and voted to abandon the town. With the vote, the Resettlement Administration, a branch of the federal government, was asked to assist the people in resettling by purchasing land, homes, and buildings in Johns Valley and helping residents relocate to more productive lands.

ENVIRONMENTAL FACTORS CAUSING THE DEMISE OF JOHNS VALLEY

There are several factors mentioned in other writings and personal histories of Johns Valley as to why people eventually left the valley. Such factors include unreliable precipitation, too short of a growing season, an inadequate supply of surface water, and insufficient forage for livestock. The main factors for the demise of Johns Valley, though, were insufficient precipitation for dry farming, unreliable precipitation from year to year, the erratic timing of precipitation within the year, and the high mountain valley location which created a short growing season. There were perhaps other non-environmental factors that could have helped influence the abandonment of Johns Valley, but this paper focuses only on the environmental factors.

INSUFFICIENT PRECIPITATION

Precipitation totals in Johns Valley were insufficient to successfully produce crops from dry farming. Widtsoe had an annual average precipitation of 10.53 inches (see table 1). John A. Widtsoe stated that dry land farming in Utah should not be done in an area that received less than twelve inches of precipitation (Widtsoe 1919). A report in 1916, entitled, "Dry-farming in Utah," stated, "A dry-farm should not be located in a region having less than about twelve inches

of rainfall in a year" (Ellison 1916). The report further stated about dry farming, "Experience ...has demonstrated that success is ...much more certain with a precipitation above fourteen inches" (Ibid. 1916). Hence, dry farming could be accomplished with ten inches of precipitation, but at the time it was felt that at least twelve inches of precipitation was required to dry farm in Utah.

During the twenty-two years that weather records were kept at Johns Valley, thirteen of those years had annual precipitation exceeding ten inches (see figure 1). There were only six years, though, that had annual precipitation being over twelve inches, and just three years were annual precipitation exceeded fourteen inches.

Dry farm experts today state that "for optimum yields [of grain], an annual rainfall of about 10 to 39 inches is required" (Stoskopf 1985). It also must be remembered that to be successful at dry farming where only ten inches of precipitation falls annually, proper techniques need to be used. It is difficult to know if farmers in Johns Valley used proper techniques, but the state experimental farm most likely did, and they were not successful. Consequently, even by today's standards, it would be difficult to dry farm in Johns Valley.

UNRELIABLE PRECIPITATION

Not only was the precipitation of Johns Valley insufficient, but it was unreliable. Johns Valley was located in a semi-arid climate, and, as with all dry climates, each year is quite variable, that is, some years have adequate precipitation, while other years have drought or near drought conditions. Precipitation in Johns Valley was also

Figure 1
Annual Precipitation of Johns Valley 1914 - 1935
Compared With 10, 12 and 14 inches

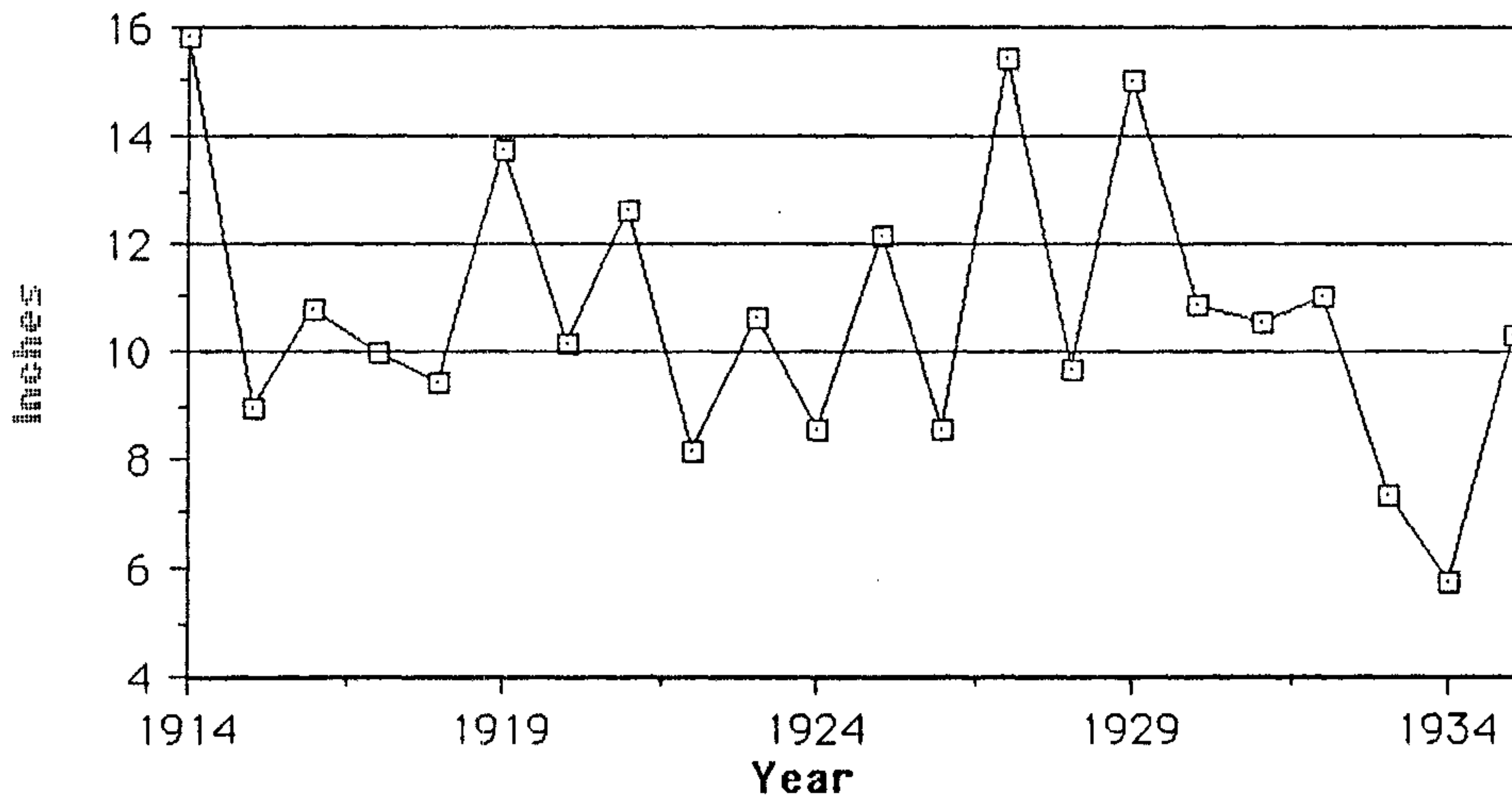
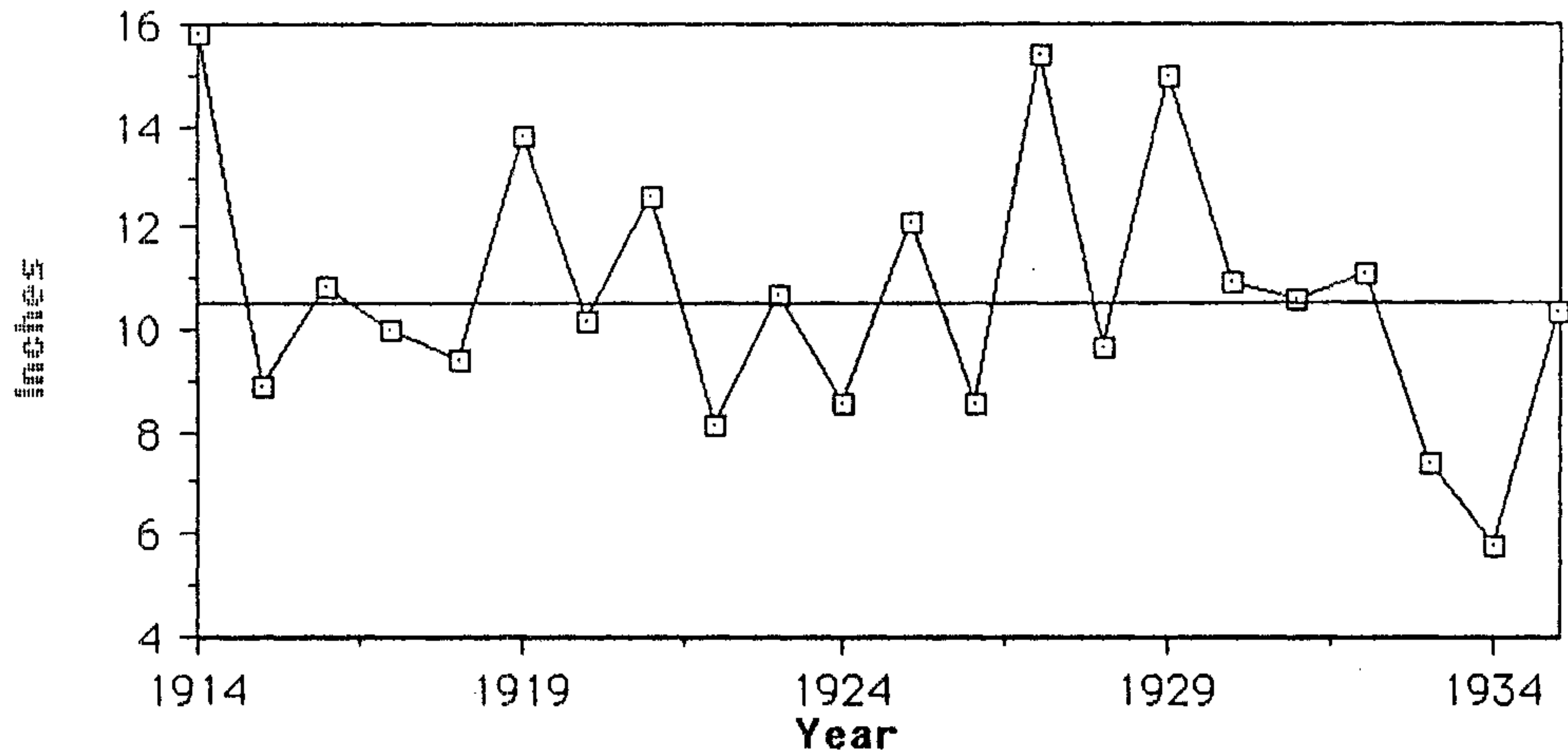


Figure 2
Annual Precipitation of Johns Valley 1914-1935



Line represents annual average of 10.53"

quite variable (see figure 2). Some residents felt there was a ten-year cycle in the valley. This cycle produced sufficient precipitation for ten years followed by ten years of inadequate precipitation, then again ten years of adequate precipitation. Climatological data of the area gives no indication of such a cycle.

Examples of unreliable precipitation. The years 1914 and 1915 were considered the peak years of immigration to Johns Valley. During this time, the precipitation seemed adequate for crop production. It was stated that "it looked as though all that was needed to be done was scratch the soil and plant, nature did the rest" (Ford 1971).

In 1914, monthly precipitation totals were recorded for the first seven months, January through July (see table 2). The monthly totals indicate that a sufficient amount of precipitation fell to support dry farming. The average precipitation for these first seven months was 5.64 inches. The records indicated that the first seven months of 1914 had 9.36 inches of precipitation, 166% of normal. Also, the precipitation totals of April and May, critical months in crop development, were 209% of normal. The following month, June, usually the driest month, had 1.81 inches of precipitation, 464% of normal. July was also above normal with 2.26 inches, 137% of normal. Thus, April through July, all critical months for crop development and growth, had precipitation well above normal. Alfred H. Thiessen, the Weather Bureau Section Director for Utah, wrote in the general summary of 1914, "Both temperature and precipitation averaged above normal ...from an agricultural point of view the year was a very successful one. The weather conditions were such that all crops fared well"

(Climatological Data Utah 1914). The year, 1914, was a good year for crop production in Johns Valley.

TABLE 2. Available monthly precipitation totals for 1914 and 1915, with monthly precipitation averages for Widtsoe, 1914 - 1935.

<u>YR/MN</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>YEAR</u>
AVG.:	0.70	0.87	0.67	0.75	0.61	0.39	1.65	1.51	1.19	0.88	0.62	0.69	10.53
1914:	0.95	1.02	0.48	1.15	1.69	1.81	2.26	-	-	-	-	-	-
1915:	-	-	-	1.98	1.52	0.24	1.28	0.28	0.67	0.01	0.36	0.53	-

In 1915, it is difficult to establish if there was adequate precipitation because the first three months were not recorded and the remaining nine months indicate that only 6.87 inches of precipitation were received, 83% of normal. A closer examination at 1915's monthly precipitation records can indicate sufficient moisture for a good harvest. April and May (the first two months that records are available and important months for planting and germination of seeds) had precipitation totals 257% above normal (see table 2). Though, June and July were only 75% of normal, there was already adequate moisture in the soil for crops to mature. Thus, during the rapid immigration to Johns Valley, in 1914 and 1915, the precipitation was adequate to produce a healthy crop. By the end of the decade though, precipitation was unreliable, and drought conditions caused the first main emigration from Johns Valley.

As discussed in the previous chapter (see section on The Drought), it is difficult to examine the precipitation amounts of the latter part

of the 1910's. Writings and histories of the time, though, indicate that 1919 was a drought year. Vird Barney wrote, "At Johns Valley we battled the elements and endured all the rigors of pioneer life. In the fall of 1919 the drought began. Slowly people began to leave" (Ford 1971).

In looking at the precipitation record of 1919, some indication can be given of Vird Barney's statement, "...in the fall of 1919 the drought began." With no record of April and May, it is hard to know if precipitation was adequate. State Meteorologist, J. Cecil Alter indicated that , "By the end of May the high temperatures and lack of important rainfall had already caused considerable deterioration in dry land crops ..." (Climatological Data Utah 1919). June records for Widtsoe indicate that no precipitation fell, but July had 3.41 inches, 207% of normal. The rain of July, though, was not sufficient enough to help the already deteriorating crops, and with precipitation in August being only 0.06 inches, 4% of normal, nearly all the crops were lost.

Another example of the unreliable nature of precipitation is found in the years 1924 and 1925. Coming into the year 1924, there was a lot of hope. It was this year that the projects of Mr. Holt were beginning to take shape. But, 1924 was a year of a drought. The Garfield County News stated that the drought was "the worst in 31 years" (27 June, 1924). Precipitation in 1924 was only 81% of normal, and April through August was 73% of normal (see table 3). The valley also experienced dry conditions from 26 April to 6 July, as only 0.44 inches of precipitation fell, with 33 days of no precipitation from 29 May to 1 July.

1925, though, was a prosperous year, as precipitation was well above normal. Again, the record is not complete, but it is adequate enough to examine (see table 3). Only the first nine months were recorded, but the record indicates that precipitation was 117% of normal during this time, with April through August being 158% of normal. June, general the driest month of the year, was nearly 300% of normal. Reed Beebe stated that 1925 was a "year of the greatest crop production in the history of the valley; more grain was produced than in all the rest of the county ..." (Ford 1971).

TABLE 3. Available monthly precipitation totals for 1924 and 1925, with monthly precipitation averages for Widtsoe, 1914 - 1935.

<u>YR/MN</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>YEAR</u>
AVG.:	0.70	0.87	0.67	0.75	0.61	0.39	1.65	1.51	1.19	0.88	0.62	0.69	10.53
1924:	0.35	0.07	0.72	1.14	0.57	0.00	1.34	0.52	1.32	0.90	0.15	1.46	8.54
1925:	0.00	0.29	0.44	1.25	0.02	1.15	1.30	4.06	1.24	-	-	-	-

Thus, adequate precipitation during one year could produce a very successful harvest, but the year before, precipitation could be less than adequate and produce drought conditions causing crops to fail. Also, precipitation could be adequate for two or three years, or more, then become inadequate again for two or three years.

ERRATIC TIMING OF PRECIPITATION AND ITS EFFECT ON DRY FARMING

Annual precipitation is important to dry farming, but perhaps more important is when the precipitation occurs. For grain seeds to germinate, large amounts of water are needed. Brengle states that "the

absorption of water may dry the soil in the vicinity of the seed, and rewetting of the soil will be required if the soil is unable to supply the needed water from the area immediately adjacent to the seed" (Brengele 1982). Thus, if there has not been sufficient water stored in the soil, additional water is needed. It was also thought that water was drawn from the water table by capillary movement to help support this germination and plant growth, but "...it has now been well established that surface soil water from precipitation is the primary source of water for growing [dry land] crops" (Ibid.). Therefore, during and shortly after seed germination, precipitation is important for plants to continue to grow.

In Johns Valley, planting took place mostly in May, with some planting as early as the latter part of April. Thus, precipitation in April and May were most important. The next most important month for rainfall was July. With June being the driest month, precipitation in July was needed to restore soil moisture and stimulate plant growth through the anthesis (flowering) and into the post-anthesis (kernel development) stages. Thus, April precipitation brought needed soil moisture to begin germination. May precipitation provided further germination, development of shoots, and began anthesis, while July precipitation made up for the June drought and took the grain through anthesis and into the final stages of development.

Examples of the erratic timing of precipitation. In 1928, Johns Valley experienced below normal conditions. Annual precipitation that year was 9.66 inches (see table 4). In addition to the fact that precipitation was below normal, the precipitation came during the wrong

time. Precipitation for the first three months was 116% of normal, but April's 0.08 inches of precipitation brought the percentage down to 89% of normal. Soil moisture was perhaps down some, but May precipitation was nearly 200% of normal, and crops began to grow favorably. Only a trace of rain fell in June and the much important July rains were only 45% of normal. From 23 May to 16 July, 54 days, only 0.15 inch of precipitation fell. On 17 July, 0.34 inches of rain fell, most likely a result of a typical summer afternoon thundershower. With the heavy downpour of the thundershower, there was perhaps more surface run off than water infiltrating the soil. August and September also had below normal precipitation amounts, 61% and 17%, respectively. Thus, the much needed rains of summer produced only 43% of normal. Once again, harvest yields of grain were very low, and people in Johns Valley got discouraged and left. This was probably the greatest emigration from the valley, as an estimated 33% of the residents left.¹⁰

TABLE 4. Monthly precipitation totals for the year 1928 and the monthly precipitation averages for Widtsoe, 1914 - 1935.

<u>YR/MN</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>YEAR</u>
AVG.:	0.70	0.87	0.67	0.75	0.61	0.39	1.65	1.51	1.19	0.88	0.62	0.69	10.53
1928:	0.42	1.11	1.08	0.08	1.20	T	0.74	0.93	0.21	2.29	1.03	0.57	9.66

Another good example was in 1921. Annual precipitation in 1921 was 12.61 inches, 120% of normal (see table 5). Though the annual

¹⁰Since no census was taken annually, church records from The Church of Jesus Christ of Latter-day Saints were again used.

precipitation was adequate for dry farming, the precipitation did not fall during the needed time of year, as 45% of the annual precipitation fell after September. Precipitation from April through August was 76% of normal. More dramatically, from 23 May to 15 July, no rain fell, a total of 53 days. The only precipitation in July was on two separate days, 15 July (0.55 inches) and 30 July (0.35 inches). Rain in August did not come until the 21st, thus, from 23 May to 21 August, only 0.90 inches of rain fell in 130 days, and then only on two occasions.

TABLE 5. Monthly precipitation totals for the year 1921 and the monthly precipitation averages for Widtsoe, 1914 - 1935.

<u>YR/MN</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>YEAR</u>
AVG.:	0.70	0.87	0.67	0.75	0.61	0.39	1.65	1.51	1.19	0.88	0.62	0.69	10.53
1921:	1.35	0.10	0.54	0.55	0.59	T	0.90	2.86	0.09	2.15	0.70	2.78	12.61

TOO SHORT A GROWING SEASON

Records kept at Widtsoe, in Johns Valley, indicated that the frost-free season was from 8 June to 11 September, a total of 95 days.¹¹ The extreme late frost occurred 3 July, 1921, while the extreme early frost was 30 August, 1932. Various writings also indicated that frosts often occurred at least once during each summer month. As an example of how bad the frosts were, a report by the

¹¹In a report by the Powell National Forest Service (now incorporated into the Dixie National Forest), it stated the frost-free season was from 6 June to 4 September, a total of only 90 days.

National Forest Service stated, "One farmer reports that on good soil with fair water rights he was able to realize only one good crop of potatoes out of twelve plantings, due to frost" (Folster 1927).

The report by the Forest Service also stated that the "frost strikes in parts of the valley some two weeks before it does in town and hangs on two weeks longer in the spring" (Folster 1937). Frost in the valley, as compared to Widtsoe, probably did occur later in the spring and then again earlier in the fall. This resulted mainly from the air drainage at night caused by nocturnal radiative cooling. This occurs on a clear night when mountain sides radiate their heat and cool, thus cooling the air in contact with it. Eventually, more of this shallow layer of air near the surface becomes cooler and denser and begins to flow downward. The air flows into the lowest point of the valley and stays until it is heated by the sun during the day. Also, with Johns Valley being in a north-south direction and mountains bounded on both sides, the valley is shaded by the mountains longer in the morning and earlier in the evening. Such conditions help inversions develop earlier in the evening and stay longer throughout the early morning hours. Johns Valley is also enclosed by mountains on all sides which adds to the inversion conditions. With the valley surrounded, winds cannot readily come into the valley and stir the air. Thus, air remains stagnant and inversions last longer in the valley.

The town site of Widtsoe was located at the base of the Escalante Mountains, and thus higher up the slope from the valley floor. The town most likely exists in a thermal belt - an area that is warmer than the valley below, due to the cold air drainage to the valley, and

warmer than the area above, due to the decreases of temperature with elevation. Therefore, the frost-free season at the Widtsoe weather station was most likely longer than in the valley. It is difficult to evaluate the difference in temperature, but climatologists estimate that the growing season can be one to two weeks longer in a thermal belt than the valley floor (Barry, 1981).

Dry farming and the growing season. The most common crops grown in Johns Valley were rye, barley, oats, wheat, and alfalfa. Each crop requires a different number of days to fully mature, as well as different temperatures for germination. Of the grains, rye is the most cold tolerant. It begins germination between 33°F and 38°F, and needs 85 to 90 days to fully ripen for harvest (Carter 1976). Barley and oats adapt well to cooler climates, such as in Johns Valley. Barley will germinate between 35°F and 40°F, and requires 85 to 90 days to mature (Briggs 1978). Oats germinate between 33°F and 38°F, and also require 85 to 90 days to fully mature (Webster 1986). Wheat is not as tolerant to the cold, but can withstand the summer heat better. Wheat requires average temperatures between 38°F and 45°F to germinate, with 90 to 100 days needed to fully ripen (Heyne 1987).

Johns Valley had an average frost-free season of 95 days, from 8 June to 11 September. It was possible, then, that in favorable places and years the various grains could fully mature. It was more probable, though, that either a late frost or an early frost caused crops to be damaged to some extent. For example, of the fourteen years that complete record were kept of the frost-free season in Johns Valley, nine of those years had either a late frost or an early frost (see

table 6). Also, seven of those fourteen years had a frost-free season less than 95 days (see table 6).

In her personal history, Golda E. Mangum wrote, "Usually, you couldn't raise wheat, but only barley, oats and rye, and one crop of alfalfa" (Ford 1971). Wheat was more difficult to grow, as it required slightly warmer temperatures to germinate and a longer growing season. Thus, wheat, an important staple, had a difficult time fully maturing in Johns Valley, without being damaged by frost. Although rye, barley, and oats adapt better than wheat, they were less important than wheat to Johns Valley and to Utah.

TABLE 6. The average frost-free season in comparison to frost-free seasons where records were available, 1920 - 1925, 1927 - 1934.

	<u>AVG</u>	<u>1920</u>	<u>1921</u>	<u>1922</u>	<u>1923</u>	<u>1924</u>	<u>1925</u>	<u>1927</u>
LAST FROST	JUN 8	JUN 2	JUL * 2	MAY 27	JUN *19	JUN *19	JUN *12	JUN 3
FIRST FROST	SEP 11	SEP 11	SEP * 3	SEP * 6	SEP 17	SEP 13	SEP 11	SEP 25
DAYS	95	101	*62	102	*90	*86	*91	114
	<u>AVG</u>	<u>1928</u>	<u>1929</u>	<u>1930</u>	<u>1931</u>	<u>1932</u>	<u>1933</u>	<u>1934</u>
LAST FROST	JUN 8	JUN *14	JUN 2	JUN 3	JUN 6	JUN 8	JUN 6	JUN 8
FIRST FROST	SEP 11	SEP 13	SEP * 9	SEP 25	SEP * 4	AUG *30	SEP 16	SEP 25
DAYS	95	*91	99	114	*90	*83	102	109

*indicates frost later than the average last frost; frost earlier than the average first frost; or a frost-free season shorter than the average frost-free season.

Alfalfa was also a main crop in Johns Valley. Most areas in Utah experienced two or three crop harvests of alfalfa per year, but Johns Valley only had one harvest per year. This indicates that the growing season was shorter and cooler than most areas and the precipitation totals were less. Thus, the short growing season often produced lower qualities and/or lower quantities of alfalfa, wheat, rye, barley, oats, and other grains and crops.

An example. In 1921, the frost free season was very short; it lasted only 62 days, from 3 July to 6 September. The Experimental Farm reported that spring wheat and other grains were started too late in the season and that "...very poor stands were obtained" (Utah Agricultural Experimental Station 1921). Also, Claybourne Elder stated that in 1921 that "...it was difficult to raise enough hay to feed the cattle in the winter, so we left the ranch, where we had lived seventeen years ..." (Ford 1971).

The farmers in Johns Valley not only had to struggle with inadequate precipitation, but the short growing season also made it difficult to adequately harvest healthy crops.

OTHER POSSIBLE FACTORS

The lack of adequate precipitation and the short growing season were the main factors in causing the discouragement of homesteaders in Johns Valley. Other factors also contributed in this discouragement which eventually lead to the demise of Johns Valley. Such factors included the long, cold winters, insufficient surface water, problems with rodents, and a lack of forage for grazing livestock.

Long winters. The winters in Johns Valley were often long and cold. An average of 270 days of the year experienced nights with temperatures dropping below freezing--nearly 75% of the year. Also, the average temperatures of the winter months, December, January, and February were all below freezing, at 25.0°F, 23.1°F, and 27.4°F respectively. Each winter month often had temperatures well below 0°F during the night. The cold extended into March, as its average temperature was 32.9°F; while April averaged 39.9°F. The cold temperatures came early, as well, with November averaging 37.2°F. Thus, from November to April, the temperatures averaged below 40°F, and December through February had average temperatures below freezing.

Several accounts from the personal histories of the residents of Johns Valley wrote of the "severe winter." The severe winters made travel difficult and those living out in the valley stated they often felt marooned during winter months. The harsh winters also made winter grains and even livestock die from exposure. James R. Pope had several cows die "from too much exposure during the cold winters" (Ford 1917). Thus, the winters were long and harsh, as they were not only difficult for the people, but caused the winter grains and livestock to die.

Insufficient surface water. Efforts of Mr. Holt in bringing irrigation water to Johns Valley were not entirely successful. The additional water brought into the valley from Pine Lake (1,810 surface acre feet) and Tropic Reservoir (1,600 surface acre feet) was not sufficient enough for the area to be prosperous. By 1928, drought conditions had again occurred. Reed Beebe wrote that in 1928, "...over

half the people had moved out; the Holt enterprise was failing; the drought had returned" (Ford 1971).

During dry years, there was not enough water in the reservoirs to make up for the lack of precipitation. Some writings indicated that up to six different studies of the area were done, and they concluded that the amount of surface water available had been grossly overestimated and there was not enough water to support the number of farmers in the valley.¹² Also, the director of the experimental farm in Widtsoe supports this thought when he wrote,

"During the first seven years the farm was operated as a dry-farm, but the rainfall was so erratic that successful cropping appeared impossible as a regular practice. Then it was believed advisable to supplement dry-farm practices with water from Johns's Valley reservoir [Pine Lake]. Crops grown under irrigation have proved fairly satisfactory in years when ample water was available. The last few years have been unusually dry, however, and crops have been extremely light."¹³

Thus, even with irrigation and sufficient precipitation, crop yields were only fair, but when less than normal conditions prevailed, crop yields were often very poor.

¹²This information was obtained from a book written by the Daughters of the Utah Pioneers. Two other authors also make similar statements (see Carr and Ford). The actual reports have not been located, but it is quite likely that such studies took place, as the federal government did have to determine if the area would qualify for funding under the Resettlement Act. The book by the Daughters of the Utah Pioneers stated that the studies indicated that 44 families were living and farming on land that contained sufficient water for only seven farm families.

¹³This statement was by P. V. Cardon, director of the State Experimental Farm. It was in a letter written at the end of 1931, addressed to E. G. Peterson, President of the Utah Agricultural College in Logan. The letter was written to ask for authorization for discontinuance of the farm--discontinuance was granted, and the farm closed in 1932.

Rodents. Rodents were also a problem in Johns Valley, particularly rabbits. Jackrabbits and cottontails were in abundance in the valley and often ate the new shoots of grains and vegetables. So bad was the problem that rabbit drives were often organized to destroy the rabbits. Fredrika Clinch wrote in her history:

"In the spring ...the fields turned green with tender blades of grain, and the people were happy to see the green fields, but their joy was short-lived because rabbits came in droves. The people had rabbit drives. The rabbits were driven in pens and clubbed to death ...It became the survival of the fittest" (Ford 1971).

Overgrazing. Today, much of Johns Valley is dominated by sagebrush. When ranchers first went into Johns Valley, they often spoke of the tall grass. John S. Baler stated that Johns Valley contained "wonderful meadows of tall bluegrass ...belly-deep on the horse ..." (Ford 1971). As was the case in the early history of Utah, and the West, overgrazing took place and destroyed much of the tall grasses. The dominance of the sagebrush today, is evidence that such overgrazing took place.

A report by the Powell National Forest Service stated that ranchers in Johns Valley grazed their livestock as early as March. This action caused the vegetation to be overgrazed and allowed animals to destroy new growth (Folster 1937). It was this uncontrolled grazing that caused the loss of the tall grasses. Thus, the Resettlement Administration had to build thirteen and one-half miles of fence to control grazing in the spring and autumn after the people left Johns Valley (Garfield County News 28 May 1937).

CONCLUSION

Most of the historic agricultural communities in Utah struggled to overcome the environment, but they could not, and these communities were abandoned. Johns Valley is a good example of such a historic community. Johns Valley went through years of growth and development, but could not overcome the environment, and the area was abandoned.

Johns Valley was predominantly a dry farming area, thus the farmers had to rely upon the precipitation that fell to provide water for their crops. Dry farm experts of that day felt that dry farming in Utah should not have taken place in areas where annual precipitation was less than twelve inches. In the twenty-two years that weather records were kept in Johns Valley, only six years had precipitation totals greater than twelve inches. Also, the average annual precipitation in Johns Valley was only 10.53". Thus, precipitation was often insufficient for successful dry farming.

In addition to the fact that annual precipitation was often insufficient to produce good yields of crops, the unreliable nature of the precipitation from year to year aided in the demise of Johns Valley. The main "boom" to Johns Valley was in 1914 and 1915. During this time, precipitation was above normal and crops grew well. By the end of the decade, though, annual precipitation totals were often below

normal, and crop yields were poor. Farmers soon learned that each year precipitation differed, as some years precipitation was adequate to mature crops, while other years precipitation totals were not adequate and drought conditions often occurred.

Perhaps more unreliable than annual precipitation was the erratic timing of the precipitation that fell within any given year. Precipitation totals for a year could be sufficient to mature a healthy yield of crops, but if little or no precipitation fell during the germination and early development of crops, the harvest would often be poor. For example, in 1921, 12.61 inches of precipitation fell, 120% of normal; but, from 23 May to 21 August, only 0.90 inches of precipitation fell in 130 days. As a result, the crop that year harvest was one of the lowest during the existence of dry farming in Johns Valley. Thus, even with a sufficient annual precipitation crops harvests could be poor when precipitation did not fall during critical stages of crop development.

The erratic nature of precipitation in Johns Valley and the general lack of it, caused farmers to become discouraged and abandon the area. Another significant factor that lead to the demise of Johns Valley was the short growing season. The frost-free season in Johns Valley was from 8 June to 11 September, a total of 95 days. It was possible for grain to fully mature in 95 days, but more often than not, either a late frost or an early frost damaged the crops to some extent and the quality and quantity of the harvest was reduced.

The harsh winters of Johns Valley also added to the discouragement of farmers in the area. Winter-time temperatures often averaged below

freezing from early December through February. Such conditions not only made day-to-day living very unpleasant, but occasionally killed livestock and made it nearly impossible to grow winter grain.

Other factors also caused discouragement to the farmers of Johns Valley. In spite of efforts to bring additional surface water to the valley, there was not enough, particularly during dry years. Rabbits and other rodents ate new shoots of the grains and vegetables, lowering potential harvests. Also, improper grazing techniques caused forage to diminish.

Thus, the insufficient and erratic nature of the precipitation in Johns Valley, coupled with a short growing season, harsh winters, and other factors, caused the discouragement of the people and they eventually abandoned Johns Valley.

APPENDIX

Weather records in Johns Valley were kept at Widtsoe town from 1914 to 1935. Early records contained precipitation only, and were often incomplete, as a month or several months were missing. In 1920, the Forest Service took over the record keeping until 1926. They kept complete record of both precipitation and temperature. In June of 1926, D. W. Woodward, who operated the State Experimental Farm, took over as weather observer until 1935, when Johns Valley was abandoned. The following is a list of the weather observers at Widtsoe:

1913	-	1914	Rollo Adair
1915	-	1916	D. P. Kimball
1917	-	1919	Orson Adair
1920	-	1925	U. S. Forest Service
1926	(Jan-May)		C. H. Mangum
1926	(Jul-Dec)		D. W. Woodward
1927	-	1935	D. W. Woodward

Tables 7 and 8 are the collection of the monthly and annual precipitation and temperature totals that were available from 1914 to 1935, in Widtsoe.

TABLE 7. Weather records for 1914 through 1919 -- only precipitation totals were kept.

<u>PRECIP</u>	<u>1914</u>	<u>1915</u>	<u>1916</u>	<u>1917</u>	<u>1918</u>	<u>1919</u>
JAN	0.95	-	1.31	0.67	0.80	0.20
FEB	1.02	-	0.11	2.60	1.00	2.80
MAR	0.48	-	0.13	0.42	2.20	0.95
APR	1.15	1.98	0.04	0.20	0.00	-
MAY	1.69	1.52	0.41	1.26	0.01	-
JUN	1.81	0.24	0.00	0.10	0.12	0.00
JUL	2.26	1.28	2.75	2.31	2.35	3.41
AUG	-	0.28	3.40	0.13	0.20	0.06
SEP	-	0.67	0.74	0.82	0.60	-
OCT	-	0.01	0.96	-	0.20	0.72
NOV	-	0.36	0.00	-	1.00	2.18
DEC	-	0.53	0.98	0.00	0.95	T
YEAR	-	-	10.83	-	9.43	-

TABLE 8. Weather records for 1920 through 1935 -- totals include precipitation, temperature, and dates for the frost free season.

<u>PRECIP</u>	<u>1920</u>	<u>1921</u>	<u>1922</u>	<u>1923</u>	<u>1924</u>	<u>1925</u>	<u>1926</u>	<u>1927</u>
JAN	0.18	1.35	0.98	1.08	0.35	0.00	-	0.61
FEB	1.04	0.10	0.60	0.13	0.07	0.29	-	1.06
MAR	0.85	0.54	0.46	0.37	0.72	0.44	-	1.35
APR	0.05	0.55	1.28	2.02	1.14	1.25	-	0.71
MAY	0.35	0.59	0.35	0.30	0.57	0.02	-	T
JUN	0.75	T	0.33	0.07	0.00	1.15	-	1.10
JUL	1.15	0.90	0.38	0.89	1.34	1.30	-	1.40
AUG	1.42	2.86	1.88	2.60	0.52	4.06	1.32	2.68
SEP	1.37	0.09	0.98	1.31	1.32	1.24	0.84	3.95
OCT	1.34	2.15	0.13	0.71	0.90	-	0.33	0.95
NOV	1.19	0.70	0.59	0.29	0.15	-	0.50	0.60
DEC	<u>0.46</u>	<u>2.78</u>	<u>0.21</u>	<u>0.79</u>	<u>1.46</u>	-	<u>0.65</u>	<u>1.00</u>
YEAR	<u>10.15</u>	<u>12.61</u>	<u>8.17</u>	<u>10.65</u>	<u>8.54</u>	-	-	<u>15.41</u>
<u>TEMPERATURE</u>								
JAN	26.8	24.6	17.0	28.1	18.5	19.2	-	28.2
FEB	28.8	26.9	23.5	22.7	31.2	28.8	-	28.0
MAR	29.5	36.6	29.0	29.4	26.2	34.6	-	32.4
APR	35.4	37.4	33.2	39.1	39.8	42.0	-	41.6
MAY	50.0	47.2	48.0	50.2	50.8	52.9	-	49.3
JUN	57.8	58.1	60.8	55.6	60.4	56.4	-	58.5
JUL	65.4	64.3	65.8	64.1	62.4	64.2	-	65.2
AUG	61.8	60.8	63.0	59.4	62.0	59.3	62.7	61.2
SEP	53.0	55.2	57.8	51.0	54.2	52.4	54.4	54.1
OCT	41.8	49.4	45.0	40.4	42.1	-	48.4	45.8
NOV	33.8	37.4	31.5	33.8	33.4	-	37.7	37.9
DEC	<u>24.7</u>	<u>29.9</u>	<u>27.3</u>	<u>24.3</u>	<u>21.0</u>	-	<u>24.0</u>	<u>22.1</u>
YEAR	<u>42.4</u>	<u>44.0</u>	<u>41.8</u>	<u>41.5</u>	<u>41.0</u>	-	-	<u>43.7</u>
HIGH	90	87	92	89	86	93	-	86
LOW	- 6	- 3	-17	- 9	-21	-16	-	-10
LAST FROST	JUN 2	JUL 3	MAY 27	JUN 19	JUN 19	JUN 12	N/A	JUN 3
FIRST FROST	SEP 11	SEP 3	SEP 6	SEP 17	SEP 13	SEP 11	SEP 18	SEP 25
DAYS	101	62	132	90	86	91	-	114

TABLE 8 CONTINUED:

<u>PRECIP</u>	<u>1928</u>	<u>1929</u>	<u>1930</u>	<u>1931</u>	<u>1932</u>	<u>1933</u>	<u>1934</u>	<u>1935</u>
JAN	0.42	1.59	1.22	0.49	0.29	1.13	0.05	1.02
FEB	1.11	0.84	0.33	0.94	1.76	0.35	0.57	0.96
MAR	1.08	0.65	0.57	0.28	0.32	0.35	0.28	1.13
APR	0.08	1.11	0.22	0.94	0.62	0.46	0.18	1.15
MAY	1.20	1.16	0.96	0.91	0.60	0.47	1.29	1.54
JUN	T	0.08	0.51	0.55	0.63	T	0.43	T
JUL	0.74	3.71	2.82	1.32	1.85	2.03	0.43	0.08
AUG	0.93	2.01	1.50	1.69	2.13	0.17	1.01	1.13
SEP	0.21	3.21	1.95	0.59	1.60	0.83	0.39	-
OCT	2.29	0.48	0.39	1.40	0.27	0.12	0.27	-
NOV	1.03	0.11	0.40	1.02	0.00	0.73	0.44	-
DEC	<u>0.57</u>	<u>0.06</u>	<u>0.04</u>	<u>0.46</u>	<u>0.99</u>	<u>0.74</u>	<u>0.44</u>	<u>-</u>
YEAR	<u>9.66</u>	<u>15.01</u>	<u>10.91</u>	<u>10.59</u>	<u>11.06</u>	<u>7.38</u>	<u>5.78</u>	<u>-</u>
<u>TEMPERATURE</u>								
JAN	27.9	21.9	19.2	25.6	16.5	20.0	27.3	26.7
FEB	27.4	20.6	32.4	31.4	27.8	18.0	34.4	29.3
MAR	36.2	31.4	32.8	38.0	32.0	32.8	42.2	30.4
APR	39.8	37.7	45.4	43.2	41.0	37.0	46.3	40.1
MAY	51.4	49.7	43.6	48.3	48.5	42.6	53.8	45.1
JUN	57.8	58.6	58.9	60.2	56.6	60.4	54.8	60.4
JUL	64.6	64.8	63.2	68.2	63.0	66.2	66.2	64.2
AUG	62.4	62.6	62.2	63.9	62.0	63.0	63.4	63.8
SEP	57.0	54.1	54.8	50.0	53.2	59.0	54.8	-
OCT	46.8	45.4	43.2	46.6	44.0	50.0	46.2	-
NOV	33.7	32.0	37.8	27.2	37.0	38.1	33.1	-
DEC	<u>23.6</u>	<u>31.4</u>	<u>24.3</u>	<u>21.5</u>	<u>19.6</u>	<u>32.4</u>	<u>24.5</u>	<u>-</u>
YEAR	<u>44.0</u>	<u>42.5</u>	<u>43.2</u>	<u>43.7</u>	<u>41.8</u>	<u>43.3</u>	<u>45.6</u>	<u>-</u>
HIGH	87	87	86	92	87	89	85	90
LOW	- 8	-18	- 8	-16	-18	-22	- 7	- 2
LAST FROST	JUN 14	JUN 2	JUN 3	JUN 6	JUN 8	JUN 6	JUN 8	JUN 1
FIRST FROST	SEP 13	SEP 9	SEP 25	SEP 4	AUG 30	SEP 16	SEP 25	N/A
DAYS	91	99	114	90	83	102	109	-

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The Development and Failure of
Historic Agricultural Communities of Utah
A Case Study of Johns Valley, Utah

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ABSTRACT

There were over eighty historic agricultural communities in Utah that could not overcome the environment. Johns Valley, Utah, is an example of such an agricultural community. People came to Johns Valley to dry farm. They came during years when there was adequate precipitation to farm, but they soon found out that precipitation was not always reliable.

On the average, annual precipitation was not sufficient to support dry farm in Johns Valley. Even when annual precipitation was adequate to dry farm, other factors created difficulties. Such factors included, dry spells during the early stages of crop development, frosts either too late or too early in the growing season, insufficient surface water, overgrazing, and rodents eating crops. In spite of strong efforts to overcome these environmental difficulties, Johns Valley was abandoned.

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