A matter of faith: A study of the Muddy Mission

Monique Elaine Kimball
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A matter of faith: A study of the Muddy Mission

Kimball, Monique Elaine, M.A.
University of Nevada, Las Vegas, 1988

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A MATTER OF FAITH: A STUDY OF THE MUDDY MISSION

by

Monique E. Kimball

A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Arts

in

Anthropology

Department of Anthropology
University of Nevada, Las Vegas
August 1988
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University of Nevada, Las Vegas
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ABSTRACT

Leonard J. Arrington, former Church Historian of the Church of Jesus Christ of Latter-day Saints (Mormon) wrote about the Mormon development of the Great Basin from 1847 to 1900 in *Great Basin Kingdom* (1966). In the opening chapter he summarized the economic ideals of the Church as seven principles: the gathering, the Mormon village, property as stewardship, redeeming the earth, frugality and economic independence, unity and cooperation and equality. These ideals were the basis of his argument regarding the success of the Mormons in the Great Basin.

In 1865 a satellite mission of the Southern Mission, centered at St. George and Santa Clara, was established on the Muddy River in the northeastern Mojave Desert. Called the Muddy Mission, its purpose was to produce cotton, provide a way station for the Colorado River trade and emigration program and serve as a barrier to Gentile (non-Mormon) expansion. The mission succeeded in only one of these before it ended in 1871.

Arrington’s seven principles represent an ethnographic statement by a Mormon regarding the ideal behavior of 19th century Mormons. The archaeological and historical data on the Muddy Mission represent evidence of actual behavior of the Mormons living there from 1865 to 1871. Comparing the statement with the evidence answers two questions about the people on the Muddy: 1) were Arrington’s ideals present and operating and 2) were they adaptive to the Mojave Desert.

The results show that the principles were present but some were in forms adapted to
fit the physiography of the region or the needs of the people. Furthermore, the
technology adapted and developed for valleys to the north failed to work in all areas of
life on the Muddy. Limited resources, the isolated locale, lack of markets and economic
stimulus, inadequate technology and disharmony represented some of the real behavior
exhibited and experienced by the settlers on the Muddy thus showing that expectations
are not always present when involved in real situations.
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CHAPTER I

INTRODUCTION

In 1865 two groups of Mormons came to and settled the Muddy River Valley (Nevada). They established the nucleus communities from which others would develop covering an area from the confluence of the Virgin and Colorado Rivers to the Upper Muddy River Valley approximately 52 miles to the northwest. The primary purpose of this mission was to grow cotton for the program of self-sufficiency and economic independence with the surplus to be used in the available external markets.

They were not as technologically prepared to develop this valley, which is part of the Mojave Desert, as they had believed they were. However, these people, and others called in the following years, stayed on the Muddy River working hard to follow the dictates of their Church. This study examines the history and archaeology these people left behind.

RESEARCH DESIGN

In any study it is necessary to have a focal point or an approach, whether it be theoretical or practical. This point or approach is determined by what the examiner of the material seeks to find. One such approach is through cognition or the world view of a particular group of people or how they see the world around them. According to James Deetz this view plays a part in the way people organize "their physical universe. . ." as well as how their lives are formed by an ideological stance (1977:23). Basically, this entails an examination of an ideal culture, what the people think is how their culture should be and how they should behave based on their ideology, and the real culture and
its associated behaviors, or how the people actually behave.

Others who have written on the historical archaeology of the Muddy Mission, to be discussed in Chapter II, limited the scope of their problems to economics, behavior and locating the meeting house, New St. Joseph as a case study in historical archaeology or Sandy Town as an ideal and real City of Zion. The purpose of this study is to expand upon their work by examining the world view of the 19th century Church of Jesus Christ of Latter-day Saints, or Mormons, as it is presented by Leonard J. Arrington in his book, *Great Basin Kingdom* (1966). Arrington has summarized this world view into seven principles. These ideals emerged from the Church's beginnings in the 1830s and developed through its midwest experiences and geographical adaptations made on the westward trek to the Great Salt Lake Valley in 1847. Economic in nature, these principles represent a précis of the ideals of the Mormon Church; the ideal culture of the Mormons.

What are these principles? In essence, they are: 1. The Gathering—the coming together of Mormons to selected gathering places, or Zions, in preparation for the Millenium or Second Coming. 2. The Mormon Village—the settlement of the gathered people into villages built according to the Plat of Zion. In this plan, the land was divided into three sections: village lots, farming lots and pasturage fields. 3. Property as a Stewardship—all property was consecrated to the Church for the benefit of building the Kingdom. The ideals behind this principle aimed for group unity rather than individualism. Although some people acquired more property under their stewardship, the Church determined disposition of the property in a fair manner with lotteries. 4. Redeeming the Earth—once the village and property rights were established, then the Mormons concentrated on developing local resources. This principle served both secular and religious needs. Secular needs resulted in the development of all available resources to their full potential. Religious needs resulted in helping to cleanse the earth of a curse
so that eventually man would no longer have warfare, famine or other suffering.

5. Frugality and Economic Independence--by achieving total self-sufficiency, the Mormons could avoid outside assistance and its accompanying debts. To accomplish this required developing each region's resources and establishing economic independence from any other region. This was "the goal of colonization, of the settled village, and of resource development" (Arrington 1966:24).

6. Unity and Cooperation--this principle was believed to be of divine origin based on its premise of oneness. This ideal of oneness was exemplified by answering the call to a mission, allowing the Church leadership to direct their lives and being cooperative and unified.

7. Equality--an early goal of the Church, its purpose was to establish a system for attaining earthly economic equality which would transcend to heaven. The ideal remained evident in the later policies of land and water allocation, public works construction, "cooperative village stores and industries" and immigration (Arrington 1966:25).

These seven principles will provide the basis for a discussion of the ideal and real culture of the Mormons located on the Muddy River from 1865 to 1871. Each principle will be examined separately by analyzing the historical and archaeological data recovered from the mission's communities in terms of these two aspects of the Mormon culture.

The historical data used in this study includes both primary and secondary sources about the people, living conditions and events relating to the mission. The primary sources used are missionary diaries or journals, records of the Muddy Mission, records about the mission from the Southern Mission Annals, newspaper articles relating to the people and region of the Muddy River. Arrington's works, historical, geographical and historical archaeological theses, some on the Muddy Mission, others related to it, and other works, some focused directly on the Muddy Mission, some focused on related material, comprise the secondary sources used.
Arrington's work serves as a base for examination of the Mormon ideal culture because his work represents an extensive ethnographic picture of the Mormon way of life as seen through the eyes of a Mormon. Further, his familiarity with Mormon history, equal to that of both Mormon and non-Mormon historians and advocates of history, provides insight and interpretation of the events involved in the beginnings of the ideal culture as well as events which assisted in its further development and maintenance in the Great Basin and surrounding environs.

We have pertinent archaeological data on three of the ten communities, but only two can be used in this study. The third, West Point, presents a study problem of a different nature with nearly continuous occupation by the Mormons, Southern Paiute and others. It will be included only in the historical context. The two communities used for the archaeological research are New St. Joseph and Sandy Town B, although data from a surface map survey of Sandy Town A will be examined as well.

The data recovered archaeologically reflects on the material culture of these people. What they left behind is information on their architectural preferences and styles, construction methods, specialty items such as craft tools, flora and fauna used as food and shelter. As with the historical data, these remains of their material culture tell us about the lives of the people on the Muddy River.

The archaeological and historical data will be used to test the validity of the Mormon ideal culture, as it is presented by Arrington, as a model of actual Mormon culture. This testing is intended to answer two questions: Do Arrington's seven principles predict real behavior as recorded by the archaeological and historical data? Was the real behavior adaptative behavior in the Mojave Desert?

DISCUSSION OF HISTORICAL ARCHAEOLOGY

Together, the historical and archaeological data provide a basis for applying the cognitive approach to studies of the Muddy Mission. Before an understanding of the
archaeological and historical material in context of the Mormon communities can be reached, however, it is important to understand the relationship between them. This necessitates a review of archaeological and historical concepts to understand the relationship between history and archaeology. Larrabee (1969:67) states that archaeology is a way of studying the remains of what man did in the past. Deetz (1977:10), on the other hand, sees it in terms of material culture which is that part of the environment man alters according to his culture's dictates. McKay, in discussing a theoretical approach to the discipline, presented Walter W. Taylor's definitions of history and historiography by way of an introduction. History is "past actuality," whereas historiography is an "abstraction from past reality." To elucidate, history describes everything that occurred and historiography pertains to "contemporaneous thought" regarding what had occurred. "Contemporaneous" refers to an individual who lived at the same time as the event and recorded his thoughts about it, or an historian who has studied and synthesized the written material on it (McKay 1975:129).

However, it is pointed out that historiography is given broad meaning and is not used consistently by historians when referring to historical research (Schuyler 1976:124). Schuyler (1970:275) does state that it is the historical research and analysis (i.e., the historiography) which provides the primary sources with meaning.

To continue, Schuyler has determined that there are two aspects of this field: historical archaeology and historic sites archaeology. Historical archaeology entails the "study of the material remains from any historic period" (Schuyler 1970:84). Historic sites archaeology, which he sees as a subfield of historical archaeology, is the "study of the material manifestations of the expansion of European culture into the non-European world starting in the 15th century and ending with Industrialization or the present depending on local conditions" (Schuyler 1970:84). The former involves the methodological and technical aspects of the subject, whereas the latter works with a
"specific historical subject that has temporal, spatial, and cultural boundaries (Schuyler 1970:84). Although there is validity in Schuyler's presentation of the more specific subfield of historic sites archaeology, this study will use the broader term of historical archaeology encompassing both in its meaning.

With these definitions in mind, the relationship between archaeology and history becomes clearer. Both are concerned with the study of man's material remains. The former examines his buildings, items used in his daily life, items which express his feelings about his life (i.e., religious and aesthetic objects), how he lived, how he interacted with others and his environment. The latter studies man's written artifacts and oral traditions. These, too, can express information similar to that contained in the objects found by archaeologists.

It is possible to demonstrate the effectiveness of the interdisciplinary approach of historical archaeology in studying people and places. Yet, the interpretation of historic sites has its problems. Besides differing theoretical stances, there is the question of the relative emphasis in appropriate archaeological and historical methods. As William G. White (Personal communication 1986) argued, some authors appear to fall within three categories: 1) history with archaeology as a footnote; 2) archaeology with history as a footnote; and 3) history and archaeology playing an equal part in the analysis. Which discipline is emphasized in the site interpretation apparently determines which category a person fits.

For instance, in Whitehall's article regarding the use of archaeology as an auxiliary to American history, he quotes several scholars in reference to this issue. Professor Grahame Clark stated that "'archaeological methods can profitably be applied to any phase or aspect of history insufficiently documented by written records, however recent in time; indeed, archaeology can not only be used to fill gaps in the documents, but also to corroborate them'" (Whitehall 1966:255). Noel Hume spoke about the use of
archaeology at Colonial Williamsburg and how it has assisted in filling in "gaps left amid the documents, and more often it will round out historical evidence to give them a substance they might not otherwise achieve" (Whitehall 1966:255).

Stone (1977) and Baker (1978), however, offer examples where one or the other aspect of historical archaeology provides the best evidence. Stone used his own research to demonstrate that historical documentation contributed more than archaeological data to his study. Baker, on the other hand, found that the archaeological material presented a better analytical focal point for studying particular traits of colonial and ethnic group life (1978:173).

The issue of bringing history and archaeology together as a more integrated interdisciplinary approach is of great importance. In this study it serves to introduce work that has been done on a particular group of people, the Mormons in the western United States. Furthermore, the discussion presents a basis for the analysis of data acquired from historical and archaeological research of a small segment of these people, the settlers at the Muddy Mission.
CHAPTER II
MORMON HISTORY AND ARCHAEOLOGY –
A LITERATURE REVIEW

A review of the major events leading to their migration to the Great Salt Lake Valley in Utah assists in any study made of Mormon history. Knowing about the early years and the problems encountered with Gentiles in the midwest explains why they selected Utah to settle, why they settled so much of the region so quickly, and how their behavior reflected their own particular subculture. One informative source is *Great Basin Kingdom* by Arrington, a former Latter-day Saints Church historian. His book describes the Church's economic history with an opening chapter summarizing events prior to the exodus. Included are seven principles which Arrington feels best represent the Church's ideals. Using these ideals as background, Arrington then presents the economic history of the Mormons from 1847 to 1900. However, it is more than just a survey of events and people. In his Preface, the author identifies four reasons why Mormon economic development was significant:

1. It illustrates the problems associated with the settlement and growth of an isolated, mountainous, and semi-arid region.
2. It dramatizes the strengths and weaknesses of attempting a comprehensive development program without outside capital.
3. It represents one of the few regional economies in modern history founded for a religious purpose, dominated by religious sentiments, and managed by religious leaders.

Mormon society, peculiar in many respects, represented a microcosm of American
religion, democracy and economics. Yet, it was the peculiarities presented to outsiders which resulted in so many of the troubles the Mormons experienced in the midwest and later in the far west. First, they encountered difficulties with their neighbors, and later, the federal government confronted them. The very institutions which made the Mormons different also nearly led to the Church’s demise in the latter 19th century.

Not content with presenting a simple chronology of key events, Arrington instead tracks the development of the Church in the Great Basin and the changes made to adapt to a changing world view without compromising theology. Some of these changes antedated the major confrontations with the federal government. For example, by the 1880s only the first marriage was considered a civil marriage. (All marriages were sealed. A sealed, or celestial, marriage means that a man and woman are married “for time and eternity.” Without the sealing, a marriage “will not be valid after death.” Furthermore, children are sealed to their parents so the family is kept together in the afterlife [O’Dea 1957:59-60].) Although the change was of a superficial nature, the Church was attempting to comply with the government’s 1862 Anti-Bigamy Act.

By the 1870s, overpopulation in the settled valleys caused problems resulting in the implementation of a new colonization program which involved the reclamation of previously ignored marginal lands in southern Utah and Idaho. Further, the program sent settlers to Mexico and Canada to establish missions as a new phase in the expansion of the Church.

These and other problems besetting the Church were soon overshadowed by the federal government’s desire to end the theocratic economic and political system created by the Mormons. To further strengthen the 1862 act, Congress passed the Edmunds-Tucker Act in 1882. In addition to the anti-polygamous statement, the law attacked the organization responsible for funding immigration to Utah, the Perpetual Emigrating Company, and threatened the temporal power of the Church in its capacity as
an economic entity. These were all important factors the Church faced as the end of the 19th century drew to a close and the chance for statehood became a reality.

Clearly, with outside assistance and gritty initiative, the Mormon Church survived the crises of the 1890s. But few people realize that the pattern of settlement established by the Mormons in the Great Basin would eventually become the guiding model for development in the rest of the West. In fact, Arrington argues that it "is now part of the heritage which Americans are passing on to governments and people in many parts of the world" (1966:412).

The relationship of sociology and geography to historical archaeology may not be apparent, but when considered as socio-demographics they should not be ignored in studying any group of people. For this reason, Joseph E. Spencer's doctoral dissertation (1936) and Lowry Nelson's work (1952) are included in this discussion of Mormon research.

Spencer's dissertation covers the Middle Virgin River Valley in Utah. A quarter of it is devoted to geographic information about the rock formations, climate, vegetation, hydrology and soils of the Virgin River system, primarily focusing on the Middle Virgin Valley which includes St. George, Hurricane, Santa Clara and Leeds. Special emphasis is given to rainfall, hydrology, climate and stratigraphy. Recognizing how these geographic characteristics relate to agriculture is crucial to understanding the area which the Mormons settled and developed.

Spencer continued the study by examining local Indians and their relations with the Mormons. He followed this by an analysis of the Mormon settlement of the valley after 1855. One important Mormon adaptation was the pattern they used in settling the Middle Virgin Valley. Unlike the valleys to the north, those in the lower Great Basin and Colorado Plateau were long and narrow with limited arable land usually bordering stream and river channels. Irrigation farming was the only agricultural method with
which they had familiarity, thus causing the Mormons to limit the amount of growth a valley could sustain. Spencer noted that dry farming did not come into practice in southern Utah until after 1910 (1936:173).

Mormons in the Middle Valley also battled flooding and stream erosion. Their system of irrigation canals and dams provided a catch for silt, but the cost of cleaning and maintaining the canals and dams was eventually too high for some of the smaller villages--stream erosion caused by overuse was another major problem. As a result, some of the smaller villages were abandoned for larger more profitable ones. The land was later taken over by wealthier neighboring farmers able to shoulder the added expense.

Spencer also traced the Middle Virgin Valley's development, dividing it into two eras: initial settlement between 1850 and 1880 and expansion from 1880 to 1931. During this later period, new towns were established and St. George finally emerged as the religious, judicial and administrative center. Further, population growth was slow and steady, yet never reaching the saturation point as in other parts of the valley.

By the late 1880s through 1910, several factors transformed life in the valley. Cheaper eastern goods found a ready market among the southern Utahans, a key indicator reflecting the gradual change from self-sufficiency to economic dependence upon supplies outside of the region. In addition, transportation and roads improved access to the area which ultimately created a tourist trade and truck-based economy.

Lastly, agriculture changed. Years of overgrazing had cut livestock. New synthetic materials like rayon and nylon cut the demand for cotton, and lower tariffs cut the price of copper, lead and other minerals shutting down the region's mines which, in turn, weakened the nearby produce market. Fortunately, northern Utah soon required an increase in grains which southerners could supply, and with better transportation and mechanization, they grew fruit crops for a burgeoning export market (Spencer...
1936:189). These changes brought innovations in irrigation practices. The Mormons used fewer canals yet were able to water more land and at greater distances.

As these changes occurred, the population began migrating from the small farming hamlets to larger towns where jobs abounded. In response, the Church decentralized itself creating new hubs with temples in other parts of the United States and other countries with substantial Mormon populations.

Nelson's book, *The Mormon Village*, reflects a continuation of Spencer's research, although it served as a basis for Spencer's dissertation. The book begins by presenting the reader with a description of Mormon settlement patterns, the Church hierarchy and its role in the settlement and development of a Mormon community as well as other general information about village populations. The rest examines three Utah Mormon towns, Escalante, Ephraim and American Fork, in the early 1920s and in 1950, and three Canadian Mormon towns, Cardston, Stirling and Orton, in 1930.

Because this is a sociological study, Nelson analyzes all changes which affected the community. Among these were occupational mobility, education and its effect on family size, agricultural productivity and the land, the size and numbers of farms, rural commuting distances and varying living standards. Nelson demonstrated that changes had occurred to some degree in the three Utah communities, affected by the Depression, World War II and other outside events. By the 1950s the outflux to high employment areas was even more pronounced than the trend Spencer found for the 1930s in the Middle Virgin Valley. Moreover, agricultural decline in the 1930s produced the same urban migration in the three Canadian towns.

The section on the Canadian towns includes their settlement and subsequent evolution up to 1930. One town, Orton, was the last to be settled and represented a community built in an area of marginal agricultural productivity kept alive by the strength of Church leadership. A number of families left by 1930 because of the low productivity
of the area. Unfortunately, Nelson never continued his study of these towns past 1930 as he had done with those in Utah. This neglect raises questions of the towns' survival and what factors accounted for their success.

*Roots of Modern Mormonism* (1979), an ethnographic study of the Mormon communities on the Little Colorado River in Arizona, presents an anthropological discussion of how the Mormon religion evolved into its modern format. Mark P. Leone opens with a brief review of the history and structure of the Church to the present and at the changes the Church experienced between ca. 1890 and 1920. Because Leone's study concerns the changes in the religion itself, he examined three areas of Mormon life closely tied to the Church: tithing, water control and ecclesiastical courts. Each was analyzed in regard to its application to the communities in the Little Colorado River region from the time of settlement into the early 20th century.

For most of the 19th century Mormons, payment of tithes was in kind, i.e., produce and livestock. Leone furnishes tables representing the dollar value and percentage of the total of the various forms of payment made by four towns from either 1887 or 1888 to 1898. Another set of tables show grain and livestock tithing for six Little Colorado towns for two periods, 1888-1889 and 1892-1893. The data is derived from Stake Records (Leone 1979:57-62). These tables provide information on the stability, or instability, of particular crops and livestock over a specific span, as well as trends appearing in the dollar value of the commodities.

Leone then examines the irrigation and dam systems constructed on the Little Colorado and its tributaries. The Mormons built a system of dams to control the flow of water and settle the silt before it got into the canals. Unfortunately, silt settling behind the dams raised the stream and river bed levels, and without occasional washout to remove the buildup, Mormons endured damage from floodwaters rising over or destroying the dams. Leone remarked that until permanent dams were built in the 1920s
the local Church leadership considered the floods and washouts as part of God's will, a form of testing to prepare for the Second Coming (1979:96). The Mormons conducted rituals revolving around the rebuilding of dams and canals which included messages about the requirements for the continual preparation for the Second Coming.

In his discussion of the ecclesiastical courts, Leone points out that three issues lay behind all of the cases brought to the Church court or High Council:

"first... secure the unity of the community... second... define the nature of authority... [and] third... reconcile [the] differences between the traditional, cooperative Mormon economy and the increasingly important capitalist economy which was absorbing them (1979:116).

To illustrate, he described the court system and the handling of various offenses in the appropriate levels of the system.

The remainder of the book concerns changes resulting from outside influences, i.e., the United States government, and the effect these have on the nature of Mormonism. Leone includes a look at contemporary Mormon church meetings where individuals discuss events and how their religion provides guidance through these situations.

A point of interest that Leone discussed is the part history plays in the Church. With the abrupt changes made before 1900, the Mormons lost their past. They no longer had a history or the institutions available to explain why and how they were different. Another point he made was that despite the collection and availability of journals, notebooks and other works about the people living in these early Arizona settlements, little appears to have been used to write a history. Leone also found that people in their eighties and nineties could not relate to past events except in anecdotes or tales. They have a history, but because they do not segment time it is not readily apparent to them how yesterday became today. He further indicates that this was because there is no past, based on Smith's claim that "reality is a continuum which is changing according to
Thus, the past is basically no different from the present or the future” (Leone 1979:209).

Briefly, Spencer and Nelson present socio-demographic studies of communities settled between 1850 and 1930. They include plats of the communities demonstrating the versatility of the Mormons to adapt themselves and their agricultural technology to the available environments. Further, they show the strength of the Church to assist with this adaptability. Leone appears to be more concerned with presenting Mormonism as a way of viewing the world and the role the religion played in the building of the Mormon subculture. Moreover, his work shows how Mormon theology assisted in the success of the Little Colorado communities where similar religions had failed.

The final four works in this discussion are master’s theses on the Muddy Mission. They all represent studies in historical archaeology, two from an anthropological perspective and two from an historical perspective. All four include a history of the mission, from the building of St. Thomas in 1865 to the departure of the missionaries in 1871. Three, Carolyn E. Grattan (1982), Jane P. Kowalewski (1984) and Anthony W. Wonderly (1976), concentrated on the excavations done at New St. Joseph, whereas Richard L. McCarty (1981) focused on the work done at Sandy Town (A and B).

Wonderly’s thesis consists of four sections. The first is a chronological review of New St. Joseph and the other Muddy Mission communities based on documentary sources. The second summarizes "a cross-cultural survey suggested by the social system which existed at New St. Joseph" (Wonderly 1976:4). In essence, he is examining the phenomenon of group settlement, i.e., "planned colonization accomplished by family units residing in agricultural, religious, and culturally homogeneous communities" (Wonderly 1976:4).

Section three entails the site’s archaeological data, including a description of the site, the structure excavated and some of the ceramics recovered. There is also mention of a
nearby cemetery established by these early settlers.

The data is then analyzed through an examination of the perspectives emic, "the views and beliefs that the subjects hold concerning their own behavior," and etic, "direct and indirect observation of human behavior" (Schuyler 1978:269) as represented by historical documents and ethnographical and artifactual data. Wonderley's conclusions, using the above information, are that there were, at that time, four areas where the archaeological material (etic) and historical documents (emic) complimented each other in explaining the nature of the settlement as a group endeavor, the location of a community structure, the investigation of wealth and status based on the statistical analysis of the artifacts recovered, the reason for constructing the community "as a symmetrical U", its association with economic functions and the evidence of previous occupation by Puebloan Indians (Wonderley 1976:65). Some of Wonderley's questions served as a basis for research conducted for the three other master's theses.

Primarily, Wonderley's thesis is a theoretical discussion of historical archaeology using New St. Joseph as a practical example of how to integrate historical and archaeological data. Finally, he provides illustrations employing the site to indicate the contributions of historical archaeology to a "true science of man" (Wonderley 1976:81).

Grattan's thesis examines the site of New St. Joseph as a reflection of "a transitional phase in the development of Mormon society" (1982:2). She notes that the devices used for creating a unified community, proving "the divinity of [the] Church's institutions by success in a secular world" and allowing wealthy Mormons "greater personal gain" were not present at New St. Joseph, which was partly why the mission failed (Grattan 1982:2-3). She approaches this through the analysis of the Mormon cognition or world view, vis-a-vis Deetz (1977:23). She asserts this world view developed in the isolated environment of the Great Basin. Grattan then suggests that the developmental stages are reflected by forts that symbolize the isolationist nature of Mormonism. The fort further
symbolized unity, which Grattan states aided in the formation of the Mormon cognition (1982:25-26). She then describes the various architectural formats followed in Mormon fort construction concluding with a discussion of the reason for the fort at New St. Joseph.

Leadership at the Southern Mission, in New St. Joseph and at St. George, is another topic discussed. One leadership decision reviewed is the building of a city, based on the Plat of Zion, on the bench east of New St. Joseph. After building in two locations, without successful use of a canal, the project was abandoned. Grattan attributes the failure to the leadership's inability to admit that a better location was needed without questioning the Church itself (1982:42).

Grattan then analyzes several categories of artifacts, such as ceramics and glass, describing them in terms of pattern, color and, where possible, history of manufacture. She does a further statistical analysis based on location to determine where the meeting house, discussed in missionaries' journals, was located. Using this data, she feels that it is possible to indicate the location of the meeting house by the frequency of fire damaged artifacts (the fort was burned in 1868). In her conclusions, she suggests that the data make it possible to determine the houses of specific individuals, in particular those who were considered the wealthier of the community (Bleak 1941:276).

Kowalewski's thesis examines the economics of New St. Joseph through the relationship between the Mormons and miners in Southern Nevada and the failure of the mission to establish such a relationship. One reason for establishing the Muddy Mission was to produce cotton, which Kowalewski suggests was the cause of the mission's demise. The cotton economy could not "support the settlements." Without diversification, "the missionaries were unable to develop a secure economic base and the settlements were abandoned within six years of their founding" (Kowalewski 1984:11).

Her initial discussion of Mormons and miners presents a general history of both
with a cursory look at settlement development by the Mormons. An examination of the variation of occupations between communities follows. The importance of this data shows the development of economic relations between the two groups because of what they lacked: the Mormons lacked cash and manufactured goods, whereas the miners lacked fresh produce and meat. This trade was not always available to the Mormons; however, when it was, economic stability was evident.

Other trade, although short-lived, came from the Colorado River, usually only as far as El Dorado Canyon. The Mormons established a landing in 1864 between the canyon and the juncture of the Virgin and Colorado Rivers. It was unsuccessful, possibly because little traffic got that far. Kowalewski indicates that competition on the river and the river itself prevented any substantial trading up to Call's Landing. Furthermore, the advent of transcontinental rail transportation precluded any need for the Colorado River trade.

Following a discussion of the political situation and the cotton industry at the Muddy Mission, Kowalewski presents her archaeological data. This includes a description of the area excavated, methodology and a detailed description of one of the structures excavated four years previously. She lists artifact categories found, i.e., leather, glass, ceramics, but devoted most of the description and discussion to seeds recovered by excavation and from flotation samples. Basing her conclusions on the portion size of various seeds, Kowalewski states that cotton seeds "(32.4 grams) [were] substantiating the importance played by this product in the local economy" (Kowalewski 1984:90). With cotton as the major industry of the Muddy Mission, no established market with the miners and other outside forces at play against them the Muddy Mission failed.

McCarty's thesis, on Sandy Town, examines the ideological factors behind Mormon settlement, desert technology and social organization comparing their model with that of Gentiles. He follows with a discussion of the environment, both objective and
subjective. The objective represents the environment as it is found in the Great Basin and Mojave Desert, whereas the subjective represents the environment as the Sandy Town inhabitants viewed it.

The next two sections are concerned with "'articulate history'" and "'inarticulate history'" (McCarty 1981:6). The former is historical documentation providing the chronological record, settlers' views and their accomplishments. The latter is archaeological data which "provides an opportunity to support, refute or embellish what has been recorded about the town" (McCarty 1981:6). Further, it provides the only descriptive information about the town as well as the scope of construction.

The conclusion answers the questions generated by the research and interpretations of these answers. McCarty concludes that several factors were responsible for the failure of Sandy Town. Any of these, lack of manpower, lack of an adequate water supply, "an inappropriate technology for the sand bench environment", the decrease in the cotton economy and poor transportation routes, would have resulted in the community's failure (McCarty 1981:176). Finally, he reviews the reasons for building Sandy Town. It was designated as a City of Zion; further, it presented a challenge which McCarty notes the Mormons needed to survive.

As examples of historical archaeology two theses best fit White's category of history with archaeology as a footnote. Grattan's historical research is good, although she should have tried to find other primary sources for discussion of the leadership on the Muddy; limiting it to one source presents the probability of a biased approach which needs to be stated as such. Her statistical analysis has merit if all of the artifacts in the categories analyzed are used. But she does not do enough to substantiate her idea of determining wealth and status. She neglects to examine the wealth indicator found in ceramics. Studies done since at least 1980 (such as Miller's "Classification and Economic Scaling in the 19th Century Ceramics", 1980) have compiled price indices of
ceramics for various types of wares, patterns or designs and size and shape of individual items in a service. Doing a statistical analysis of this in conjunction with an analysis of artifact locations would have assisted Grattan greatly in her final conclusions.

Regarding her explanation of the development of the Mormon world view, Grattan did not include in her research Arrington's *Great Basin Kingdom*. If she had, she would have realized that the Mormon world view began long before they arrived in the Great Basin. The geographical, political, religious and social isolation of the basin provided the Mormons with the opportunity to continue to develop as they wanted with little or no interference from others who opposed their way of thinking and living.

Kowalewski has sound conclusions; cotton was the predominate economic crop at New St. Joseph. However, she limits her data to a single structure which could have had an unusual amount of cotton seed when compared with other structures at the site. A data base which included a count of all the seed recovered from the site up to that time would allow for any aberrations a single sample might project.

McCarty's thesis represents an excellent integration of history and archaeology. The paucity of documentation on Sandy Town is one factor for this; the other is that his question determined the scope of his archaeological project. He had to examine the geography to find traces of the bench communities' structures and canals. Moreover, he had to acquaint himself with the geology of both the Great Basin and the Mojave Desert to illustrate how Great Basin technology did not necessarily work in the Mojave.

As with the others, McCarty limited his research to one community, not the entire mission. However, he indicates that, though the entire mission served as a challenge for the Mormons, he feels that Sandy Town proved the greater. He further sees that no one factor determined the demise of the mission, rather it was a series of factors. Grattan argues that McCarty was precipitous in stating that the mission was a failure "prior to the abandonment of the area, because of problems with the canal and water supply"
That he had also neglected to look at the successful development of Overton and the bench abandonment as another example of the limitations of Church leadership.

Grattan, on the other hand, missed the point McCarty makes. The drought of 1869, together with the demise of the bench communities, coincided to increase the deleterious factors inherent to the Mission. A need for tools and clothing, no market for a small cotton crop followed by the unsuccessful visit by Brigham Young could not be altered by the increase in crop production in 1870. Too many factors impeded the continuation of the Mission as it had been originally defined.

Wonderley's thesis presents a different approach because it is a preliminary study in the discipline presenting a more theoretical application than practical. Most of his conclusions regarding the use of emic and etic were answered by the historical documents with the archaeology providing collaborating data. However, he augmented this with analogies provided by ethnographic studies; a well defined and acceptable anthropological approach to data. This places him in White's third category.

Arrington's principles appear, in various interpretations, among the works of all of the above. However, only Leone, Wonderley, Grattan and McCarty touch upon a world view, or cognition, of the Mormons. Leone went into great depth, primarily in his discussion of the changing role of the Church, its views and practices, to accommodate for a changing world; one where it lost control of the political and economic control of Mormon life as well as programs that were an essential part of the religious life, i.e., polygyny. These created a change in the world view, one where the individual plays a greater role in the religion and the belief that Zion is wherever there are Mormons (Leone 1979:7-9).

Wonderley approaches the examination of a world view through the use of emic and etic perspectives. Specifically, he uses historical data as emic material, i.e., how the Mormons saw and recorded their own behavior, and archaeological data as etic material,
i.e., how the inarticulate artifacts present the lives of the Mormons. His use of anthropological analogies is in coordination with the artifactual data.

Wonderley presents a brief explanation of world view with regards to Mormon ideology and theology. It provided the motivation for these people to always perform at their best; to labor long and well could bring god-like status to the worker. Part of this reward was also seen in the submission to authority and the ability to unite and cooperate as a group. For this reason, group settlement was important to maintain the religion as well as to continue it. Two ideals associated with group settlement, developed and tried unsuccessfully, were Smith's Plat of the City of Zion, the perfect city for Christ's Second Coming, and the Order of Enoch, a true communitarian settlement. Part of the success for any variations on these ideals was due to the common religion shared by everyone and the acceptance of an "authoritarian hierarchy" (Wonderley 1976:7). Finally, Wonderley notes that "the Mormons accepted subordination to a higher purpose" because theirs was "A... [sub]culture with specific behavioral and attitudinal traits ubiquitous to Mormons but not to others" (Wonderley 1976:9-10).

Grattan sees Mormon cognition primarily in the symbolism associated with forts. They represent unity, the one thought. Unfortunately, forts were, according to Grattan and Wonderley, generally a secondary element in settlement occurring after an initial village had been built and used for the purpose of protection from the threat of Indian attack. Furthermore, most were never completed and served only as a temporary settlement. In Grattan's case study, though, the fort community of New St. Joseph did serve as a uniting force of two groups of settlers--those from St. Joseph and those from Mill Point. It is possible, due to the unfort-like nature of the community and the lack of any definite threat from local Indians, to interpret its purpose as being more for bringing two different groups together as one than for protection.

Both of these studies, though, present only a cursory look at the Mormon world
Grattan states that it developed in the Great Basin because of its isolated nature, a point already argued against by the presentation of Arrington's principles. She also limits her discussion of the Mormon cognition to the symbolism of the fort as a unifying force, as well as the role of the fort community New St. Joseph. She ignores the role of the other Sand Bench communities, which are equally important to the development of the Mormon world view because they represent the attempt of building the ideal city on the Muddy River. Her discussion of the other Sand Bench communities is used to show a lack of unity and cooperation amongst the New St. Joseph settlers after the 1868 fire.

Grattan takes a cursory look at the environment following Leone's interpretation of Mormon cognition. Leone sees the cultural compartmentalization of the physical world, i.e., fencing and platted communities, as an integral aspect of their world view (1978:199). This ability to compartmentalize needs to be continued to enable the modern Mormon to synthesize the contradictions in his religion. Grattan notes that it is reflected through the symbolism associated with a "compartmentalized landscape" (1982:25).

Unfortunately, Grattan does not carry out Deetz's definition to its fullest by looking at how a "past people . . . perceived their environment, the world view that underlay the organization of their physical universe, and the way ideology shaped their lives" (1977:23). She does not examine their ideology and provides only a brief discussion of the environmental perception and organization vis-a-vis Leone. These are essential aspects of that cognition and should be addressed.

Wonderley is also very brief in his examination of the Mormon world view. He does bring out the importance of the theological stance of the Church in its role of developing that view. He also points out two ideals which played an important part in 19th century cognition. Furthermore, he sees the connection between the secular and spiritual traits associated with daily acts and chores in their relation to achieving the perfection necessary for Christ's Second Coming.
McCarty offers a good discussion of the Mormon ideology, concept of environment and how they used this cognition to shape their world. Arrington served as a source of information regarding this discussion, so all of his ideals appear in McCarty's thesis. However, he is more concerned with this cognition as it applies to the building of a perfect city for the Second Coming and a look at Sandy Town as an example of how the Mormons tried to make the real fit the ideal. His comments and conclusions will be elaborated upon in the later discussion of the ideals.

The Muddy Mission has generated a substantial amount of literature, mostly historical. Studies based on the historical archaeology of the mission are increasing in number, including this one. With this information, a clearer picture of life on the Muddy emerges. The above four theses concentrated on a single community and examined the behavioral, economic or technological factors of that community. The purpose of this thesis is to bring all of that together by looking at Arrington's principles in the context of the ideal culture of early Mormons as stated by a Mormon informant. Using the statement for comparison, the archaeological and historical evidence will be examined to determine if 1) these ideals were present and operating and 2) they were adaptive to the Mojave Desert.

Preliminary historical and archaeo logical data is presented in Chapters III - Historical Elements and IV - Archaeological Elements. Chapter III includes a brief review of the explorers and traders who travelled through and wrote about the region of the Muddy River. The information these people provided assisted in the settling of the valley in the 1860s. Following this is an examination and comparison of the Gentile and Mormon frontiers. Part of the comparison includes a brief look at the real and ideal behavior of the two groups. A chronology of important events follows and the remainder of the chapter presents a general history of the mission. Chapter IV presents archaeological data in the areas of the environment, including a comparison of the Great Basin and
Mojave Deserts, excavation methodology and site descriptions of New St. Joseph and Sandy Town B. The chapter concludes with a brief look at house construction techniques used at the sites.

Chapters V and VI address the archaeological and historical evidence in greater detail as they apply to particular principles. Chapter V - Man and the Environment - looks at the first four principles, the gathering, the Mormon village, property as stewardship and redeeming the earth, as the Mormons' relationship with their environment. Chapter VI - Man and Society - examines the last three principles, frugality and economic independence, unity and cooperation and equality, in the ways Mormons interacted with each other, the Church leadership and Gentiles. Both chapters introduce a more detailed explanation of each principle followed by the presentation of archaeological and historical data. A discussion of the evidence and a comparison of the ideal behavior suggested by the principle and the real behavior as it is inferred by the evidence complete the examination of each principle.

Examining all of Arrington's principles in relation to their appearance on the Muddy River focuses attention on more specific aspects of life there. Presenting the principles as a reference of expected behavior for comparison with the archaeological and historical data as inferred actual behavior serves as a directing force in that focus. Thus, synopsizing previous studies and introducing new material should create a more vivid picture of life on the Muddy from 1865 to 1871.
CHAPTER III

HISTORICAL ELEMENTS

The history of a community cannot be limited to just the beginning, ending and years between. Questions arise about why and who established the community and why did they choose that particular spot of geography. These reasons necessitate setting the stage for the historical script of the community, in this case the Muddy Mission. This chapter, then, has three sections to assist in setting that stage. They are: "Explorers and Traders," the people who sought, found, travelled through, wrote about and selected the geographical spot; "Comparison of Mormon and Gentile Settlements," a discussion of who established the community and how and why they differed from other Western settlers; and "Chronology of the Muddy Mission," a brief look of the major events from beginning to end and the years between.

EXPLORERS AND TRADERS

Located in southeastern Nevada near the confluence of the Virgin and Colorado Rivers, the Muddy River Valley gained importance in the slowly emerging trail network for trade and travel prior to Mormon settlement in the 1860s. Trading parties from New Mexico Territory enroute to southern California, a United States military exploratory party and others travelled through the valley between c. 1831 and 1864. The valley provided water and food for both men and animals in addition to easy access to better developed trails in Utah and Arizona. The Mormons learned of the Muddy River Valley from the written and verbal reports of these travellers.

As early as 1776, the need for a trail from the old Southwest of New Mexico to
coastal ports in California was apparent. However, it took until 1831 to find such a route which provided water, forage and accessibility to animals with heavy loads.

Between 1829 and 1831 three parties from Santa Fe travelled near the Colorado River. After the third party, Wolfskill-Yount, went through from Santa Fe to Los Angeles via the Colorado, two unknown groups added short cuts. The second short cut took the trail to the previously established route to the Virgin River near present-day Hurricane, Utah, and used the Virgin River route until reaching Bunkerville, Nevada. From here, the party travelled west and crossed the Mormon Mesa at a point on the Muddy River below present-day Moapa, Nevada. Then they moved southeast for the 55 mile trip to the Las Vegas Valley springs. The present-day Interstate 15 follows the general course of the trail (Hafen and Hafen 1954:1:139-46, 153-54; Cline 1963:166; Moody 1963:171-77; Warren 1974:181).

The parties from New Mexico used the trail primarily for trade. Others also saw the advantages of southern California trade centers. The Mormons learned of the low-priced and abundant food and livestock available when the Mormon Battalion returned from southern California after the Mexican War. They established trade with merchants for goods unavailable in the Great Salt Lake Valley and surrounding area. Because of limited ready markets in Utah crops were sold for cash in California, especially cotton grown in the early 1860s. With no factory in Utah to make the raw lint into yarn and no one wishing to buy home-grown material the Mormons sought outside markets to sell their cotton lint. In 1864 11,000 pounds of lint were hauled to California to sell for cash and manufactured goods such as shoes, farm equipment, stoves and cooking utensils. The trade with California brought cash and goods to the Mormons of southern Utah, but Church leadership eventually discouraged this trade with the introduction of machinery for making cotton yarn and cloth. However, even then they did not completely abolish the California market as trade was continued under the auspices of the
Southern Utah Cooperative Mercantile Association (SUCMA) in the late 1860s and the combined SUCMA and Zion's Co-operative Rio Virgen Manufacturing Association in the 1870s (Barrett 1947:222-37).

Changes in the trail made it more accessible, but travellers still encountered problems. Potable water was available in both the Las Vegas and Muddy River Valleys, but not in the region between. In his report concerning travel through this region, Lieutenant John C. Fremont described the region and how he and his men prevented thirst in an arid area by moistening their "mouths with the acid of the sour dock" (Fremont 1956:409). He commented that those inland with trees and water would find it difficult to understand the situation in which he and his men found themselves.

Fremont and his men stayed at the Muddy for a day to rest their animals before continuing to the Virgin River and on to the Great Salt Lake Valley. While there, he noted the terrain where they camped and the route they took to the Virgin. His general appraisal of the area was not encouraging. The land was composed of yellow sandstone and a rough composite of rock and clay which hindered the animals' progress. Grass was available near the Muddy, but little grew near the Virgin (Fremont 1956:408-9; Cline 1963:213).

Another traveler, Orville C. Pratt, a young lawyer travelling to California in the Kit Carson party of 1848, wrote enthusiastically about what he saw. As the party approached the Muddy from the Virgin he wrote that the road was difficult to cross and had no water or forage for the animals. When they reached the Muddy they camped near the river in a grassy area. Pratt described the valley as large with fertile land and pure water. He could envision the valley supporting a large number of people with little difficulty. While there, they encountered a band of Paiute Indians from whom they bought corn and beans (Hafen and Hafen 1954:1:354-55).

Others who travelled through the valley commented on the possibilities of settlement
or questioned the practicality of it. In the fall of 1856, the Las Vegas Mission sent an exploratory group to the Muddy River area. The leader, William Covert, reported finding several hundred acres of good bottom land on the Muddy. Another member of the mission, Samuel Atwood, who visited the Muddy in December, had a different opinion. He could not see any potential in the area. There was no visible farm, meadow or range land, nor was there any wood or timber available (Jenson 1925-1926:264-65).

Despite what Atwood wrote about the land, staple crops could be and were grown in the river valley. In his journal, Pratt wrote of the corn and beans the Paiutes grew. The Paiutes also grew wheat (Hafen and Hafen 1954:1:354-55).

Others sent by Brigham Young to the Muddy River Valley examined its suitability for settlement and noted the best locations for farming. Of these men, the most important was Anson Call. Call came to the Muddy to explore and build a landing and warehouse at the head of navigation on the Colorado River under the aegis of the Deseret Mercantile Association (Larson 1961:7). In his report, Call wrote that the fertile land found near the mouth of the Muddy could support several hundred families without overcrowding. Brigham Young, pleased with Call's report, made plans for settling the valley (Figure 1, p. 30). He wanted to use the Colorado River for shipping goods and people to and from Deseret, the unofficial Mormon state established in 1849 encompassing Utah, Nevada, most of Arizona and parts of Idaho, Oregon, Washington, Wyoming, Colorado, New Mexico and California. He planned to settle the Muddy River Valley quickly with a large population. Furthermore, Young wanted to prevent non-Mormons from settling in the area because he believed that they would take over the best parcels of land and benefit more from the Mormons' work than would the Mormons, especially the expected Colorado River trade (Corbett 1968:30-32; O'Dea 1957:97-98).
Figure 1. Location of the Muddy Mission (after Bulkin n.d.; Grattan-Aiello 1986:29:33).
COMPARISON OF MORMON AND GENTILE SETTLEMENTS

In his 1959 attack upon the famous Turner Thesis, Richard C. Wade asserted that "The towns were the spearheads of the frontier. Planted far in advance of the line of settlement, they held the West for the approaching population" (1959:1). Yet, the Turner Thesis still remains popular in Western historiography. Scholars still debate whether the West was settled by discontented individuals and families who wanted to escape overcrowded cities or acquire land cheaply. The lure of the West, with its vast lands yet to be plowed, is a Turnerian theme which is not in direct conflict with Wade's urban view. Turner stated that the frontier, with its free or cheap land, presented an environment where the advance of settlement played a greater part in creating the American civilization than European institutions. The movement of people, through different phases of the frontier, forged the Old World institutions into newer, American ones, such as democracy (Turner 1972:3-28). The frontier also served as a safety-valve for the wage-earners, immigrants, non-laborers, anyone seeking mobility in social and economic status (Simler 1958:256).

Primary development of the West, however, was conducted by land speculators and railroad companies. They created towns and cities in prime locations before the adventurous, economic and social mobility seekers, laborers and farmers migrated west (Reps 1965). Common to both views is that the development of the western frontier of the Gentiles involved capitalist endeavors. Further, they inspired the idea of rugged individualism and the acquisition of material things through free enterprise.

The Mormon settlements, of which there were approximately 357 in the Far West with 40 located in southern Utah (these are 1877 figures) (Encyclopedia Americana 1972:464; Corbett 1968:33-34), began as planned, compact villages which enlarged as the population increased. The farm lands were located beyond the housing area and divided equally amongst the settlers by the drawing of lots, thus allowing each individual
to have both good and marginal farmland. Settlers followed the Prophet Joseph Smith's plan for the City of Zion when developing their villages (Nelson 1952:14-17, 25-6).

As conceived by Smith in 1833 the idealized City of Zion was intended to provide shelter for every member of Israel who did not go to Jerusalem for the Second Coming (Figure 2, p. 33). The city would be Christ's headquarters after his return to earth when the world was free of worldly vises and imperfections. The design of the city placed homes, gardens and official buildings within its confines and the farm buildings and land outside. Villages followed a similar plan on a smaller, modified scale (Spencer 1937:90; Nelson 1952:38).

Rugged individualism and the acquisition of material goods did not play a similar role with the Mormons as it did with the Gentiles. Individualism amongst the Mormons was not necessarily discouraged, but rather seen as reflecting the achievement of the whole group. This differs greatly from the Gentile view which the frontier supposedly enhanced—that is, man against nature surviving by individual effort. The acquisition of material goods through capitalism, on the other hand, was challenged early by Joseph Smith as a "system which created inequalities" (Hayden 1976:107). His answer was the Law of Consecration and Stewardship where all were made equal by giving all property to the church. The practice did not fare as well as Smith would have liked, so he replaced it with a ten percent tithe of all surplus property to go to church supported projects.

Other differences between Mormon and Gentile communities included governing bodies, Indian relations and the basic organization of the settlements. Gentile settlements usually incorporated the governing bodies when they built the community. Prior to that the scattered inhabitants determined law enforcement and decision making. The Mormons, on the other hand, established religious and civil government bodies as part of their planned villages. Until Congress established the Utah Territorial government in
Figure 2. Plat of the City of Zion (after Reps 1965:466; McCarty 1981:23).
1850 (Encyclopedia Britannica 1967:798), or in isolated settlements, religious leaders also served as civil leaders.

Indian-white relations were not always amicable, even at the best of times. Settlers often took land from the Indians, pushing them out of their established territories which provided them with food, clothing, shelter. And many areas could not be settled until the Indians had been moved to a reservation or subdued by the military. When the Mormons arrived in any area inhabited by Indians they immediately began establishing friendly relations with them. Brigham Young expressed the view that it was better to give food to the Indians than to fight them (Larson 1961:22). The Mormons also made special efforts to teach the Indians new farming methods and to try to convert them to the Mormon Church.

Although the Indian-Mormon relationship was better than that of other western settlers, the Mormons still experienced Indian depredations. There were three wars between the Mormons and Utah and northern Arizona Indian tribes, but the last, the Black Hawk War, is the only one which pertains to this study. That war occurred during the mid-1860s throughout the territory of Utah and into southern Nevada (Corbett 1968:111, 125).

The basic organization of the Gentile community was similar to that of any non-religious oriented community with a definite separation of church and state. The Mormon village settlement, however, not only served religious purposes but was practical in the arid Great Basin environment. A limited and localized water supply necessitated cooperative use of the water (Nelson 1952:34-37; Spencer 1937:115-16, 122). Moreover, lessons learned at the Illinois city of Nauvoo showed the need for common ownership of water as well as mineral and timber resources (Hayden 1976:142).

The village settlement manifested basic Mormon ideology established in the first
decade of the group's existence. The village provided security and maintained social and religious contact. Difficulties, faced as a community, served to strengthen the Mormons. Such strength and cohesiveness helped the Mormon movement survive when many other reformist and religious movements of the 1830s failed (Nelson 1952:30-34; Spencer 1937:122).

Another important difference between Mormon and Gentile settlements becomes apparent in how they appear to an outsider. Frederick DeUenbaugh, who accompanied John Wesley Powell on his three trips down the Colorado, made two comments regarding this difference in *A Canyon Voyage*:

The entire settlement had a thrifty air, as is the case with the Mormons. Not a grog-shop, or gambling saloon, or dance-hall was to be seen; quite in contrast with the usual disgraceful accompaniments of the ordinary frontier towns (1962:167).

In all Mormon settlements the domestic animals were incorporated at once and they received special care; butter, milk, and cheese were consequently abundant; but in a "Gentile" frontier town all milk, if procurable at all, was drawn from a sealed tin. The same was true of vegetables. The empty tin was the chief decoration of such advanced settlements, and with the entire absence of any attempt at arrangement, at order, or to start fruit or shade trees, or do any other sensible thing, the "Gentile" frontier town was a ghastly hodge-podge of shacks in the midst of a sea of refuse. As pioneers the Mormons were superior to any class I have overcome [sic] in contact with, their idea being home-making and not skimming the cream off the country with a six-shooter and a whiskey bottle (1962:174-75).

DeUenbaugh presented two salient differences between the Mormon and Gentile settlements. Although Gentile frontier communities are characterized by the inevitable saloon complete with gambling and alcohol, the Mormons had their own gathering place, the meeting house (which sometimes doubled as the school), and had some problems with the consumption of wine made from the grapes they grew and whiskey (Foote 1975:202). However, the Mormons were more concerned with developing a region, in these examples by farming, whereas the Gentiles were not always concerned with that
task. The mining settlements, which dot many of the western states, were established for the single purpose of extracting as much of a particular mineral from the ground as possible. If farms and ranches were built nearby they were not necessarily first but rather resulted as a means of providing for the miners. The same could be said of towns which grew up as a result of an influx of people there to take what wealth they could find in the ground.

Dellenbaugh presented the second difference, of conspicuous consumption, in an interesting fashion. Mining communities, in particular, are known for massive dump sites composed of cans of all sizes and shapes for the storage and shipping of meat, milk (the most prevalent of tin cans found) and vegetables. Bottles are second in number, mostly liquor but also chemical, used in the mining operation, and medicinal. Mormon communities, whether it was agricultural, manufacturing or mining, were established with the idea of the people providing everything they needed themselves. The village plan allowed for individual gardens, orchards and vineyards so each family could grow some, if not all, of their food. Purchasing prepared foods was a necessity for many Gentile communities but not so for Mormon.

Finally, it is suggested that Gentiles would abandon an area or a structure if it did not prove productive. Another might reoccupy it and continue to make the same mistakes as the original settler, resulting in a second abandoning of the site. The Mormons, on the other hand, learned from their mistakes and worked to make adaptations toward improving the situation (McCarty 1981:19-20).

An example is the building of their cities. Nauvoo, the biggest and most important to the Mormons prior to migrating to Utah, was an example where massive monuments were built as a way of showing their exceptionalism, causing economic, ideological and practical problems for the Mormons. There was a conflict between their idea of the earthly city of Eden and the heavenly city of Jerusalem where they tried to do both in the
same locale. Furthermore, there was no area where secular and spiritual buildings provided a centralized focal point for the people.

The move to the Great Basin allowed for them to see where their problems lay. The leadership forbade land speculation and divided the land equally for all. A central plaza was designated for church, community and school buildings, preventing the conflict that arose in Nauvoo when two central areas operated in competition with no control by the church. The building of temples and other monumental buildings took a lesser place in the priority of construction projects. They were also built more slowly to avoid the economic problems encountered in Nauvoo and Kirkland, Ohio where land speculation was used to defray building costs (Hayden 1976:113-131).

The role of the temple changed, as well. During the construction of the Temple of Nauvoo, in 1844, Joseph Smith and his brother Hyrum were killed by a mob in Carthage, Illinois. For the next two years the temple became a focal point for the "collective grief" (Hayden 1976:143) of the Mormons. No longer a place of assembly, the role of the temple changed to that of a monument to the past, present and future of the church used only for special purposes.

Finally, in the Great Basin, the Mormons were able to combine the earthly Eden with the heavenly Jerusalem by working toward improving the environment and building "vernacular" structures. Brigham Young stated that purity, a lack of pollution, in the heart, land and town represented "signs of inner spirituality" which would be "recognized at the Second Coming" (Hayden 1976:142).

**CHRONOLOGY OF THE MUDDY MISSION**

1864

1865

1. January  Thomas Smith led the first group of missionaries to settle near the juncture of the Muddy and Virgin Rivers (Carter 1946:7:465).


3. October Orrawell Simons built a grist mill three miles downriver from St. Joseph. A cotton gin was added later (Foote 1975:193-95).

4. Five people died from malaria at St. Joseph and several families returned to Utah because of extreme summer temperatures (Bleak 1941:1:189-90).

5. A third community developed near the grist mill called Mill Point or Simonsville (Foote 1975:193-95).

1866

The Black Hawk War erupted in Utah and Nevada (Corbett 1975:1). St. Thomas relocated and built a fort (Foote 1975:201). St. Joseph lost stock stolen by Paiutes (Corbett 1968:121-22) and residents were advised to join with either St. Thomas or Mill Point residents. The combined Mill Point-St. Joseph settlers built a fort on the bench overlooking the mill (Bleak 1941:1:220-21). Water was brought closer by a five-mile extension on the St. Joseph canal (Foote 1975:198-99).

1867


2. Sandy Town A possibly under survey; construction may have begun
that year (McCarty 1981:89).

1868


2. August Junction City established on the Colorado River (Clement 1868:1; Foote 1975: 207; Deseret News 1868:17:293; Corbett 1975:147).

3. August 18th New St. Joseph burned because of two boys roasting potatoes (Clement 1868:3-4; Wood 1868:49; Deseret News 1868:17:225, 287, 293).

4. Fall 100 more families sent to the mission (Bleak 1941:1:276-77). They joined the residents of New St. Joseph who were building Sandy Town A (Clement 1868-1869:10; Kimball 1847-1889:75; McCarty 1981:89).

5. December West Point reorganized (Southern Utah Mission Record 1869:n.p.).

1869

1. Sandy Town moved about one mile north to reduce the length of the canal. Sandy Town B abandoned after nine months. Residents either returned to the original St. Joseph or established the town of Overton (Foote 1975:206-7).

1870


2. Fall  West Point abandoned after flood (Leavitt 1934:96).

3. The boundary of Nevada and Utah was resurveyed. Nevada recognized that the Muddy Mission was under its jurisdiction and demanded payment of back taxes (Foote 1975:207-8). The Mormons were unable to pay, so Young gave them permission to leave (Corbett 1975:150). A vote was taken; three individuals voted nay. One family remained after the others left in 1871 (Southern Utah Mission Record 1869:n.p.; Reese River Reveille 1871:15:2; Corbett 1968:157).

HISTORY OF THE MUDDY MISSION

Mormon leadership established the Muddy Mission for several reasons. First, the mission served as a supportive base for Call’s Landing (Callville) and warehouse on the Colorado River, which, together, supported the upper Southern Mission centered around St. George in Utah Territory. A severe drought experienced by the upper Southern Mission in 1864 made the Muddy Mission and Call’s Landing important. Second, the mission served as a way station for Mormon immigrants coming from the Colorado to Utah and protection for travellers going to California. Third, as part of the economic program of self-sufficiency it was to produce cotton and other semi-tropical produce. Finally, it was part of the barrier against outside pressures (Larson 1961:14; Corbett 1975:143).

The Muddy Mission consisted of several communities. The first, settled in the spring of 1865, was St. Thomas, named for Thomas Smith, leader of the first settlers (Carter 1946:7:463). The second, settled soon after, was St. Joseph. This was either named in honor of Joseph Smith, whom some of the St. Joseph settlers had known
personally, or for Joseph Warren Foote, one of the settlers (Larson 1961:142; Corbett 1968:73). The third, settled in 1866, was Mill Point (Simonsville), later to be combined with settlers from St. Joseph into Fort (New) St. Joseph. The other settlements were West Point, Sandy Town (A and B locations), Overton and Junction City (Rioville) (Figure 3, p. 42)

St. Thomas, located at the juncture of the Muddy and Virgin Rivers, was surveyed and settled January 8, 1865. The town site had 300 acres with another 900 surveyed as farming land (Deseret News 1865:14:237). Nine miles north a second group of settlers called to the Muddy Mission settled St. Joseph in May 1865. They selected the St. Joseph site because of its proximity to St. Thomas, a meadow of 600 to 700 acres and a nearby potential mill site. Warren Foote, chosen Presiding Elder of St. Joseph, described the site of the first St. Joseph in his journal as:

"Below the crossing of the California road the creek runs through a kanion [sic] called the narrows. It is about six miles through the kanion [sic]. On emerging the creek forms a large swamp three miles long and will average one and a quarter mile wide. Our location is about one mile below the swamp on rising ground east side of the creek. . . . I looked around some today and found that there was considerable land suitable for farming and some fine grass for hay (Foote 1975:186)."

Having selected the site, the settlers surveyed 60 one-acre lots for the village and a number of two and one-half-acre and five-acre lots for vineyards and fields. They drew city lot numbers, written on pieces of paper, from a hat. Fields were allotted in a similar fashion. The settlers, including some who arrived during the survey, began constructing houses on their lots. During the remainder of the year the inhabitants of St. Joseph and St. Thomas worked diligently on their homes and fields. Dams, irrigation ditches and canals were built as part of the public works for both communities.

During its first year St. Joseph's population decreased. In October of 1865 five people died from a fever attributed to mosquitoes from a tule swamp a mile away.
Figure 3. Muddy Mission 1864 to 1871 (after Gannett 1902).

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Several families who could not endure the extreme temperatures, cultural and economic isolation, primitive conditions and backbreaking labor left the valley. By the end of 1865 only 25 families remained (Bleak 1941:1:189-90).

The development of another village, Mill Point, or Simonsville, led to friction in the mission. Toward the end of 1865 Orrawell Simons began construction of a grist mill about two miles south of St. Joseph on the river bank to use the available water power. Friction developed between Mill Point and St. Joseph because the Mill Point inhabitants believed theirs to be the superior site and urged the settlers of St. Joseph to join them. When settlers in St. Joseph got land near the mill, the situation became difficult. Although many said they would never move to Mill Point, they were soon instructed by the Church leadership to join the Mill Point settlers (Foote 1975:193-5).

In the early months of 1866 Indian unrest spread from northern Utah southward into Nevada with the confrontation called the Black Hawk War. Indians of the Muddy and Virgin Rivers were hostile during those months. In February they stole several head of stock from an island near St. Joseph. What stock they did not slaughter they drove toward the Timber Mountains. A group of St. Joseph settlers, with help from Mill Point and St. Thomas, went after the raiders with no success. It was later learned that the Indians in the Timber Mountains had coerced the Muddy River Indians to steal the stock and drive them to the mountains (Corbett 1968:121-22).

Because of the Indian unrest Erastus Snow, President of the Southern Mission, wrote to the Muddy Mission settlers in early March advising them to fortify themselves and minimize the distance between field and home. Furthermore, Snow suggested that a fort be built on the bluff (bench) overlooking the mill site. It would protect the mill and provide a healthier location for the families being further from the tule swamp than St. Joseph.

In late March, Paiutes on the Upper Muddy harvested their wheat and moved into
the mountains, taking with them 32 horses, mules and cattle stolen from St. Joseph and Mill Point. The Mormons sent another party after the Indians, again with no success.

As a result of Indian attacks on Southern Mission settlements, at the end of May, Brigham Young wrote to his followers:

Many of your settlements are at the present time too weak to successfully resist attack, or to prevent their stock from being driven off by any band of Indians, however contemptible, who may choose to make a descent upon them. These small settlements should be abandoned, and the people who have formed them should, without loss of time, repair to (to) [sic] places that can be easily defended, and that possesses [sic] the necessary advantages to sustain a heavy population. . . . (Bleak 1941:1:209-212).

Young gave detailed instructions on how settlements could protect themselves against further attacks and thefts.

In response, Snow went with ten men to the Muddy Mission to meet with local Paiute chiefs. The meeting was recorded as being successful, and the raids on the Muddy settlements stopped. Nevertheless, for further protection the community organized a battalion of the Nauvoo Legion, the Mormon equivalent to a state militia, with Thomas Smith appointed commanding officer.

There is no record of how long the truce lasted. Theft continued to be the most prevalent offense increasing by 1869 to where there was a possibility of retaliation by the settlers. In the first year, those Indians caught with stolen stock would receive five lashes, to be doubled with each succeeding offense. One Indian, Koquap, was killed after he was caught and when he tried to escape from being hanged. He and another Indian, Yambo, had been declared outlaws when they continued to steal livestock. Koquap had stated that he would continue to take cattle from the Mormons as long as he lived. The continuation of this crime caused James Leithead, second Bishop of St. Thomas, to declare that any Paiutes caught with stolen livestock would be put to death. Fortunately, most of the local Indian population was more interested in retaining good
relations with the Mormons as it meant a continuation of their receiving food and clothing in exchange for labor (Larson 1961:147-48; Corbett 1968:126-30).

In June Smith received instructions from Snow to build fortifications on the Muddy. Snow advised the settlers to divide themselves, according to their own preference, between St. Thomas and Mill Point. He suggested that the newcomers to Mill Point make a temporary fort with their wagons and shelters to protect their families and their mill. He urged the settlers to gather and store crops at Mill Point in preparation for winter and to make adobe bricks for the fort, homes and other buildings (Bleak 1941:1:220-21).

At a community meeting the St. Joseph settlers discussed the advantages and disadvantages of resettlement at Mill Point. Those in favor of the move to Mill Point liked the bench above the mill east of the river. It seemed to be a good location for a city and it would protect the mill. The site's disadvantage was a severe lack of water. The settlers decided to build a canal from the site of the first St. Joseph to the bench. After the meeting, the majority moved to the bench site despite Foote's warnings that water could not be brought to the bench by canal because three miles of the completed canal would be dug through shifting sand (1975:198-99).

No one provided a written description of the Mill Point fort at the time of construction, but Foote described the newly fortified St. Thomas, built at the same time, as follows:

... They built their houses about ten rods apart running north and south. The northern end was kept open so as to add to the length if necessary. . . . The town was surveyed into 85 city lots, and adjoining, there was surveyed about the same number of two and an half acre lots for vineyards, and outside of these about the same number of five acre lots for farming purposes (Foote 1975:201).

Mill Point settlers built the two rows of houses farther apart than at St. Thomas.
Fortification could be accomplished when needed by erecting a barricade between houses in each row. A meeting house closed the southeastern end of the fort and the opposite end was open.

Mill Point, later changed to St. Joseph (1867) and hereafter designated as New St. Joseph, developed during 1866 and 1867 (Corbett 1968:76). Cotton production was high—high enough to convince Brigham Young to call another group of settlers to the mission. However, only half of those called responded. Arriving late in 1867 or early 1868 the new arrivals were unimpressed with St. Thomas and New St. Joseph. A settler described New St. Joseph as sitting on a bench overlooking the Muddy River and a canal, but the canal was not close enough to the fort. Settlers still had to haul water up the bluff to their houses. A small meeting house stood in the center of the fort, and a grist mill was close by. Many of these newcomers joined a group of selected settlers to establish a new community 25 miles northwest of St. Thomas naming it West Point. This settlement lasted for a short time before trouble with the Paiutes and other problems compelled Brigham Young to order their return to either New St. Joseph or Utah. West Point was officially resettled in 1869 (Kimball 1847-1899:61-62; Southern Utah Mission Record 1869:n.p.).

By August of 1868 the New St. Joseph bench community was discontented with its situation. At a mid-August meeting called by Joseph W. Young, nephew of Brigham Young and the new president of the community, three topics were discussed; moving to a new location, problems with water usage and relations with the local Indians. The settlers proposed three new locations, but Young convinced everyone to remain on the bench to try to improve the land. They discussed complaints by St. Thomas residents regarding water use. St. Thomas, finding its water supply diminished by the canal to New St. Joseph, wanted to limit use of the canal. No record of the decision was made. Nor was there any record of the discussion on Indian relations (Clement 1868:2:1).
Only two days later, on Tuesday, August 18th tragedy struck. In the late afternoon, a fire built midway on the fort's eastern side blazed out of control. The thatched-roofed houses were close together, and wind blew sparks to the far side of the fort so the fire spread quickly. The flames were stopped by an incompleted room in one of the houses on the eastern side of the fort. The meeting house was destroyed, and 12 to 19 families lost their homes (the number of families varies in three accounts researched, i.e., 12, 14 and 19. Based on the names listed in Bennett's letter and Clement's journal the number is probably closer to 16). Only a few families were able to save any of their possessions. Louis R. Chaffin's cotton gin, built near the fort, was also destroyed (Clement 1868:3-4; Fleming 1967:164; Deseret News 1868:17:225).

Alma Bennett, the local Bishop, wrote to President Snow that "those who were in the best circumstances are the greatest losers." He blamed the fire on "some small boys who went out to make a fire to roast potatoes back of Bro. Miles and Streeper's houses" (Bleak 1941:1:277-78; Deseret News 1868:17:293).

Snow wrote back to Bennett that aid was forthcoming from St. George and surrounding communities. He also said that the New St. Joseph settlers would receive help wherever they were, but "there is no place where your own labor can do so much for your recovery, as where you are now..." He granted permission for settlers to return north if they had a place to stay and their families were provided with shelter (Clements 1868:5-6).

As for donations promised from St. George, William Gibson, one of the heaviest losers in the fire, wrote, "it was only the poorest that came to the share of the sufferers. Where the best went is still a mystery to me & others, although we may have our own guesses" (1809-1875:78).

Fortunately for the residents of New St. Joseph they did not lose their grain. The wheat stood unharvested in the fields because the threshing machine was broken. Thus,
no wheat was stored in the houses which burned (Clement 1868:8-9).

In the fall of 1868 more settlers were sent to New St. Joseph. With those families remaining on the bench they worked towards finishing Sandy Town, near the burned New St. Joseph. However, they could not efficiently bring water the length of the canal through the three-mile section of drifting sand. To solve the problem, in 1869 they moved about one and one-half miles farther up river to build a second Sandy Town. They built a branch from the old canal to the new site, shortening the distance the water travelled and bringing it directly to the community. Although they had moved to another area of continually drifting sand, they hoped that the water would sufficiently pack the soil in the ditch to permit adequate flow (Foote 1975:206).

Sandy Town (A and B) proved to be an impractical location. The adobe bricks for houses were hauled up from the river. The new canal, cut through a ridge, collected blowing sand and, subsequently, was cleaned frequently with great effort. The settlers once more relocated. Part of the group returned to the original St. Joseph site and part moved a mile south of Simon’s mill on the western side of the Muddy River establishing the new community of Overton (Foote 1975:207).

Three major events made 1870 a hard year for the Muddy Mission. First, Brigham Young visited the mission in March giving the settlers a negative response to their years of hard work. Second, late summer rains caused destructive flooding of West Point, which was subsequently abandoned. Third, a survey of the Nevada-Utah boundary revealed the line to be "about 18 miles east of St. Thomas thus throwing all the Muddy settlements into Nevada" (Foote 1975:207-8). This third problem began in 1866 when the United States Congress added "one full degree of territory from western Utah and Arizona" to Nevada (Larson 1961:150). It was not until 1870 that Nevada recognized this area and demanded payment of taxes, current and past due. From 1866 to 1869 the Mormons in the Muddy River Valley paid taxes in cash and kind to Arizona and Utah, a
fact they conveyed to the Nevada state government. Nevada, however, insisted on its taxes, paid entirely in coin which the settlers did not have. Brigham Young, who had experienced some of its hardships, gave permission for people to leave the mission. All of the mission's settlers met, some voted to leave, many did not vote at all and three voted to remain (Corbett 1968:157; Corbett 1975:147; St. Thomas Ward 1870:n.p.). By 1871 everyone had left who wanted to go. Daniel Bonelli and his wife Ann, who was expecting a child, elected to remain. Bonelli felt it was better to pay $4.00 in taxes to Nevada than to lose $100 in land and improvements (Reese River Reveille 1871:15:2).

It is remarkable that the settlers of the Muddy Mission maintained their communities as long as they did. For five years they battled the arid land, manipulated a limited water supply and futilely chased Paiutes who stole livestock. They were challenged by fever, fire, drought and flood which devasted their small resources. Their cotton produced relatively little profit. Some settlers could have been considered materially wealthy when they arrived, but few improved their circumstances by the time they left. Perhaps the communities lasted as long as they did because the Mormon Church was strong and had good leaders. It is also possible that the advent of the transcontinental railroad and the inability to establish the hoped for Colorado River trade were considerations in the decision to end the mission. Whatever the reason, the Muddy Mission settlements began as a promising idea but ended as a disappointment.
CHAPTER IV

ARCHAEOLOGICAL ELEMENTS

In an archaeological examination of any site several factors can influence the outcome of the research. These include the methods, knowledge of the site's general history (this also helps in determining what will be done at the site), physiographic setting and artifact assemblage. Keeping all this in mind the archaeologist can find the reality of her expectations as well as surprising exceptions.

In the geographical location of the Muddy Mission today an archaeologist can examine the remnants of the two Sandy Town locations, New St. Joseph, West Point and possibly Mill Point and the first St. Joseph. Modern Overton has built up over its original townsite and has at least one building remaining from that era; the other communities are now under modern Lake Mead.

Fortunately, a wealth of information is available at the extant sites. Such data includes methods of house construction, position of the Sandy Town structures in relation to the Plat of Zion, and an artifact inventory. This archaeological data can provide insights into questions about diet and lifestyle (i.e., monogamous vs. polygynous households) of the inhabitants as well as their use of natural resources and the animals which they kept and hunted for food.

This chapter is divided into three sections. The environmental description pertains to the geology, hydrology and vegetation of the region. Method of excavation and site descriptions relate to the individual sites of New St. Joseph and Sandy Town.
ENVIRONMENTAL DESCRIPTION

When the Mormons entered the Great Salt Lake Valley in 1847, the writings of earlier travelers and the Fremont expedition of 1844 had provided them with a written description of the region. The description depicted, somewhat mythically, a huge desert lacking in potable water or soil rich enough to sustain life for a sizable population. However, what the Mormons actually found was not precisely what had been reported.

The eastern Great Basin is referred to as a cold desert. It is characterized by an annual precipitation of 15 inches (in.), temperatures ranging from 5 to 45°F (-15/7°C) in January to 50 to 95°F (10/35°C) in July (McCarty 1981:65). Snow from the mountains feeds streams and rivers, thus supplying year-round reliable water sources. Broad alluvial fans provide soil suitable for farming. The vegetation varies from zone to zone as determined by elevation. In the lower elevations, or foothills, plant communities include shadscale (Atriplex confertifolia) and sagebrush (Artemisia tridentata). Shadscale is found in elevations ranging from 4500 to 5000 feet (ft) or 1372 to 1524 meters (m) and sagebrush is found from 5000 to 6000 ft or 1524 to 1982 m. The upland, or higher elevations of settlement, 6500 to 7500 ft (1982 to 2287 m) are represented by the piñon/juniper community (McCarty 1981:66-67).

In contrast, what the Mormons encountered in the Muddy River Valley was the northeastern edge of the Mojave Desert. This is a hot desert characterized by mild winters, extreme heat in summer and limited water resources with farming occurring in flood plains on valley floors. However, it has a longer growing season, about 255 days (Wonderley 1976:18), and crops sensitive to the cold can grow here. Annual rainfall is 4 in with fluctuations between 0.6 to 11 in. The region has different storm patterns as well; in the summer the pattern is convection whereas the winter pattern is cyclonic.

However, it is the vegetation which shows the difference between the two deserts. The Muddy River Valley has two vegetation zones, riparian and bench. In the riparian
are found thorn bush (*Lycium* sp.), mesquite (*Prosopis juliflora glandulosa*), screwbean (*P. pubescens*), willow (*Salix* spp.), cattails (*Typha* sp.), rushes (*Juncus*) and Mormon introduced tamarisk (*Tamarix pentandra*) and cottonwood (*Populus fremontii*). The bench presents a specialized dune community comprised of creosote (*Larrea divaricata*) and bur-sage (*Fraiseria dumosa*) with sand-verbena (*Abronia pogonantha*), gallenta grasses (*Hilaria* spp.), evening or dune primrose (*Oenothera deltoides*) and globe mallow (*Sphaeralacia sp.*) (McCarty 1981:69-70).

In a desert environment proximity to water is a vital concern in settlement patterns. For this reason, most settlements, particularly as the Mormons moved south, were established alongside permanent water sources such as streams and rivers. The region of the Middle and Lower Virgin drainage system is composed of long valleys with loose soils. This limited the area suitable for farming. Moreover, the streams and rivers were prone to destructive floods and unpredictable flow. In fact, the flow of the Virgin River has been measured to be between 25 to 3000 cubic feet per second (cfs) (McCarty 1981:72). In contrast, the Muddy River has fewer and less devastating floods than the Virgin. Further, the flow is generally steady, even during times of drought. Its measured flow rate is 64 cfs.

The soils found in the Muddy River Valley are a "combination of clays, silts, sandy loams and gravels" (McCarty 1981:77) brought down to the lower valley from the Meadow Valley Wash and the upper valley. This combination has created a highly suitable soil for crop growth. However, at the same time, the gravels and clays are interbedded to form either a well-drained area or an area saturated with salts.

The soils of the bench are "divided into two distinct horizons -- cobble matrix and blowsand surface" (McCarty 1981:77). The bench is formed and defined by the cobble matrix which is "moderately cemented." According to McCarty, the gravels in the cobble matrix "range from pea-sized to 1 ft (30 centimeters--cm) in diameter" (1981:77).
The size of the cobbles suggests fluvial deposition of considerable force; however, the process creating the terrace is not fully understood and dates to the Wisconsin age (1981:77).

Atop the cobble matrix lies a layer of aeolian sand which is anchored by the creosote/bur-sage vegetation. This sand, described as "Mojave fine sand", varies from a "relatively light brown strata with carbonate gravel lens to loose, very mobile pink" (McCarty 1981:77) aeolian deposit. The blow sand matches the fluvial sand underlying the cap of the Mormon Mesa, while carbonate gravels are similar to conglomerates forming parts of the mesa's surface.

While doing test excavation and trenching at the Sandy Town B site, McCarty found that the depth of the aeolian deposit was, in level areas, almost two to three ft (90 cm) whereas on the "sides of the bench and in major washes, the depth ranges from deep loose drifts to being totally absent exposing the cobble subsurface" (1981:78).

METHOD OF EXCAVATION

The first University of Nevada, Las Vegas field school in Historical Archaeology, directed by Dr. Claude N. Warren, was held during the summer of 1975. The site excavated was New St Joseph, located two miles north of Overton, Nevada. The site Figure 4, after Grattan 1982:Figure 1) consists of two parallel lines of house mounds oriented in a northwest direction. The local county airport, roads and bulldozing have either destroyed or disturbed a large portion of the site. The airport and county road cover most of the eastern line of house remains. Despite this disturbance the design of the community is still apparent (Wonderley 1976:56-57).

An initial survey of the land's surface indicated that there were remains of 13 structures. Of these, only two were selected for excavation because this was the only section of the site the field school obtained permission to excavate. The owner was Mr. Richard Cooper of St. George, Utah.
A grid system of 10 ft squares was established on a true north-south axis with a datum point at an established corner marker at the southwest corner of the NE 1/4 of the NE 1/4 of section 12, T16S, R67E (Wonderley 1976:56).

A surface survey for artifacts was made of the grid area which included the remaining two structures near the airport entrance and two southeast of House 1. After the surface artifacts were collected, the group began work on the northern-most structure on the west side of the community. Excavation was done by separating the deposits into: 1) fill, everything that is above the floor, 2) floor fill, the occupation on the house floor, 3) exterior fill, and 4) exterior occupation zone.

The first field school excavated only the one structure, identified as House 1. Goals for the work done in 1976 included determination of house construction and layout differences and similarities, as shown by the excavation of Houses 1 and 2, search for data of activities on the exterior of the fort and remains of associated outbuildings. The second field school, held during the summer of 1976, excavated portions of House 1, and its northern, eastern and southern exterior areas. This group also began excavating on a second structure, identified as House 2, and excavated a smaller structure southwest of the houses, identified as Outbuilding 1.

The procedures followed during the 1976 field school were different from those of the previous year. Instead of using strata to determine levels, the more uniform system of measuring levels by .25 (tenths of ) ft was used. The crew used 1/4 in. and 1/8 in. mesh for screening.

Although primarily concerned with excavating a pueblo located northeast of House 2, members of the 1977 field school worked in the exterior fort area near House 1 and on the south end and west wall of House 2. The work near House 1 concentrated on looking for any indications of extended adobe rock features from the southwest wall and for associated outbuildings. They found what appeared to be an adobe chicken coop.
(Outbuilding 2). No field notes are available regarding the excavation conducted on House 2. Any data used is based on the field map drawn and artifacts recovered during the 1977 field school. Nor is there any information available detailing procedures of excavation.

Two field schools were held in 1980, one in January for two weeks, and one in the summer. The January field school mapped eight house mounds, taking measurements and directional indications for Sandy Town A. At New St. Joseph they surface collected House 5 and the badly disturbed mound to the southeast as well as House 4. When collecting at House 5 indications of a wall led to a surface scraping to show the brick pattern.

In the 1980 summer field school, students worked on House 4 looking for a missing room. They surface collected and excavated the structure to study its construction and architectural design. They exposed most of the collapsed northwest wall, which fell into House Mound 3. Procedures for this field school were similar to those of 1976, using .25 ft (sometimes to .5 ft) per level.

The spring 1986 field class spent the last of the semester excavating portions of House 6 and surface collecting selected units in the interior fort area. However, unlike previous field work, the unit size for collecting and some excavating was decreased to 5 x 5 ft instead of the usual 10 x 10 ft. Further, three 1 ft wide trenches were dug on the road side of the mound to determine the extent of wall-footings.

Levels for the units were separated into: 1) surface to adobe wash, and 2) adobe wash to floor. For the trenches, a more conventional .2 ft level was used.

Field work at the Sandy Town sites has been more limited. Prior to mapping the house mounds at locality A in 1980, mapping and excavation were conducted at locality B in 1978-1979. Beginning in September 1978, locating, mapping and grid set up of the site were done in preparation for a two week field school held in January 1979. The
The purpose of the school was to collect data on foundation construction, locate structure entrances and fireplaces, and locate and determine the direction of irrigation channels. The uncovering of a nearly complete collapsed wall inside House 2 presented additional information on wall construction and house size.

Test units were excavated throughout the area surrounding the four house mounds identified as Houses 1, 2, 3 and 4 (Figure 5, p. 57). These units were excavated in both specific and random areas. The ones excavated beyond the structures were for the purpose of locating associated outbuildings and refuse pits. Those next to the structures were for collecting data on construction techniques. Trenches were also excavated in a channel to acquire information on construction, use, termination and course. Unlike the excavation techniques used at the New St. Joseph site, the metric system was applied at Sandy Town. Units were measured on an established grid system at 1 x 1 m. Levels were excavated in 20 cm increments.

SITE DESCRIPTIONS

The two communities of New St. Joseph and Sandy Town (Figure 6, p. 58) not only represent two periods in the history for the Muddy Mission, but two different examples of spatial use as well. New St. Joseph was designed as a rectangular fort of approximately 600 ft long and 160 ft wide. The structures were built, for the most part, end to end with little space separating them. Although House 4 was not built with the rooms placed in a north-south direction, the length of the structure is equal to the width of House 5 to the south. It is possible that it was added at a later date necessitating a different layout.

The purpose of the fort was defensive in nature, but archaeological evidence indicates that the opposite is true. No protective walls were built near the structures, the northern end was left open, structures opened to the exterior as well as the interior of the fort and outbuildings were located to the western and eastern exterior side.
Figure 5. Sandy Town B.
Figure 6. Location of Bench Communities (U.S. Geologic Survey 1983, 10 meter contours).
Archaeological evidence from the areas to the south and east is limited due to damage and destruction caused by bulldozing and construction of the county road and airport.

Sandy Town (both location A and B), on the other hand, covers a larger area as it was built according to the Plat for the City of Zion. The layout of the community was "oriented to the cardinal directions with evenly spaced platted lots of approximately one acre for each household" (Shepperson & Warren, n.d.:3). This represents a period toward expansion and the development of a regional center for the southwestern missions.

Unfortunately, the nature of the community has presented problems for those who would attempt interpreting the archaeological data. The missionaries did not build structures in a concentrated area or on every lot, thus creating a widespread community covering less than one square mile. Some of it has been destroyed by the construction of the county airport and other recent construction projects. For these reasons, it has not been possible to do a conclusive map of Sandy Town with regards to the structures situated within the city grid. However, 51 structures have been identified (for both locations), 2 of which were excavated.

Of the 13 identified structures at New St. Joseph, 8 have been fully or partially excavated. The factors of time and specific questions to be answered determined the extent to which the excavation was conducted. Some of the structures had more extensive work done on them than others, but basic information such as size, shape and number of rooms was determined on all but one of these structures. Using data resulting from excavation of the structures at New St. Joseph and Sandy Town B a more accurate picture of adobe house construction at these sites has been determined. At New St. Joseph most of the structural remains consisted of the foundation and no more than three courses of bricks. Doorways were indicated only by exterior steps, unless the first two or three courses above the foundation remained. Floors consisted of packed adobe
which served as a supporting feature when abutting the foundation. Apparently, interior walls which did not provide structural support but rather served as room dividers were built atop the packed adobe with no foundation.

The Mormons made bricks from local clays found near the Muddy River. These clays were mixed with sand and fine gravel and the amount of salts in and the quality of the clay controlled the quality of the bricks. Some dried hard and compact, whereas others dried soft and flakey so that when excavated they disintegrate easily.

There appears to be a uniform brick size of 10 x 4 3/4 x 3 in. This fits the modern brick ratio of 1:1/2:1/3 allowing for the mortar joint dimensions. Examination of recovered bricks indicates that they were probably made by using a wooden form; however, it is conjectured that they have been allowed to dry free standing.

Judging by the distance from the river to the top of the bench, it would be easy to accept the idea that the bricks were made by the river, the source of the clay, gravels or sand and water. Carrying dried bricks is less costly in energy use than hauling the basic ingredients to the site. However, the discovery of a mortar pit confirms the idea that mortar would have been produced at the site. The pit location is approximately 5 ft from House 2. It is not quite circular with "gently sloping sides, approximately 2 feet deep (as measured from the original surface) and 5 feet in diameter" (Shepperson and Warren, n.d.:6). Not all of the mortar was used and the remains dried leaving the swirl pattern from the last mixing. Before it had completely dried, though, a bird, possibly a chicken, walked through leaving its tracks.

The Muddy River provided roofing material. Cane (Typha sp.), rushes and willow were found, separately and together, in some structure interiors and on the exterior of House 2. The recovery of carbonized cane layers of about 2 1/2 in. thick indicates that this strong material was the predominant roofing material. Although no evidence has been found to support the idea, it is believed that a framework of willow poles provided
the roof substructure.

The excavation of a nearly complete collapsed wall in House 2 at Sandy Town B, with the data from the New St. Joseph structures, formed the groundwork from which Shepperson and Warren (n.d.) were able to reconstruct the type of adobe structure built on the Muddy. The basic characteristics of the 1865-70 Mormon structures were:

1. Stone foundations of local stone placed in shallow ditches and mortared with adobe are approximately 1 foot wide, raised above the ground level and capped with a layer of adobe mortar and a single course of headers.

2. The floors of the houses were constructed of packed adobe, usually at levels 2 to 4 inches below the upper surface of the stone foundation.

3. Walls were constructed of adobe bricks, measuring 10 x 4 3/4 x 3 inches, and adobe mortar. The walls were generally two mirror-image running bonds, with headers at the top of the walls or base of the gables, serving to tie the two running bonds together. Courses of headers may occur at regular intervals on exterior walls, but supporting data are lacking. Spacers are commonly used to gain proper spacing of stretchers at corners and doorways. Rowlocks occur across the top of doorways where they are supported by lintels.

4. Doorways have wooden frames with heavy wooden lintels. Doors may be absent from interior doorways where blankets and rugs were hung for privacy. Exterior doors were apparently made of wood, with drawstring latches used in some cases.

5. Roofing was primarily of cane thatch, apparently supported by light framing of poles and small branches (Shepperson and Warren, n.d.: 10-11).
CHAPTER V

MAN AND THE ENVIRONMENT

This morning we crossed the river, and passed up on the upper side of the Muddy. We were well pleased with the extent of land and with the quality. It is a light clayey loam with an under strata of blueish clay. . . . Most of the land is suitable for cultivation. Here are found a species of three cornered grass. . . . (Deseret News 1865:14:124).

The above excerpt of a letter from Anson Call to George A. Smith together with comments from other Mormon travellers and settlers about the Muddy River Valley indicate the importance of knowing soil to these people. Being aware of the availability of good soil for growing a variety of food and production crops made settling the valley more encouraging. But the knowing and doing were overshadowed by other aspects of this new environment--the Mojave Desert. How well did the Mormons at the Muddy Mission deal with the Mojave Desert? What part did Arrington's principles play in this attempt to subdue nature?

An examination of the seven principles shows that they fall into two groups: this chapter will discuss the first four principles: the gathering, the Mormon village, property as stewardship and redeeming the earth. What they have in common is the relationship of man to the environment, with each looking at different aspects of that relationship. The following chapter will discuss the remaining three principles.

THE GATHERING

In 1830, Joseph Smith saw the United States as the new location for establishing gathering areas to prepare for the Second Coming of Christ. The Bible provided the
basis for the idea which became a revelation and later a part of the Church's Articles of Faith, "We believe in the literal gathering of Israel... that Zion will be built upon this [the American] continent..." (Smith 1958:60). From this evolved the "large and highly effective missionary system, an overseas emigration service, and the establishment of a series of 'Zions' or gathering places" (Arrington 1966:24).

Archaeological Evidence. The Muddy Mission is a "Zion" or gathering place. There are the complete or nearly complete remains of four communities (Sandy Town A and B count as two) and the possibility that adobe structures still in use were once part of at least two other communities. St. Thomas, Junction City, or Rioville, and Call's Landing are under the waters of Lake Mead. However, there might remain some structural or artifactual material of these communities for an underwater archaeologist to explore.

Historical Evidence. Missionaries' journals, Church records and other sources provide data on early travellers through the Muddy River Valley pointing out its potential for a viable agricultural gathering place. The Mission was established in 1865, consisted of ten communities during the course of its existence, two of which were locations for a new City of Zion, and it was formally ended in 1871.

Discussion. There is very little material that provides evidence of the gathering. The existence of the mission, represented by the structural remains and historical records, shows the work of the Church toward expanding their Kingdom of God by establishing a gathering place on the Muddy River.

THE MORMON VILLAGE

Once the gathering places were formed, villages were built following Smith's Plat of
Zion, a formalized plan similar to the New England village. Smith’s plat used the cardinal directions with streets intersecting at right angles. The streets were wide, the house lots of a uniform size large enough for gardens, orchards and keeping livestock and poultry. Farm lands were separate requiring farmers to drive out to them. However, the village was not necessarily only agricultural. The plan was also used for communities concentrating in mining and manufacturing.

Smith used this plan in settling Far West and Nauvoo. Brigham Young brought it to the Great Basin where it proved most effective. The advantages to this system are multifold: 1) It made more efficient use of the land. 2) There was effective use of irrigation. 3) It kept the people together providing protection to settlers and their property from Indians. 4) People were close to their leaders so the community retained its cooperative and unified nature. 5) Educational, religious and other social institutions were more easily maintained by the community.

Archaeological Evidence. Each community represents a village. New St. Joseph reflects a brief period of time when it was felt necessary to build a defensive community, or fort, in lieu of the usual plan following the Plat of Zion. Grattan identified it as being cabin-row, but the walls of the houses are not joined together to form a square or rectangular enclosure (1982:28; Pitman 1973:128). The fort pattern it seems to best represent is the detached wall. The detached wall fort joined the houses together at the gables, as did the cabin-row, but the houses were built on small lots and could be closed together by building walls between or one wall around the cabins (Pitman 1973:130). New St. Joseph was U-shaped with an open end, had no walls surrounding it or between structures and structures opened to the exterior as well as the interior of the fort. In addition, outbuildings were located beyond the fort’s exterior.

A ground survey of New St. Joseph shows that most of it was damaged or
destroyed resulting from construction of the county road, the Clark County Airport and other unpaved roads running through the site. However, 13 structures were identifiable.

Eight of these structures have been excavated at New St. Joseph, two of which are one-room associated outbuildings. The other six structures are all multi-roomed displaying a variety of floorplans. All but one structure had hearths or fireplaces, two had an associated outside hearth on the fort’s interior. The structure without a fireplace or hearth, House 4, is small and differs in alignment from the rest of the structures. Instead of the longest side following along the northwest/southeast coordinates, it runs almost east/west. However, the length of House 4 is approximately equal to the width of other structures at New St. Joseph (Claude N. Warren, personal communication 1988).

Briefly, the structures at New St. Joseph have been identified as either houses, shelters for animals or storage structures. Houses 1, 2, 5 and 6 were homes. Outbuilding 2 was a chicken coop, House 4 was used for storage and as a granary and Outbuilding 1 may have been a smokehouse. Additions were made to Houses 2, 5 and 6 but only House 2 appears to have been specifically enlarged for additional people, a second family or a child’s family.

Interesting architectural features revealed during excavation include a circular room attached to a room with a flagstone in the floor at House 1. House 4 had an adobe slab floor instead of poured adobe, and walls covered with wattle and daub. The addition at House 2 was built upon a foundation of broken adobe instead of rock.

The location of the meeting house has never been firmly established archaeologically. Grattan used an analysis of burned glass recovered from the area where the southeast corner of the fort was located (now the entrance to the county airport, a nearby cemetery and a road going to the Mormon Mesa, probably following
the Old Virgin River road). Based on her findings, she suggests that the meeting house was indeed located in that general area.

Sandy Town (A and B) presents two locations which follow the Plat of Zion. Land was surveyed using the cardinal directions with one acre lots laid out uniformly spaced. Fifty-one structures have been identified for both locations. Location A had 17 houses, 2 associated structures and 8 isolated structures for a total of 27; location B had 14 houses, 2 associated structures and 7 isolated structures for a total of 24 (McCarty 1981:120-121). Not every lot surveyed had a structure built on it.

McCarty's study on Sandy Town revealed that the two locations were not following identical plats nor were they explicitly based on defined plat types of the mid-19th century. He was able to tentatively identify location B with two possible fits; a four acre block with eight one-half acre lots or a six acre block with eight three-quarter acre lots. The street widths were estimated to be between 66 to 99 ft. Unfortunately, isolated structures do not fit well into either of the plats. Location A was not identified with any plat type, possibly due to its layout which McCarty believes to be either "rectangular or combined rectangular square design" (1981:131-135).

Two structures were excavated at Sandy Town B providing valuable data on house construction, foundations and the height of the structures. Trenches dug into the channel near House 3 aided in the study of Mormon irrigation technology. Interesting features about the structures include a collapsed wall and a chicken coop in House 2 and an apparent lack of hearth or fireplace in House 3. Baumkratz, Coughtry and Kimball (1983:5-8) suggest that House 3 was built as a multi-use communal structure, but House 2 was a home. Detailed descriptions and illustrations of these structures and those excavated at New St. Joseph are in Appendix A.

Historical Evidence. Descriptions of St. Thomas, Fort St. Joseph and Sandy Town are

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available from the records of the Southern Mission and by settlers. However, these are not complete pictures of the communities. Sandy Town is described as a city on the bench, established with the hope of housing thousands and being the new center for the southwestern settlements, only to be moved because of drifting sands. Unfortunately, this second effort also failed due to the drifting sands. Nothing is provided by way of a description of the plat used for either location; however, the distance from New St. Joseph is mentioned. Sandy Town A was built one-half mile northwest from the fort. Sandy Town B was built one mile north of location A. McCarty compared this data with his survey information and his findings show that location A had a cluster of structures ".05 mile (0.8 km) north of the fort" (1981:113). The cluster spreads to the north and west over an area of about one-quarter mile square which McCarty indicates are "the four central 1/4, 1/4 sections of S.1, R.67E, T.16S" (1981:113). Location B lay between "0.3 and 0.8 miles (0.5-1.3 km) northwest..." of the first settlement based on where the initial point is made from location A, which is "NE1/4, NW1/4, S.1, R.67E, T.16S" (McCarty 1981:113).

The description of the fort at St. Thomas serves as a rough model for the bench fort. Another description, made in early 1868, noted the location of a canal, a meeting house in the center of the fort and a nearby grist mill. At the time of the fire, August 1868, one journalist noted that wagons and tents were used as part of the housing there. Darius S. Clement wrote about the fire starting on the east side and burning until it reached an unfinished room in a structure on the same side. The fire destroyed the meeting house as well as Chaffin's cotton gin, and several families lost their homes: "...a string of houses, 9 rods long, on each side [of] the fort, with the meeting house between... The roofs of both Strings of houses were joined; but disconnected from those that did not burn" (Clement 1868:3). The houses can be identified by owner:

"Those burned on the upper string were: James Farmer, Orton Miles, Wm.
Streeper, D. M. Thomas, E. Bellingeley [sic], & T. Day. On the west side: L. R. Chaffin, Wm. Gibson, G. D. Watt, J. Cahoon, J. Ferguson, Wm. Moyes. . . Every house on the south end of the fort was emptied of its contents in expectation of the fire reaching them, but fortunately one of Bro. Day's rooms had been left uncovered. . . 6 or 7 other families escaped its ravages. (Clement 1868:4)

Bennett's letter to Snow and Young about the fire mentions a few other names. "Bros. Weiler, Pratt, Clayton, Rydalch. . . " who were visiting north (Journal History 1867-1868:5; Bleak 1941:1:276-277; Deseret News 1868:17:293) There has been no identification of house by owner archaeologically, although it is not certain that this can be done without more historical data on who lived in which house. Nor has any archaeological work been done to date to try to locate the cotton gin.

St. Thomas, when first built, was incorrectly surveyed. It required resurveying to be realigned along the cardinal lines. In 1866, Foote noted that a fort was built there and provided a description. St. Thomas was described, in later years, as having broad avenues lined with cottonwood planted by the first settlers (Carter, 1946:7:468).

There is very little data regarding West Point, Junction City and Call's Landing. Abraham A. Kimball wrote in his journal that the settlers at West Point "had a fort laid out and a ditch made. . . Some of the brethren had a large army tent which was used for a meeting house" (1847-1889:63). A post-1903 photograph of an early post office for the Moapa Valley area (Figure 7, p. 69) has been tentatively identified by Grattan (1982:78) as being the one at West Point, established September 25, 1869 and ended October 29, 1870. Garnett and Pahrer indicate it was located five miles west of present-day Glendale (1983:138).

Foote wrote about how James Leithead and A. S. (Andrew) Gibbons "were employed to put the roof on the warehouse at Call's Landing . . . the walls were built by rock" (1975:202). Leithead also wrote about the experience of putting a roof on as well as putting in doors and windows at the warehouses with Gibbons at 'Callville' in
Figure 7. Moapa Post Office, West Point (photograph courtesy of Ferron-Bracken Collection, University of Nevada, Las Vegas Library).
1866 (Carter 1946:7:467). Call's Landing proved to be a photographers haven long after it was abandoned. What remained were two long and narrow structures, the warehouses, missing roofs, windows and probably wood fixtures. Oxen pens graced the slopes to one side.

Little has been written describing Junction City. In his diary entry for August 6, 1868 Clement wrote about a trip taken to the mouth of the Virgin to locate the settlement site (1868:1). Joseph W. Young wrote about the trip in a letter submitted to the Deseret News (1868:17:293) describing the survey done to set up the site. The city was located on bench land 50 ft above the Virgin. The site had 1,000 acres of sandy soil said to be good for growing grapes and fruit trees but not for grains. About four miles above the site on the Virgin was a place Young suggested the settlers could put in an irrigation canal to bring water to it.

During Brigham Young's 1870 visit they stopped at Junction City and found that it was not possible to build a canal from the Virgin. George A. Smith commented that it would have to go "through several miles of quicksand, countless washes... it is best to use windmills" to bring water up from the Colorado River (Deseret News 1870:19:118). A canal coming up from the Colorado River to the city was also considered to be impractical.

Discussion. The presence of the Mormon village is supported by archaeological and historical data. Archaeological evidence includes surface surveys of the region, particularly the bench, which show the mounds of adobe and sand indicating structural remains and irrigation canals. The layout of the fort New St. Joseph is easy to discern even without corroborating historical data. Sandy Town A and B are not easily identified as following a Plat of Zion, but it is possible to distinguish at least one sizable community. Historical data is limited to journals, letters of the missionaries and records
kept by the secretary of the Southern Mission. Any plats drawn to show how the communities were to be laid out are not available.

Because it is difficult to set Sandy Town A to a particular plat, the division by lot size is not apparent. Sandy Town B could fit one of two plats, providing two different lot sizes which allow for a house, garden, animal shelter or pens and possibly an orchard, particularly if the house followed the two room style.

When McCarty surveyed the structural remains for the Sandy Town locations he noted the floor plans which he included in his study (see 1981:125-27). The brief examination here of the structures excavated at New St. Joseph and Sandy Town B indicate that there were a variety of floor plans but in a standard structure made by joining two rectangles or squares. Other variations resulted when the owner wanted or needed to expand or if the structure had a limited purpose, such as the outbuildings.

No information is available regarding farm lands other than what Foote noted in his journal about the division of land at St. Joseph in 1865. The same holds true for any land set aside specifically for use as vineyards or orchards. Furthermore, the subsequent development of the valley has obliterated any of the geographical features those first Mormon settlers used for protecting their livestock.

The location of specific households, along with a detailed description of artifacts recovered from these houses, would present a more enlightening picture of the people at New St. Joseph. Unfortunately, the historical data is not as specific as is required to state, unequivocally, which individual lived in which structure. Furthermore, impact to the site by the construction of the airport and county road eliminated important structural information, particularly that of the meeting house.

The paucity of historical data regarding site and structural descriptions leaves much to the archaeological record to explain. Yet, room or structural use is not always easily determined by the architecture. Nor can artifacts always provide a definitive explanation.
Therefore, when faced with a situation of this type the archaeologist bases her determinations on a logical assessment of the available data. Fortunately, most of the archaeological data recovered from New St. Joseph and Sandy Town B provide a viable explanation of the purpose of the structures excavated as well as answering other questions presented in the above data.

Ideally, the plat of the City of Zion called for an area which could accommodate a one mile square community and outlying farm lands. Furthermore, the center was reserved for religious and secular buildings, such as a temple and government buildings. What the Mormons actually built was very much determined by the local geography. Changes had already been made to the original plat in the midwest communities of the 1840s, but the physiographic nature of the Great Basin, Colorado Plateau and other regions restricted the early form used. The adaptations made for the Great Basin were also incompatible with the terrain encountered as the Mormons moved away from the areas of early settlement. The settlers of the Virgin River Basin found an environment which did not recommend itself well to the plat as ascribed to by Brigham Young and other leaders.

The Great Basin has a greater number of benches and alluvial fans on which to build communities following the plat. But in the region of the Southern Mission very few of these are found, and even those few would not necessarily be effective if too far from a reliable water source. Water was definitely a major consideration in the planning of these southern settlements (Spencer 1936:90, 117-18).

The bench above the Muddy River provided an area considered large enough for the building of a new City of Zion for the southwestern settlements. Unfortunately, the leadership failed to take into account that the geography was against such a development. Water had to be brought to the community under adverse conditions, yet was not effective despite considerable effort on the part of the settlers (see Redeeming the Earth.
pp. 79-82, for further discussion on the canal system on the bench). Furthermore, McCarty did not indicate that either community had a specific area set aside as a central square. It may be that the limited construction done at the sites prevented the settlers from building any central structures, such as the meeting house at New St. Joseph. Finally, there is no archaeological or historical information regarding the development of gardens or vineyards in the individual lots at either Sandy Town location or New St. Joseph.

However Brigham Young may have dictated the building of settlements, the settlers had to build according to the physiographic locale. For this reason the villages of the Southern Mission rarely followed the plat for the City of Zion. The only aspect of the plat which they could follow was establishing the direction of the communities along cardinal lines and creating separate lots for housing, gardening and farming.

PROPERTY AS STEWARDSHIP

The Church allocated holdings and regulated property rights in the village in agreement with the "principle of 'stewardship'." According to Church doctrine, the earth belonged to "the Lord" and men had to accept that the Church disposed of land. It was the concept of property of the group over the individual which engendered this principle. The land was used for building the Kingdom of God. Each man was to be a steward over what he possessed, yet it was not expected that there would be similarity in use of the land. Arrington quoted Brigham Young's summary of the principle that "not . . . all men shall be made equal in all things, for to one is given one talent, to another two, and to another five, according to their capacity" (Arrington 1966:25). However, each began with an equal chance through the use of lotteries. This allowed for the acquisition of good arable land as well as marginal land.

Archaeological Evidence. No archaeological data is available regarding the land put
under cultivation. Only the land used for structures has been examined archaeologically. Sandy Town's two locations show the best indications of a land survey for individual lots, some of which have structures on them. Unfortunately, as McCarty notes in his study on Sandy Town, there are no existing survey markers from that period on the bench.

An archaeological indicator of talents, that is, specialization of labor, also associated with this third principle, is found in the architecture of the sites. House 2 at New St. Joseph, for example, displays the work of two different brick layers. What is probably the original structure (Rooms A, B, C and D) was built with low quality bricks. The addition (Rooms E and F) appears to have been built with high quality bricks. This is apparent in the degree of deterioration evident in examining the three brick thick wall dividing the addition from the original structure.

**Historical Evidence.** Historical documents, both primary and secondary sources, also seem to be rather scanty on data regarding property. At St. Thomas Foote purchased an additional lot for an orchard and later built a house for his second wife on it (1975:205). William Wood wrote in his journal about cutting hay when the land was badly flooded. He had to:

> cut a small quantity at a time and then rake it up and carry it out and spread it on the dry ground. . . . Then when it was cured I hauled it in and in this way I got a small stack of hay for my stock. To obtain my bread I cradled wheat at the rate of one bushel per acre as most of the settlers had small patches of wheat (Wood n.d.:47).

One indicator of wealth comes from William Gibson's journal. He wrote that when he first arrived at the Muddy in January 1867 he bought a house from a man named Angel who was leaving the fort because of poor health. The house had two rooms, a wheat bin and a "pig sty [sic]" and included some of Brother Angel's furniture. Gibson
would pay him in the fall from his cotton crop, which Gibson felt would be good (1867-1869:77).

Few settlers newly come to the area could boast of being able to buy a house. Kimball wrote that when he first arrived he lived in a "tent on the brink of the Hill: west of the Fort, as all vacant rooms had been secured before I arrived" (1847-1889:62). When he had to move back to the bench later in 1868, he set up another tent beside the cemetery about 300 yards from the east side of the fort (Kimball 1847-1889:64).

Regarding the lots at Sandy Town. Clement made an entry in his journal about the March 21, 1868 visit made by Erastus Snow and Joseph W. Young. The location of the city was determined and a survey was to commence "near the middle of the bench, about 1/2 mile north of the fort" (Clement 1868:25). Snow and Young felt that the area would soon fill with settlers. The Sand Bench lots were surveyed by J. Fuller (probably Jesse Johnson Fuller) on March 25th.

Discussion. A discussion of material wealth appears in the examination of principle seven, equality (Chapter VI - Man and Society). In this section, wealth is seen in the development of the land. Once the settlers arrived on the Muddy, the acquisition of land and its improvement under their stewardship appears to be the only means of gaining wealth in the isolated region. In 1869 N. H. Carlow, the Assessor for Lincoln County, Nevada, travelled through the Muddy and surrounding region. His assessments to determine taxes due Nevada were tentative because of threats and protests. He believed that the final determination of the state boundary would allow for a more accurate assessment. While on the Muddy, he found:

Fruit and Shade Trees, On the Muddy the inhabitants are engaging largely in fruit growing, and have very prosperous young viniyars [sic] and orchards, they have also about 3000 shade trees in a prosperous and growing condition (Carlow 1973:247).
The taxable property was assessed at about $48,499 with the belief that it would be doubled in 1870 (Carlow 1973:246).

Despite this expected wealth from the land, they apparently did not receive very much of it at the time of departure. When the Mormons left in 1871 they sold their land and unharvested crops to a man named Jennings, but no record is available indicating how they were paid. Jennings later harvested 8,000 bushels of wheat which he sold to the United States government for 6 cents per pound. He also tore out and sold all of the lumber in the houses. The same occurred at Call's Landing. However, the Mormons never received any of the agreed upon money for the sale of these items (Leavitt 1934:106-7).

The reality of stewardship is not too different from the ideal except in the original sense. Smith had originally devised the Law of Consecration and Stewardship, an ideal in direct contrast to the premise of capitalism, where all Mormons would give up their property to the Church for equal distribution. No one would have more than any other: a fact well-liked by the poor, but not by the wealthy. Eventually, Smith realized that the system would not work, so he revised it to a ten percent tithe of surplus property but kept the program of land stewardship (Hayden 1976:107).

In the 1870s people from the Muddy Mission, now living in Long Valley, reintroduced the concept of Smith's original law as the Order of Enoch. It was successful for several years, but it was a system which could not survive the pressures engendered by free enterprise.

Spencer writes that part of the purpose of drawing lots also showed that ownership of the land was:

...a matter of mutual recognition. In the case of common pastureland there was originally nothing concerning ownership and they frequently represented a reserve of arable land which could be allotted to later arrivals (1936:96).
Surveying and recording of allotted lands was usually conducted in a loose fashion until Gentile and federal surveyors arrived.

Land allotment by means of lottery kept the system as equal as possible in the distribution of all types of land available. Its practice on the Muddy was duly noted by Foote for the first St. Joseph. Land surveys were mentioned by others for other communities on the Muddy, and although no other mention was made of the lottery system, it was probably used at the other communities as well.

Without this system of equal distribution, the practice of setting aside land for additional settlers and land as a prime incentive for converting, the number of European converts made would have been limited. Furthermore, the Mormons would not have been able to accomplish the next ideal, which played a very important part in their faith.

REDEEMING THE EARTH

Following the settlement of the village and the disposition of property, the Mormons were to develop local resources. They considered it sacred seeing its purpose as both temporal and spiritual. Arrington notes that James E. Talmadge, a leading apostle, explained that the Mormons believed the earth was cursed and required purification and rejuvenation, which, in turn, would end war and social strife and make the earth fruitful once more.

Arrington continues by saying that the manner of purification would not be mechanized or by fire and water. Rather, it would be accomplished by "God's chosen" who would master nature by turning barren land into flowering and abundant fields teeming with animal life. All this was in preparation for the return of Christ. The belief in industriousness not idleness lent itself well to this principle.

Arrington further explains the duality of this principle. It was an economic necessity to develop arable lands with crops and pasturage. But it was also a spiritual experience. The construction of irrigation canals has been equated to baptism by water in its
importance to the Church.

When first arriving in the Great Basin, Young told his people that the land had the components for everything they needed to survive. God provided them with these components, it was up to the Mormons to develop the resources to their fullest potential. It can be said that the sacred duty of a Mormon to purify his heart went hand-in-hand with his sacred duty to cleanse the earth of its curse.

Archaeological Evidence. Archaeological data supporting the premise of this principle falls into two areas, artifactual and structural. Under the artifactual there are three categories. Bone makes up the larger collection, followed by seeds and wood. Wood is included because cottonwood is not indigenous to the Muddy River Valley; the Mormons brought it with them, planting trees along streets and in lots.

These artifacts represent the use of regional natural resources as well as Mormon introduced resources to fulfill part of the principle of making the earth blossom. The process of developing the local resources, using the water to irrigate fields of cotton and other crops, making fences and roofs from local willow and cattail, harvesting indigenous plants (not those cultivated by the Indians) for food, serves to increase the productivity of a region. Cultivation, planting trees for shade, fencing, fruit, and animal husbandry, bringing and breeding animals for food and work, are also seen as ways of changing a region from barrenness to a garden of Eden.

Several species of animals are represented at both sites. Cattle (*Bos*), sheep (*Ovis*) and goat (*Capra*) (Douglas 1978) predominate the collection followed by a variety of fowl. These fowl include an early domesticated chicken (*Gallus gallus*), domesticated mallard (*Anas platyrhynchos*) and Chinese goose (*Anser cygnoides*) (Rea 1978; Douglas 1978; Delacour 1964:107-8; Delacour 1973:1:95-98; Clements 1974:393; Pennak 1964:429). All of these species form the core of dietary protein as well as the animals
brought to the Muddy as part of the cleansing process. Although there is no bone artifactual evidence to corroborate it, other animals they brought with them were horses and mules (a horse shoe nail and hoof prints in the clay lining of irrigation canals [McCarty 1981: 164] attest to their presence at the Mission). Historical records indicate that the remains of any animals (horses and cattle were probably the primary stock cared for by the Indians) consumed by the local Paiutes will not be found near any of the sites. On two occasions they drove the stock away into the mountains. When hired to watch the stock some animals fell into the quicksand in the Virgin. The Indians were unable to get them out so they killed and ate them (Corbett 1968:120).

Seeds recovered at New St. Joseph and Sandy Town B include cotton (Gossypium hirsutum), squash (Cucurbita pepo), apricot (Kowalewski 1984:90), melon/cantaloupe, pumpkin, peach, sunflower and corn/maize (Teri Swearengen, personal communication 1978). Cotton makes up the majority of seeds recovered, which is not unexpected due to the nature of the Mission. Although no grain seeds have been recovered or identified, historical records sent to St. George describe the amount of acreage cultivated in wheat as well as the number of bushels harvested. Other grains grown on the Muddy were oats and barley, although very little data is available on these crops. The seeds show the variety of foods brought to the Muddy as dietary supplements.

Structural data results from examination of aerial photographs combined with a ground survey followed by the excavation of irrigation canals to and at Sandy Town (A and B) (for locations see McCarty 1981:139). McCarty was able to trace about half of the main canal’s route from the Muddy River to the bench. The rest was either obliterated by agriculture or incorporated into the modern irrigation system. On the bench he test excavated a portion of the main canal and part of an auxiliary canal.

His findings provide interesting data regarding Mormon technology as well as one of the reasons why their main canal failed. Canal construction at that time involved digging
a channel, lining it with adobe clay and "tamping the bottom and sides of the channel" (McCarty 1981:169) to reduce water seepage. An acceptable amount of water loss was expected, McCarty notes, of about 75 percent. Unfortunately for the Mormons, they dug part of the canal through what McCarty calls a sand matrix. This matrix was composed of two layers of sand, a topsoil and deep subsoil. The other two soil matrices are a "combined stratified matrix" of sand topsoil and caliche gravel subsoil and a "gravel matrix" of caliche gravel topsoil and subsoil (McCarty 1981:140-47, 152).

McCarty found that the soil matrix, and thus the terrain, played a determining factor in the "general configuration of the channel's profile" (McCarty 1981:140). Historical records indicate that the Mormons dug a canal "6 miles in length, three feet deep and six feet wide, with a large dam at its head..." (McCarty 1981:135). McCarty's 12 test excavations along the canal showed that the portion dug through the sand matrix was wider and shallower than in the other areas. The sand could not support sidewalls and it was lined with a thin and unstable layer of clay. On the other extreme is the gravel matrix, which produced a U-shaped channel. It was lined with "thick, compact layers of clay covering the sides and the bottom" (McCarty 1981:142). In between was the combined stratified matrix, also U-shaped, although the sides widened at the top.

McCarty notes that the latter is the predominate shape of the channel. It was lined with compacted clay on the bottom thinning as it was brought up the sidewalls. Based on the data from these test excavations, he found that on the average the canal was four feet wide, one and one-half feet deep and three miles long.

McCarty was also concerned with percolation or water loss in the canal. He applied the Chezy-Manning Formula to the Sand Bench channel measurements to determine water velocity of 1.53 feet per second. Results from further calculations show that at its most efficient, with no blow sand blocking the channel, there was still a 90 percent water loss (McCarty [1981:151] describes this as a conservative loss). Further, the additional 15

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percent water loss over what the settlers could expect "was a critical balance between success and failure" (McCarty 1981:152).

The move to the second location helped reduce the length of the sand matrix; however, it did not reduce the water loss or the energy required to clean it of blow sand. McCarty suggests that a move of another "3/4 of a mile up the bench" might have increased the efficiency of the channel in bringing water to the bench community (1981:151). He further points out that, based on flow rate figures of the Muddy and water use in the valley, if the Sand Bench canal had proven successful it is possible the Muddy could not have supplied it and the rest of the valley with enough water (McCarty 1981:152-53).

The excavation of an auxiliary canal, located within Sandy Town B, provided more information about construction techniques. Unlike the other channel, it was never used, had two termination points and was associated with the community's plat. Using the western point as a beginning reference, the canal runs east over 49 ft (15 m), turns 90 degrees and runs south over 207 ft (63 m).

As with the main channel, it was lined with clay which was applied wet and smoothed. The impression of a corn stalk and hoof prints (McCarty [1981:155] thinks they might have been horses) in the bottom of the channel in one of the test units corroborates this idea.

The suggestion that it was never used is further demonstrated by the lack of lamination along the sidewalls, as was found in the main channel, and the contact of channel fill with the clay lining. The channel fill is a layering of "loose tan sand" on the bottom graduating to the "light red blow sand" characteristic of the bench's surface (McCarty 1981:155). One test unit exhibited a deliberate refilling of the channel covering the fill with an adobe slab. Atop the slab were remnants of adobe bricks and a dense layer of fecal matter. McCarty suggests that after completing and filling in the "lateral channel"
other activities were conducted over it. He further indicates the possibility that these activities may have occurred after the city was abandoned (McCarty 1981:157).

Another construction feature of the channels is berms. The berm on the main channel was laid down-slope, the southwestern or windward side of the channel. It provided structural support as well as a windbreak for the channel by slowing down sand deposition. The berm built for the auxiliary channel lay on the up-slope, or leeward side, increasing sand deposition rather than preventing or slowing it down. McCarty suggests that the placement of the berm on the up-slope side was because the channel "defined the edge of a city block and the berm was to be used for road fill" (McCarty 1981:158). The absence of a berm on the northern edge may be indicative of some form of road construction.

While excavating the auxiliary canal it was discovered that there was a problem with the depth of the channel. It is two feet deeper than the main channel at the point where the two are the closest together. It is suggested that this might represent a possible "spill gate" from the main channel used to feed the auxiliary. Another suggestion is that the auxiliary canal may have been part of a larger system which would join at the northern end of location B, in which case the distance would balance out the gradient discrepancy (McCarty 1981:158). (See McCarty 1981:103 for a map showing the entire canal system for St. Joseph, the bench communities and St. Thomas.)

Historical Evidence. There is a great deal of historical data available regarding work done by the Mormons on the Muddy towards cleansing the earth of its curse and making it teem with plants and animals. Reports were made regularly on the cultivation and harvesting of cotton, wheat and other crops.

Settlers wrote about their work in their diaries and journals. Thomas Day, an early settler in the valley, commented on planting grape and fruit trees, digging ditches and
plowing the hard soil with heavy plows and strong teams (n.d.:15). Clement wrote about how the bench was the best locality for growing fruit and grapes (for making wine) (1868:22).

Daniel Bonelli, in several letters to the Deseret News, discussed the types of grapes grown in the Southern Mission. How many were present at the Muddy Mission is unknown, but the variety probably included Fiher Zagos (Hungarian Raisin), Black Hamburgh, Chasselas, Isabella, Catawba, Syrian and Muscat. Some were cultivated as an experiment and may not have been hardy enough for the region, but others were, such as the Fiher Zagos, and probably the Muscat (from Egypt) and Syrian (from the Holy Land). The soil was good for these grapes as well as several fruit trees (Deseret News 1868:17:127, 156, 227). Bonelli commented that many of the fruit trees would flourish if better cared for, but many of the people cultivating them went north for the summer months leaving the trees untended in the "dry heat of summer" (Deseret News 1868:17:127).

Kimball's description of St Joseph when he first arrived in late 1867 includes the land under cultivation. The settlers had "from 12 to 15 hundred acres, mostly swamp [,] and quite an abundance of Hay land and a good supply of farm land..." (Kimball 1847-1889:61). All agreed that putting in crops and establishing a temporary home were the first things to accomplish upon arrival to the valley.

Because cotton was a major factor in the formation of the mission, it will be discussed separately from food production and irrigation. It is interesting to note that the Muddy River Valley proved an excellent choice for growing cotton.

Cotton Production. Although interaction between the various communities appears to have been minimal, cotton production of the entire valley was considered as a whole in Church records. It is important to note that the records indicate only the production from St. Thomas and St. Joseph (refering to all of the communities of that name). It would
appear that West Point may not have been as involved in cotton production as were the original settlements in the lower valley. Overton's population probably continued to farm lands allocated when they lived on the bench communities.

The Muddy Mission consistently lead in cotton production for the Southern Mission throughout its six year history. Table 1, showing cotton production at St. Thomas and St. Joseph, was taken from the text of the Southern Mission records (Bleak 1941:1:202, 240-42, 255):

Table 1. Cotton Production - St. Thomas and St. Joseph.

<table>
<thead>
<tr>
<th>Year</th>
<th>Production of Cotton Lint</th>
<th>Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1865</td>
<td>5,000 both</td>
<td>---</td>
</tr>
<tr>
<td>1866</td>
<td>6,000 St. Joseph only</td>
<td>17</td>
</tr>
<tr>
<td>1867</td>
<td>14,600 St. Joseph only</td>
<td>---</td>
</tr>
<tr>
<td>1868</td>
<td>80,000 to 100,000 both</td>
<td>200-250</td>
</tr>
<tr>
<td>1869</td>
<td>Drought</td>
<td>---</td>
</tr>
<tr>
<td>1870</td>
<td>25,000 St. Joseph only</td>
<td>---</td>
</tr>
</tbody>
</table>

The 1865 crop was small because it was the first year of production and only a small amount of acreage was planted. Nevertheless, the Muddy Mission was the most successful of the entire Southern Mission in production. The rest of the Mission suffered severe crop damage from grasshopper and worm infestations.

The 1866 crop was also small. In February, the Muddy River Paiutes, urged by the Timber Mountain Paiutes, raided St. Joseph for the livestock. The men went after the Indians but failed to retrieve any of their animals. The settlers experienced additional raids for livestock which prevented them from planting and cultivating their crops. This prompted the Church to insist upon fortifications. Moving and building a new settlement prevented extensive cultivation. Further troubles with the Indians, however, were curtailed with the re-establishment of business dealings with them. As long as the Paiutes had food they were not hostile.
The 1867 crop showed promise for the Mission. The settlers were now established in their new homes and could give more time and attention to developing their cotton crop. Paiute raids had stopped, temporarily, after a meeting with Mormon officials.

The 1868 crop was a record-breaking yield produced by both New St. Joseph and St. Thomas. The settlements were growing with more land under cultivation. In mid-August, the Muddy Mission had a grasshopper infestation of severe proportions (Journal History August 24, 1868:5; *Deseret News* 1868:17:293) and New St. Joseph was burned, yet neither of these events apparently affected the yield. Gibson wrote in his journal that the crop was picked in September (1867-1868:79), and Bleak recorded it as being the best yield for the six years noted.

The fire at New St. Joseph also destroyed Chaffin’s cotton gin. Another was under construction by October 5th. It was run in the grist mill as the previous one had been (Clement 1868:1:11).

During his visit to the Mission in August, Joseph W. Young noted the number of acres under cotton cultivation:

At Rice’s Camp [West Point?] on the Upper Muddy they have nine and a third acres. At St. Joseph they have sixty-one acres, and here [St. Thomas] they have fifty-eight acres. This is quite an advantage over any previous year’s crop, and I am told that the crop never before promised so large a yield (*Deseret News* 1868:17:293).

Bleak had no record for a crop in 1869. The entire Southern Mission suffered a drought and only a small amount of cotton was planted, which resulted in poor quality lint. The settlers used the water primarily for food and personal use. The situation was much better for the settlers in the Upper Muddy Valley at West Point. Barrett notes that these people suffered very little from the drought and that the Muddy continued to flow with little loss contributing to a good cotton crop. Unfortunately, no figures are available regarding pounds of lint grown or acres under cotton cultivation (Barrett
Based on the New York Price Index (Table 2), Bleak noted in the Annals of the Southern Mission that by 1869 prices had dropped drastically, and there was no market for cotton lint (1941:1:192, 240, 255). To provide incentive for cotton production, Brigham Young gave the Washington cotton factory to the Southern Mission as a cooperative. During the year the settlers of Sandy Town (A and B) moved to the original St. Joseph and also established Overton.

### Table 2. New York Price Index: Cotton

<table>
<thead>
<tr>
<th>Year</th>
<th>Low Per Pound</th>
<th>High Per Pound</th>
</tr>
</thead>
<tbody>
<tr>
<td>1865</td>
<td>$0.35</td>
<td>$1.20</td>
</tr>
<tr>
<td>1866</td>
<td>$0.32</td>
<td>$0.52</td>
</tr>
<tr>
<td>1867</td>
<td>$0.15 1/2</td>
<td>$0.30</td>
</tr>
</tbody>
</table>

The 1870 crop was a fair yield; however, it was not enough to bring in a substantial profit for the settlers. It did show that the area was still productive after experiencing a severe drought. The incentive Young provided helped somewhat in the production, and the seed quality was slightly improved by the introduction of a new Georgian seed. Prices remained low, and this lack of finances was made more desperate by the need for clothing, tools and food made scarce because of fire and drought.

Other cotton production economics were concerned with the factory in Washington, Utah and the trade value of cotton lint. The factory, built on Mill Creek in 1866 and located about 63 miles northeast of the Muddy Mission, opened in 1867. During construction Brigham Young and Erastus Snow encouraged the Muddy Mission settlers to underwrite the cost of the construction, although their coin was limited. Bleak noted that the Mission, overall, underwrote more than $1,500, with $1,110 from St. Thomas, $400 from West Point and a “generous amount” from St. Joseph (1941:1:301-2). Loans
provided a further means of paying costs for the factory.

All lint from the Southern Mission was brought to the factory for processing in exchange for food, clothing and tools. The factory was a ready market always in need of lint, an improvement over previous years when there was difficulty selling the raw material.

The factory became a cooperative in 1869 with Brigham Young as a principal stockholder. He added his wool factory to the one-story building as an incentive for that enterprise. As a cooperative, the factory manufactured the cotton and woolen goods, and bought and sold merchandise, supplies and livestock (Larson 1961:148-49, 197-99).

Food Production. Food production in the Muddy Mission was an absolute necessity because of the lack of external suppliers. When the settlers first arrived in the Muddy River Valley, they put more acreage under food production following the experience the upper Southern Mission suffered during its early years. Those settlers had planted more cotton than food, believing they would find a local market to exchange the lint for food. No one wanted the raw material, so the settlers established a market in California, against the wishes of the Church (Arrington 1966:218).

The Southern Mission later established a market with the miners in Pioche, Nevada. They exchanged fresh meat and produce for cash and empty tin cans. Another market, closer to home, was the annual fall fair held at St. George. There the Mormons traded with each other, generally buying and selling on credit. When the seasonal crop was harvested, payment was made (Spencer 1937:153, 155).

There are few records of the acreage for grain production at the Muddy Mission. One report, for 1866, stated that the combined efforts of St. Joseph and St. Thomas cultivated 400 acres of land, mostly in wheat and corn. Wheat, like cotton, did well in the valley. The lowest yield, in 1868, was 100 bushels; the highest, in 1871, was 8,000
bushels (Larson 1961:143, 153; Bleak 1941:1:263). Bonelli, in a letter to the Deseret News, wrote about how well the people were growing crops in the soil on the Muddy. He noted that "Lucerne clover is now growing... wheat generally looks promising" (Deseret News 1870:19:65) Lucerne, or alfalfa, was a late comers to the valley. Larson writes that it was not being grown in the Muddy Mission in 1866, possibly because the settlers felt that there was enough "meadow grass for hay [which] assured a good supply of forage for winter" (1961:143). It was being cultivated as early as 1869, however, according to A. Milton Musser who visited the mission as part of the Young party in 1870 (Deseret News 1870:19:120).

Neither Call's Landing nor Junction City had any land under cultivation for grain. The soil was not suited to growing it (Deseret News 1866:15:229; Deseret News 1868:17:293).

Another crop grown in quantity in the Southern Mission and at the Muddy Mission was Chinese sugar cane (Larson 1961:31), an imported seed. The "juice was crushed out of the cane stocks and made into molasses" (Barrett 1947:15). The molasses served as a substitute for sugar because the import cost of sugar was so high.

Other foods included, and not yet noted, in the settlers' diet were meat--fish, rabbit, tortoise and venison, nuts and other wild foods--piñon nuts and mushrooms. The fish, although vertebrae are not identifiable by species, probably included Moapa dace (Moapa coriacea), Moapa speckled dace (Rhinichthys osculus moapae), Colorado squawfish or white salmon (Ptychocheilus lucius), roundtail chub (Gila robusta), and Moapa White River springfish (Crenichthys baileyi moapae) (Cross 1975:47-59; La Rivers 1962:357-62, 436-44; Ono et al. 1983:105). George A. Smith noted in his report about the trip to the Muddy Mission in 1870 that the group was served camel back fish (this might be the humpback sucker (Xyranchen texanus) [William L. Pratt, personal communication 1988; La Rivers 1962:381-84]), taken from the Virgin River, by Joseph
Asay when they were at Junction City (Deseret News 1870:19:118). Rabbit was represented by two species, cottontail (Sylvilagus auduboni) and jackrabbit (Lepus californicus), and tortoise by one, desert tortoise (Gopherus agassizi) (Douglas 1978: Bradley and Deacon 1965:42; Christie Leavitt, personal communication 1988).

Vegetables consumed on the Muddy were recorded as being the general type grown.

Without irrigation, none of the food or cotton production would have been possible. Building irrigation canals were Church directed projects to provide the communities with water for agriculture and general use. One example noted by Bleak was the building of a ten-mile canal from the tule swamp above St. Thomas to the existing seven-mile canal in 1869 (Bleak 1941:1:198, 225).

Clement wrote about building canals to the bench community noting that on February 17, 1868 work began on a canal "to the fort" with water coming through on the 22nd (1868:n.p.). Later that year, Clement wrote about using the bench (city) ditch for the fields and constructing a new one for the city "taken out at the Narrows, & run further back on the bench than the present one, making considerable room for more city lots" (1868:20).

There were problems associated with the canals. Day wrote about the site for the fort (New St. Joseph) which required a four mile canal to get its water. He noted that the canal "would frequently fill completely level with sand and would, of course, have to be remade" (Day 1866:15).

Clement noted other problems associated with the canal system on the Muddy. In August 1868 a meeting was held with Joseph W. Young presiding. A fear was expressed that water taken to the bench would take away from the supply going to St. Thomas. St. Thomas also indicated that the continual running of the water was a waste (Clement 1868:1-2). Later in 1868 Clement presented an option for the canal system. He wrote:
Let the Muddy Stream be turned out at the upper end of the valley where it issues from the Narrows, into 2 canals, one on the East to water the bench & one on the West side of the valley, extending its whole length, bringing it all into use... (Clement 1868:2-3).

The suggestion apparently was never used.

The problems with the canal continued to plague the bench communities. Additional work on the main canal was carried out in early 1869. The results were the same; the canal filled with blow sand requiring regular cleaning. On a diminishing work force, due to families leaving the mission, this added burden of regular canal maintenance reduced labor efficiency and productivity (Grattan 1982:19-20).

A final problem affecting food production for the settlers on the Muddy was flooding. An article in the Deseret News by Joseph Felt of St. Thomas described a flood occurring in January 1868. The flood swept through the St. Joseph fields, on the flood plain, rising "so suddenly that the boys who were out in the field had to swim home." Very little damage occurred at St. Thomas because their fields were "higher up from the creek" (Deseret News January 5, 1868:2).

In 1870 "summer brought disastrous floods at West Point on the Upper Muddy, almost completely demolishing their settlement" (Leavitt 1934:96) and causing disease (Ellsworth 1985:24). The settlers requested for and received permission in September to leave the settlement as long as they went to strengthen one of the other settlements, i.e., Old St. Joseph, Overton or St. Thomas.

Discussion. The Mormons were successful in following this principle. When they arrived they had brought with them livestock and seed to develop the region. Its potential was seen as an agricultural region, particularly suited for semi-tropical crops such as cotton, grapes, peaches, apricots and pecans. Furthermore, they planted cottonwood (Populus fremontii) to add shade to their streets and lots.
Nor did the Mormons neglect the local resources. Flora and fauna of the Muddy River Valley provided food and shelter. The food has been mentioned; the flora used for construction were willow (*Salix, Salix spp.*), cattails (*Typha angustifolia*) and rushes (*Juncus*) (Niles 1978; Bradley and Deacon 1965:44-49). These were used in roofs on the houses and fences for the livestock.

Improvement of the land, however, could not have been accomplished easily in the lower Muddy without the use of irrigation canals. It is certainly possible that the current system in use in the valley was developed from the original. Unfortunately, not all of the original canal system was successfully used. A detailed look at the bench canal shows how ineffective it was due to the terrain and the technology of the era.

The climate played an important part in the production of food as well. The drought of 1869 necessitated the building of a canal from a tule swamp to provide water to St. Thomas. McCarty (1981:171) notes that the drought may have been the deciding factor in the demise of the mission as it pointed to the problem of water supply. The bench canal reduced the amount of water available for the rest of the valley—the technology of the time did not provide enough water for the population and their agriculture.

Flooding was another climatic problem faced by the Mormons on the Muddy. Although very little mention is made of floods, two, noted in the historical evidence, were bad enough to warrant one to be mentioned in a newspaper and the other causing the people to move because of severe damage to their homes and land.

Despite these problems, food production on the Muddy did well for the most part. The soil, though very alkaline and hard to plow, proved as productive as some of the early travelers believed it would, producing substantial quantities of wheat, fruits from the orchards and vineyards, vegetables such as sweet potatoes. By planting more acres with food stuffs rather than cotton, as was done in St. George and surrounding villages, the Muddy Mission settlers saved themselves from severe food shortages. Even the fire
at New St. Joseph did not destroy their supply of wheat, which was being harvested at
the time.

Cotton production also fared well. The alkaline soil was not a deterrent to growing
cotton, nor was the excessive heat or need for irrigation. According to Hay and Taylor,
depending upon the desired amount of lint bales per acre, the cycle, from planting to
picking, can last from 150-160 days to 180-190 days (Collier's Encyclopedia
1984:7:385). The major problem the settlers faced with their cotton crop, besides the
drought, was the infestation of grasshoppers in 1868. Yet, the record crop makes one
wonder how true the account was represented to the St. George leadership.

One last problem faced by the Muddy Mission regarding cotton production was the
lack of a market. Trade with California and the building of a factory in Washington.
Utah helped to alleviate this problem so the settlers could expect a market for their
product and continue cultivating it in greater quantities.

To redeem the earth by cultivating crops and breeding livestock was not only an
ideal but a reality. The Mormons placed themselves in a region where they would have
little contact with outside markets, so they had to produce for themselves. That they
were so successful attests to their acceptance of the belief that it was necessary to work
hard in bringing as much of the land under cultivation as possible.

Several people travelling through the Muddy River Valley, as well as people living
there, stated that the valley was perfect for growing cotton, wheat, grapes and other
crops. William Kartchner, in a letter to George A. Smith, wrote most eloquently:

The soil is said to be excellent and the climate most solubrious.... The
Muddy is evidently an inviting place, for all the testimony that comes from it
is of the same character (Deseret News 1866:15:381).

It is possible that many of these testimonials, which tend to appear in the news most
often during the more pleasant times of the year, were generated to create interest in the
mission. That it was productive is without question. That it fulfilled the goal of
producing cotton for the mission and the rest of the Mormon state is also undeniable. But there were problems, such as the attempt to develop the bench, the heat driving people north to escape it, disease resulting from the mosquito infested swamps, drought, fire, grasshopper infestation, and the continous moving and rebuilding, any of which would have prevented many people from wanting to continue in a seemingly hopeless project.
CHAPTER VI

MAN AND SOCIETY

In the preceding chapter the first four of Arrington's principles were examined with regards to man's relationship to the environment. This chapter will look at the other three principles, frugality and economic independence, unity and cooperation and equality, in terms of man's relationship to society. All three present Mormons relating to other Mormons, but principle five also looks at Mormon and Gentile and Mormon and Indian relations.

Although these principles are more concerned with relationships between men, the relationship of man and the environment cannot be separated, anymore than man and society can be separated from man and the environment. What affects one will affect others. In this respect, the effectiveness of the Muddy Mission as a way station, a cotton producing settlement and a deterrent to Gentile expansion greatly affects the outcome of its economic status, the unity and cooperation of the settlers and their acquisition of "earthly things". How did Arrington's last three principles fare in the Mojave Desert?

FRUGALITY AND ECONOMIC INDEPENDENCE

The goal of the Mormon Church for all of its villages was self-sufficiency. Past experiences in the midwest, such as the ill-fated Kirkland Bank which closed due to a lack of funds, served to strengthen the directive toward self-sufficiency. The directive was based on an 1831 revelation, which stated: "...let all thy garments be plain, and their beauty the beauty of the work of thine own hands; ..." (Smith 1964:151; Smith 1982:72) and was to be accomplished without contracting debts with Gentiles (Arrington...
1966:26). Thus, all enterprises engaged in by the Mormons must be conducted without any assistance from outsiders. They believed it possible because God had given each region resources to be used and developed.

Archaeological Evidence. The people on the Muddy, being as isolated as they were for much of the Mission's duration, had little choice but to be frugal and self-sufficient. Anything that broke had to be fixed from what was on hand, unless a trip to St. George could be made. The leather scraps found at both sites are probably indicative of the necessity of repairing tack, especially for the draft animals.

The leather may have also found a place in the shoemaker's supply. A shoe last (Figure 8, p. 96) was found in the hearth of House 2 at New St. Joseph. However, the only historical record of a shoemaker was found in one of Clement's notebooks where he wrote "1869 Brown Shoemaker" (n.d.:3:2). No other information is provided, so we do not know what Brown the shoemaker did or how he was paid. In addition to the shoe last, parts of shoes were recovered, including complete soles and heels (Figure 9, p. 97).

Tin cans do play a part at the Muddy Mission, but the question is in what fashion. Many of the cans and fragments of cans were found on the surface, presenting the probability of intrusive material. This holds true with those identifiable artifacts which post-date 1871. However, the few cans and fragments which date before or during the 1865-1871 time frame present another possibility. Spencer wrote that Mormons obtained tin cans through trade with miners.

Another possibility is that through the sale of salt to the miners in the Pahranagat Valley, settlers such as Kimball bought tinned food stuffs. If they did, the fragmentary remains of larger cans and pails, found on and just above the house floors, are quite likely to be the net results of this trading practice. The larger size would be more
Figure 8. Two views of a shoe last, New St. Joseph.
Figure 9. Two left inner soles and top and side view of a heel, Sandy Town B.
practical allowing for more uses for storage.

With regards to the smaller cans (Figure 10), it is quite possible, in addition to trade with the miners, that the Mormons brought with them or obtained in St. George food or other items shipped and stored in tin cans. However, the extensive use of tinned food appearing on the Muddy at this time is highly unlikely. Church leadership strongly extolled the virtues of growing crops and providing as much as they could through their own toil.

Glass containers do not necessarily fall into the same category as the tin cans. Some of the glass fragments are from dishware. Bottle fragments, though, do include a substantial amount of intrusive material. Of the bottle fragments which could fit into the mission's time frame most are likely to be from medicinal bottles. Two examples are

Figure 10. Tin can, c. 1865, New St. Joseph
sherds from medicinal bottles found at New St. Joseph. The first was identified as Ayer's Cherry Pectoral (Figure 11a, p. 100) and the second as Mrs. Winslow's Soothing Syrup (Grattan 1982:62-63). The sherd from the Ayer's bottle has the letters "AY", but the placement fit a picture of the medicinal bottle. Information about the company indicates that it was established in 1841 in Lowell, Massachusetts and first introduced the pectoral in 1847. The company was also known for its Sarsaparilla, Carthartic Pills and an "... Ague Cure for all Malarial Disorders" (Grattan 1982:63; Fike 1987:94, 199).

The second sherd was identified by the letters "WS" and "RU". Mrs. Winslow's Soothing Syrup was a "treatment for problems of teething babies" (Fike 1987:231). Fike writes that the original medicine was attributed to Mrs. Charlotte N. Winslow who created the syrup in 1835. Her son-in-law, Jeremiah Curtis, and his partner, Benjamin A. Perkins, introduced the product to the public in 1849. Unfortunately, Grattan was unable to locate a picture of this bottle.

Two other glass bottle fragments of note are the finish (i.e., lip and collar, neck and part of the shoulder) of a small bottle (Figure 11b, p. 100) and a sherd with the letters "SIA" (Figure 11c, p. 100), both recovered from Sandy Town B. The first bottle was made in a mold with the lip and collar applied. The stopper may have been made of cork, but it is possible that another material was used because of an uneven, horizontal striation on the lip interior. It is clear glass with a patina. The other fragment, with the embossed letters, is clear glass with a patina. No identification has been made at this time (Coughtry, Baumkratz and Kimball 1983:11).

It is highly unlikely, although wine was made from grapes grown on the bench, that the Mormons would purchase bottles expressly for the use of storing it. There is the possibility that, like the tin cans, empty liquor bottles found their way to the mission through trade with the miners. It is also probable that the Mormons made some of the
Figure 11. Glass containers, New St. Joseph and Sandy Town B.
wine to sell to the miners, although no one stated such a transaction in their journals or diaries.

**Historical Evidence.** Communities were designed to be self-sufficient. All necessary skilled people were included in the call. Representative skills necessary in a frontier community included masons, carpenters, butchers, millers and blacksmiths. But not everyone called went. Many wealthy Mormons paid substitutes to replace them, often sending them without supplies. Those unprepared substitutes then became burdens on the already overtaxed settlement to which they were sent. The Muddy Mission undoubtedly was no exception. Thomas Smith, leader of the first settlers to the valley, stated his hopes that those who had sent substitutes would send plenty of provisions for them because the ones living at St. Thomas were "living on little more than bread and water; the flour in some instances is procured by borrowing" (*Deseret News* 1865:14:237).

Frugality, another aspect of self-sufficiency, was clearly evident at the Muddy Mission due, in large part, to its isolated location. However, it was not necessarily economically independent. Economics played an important part in the creation of the mission and continued to be significant during the mission's six years of existence. Examination of the historical data shows that the mission was not quite as independent of others as the Church leadership would have wanted.

Trade conducted by Muddy Mission settlers was both external and internal. External trade was carried on with the railroad, miners and California and other merchants. Internal trade was with the Church and amongst themselves. Internal trade could also be deemed as functioning between the missionaries and the local Indian bands.

**External Trade.** Because of their inherent geographical isolation, the communities on the Muddy had limited outside trade. Roads to St. George and Santa Clara were
usually scraped gravel, made by pulling a wooden plow over the surface to level it, or packed sandy beds, which were not always safe for travel. In January 1866 the Utah Territorial legislature made a request to the United States Congress for appropriations for road improvement from Call's Landing to Salt Lake City. The request was not granted.

The Colorado River, a highway to the Pacific and world trade, was used for two years, from 1865 to 1867. A store at Call's Landing paid for settler flour with cash and kind. However, it was Gentile interest in navigating the Colorado that tried to establish a permanent use of the river. The Utah and Arizona Territorial legislatures introduced bills to appropriate funds to make the river passable above El Dorado Canyon, a mining area south of Call's Landing.

After 1866 river traffic declined. Kowalewski indicates that the decline resulted partly from the intense competition between three companies: Captain George A. Johnson, first on the river and military supplier, Samuel "Steamboat" Adams and Captain Thomas Trueworthy, Johnson's river competition, and William Hardy, a merchant who traded with the Church from his landing below El Dorado Canyon. Johnson refused to go beyond El Dorado Canyon saying it was the highest navigable point. Adams and Trueworthy went to Call's Landing, but their scheme failed because of "seasonal fluctuations of river depths and the opposition from downstream merchants and shippers who preferred El Dorado Canyon as the head of navigation" (Kowalewski 1984:45). Hardy's trade was too well established to be moved closer to the Muddy, so the plans for using the Colorado eventually dwindled to a dream that did not succeed.

Furthermore, construction had begun on the first transcontinental railroad in the mid-1860s. With its completion in 1869 near Ogden, Utah, need for trade or travel on the Colorado was greatly diminished (Corbett 1968:49-61).

Construction of the railroad did provide work for enterprising men. Kimball wrote in his diary in 1869 that he left the Mission for a short time to work on the railroad in
northern Utah. He was paid $5.00 per day for each team and had two additional drivers who worked for him (Kimball 1847-1889:65-75).

Surplus food and salt were also used in external trade. Pahranagat Valley, a few days drive northeast of the Muddy, had at least one mining camp with which the settlers traded. Kimball, from West Point and New St. Joseph, and Helaman Pratt and William Seegmiller took salt to Pahranagat Valley and were paid cash ($350.00) for the three wagon loads of "28 hundred per wagon" (Kimball 1847-1889:65-71).

The mines provided work for anyone interested and in need. Wood, also from New St. Joseph, went to work for the quartz mill cutting cedar. Later that summer he and Alfred Ketch each took a few hundred pounds of wheat to the Pahranagat Quartz Mill and were paid six cents per pound. Wood brought back lumber for his new house (1837-1915:47-49).

Internal Trade. Most of the trade within the Church was centered in St. George, the principal settlement in the Southern Mission. The city had an annual fall fair and was a major seat for both Church and civil activities in southwestern Utah. Moreover, it was connected to Salt Lake City by a telegraph completed in 1867. The late 1860s brought work for settlers, although there is no record of Muddy Mission settler involvement, when construction was begun on a tabernacle and temple in St. George.

The Washington factory was built near St. George. Prior to its opening cotton lint was sold to local individuals or transported to the factory located at the mouth of Parley's Canyon near Salt Lake City in exchange for goods. The opening of the Washington factory, which used parts brought down from the northern factory, stabilized trade in the region by providing a regular buyer for the lint. No longer was trade to be determined by the needs of individual buyers (Arrington 1966:218-20).

When cotton production decreased Brigham Young offered both his cotton and wool factories as cooperatives for the Southern Mission. As cooperatives the factories would
be more productive than as factories owned by someone outside of the area. Furthermore, with a profit-making share Young believed that the settlers would increase their cotton yield.

On December 3, 1869 Clement wrote that a sawmill was built on the upper Muddy River. The original idea was for people to bring logs down to the mill; however, it did not succeed. Then the idea of establishing a "Cooperative Lumber Co." was presented. Anyone interested in having shares in the enterprise would "pay in cash[,] labor or available property" (Clement 1868-1869:17) with a board of directors taking care of the capital. The cooperative would either buy an existing mill or build their own, making roads to the mill for transporting the lumber (Clement 1868-1869:17). No other mention is made of the proposed cooperative mill so it is not known if the idea became reality.

Other internal Church trade entailed surplus wheat and flour and salt refined at a mill in St. Thomas and Simon's grist mill at Mill Point. These items were exchanged for supplies, manufactured goods and materials unavailable in the Muddy River valley. The surplus food-stuff was given to settlers who did not have enough food but had a surplus of other items. The surplus would also be given to stores in exchange for goods.

Much of the lumber used in construction was from the Timber Mountains, Mormon Mountains and Pine Valley. The Mormon Mountains has conifers and white fir and Pine Valley has pine, oak and spruce trees (Wesley Niles, personal communication 1978). The Timber Mountains, 65 miles northwest of the Mission, had trees but these were of little use in construction. Kimball, on the return trip from Pahranagat Valley, wrote that he and his friends went to the Timber Mountains to get wood. Unfortunately, they were unable to find it, and fearing they might get too far from the only water source in the area cut ash from the swamp (Kimball 1847-1889:72).

Based on the historical records it is apparent that most of the lumber was obtained from Pine Valley, 130 miles northeast of the Muddy. Costs were high so the settlers
bought only what was necessary. Table 3 shows the cost of Pine Valley lumber based on Bleak's records (1941:1:185):

Table 3. Pine Valley lumber costs per mile.

<table>
<thead>
<tr>
<th>Type of Lumber</th>
<th>Cost Per Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumber for common building</td>
<td>$40.00</td>
</tr>
<tr>
<td>Fencing &amp; flooring</td>
<td>50.00</td>
</tr>
<tr>
<td>Finishing lumber</td>
<td>70.00</td>
</tr>
</tbody>
</table>

Another form of trade common in the Southern Mission was carried out by peddlers, whether Mormon or Gentile. They brought manufactured goods and knick-knacks, fixed broken tools, and repaired boots and shoes in exchange for anything the settlers could offer. Peddlers were also a welcomed source of outside news (Spencer 1937:154). Clement wrote about a man named Bringhurst who brought goods to trade for cotton (1868:1:11).

Internal trade within the Muddy Mission was necessary because no one family was completely independent of any other. It was important for cooperation and a sharing of skills amongst settlers. Further, all new settlements ideally began with the necessary specialists.

The community trade system functioned on different levels. One level was the exchange of skilled labor for wheat, flour or other crop surplus. Alma Bennett, the first presiding elder of New St. Joseph, was a mason. Kimball employed him to help build his house at Sandy Town A (1847-1889:75). There is is no record of how he was paid, but it was probably with grain or flour. After the fire destroyed his house at New St. Joseph Gibson and his son, David, built a new one on their city lot. David laid the foundation for the two-room structure and they paid Brother Gillespie, another mason and bricklayer, with food to put up the walls (Gibson 1867-1869:79).

In 1867 Orrawell Simons exchanged his grist mill for James Leithead's farm in
Farmington, Utah. Leithead, Bishop of St. Thomas, hired Foote, an experienced miller, to run the grist mill. Foote received as payment two-fifths of all the tole and smuttings. Tole was the miller's portion of grain taken as payment for grinding. There is no colloquial definition for smuttings; however, they are wheat parts with smut, a black fungus, and are a source of food (Alma Rosa Corona, personal communication 1979).

Clement, an employee hired by Foote to work at the mill, left an account for later credit payment (1868:2:3-4). Credit, an I.O.U. system, was usually payable with a seasonal crop.

Indian labor was another vital part of the economic system on the Muddy. When Kimball and his friends went to get wood in the Timber Mountains they had counted on Indian assistance. The Indians ran away but were met on the way to the Muddy. Kimball wrote that they convinced the Indians to carry the three six-mule loads of timber for their (the Indians') pistol, which the Mormons held for security, and flour. Kimball noted that this arrangement was made as a compromise to fighting, although he, Pratt and Seegmiller would fight if necessary (Kimball 1847-1889:72-73).

Gibson also used Indian labor. In August 1868 his son David hired an Indian to assist in constructing the two-room house at their new city lot. They made about 10 to 12 thousand adobe bricks for the construction. The Gibsons paid the unknown Indian with either a blanket or a pair of pants (Gibson 1867-1869:79).

In September Gibson wrote that the Indians assisted in picking the cotton, noting the barter system used in exchange for the labor. For a day's work, a "squaw" received "a yd of Calico & three cakes of bread" (Gibson 1867-1869:79). The picked cotton traded for calico and "we could also get Boots [,] shoes & groceries..." (Gibson 1867-1869:79). He further noted that the crop was good that year and that he received 40 cents per pound when the cotton was cleaned and baled. Grattan mentions 2 other prices offered for the cotton, 30 cents per pound and 26 cents per pound (1982:36). The
person making the offer apparently made his own decision as to what he would pay. Gibson did write that he was paid for his cotton with trade goods rather than cash.

Indians also herded stock for the Mormons. This task sometimes resulted in the loss of stock either by an animal getting lost or trapped in quicksand. Andrew Gibbons, the Indian interpreter, had to continually convince the Indians that the loss of stock, whether from stealing or being consumed, meant that the Mormons lost a valuable draft animal. In turn, that reduced food production which limited what was on hand for feeding the Mormons. With no stock for plowing and limited crop production the Mormons would be unable to provide the Indians with any food, a circumstance to which they had grown accustomed (Corbett 1968:115-122).

Another level involved the loan of equipment or animals. The transaction Kimball and his associates made in Pahranagat required an exchange between the three men and others in the settlement who had loaned each a team of mules for the enterprise. The price for the loan was 100 pounds of bacon bought for $75.00 from the miners (Kimball 1847-1889:65, 71).

Discussion. The directive of self-sufficiency can be found at the Muddy Mission, although not in the degree that would have been expected by the Church. The economic climate did not present the people on the Muddy with the choice of maintaining economic independence from surrounding Gentiles. One of the purposes of the mission, a way station for traffic on the Colorado coming to Call’s Landing, precluded an isolationist attitude. Although most of the traffic was expected to be Mormon or for the Mormons, inland businesses, such as the mine owners in Pahranagat and Pioche, would want to take advantage of the decreased distance machines and other supplies traveled from the river to the mine.

Unfortunately, the Colorado River trade, which had potential, did not survive its
own problems and the ease with which the transcontinental rail system brought goods and people west. Its demise decreased the value of the settlements on the Muddy; one of the reasons for the mission was to produce food and cotton to be sold at Call's Landing and shipped to outside markets.

The people at the Muddy Mission had several avenues open to them for achieving self-sufficiency. Cotton production was one of these. Church projects, paid by the Church or the Territorial government, food production, internal trade and Church donations were other ways they overcame difficult living conditions on the Muddy River. Although not always encouraged, external trade was yet another means of maintaining a limited economic independence on the Muddy.

Church projects provided economic stimulus to the various settlements, but often it was not enough. Church officials did their best to get funding to pay for work done in the Southern Mission, but there were too many projects for the amount allocated. Therefore, funds received were spread thinly amongst the settlements. The Muddy Mission did well to receive funding for their various projects.

Trade also played an important part in a settlement's existence, moreso when isolated by distance. It provided communication with others, sometimes brought in cash, but always goods and food. When kept between Mormon settlements, the Church maintained control over and contact with the settlers. External trade, although discouraged as much as possible, extended the world of the Mormons as well as being a readier source of cash and items not always available in the isolated settlements such as the Muddy Mission. This trade with outsiders included the railroad and miners who welcomed the fresh produce, meat and salt the Mormons sold them. The trade with the miners in Pahranagat Valley and possibly El Dorado Canyon, south on the Colorado River, gave the Mormons on the Muddy extra cash and access to other types of food, such as bacon. But even this trade was limited because Mormon communities near the
mines provided most of the grains, produce and fresh meat the miners needed. These communities included St. George and Santa Clara in Utah and Clover Valley and Pioche in Nevada (Kowalewski 1984:34-35).

However much Brigham Young and other Church leaders deplored the purchase of goods from Gentiles, especially expensive goods such as tobacco, this economic exchange existed even after the move to the Great Basin. Most of the ceramic sherds recovered at both New St. Joseph and Sandy Town B represent vessels imported from England. Although ceramics do not play an important role in world economics, the fact remains that the substantial amount of imported ceramics is indicative of the Church's participation in world trade patterns. It also suggests a high occurrence of English Mormons immigrating to Utah and the Muddy bringing their ceramics with them.

Clearly, the interaction between Mormons and Gentiles was inevitable, particularly when no other market was available. Interaction with the Indians, although presenting a different economic picture, was kept as friendly as possible with the exchange of food and clothing for services rendered by the Indians for the Mormons.

The interaction between Mormons was necessary. No one person could do everything himself, particularly in an environment vastly different from anything previously encountered. A purpose of the call required that each mission have a complement of people with the skills needed to make it successful and self-sufficient.

The ideal of self-sufficiency had merit but could not always be practiced with the exclusion of outside economic contact. Travellers going west stopped in Salt Lake City to buy supplies and often left furniture and other items they were unable to take across the desert region as well as paying with cash for what the Mormons could provide them. There were goods that they could only purchase from outsiders, items such as tobacco, cotton cloth, sugar. Because the costs were high before and during the Civil War, growing their own crops to supply these items became an important reason for working
towards greater self-sufficiency.

The Southern Mission was established for the purpose of supplying the entire Kingdom with items usually procured from Southern markets. Cotton was considered the major crop with the surplus to be sold to the national market in St. Louis or to California merchants. However, this project did not always prove as efficacious as expected. Markets were limited, crops failed or were damaged by pests or there was no means of bringing the raw lint to a factory for preparation for sale. Finally, after the Civil War, the need for cotton grown in other parts of the United States diminished as the South revived its own cotton industry.

In addition to the problems associated with cotton production, the Muddy Mission suffered from its isolated location. The failing of the Colorado River steamboat trade took away a possible avenue of economic growth for the communities on the Muddy. Kowalewski (1984:53) notes that the people of St. Thomas traded with the miners of El Dorado Canyon but does not indicate how long nor how productive this trade was. Nor does she state if it was accomplished by taking goods by river or overland route. If it was by river, it probably ceased with the ending of Call's Landing in 1867.

Kowalewski also suggests that the economy based on the cotton failed to develop, thus cutting the people on the Muddy off from markets in Nevada and Arizona mining camps (1984:97). What she fails to demonstrate is that the Muddy had competition for providing grain, meat and produce to miners in Nevada, particularly those to the north. This competition, about which she goes into detail, was closer and better able to provide these fresh food items sooner and more easily than the people on the Muddy.

None of the journals mention conducting any trade with miners in Arizona, so only theories can be presented as to why this trade did not develop. It is possible that the failure of the Colorado River trade, the lack of well maintained roads to the Colorado and beyond, as well as the undeveloped cotton economy prevented the establishment of a
market with Arizona miners. Another supposition would be that the trade carried on in
the region below Call's Landing by various entrepreneurs, such as Hardy and Johnson,
included a lucrative business with the Arizona miners and precluded the need for any
additional supplies from the Muddy settlements.

The Muddy had one commodity welcomed by both miners and Mormons—salt. The
sale of salt helped those individuals enterprising enough to take it the long distances to
St. George and Pahranagat Valley, but it was still a limited trade.

Economic frugality was practiced on the Muddy, but not because the people
necessarily wanted to do so. The history of the Southern Mission is rife with requests
for funding or economic assistance. People with money stayed in the north, or if they
were able to make money in the south, they found a way to return north taking their
money with them. Church funded projects, appropriations from the territorial
government, cooperatives created as incentive to production were all present to assist the
Southern and Muddy Missions. Yet, even these were not always enough to bring
respite to the economic dependence these people had on others.

The people on the Muddy had two additional problems to overcome. One was the
need for basic items such as shoes, clothing and farming tools, i.e., hoes, shovels,
ploughs. Leithead wrote to Snow about the mission's need for these items in late 1870,
but to be acquired through an exchange of cotton lint at the factory in Washington. If the
factory, under the Rio Virgen Mercantile Cooperative, was unable to give them a good
exchange for their lint, Leithead stated that they would seek another market (Leavitt

The second problem was the harsh climate on the Muddy. It served as a deterrent to
keeping some people there beyond the early summer months. Those who were hardy
enough to stay and endure the high temperatures, and those who would live there only
during the cooler months constituted a much smaller labor force than needed to make the
mission an economic success.

These problems, coupled with a lack of timber for building material, made this mission less economically independent than the leadership expected it to be. Still, the mission continued resulting from the interaction among the people inhabiting the various communities. This interaction served at least two purposes--economic exchange was one, cooperation was another.

UNITY AND COOPERATION

Unity was part of an early revelation, from 1831, which stated, "I say unto you, be one; and if ye are not one ye are not mine" (Smith 1951:142; Smith 1982:65). It was evident in a "strong central organization and self-forgetting solidarity..." (Arrington 1966:27), that is, the people gave their leaders the right to direct them and, in turn, willingly cooperated with the leaders. Everything important to the Church, construction of ditches, mills, forts, migration organization, required cooperation. It signified that a person respond to a call from the Church providing his labor wherever they determined for the economic growth of the Kingdom.

Brigham Young took the early program providing the action necessary to make it a working principle. He instituted several projects, in construction, migration, manufacturing and other economic areas, to build the Kingdom of God in the Great Basin. Seeing themselves as one, as a group, permitted the leadership to direct its people toward attaining their secular and religious goals.

Archaeological Evidence. Unity and cooperation are not as readily apparent in the archaeological record as the previous principles. But in examining the construction accomplished at the mission, the importance of unity and cooperation appear. Building and maintaining an irrigation system of any size requires the shared efforts of several people. Building and maintaining the irrigation canal to the Sand Bench communities
exemplifies that need for a shared effort. The length of the canal, the terrain through which it was built and the necessity of continual cleaning were all aspects requiring a great deal of labor in terms of man hours. The historical records provide the dates and number of men involved in building canals in the Muddy River valley. The 1869 canal built from a swamp to the existing St. Thomas canal is an example of this cooperation where the Church's ideal of everyone being one with the group comes through very clearly.

The Sand Bench communities present another example of cooperation and unity among the settlers of the Muddy River valley. Following the edicts of the Church leadership, the settlers built a fort and two communities in an area that was different from any other environment encountered by the Mormons. An aerial photograph McCarty took of the bench and nearby low lying fields clearly shows the vast differences in the productivity of the land. The bench is predominately light colored with some shading resulting from roads, the airport and areas where the bench slopes down to the lower elevations. These lower elevations, on the other hand, appear in various shades, from very dark to light, the darker shades representing vast arrays of vegetation (McCarty 1981:195). Furthermore, McCarty notes that the soil was incapable of providing enough vegetation to "stabilize the sand and retard the deposition" of blow sand into the canal (McCarty 1981:169). Even today many of the people living on the bench still find it difficult to grow small areas of grass with the use of modern fertilizers and an abundant water supply. Only a unified group of people who knew the agricultural limitations would have built in an area so devoid of arable soil.

**Historical Evidence.** The historical records contain more data regarding the unity and cooperation of the settlers in the Muddy River Valley. The initial calls to a mission were readily answered by people in Utah and the missionaries went forth to create a new
settlement following the same procedures established for previous settlements. It was missionaries of later groups, after hearing of the hardships on the Muddy, who refrained from heeding the call or sent substitutes in their place.

Despite this, people went to the Muddy River Valley, stayed and built a new life there. The records offer different pictures of the people living there. On the one hand, there is cooperation and unity in building when and where requested by the Church leadership (from St. George). Yet, there apparently was discord amongst the settlers. Before discussing the problems causing or resulting from this discord, first there will be an examination of the projects displaying a more cordial view of the settlers on the Muddy.

Church Projects. Church projects were designed primarily to develop and tie together Deseret, the short-lived state Brigham Young established in 1847 and which was later replaced by the smaller Territory of Utah by the United States Congress. Nevertheless, the projects brought money into areas needing economic stimulus. Project costs, determined by the amount of money and labor spent and the project's measurements, were paid back to the communities, sometimes by the Utah Territorial government. Another aid, for individuals, was credit from tithing labor on Church construction (Corbett 1968:95-96).

Some of the Muddy Mission's income was augmented by building Church directed projects. Settlers from St. Joseph and St. Thomas assisted in building canals and dams, and, with West Point, provided funds for factory construction. Canals and dams were constructed from 1865 through 1869, at a great cost to the settlers. For example, the cost for building canals in 1865 was $5,000. Early canals were for both general and agricultural use, whereas later ones were for general use. An exception was the 1869 canal. The drought dried up the Muddy River leaving the tule swamp as the only water source in the lower valley. Joseph W. Young suggested that the settlers cut a channel
from the swamp to the seven-mile canal above St. Thomas. Seventy men worked on the five day project saving part of their crop. They were repaid for their work, but there is no record of how this was accomplished (Bleak 1941:1:1).

Roads were other Church directed projects, but with funds appropriated by the Utah Territorial legislature. In January 1866 $800 was appropriated for rebuilding and/or improving the St. George road to the Muddy River. The following year $1,500 was appropriated for altering and improving the Beaver Dam Wash road to the Muddy River (Bleak 1941:1:198, 255). Funds were limited, however, because many Southern Mission roads needed repair work.

The St. George road was well watered, crossing the Virgin River 38 times before reaching the Muddy. But quicksand and the possibility of drowning made it dangerous. The Beaver Dam Wash road was made because of those dangers. Although the road was sandy and had fewer difficulties, it held its own dangers. There was no water from the Muddy to the wash, especially perilous to those unfamiliar with the road. Larson recounted about a family of three, James Davidson, his wife and son, who, in June 1869, died of thirst on the Beaver Dam Wash road (1961:520). Occasionally, the wash itself went dry, so the Mormons dug a well (Bleak 1941:1:198, 255; Larson 1961:519-20).

Because communications were poor, in 1869 Brigham Young requested that the Muddy Mission settlers build a telegraph extension line to St. George. He stated he would provide the wire and instruments if they would put up the poles. Plans were made, but the settlers never erected the line (Bleak 1941:1:301-2; Larson 1961:528).

Tithing, part of the Church's economic program, was the payment of one-tenth of all derived yearly income in coin or kind, i.e., food, clothing, merchandise, livestock. The tithes were then used by the Church to give credit for labor, to aid the needy and for other Church use. Tithes were considered more important than civil taxes because there
were limited financial resources in the territory to provide funds for every aspect of public administration. The lack of coin added to this difficulty, leaving the Church as a source of funding for some of the administrative functions. These economic conditions made the Utah and Arizona tax assessors lenient on the Muddy Mission which had little money for payment (Spencer 1937:125).

Discord on the Muddy. In 1866 the settlers were asked to build forts to protect themselves and their property from the local Indians. St. Joseph's (the original community) settlers were praised for building a fort-like settlement, and "adopting means to farm compactly and near their fort" (Journal History March 1, 1866:2-3) The same was suggested for the St. Thomas and Mill Point communities.

It was in this letter from Snow and Elder George A. Smith that first mention was made of building a fort on the bench. Their reasoning was that "a fort might be located on a point from which rifles might protect the mill, where at the same time it would afford a more airy and healthy location for families" (Journal History March 1, 1866:2-3). Then they admonished the settlers to make provisions for protecting the mill at Mill Point as they have "a common interest in" it. Snow and Smith also stated.

If any man among you think himself wise and bluster about the law and personal rights and attempts to draw off and refuse to carry out the necessary measures to secure the safety and prosperity of your settlements, let them understand that the country and home for them is not among saints and they cannot have [a] place among them (Journal History March 1, 1866:2-3).

They concluded by writing that Thomas Smith had temporary authority over the entire valley and would do whatever was necessary in church, civil or military matters. Although no other mention was made of problems occurring amongst the brethren on the Muddy, it would appear that rumors had reached St. George of the possibility.

The discord suggested above might have resulted from the development of a
community near Simon's grist mill below St. Joseph. St. Joseph was not necessarily in 
an enviable location being near a swamp infested with malaria-bearing mosquitoes, 
although the settlers were unaware of the connection between the disease and the vector. 
However, it would seem that the Mill Point inhabitants felt it important to taunt them 
with how their community was superior. Yet, according to Foote, most of the St. Joseph inhabitants moved to the bench in 1866 when the St. George leadership told them 
to consolidate into two communities.

As early as March 1866, the Church leaders in St. George wanted to develop the 
bench. Foote warned that it was a poor location because of the drifting sand, but it was 
believed that the bench could be made productive. Foote indicated that Snow had plans 
to develop a city on the bench at this time (1975:206; McCarty 1981:88, 93).

An examination of the records shows that 1868 was a year of disharmony at the 
mission. First, not all of the 150 to 200 missionaries called in 1867 arrived. Those who 
did come were not impressed with what they saw upon arriving to the valley. Kimball 
wrote that people at New St. Joseph were destitute with very little clothing and that in a 
poor state. Jealousies arose because all of the newcomers had finer clothes and better 
food. He also wrote that none of the newcomers, probably himself included, treated the 
Bishop (Alma Bennett) as he was entitled.

After a two month stay at the fort, an exploratory group went looking for a new 
place to settle. They located a new settlement, called West Point, about fifteen miles 
north of New St. Joseph on the Upper Muddy. The people were happy there because 
they could do as they wished (Kimball 1847-1889:62-65).

According to Bleak, the settlers at New St. Joseph had been very generous to the 
newcomers, sharing their land with them. But these new settlers were dissatisfied and 
asked to join Andrew Gibbons and his group in establishing a new settlement on the 
Upper Muddy. They apparently had troubles with the Indians from the start, but a show
of force by the settlers prevented any bloodshed. The Indians feared that Mormon livestock would trample their crops. They demanded payment for the land, but apparently did not receive any (Bleak 1941:1:257-258).

Kimball wrote that not long after they had begun work on the new settlement word came from Brigham Young that they were to return to either New St. Joseph or Utah. They had been reported as runaways to him (Kimball 1847-1889:64). Clement wrote that after receiving Young's dispatch of February 19th the newcomers were upset about the move back to New St. Joseph. They believed that they had been misrepresented to Brigham Young by D. McArthur, who had visited the community that spring. Young indicated that he would come to the Muddy to discuss the matter but never did. Instead, Snow came down arriving on March 21st. According to Clement, Snow's visit ended the question of the settlement on the Upper Muddy. There was to be no settlement there (Clement 1868:n.p.). However, Foote wrote that Snow knew of the situation on the Upper Muddy in February and had reluctantly conceded to let them remain there. Foote agreed that Young's dispatch directed the settlers to go back to New St. Joseph or return to Utah (1975:206).

Apparently when Gibbons was instructed to establish a new settlement on the Upper Muddy he was to take.

twelve or fifteen families, ... and had called for five or six men to volunteer from St. Joseph [the fort] as part of the number. As soon as the volunteering began, they continued to volunteer until about all the newcomers at that place volunteered (Bleak 1941:1:257).

Brigham Young's reaction to this was to send a telegram charging that, "... The brethren who are on the Upper Muddy must return to the place where they were sent, or else return home" (Bleak 1941:1:258).

Fleming noted that it is uncertain if the first settlement on the Upper Muddy was
abandoned at that time or later, and if the settlers defied Young. He did mention that a settlement called West Point was established in the Upper Muddy by 20 families in 1868 (Fleming 1967:163). Furthermore, Fleming wrote that the West Point settlers had built irrigation canals simply by cutting through the banks of the river. They harvested "2,000 bushels of wheat and raised a good cotton crop" that spring (Fleming 1967:163).

When Joseph W. Young visited the mission in June, he noted that five families from the Beaver Dam settlement stayed at West Point (Deseret News 1868:17:175). According to William G. White (Personal communication May 1988), they stayed because they felt they were not included in the missive to return home. The families apparently remained at West Point until the settlement was abandoned in 1870.

Because he rarely used dates in his journal, it is difficult to determine when Kimball returned to New St. Joseph. However, he wrote that he stuck it out, put in crops and set up a tent near the cemetery at the Fort. He was out of food, so with Pratt and Seegmiller took the salt to the miners in Pahranagat Valley. Not long after his return to New St. Joseph he received word that his father, Heber C. Kimball, had died on June 22nd (Kimball 1847-1889:74).

Others on the Muddy also voiced discension. In August, after a trip to locate a new settlement at the mouth of the Virgin, Joseph W. Young met with the people of New St. Joseph. The first topic of discussion regarded where the people resided. Some wished to return to the original St. Joseph, some wanted to build a "city down on the west side of the valley in the red sand", whereas others "would like to build their 2 1/2 acre lots at the mouth of a wash where a big wave could come down & wash them away" (Clement 1868-1869:1). Young admonished them to stay where they were now living and to work at improving the land.

After the fire on August 18th, Snow wrote to the New St. Joseph settlers to stay there, that:
...there is no place where your own labor can do so much for your recovery, as where you are now.... We most emphatically advise you to go on to your city lots whenever you commence rebuilding & put your labor where it will be of future worth to you, & where you will be less exposed to fire in the future (Clement 1868-1869:5).

However, only Kimball's house was completed in September (Kimball 1847-1889:75; Clement 1868-1869:10). By November 15th, three or four families were living on the new city lots and three houses were completed (Clement 1868:n.p.). Grattan indicates that people were slow to move from New St. Joseph, even with so few houses remaining after the fire. People continued to settle into the first Sandy Town location until December. A resurvey of Sandy Town A at that time showed it was out of alignment, so a new site was surveyed north of the first. Grattan contends that this second site was Sandy Town B (1982:13-14); however, McCarty indicates that the move to the new site was in June 1869 resulting from problems with drifting sand at the first Sandy Town (1981:96).

Settlement of the new town site was apparently slow as well. Grattan feels that this resulted in Bennett's decision to allow people to move to a third site north of Sandy Town B, to an area known as "Big Hollow" (Grattan 1982:14; McCarty 1981:113). She goes on to write that people were scattered over the bench and that one settler wrote of there being three teachers listed for three districts on the bench, the fort, middle and northern areas of the city (Grattan 1982:15).

In 1869 some of the bench population moved to the original St. Joseph location. Others went to the area on the "west side of the valley" to build Overton. Grattan notes that, again, people moved without receiving sanction from the St. George or Salt Lake City leadership (1982:19-20).

Bonelli made a comment about the move in a letter to the Deseret News:

St. Joseph has at last abandoned the impracticable [sic] drift-sand bench as a
town-site, and is now commencing its building upon the better suited site of old St. Joseph, or the place settled on the first season [Overton]. When its people recover from the discouragements of the past they will no doubt feel satisfied with the present and the prospective future (1870:19:65).

Discussion. Along with the concept of the village and the economic values espoused by the Church, unity and cooperation were integral parts to the survival of any Mormon settlement. The records show that the people practiced this principle at the Muddy Mission, but they did not behave with consistent harmony. Initially, settlers responded to the call to the Muddy with no apparent hesitation. It was after people had lived there through the heat of the summer and the malaria season that the call was not heeded or substitutes were sent. Those who responded made an effort; some were unable to endure and left after a short time.

Apparently most of the discord occurring on the Muddy revolved more around places of settlement than for any other reason. The first instance was the argument between St. Joseph and Mill Point regarding which site was the more superior. The next involved the development of the bench. Foote warned that water could not be brought to the bench nor could there be adequate farming because of the sand. It is highly probable that the people who did go to St. Thomas did so because they accepted Foote's warning, and followed Foote because he had been presiding Elder at St. Joseph.

In 1868 another group of missionaries arrived on the Muddy. These people found the established communities not to their liking because of the poverty and problems with getting water onto the bench. As soon as they had convinced Andrew Gibbons to let them join his group and a location had been selected, they left to settle the Upper Muddy. Kimball noted the disrespect his group accorded Bishop Alma Bennett. He also indicated these settlers had a feeling of freedom from being controlled by that authority because they settled so far north of the other communities.

Despite the lack of respect for established authority, these newest settlers asked to
join under the leadership of a man who had been living at the Mission for several years. Furthermore, it is quite likely that on the trip down to the Muddy, these people developed into a partially unified group based on that short term experience. This unity, and its associated cooperation, were probably very much in evidence as they established and built their community of West Point.

Grattan writes that after the fire at New St. Joseph the settlers were slow to move to the city lots. In a letter sent to the Deseret News, dated May 25, 1868, established settler Elijah Elmer wrote about these new people and their plan for building on their city lots:

The brethren that came in last Fall are beginning to feel at home; they are preparing to build on the new city plot during the coming Winter, and are making ‘dobies, hauling rock and poles (17:149).

Elmer’s letter shows that the people were slow to move onto city lots because they were preparing for construction of their new homes in the cooler months. Furthermore, it takes time to collect rocks for the foundation and make enough adobe bricks to build a house, Gibson wrote he needed between 10 and 12 thousand bricks. Thus, it is very possible that each move was slow because time was needed to gather and make the materials to build a new community.

In 1869 the bench communities finally ended when some of the settlers moved back to the first St. Joseph and others established the new community of Overton. Grattan sees the scattered settlement on the bench and the movement off of it as examples of individualistic behavior, especially as they do not appear to have been sanctioned by the regional leadership (1982:15, 19). Although the Church leadership may not have told the settlers to move from the bench, calling it individualistic behavior is inappropriate. The people moved as two groups to two other locations, one already established and one new. It appears to be a similar situation to when the choice arose to move to either St. Thomas or Mill Point in 1866. Individual preference would have been part of the
decision to go to one place or another, but a group settled each area, just as a group settled West Point in 1868. Unity was prevalent in the form of a smaller group of people who could live together.

Grattan does present an important point regarding her argument on individualistic behavior. The personal faith of each individual governed the extent they followed the "advice of the Mormon heirarchy [sic]" thereby making their efforts "in following their leaders . . . proportionate to their individual belief" (Grattan 1982:38-39). In this respect, the idea of independent action by individuals, as well as segments of the larger group, would indicate individualistic behavior.

Arrington makes a point that the lack of unity was often felt when economic programs failed (1966:26). It is quite possible that the failure of the 1869 cotton crop and the problems with the bench canal proved to be more than the settlers wanted to continue dealing with in their lives. They had come to the Muddy to establish a mission to grow cotton. These particular people had spent much of the three to five years there relocating and building homes. When it became evident that a successful and productive city could not be built and maintained on the bench, they accepted what many had known before the original move in 1866--the bench could not be developed because of the drifting sand and lack of available water.

This aspect of the economic program had failed, therefore, as Arrington indicates, the unity of the group failed. They went back to an established and successful community and created a new one in an area held to be equally productive.

Another point Grattan fails to address is that the unity developed on the Muddy manifested itself in the re-established United Order in Orderville, Utah Territory during the 1870s. Although the United Order, or Order of Enoch, was part of Church doctrine in its early years, it was never practiced as successfully as it was at Orderville. In essence, it was considered a divine socio-economic system where the participants
achieved a high order of equality and self-sufficiency. The situation faced on the Muddy prepared these people for this communal way of life by strongly re-indoctrinating the principles of frugality and economic independence and unity and cooperation. Arrington feels that, "Only the practice of mutual helpfulness and the patriarchal organization of the community..." prepared the way for this type of existence (Arrington 1966:334).

Ideally, people were believed to want to heed the call going wherever the Church felt their presence would best suit its further development. Foote, when writing about the 1870 abandonment of West Point, made some interesting comments regarding how many really felt:

Some of the brethren on this mission were not satisfied and never had been, but were staying because they were called to come here. Their hearts was [sic] not in the mission, consequently they hailed with delight anything that would be calculated to release them even to the breaking up of these settlements (Foote 1975:208).

People accepted the call, but not always feeling about it as the Church expected.

Substitutes, another problem for new and existing missions requiring people, undoubtedly lacked the skills of the people they replaced and adequate supplies, yet made an attempt to become a productive part of the communities they settled. In both instances, cooperation and unity were provided to build a community and assist in its ongoing development.

Therefore, ideally, this principle was very much in evidence on the Muddy. Yet, there was enough discension apparent to show that the mission was not presenting itself in an ideal manner. The settlers sent to augment the communities of New St. Joseph and St. Thomas refused to live there, not liking the Bishop at New St. Joseph, the location of either community, or being continuously viewed in an envious fashion because they had more food and better clothing. It is possible that the opportunity to go to a new community site, with its undeveloped acres, available choice lots and chance to form a
leadership more amenable to their desires, made it more appealing than established communities.

The ideal was present; cooperation was needed to build homes, canals, recover stolen livestock, fund Church projects. Unity was manifested in the communities that emerged from the continuous moving, yet, it was not total, as groups split when presented with a choice of a new location. Still, the unity held when the people left the Muddy and settled in Long Valley in the early 1870s. The principle was present but it was realized in unexpected ways as the people adapted it to fit their needs on the Muddy.

EQUALITY

In explaining this principle, Arrington notes that although Mormon Church policies stressed management of both natural and human resources and production, behind these policies was economic and theologic equality. This equality found its roots in Jacksonian democracy as well as the demands of the Church itself to survive the early years.

Equality became part of Church doctrine from the beginning when Smith revealed "... if ye are not equal in earthly things ye cannot be equal in obtaining heavenly things" (Smith 1964:256; Smith 1982:147). The first use of this and subsequent related revelations was an equal allocation of land and "other properties" based on the wants and needs of each family. This equal allotment continued through the stewardship program with each individual given management of what he wanted as long as it was equitable.

In later years, "material well-being" overshadowed equal stewardship. However, Arrington notes that it survived in such programs as public works construction, land and water allocation, immigration and "cooperative village stores and industries (Arrington 1966:28).

Archaeological Evidence. What is apparent with regards to this principle of equality is
the irrigation system, the existence of a city on the bench with its individual house lots and, to a degree, the structures excavated at the two sites. Arrington states that irrigation and land and water allocation were three of the surviving examples of equality remaining within the Church's program after the initial years of struggle in finding a home.

Irrigation played an important part in the lives of the Mormons in the West. Survival in either the Great Basin or the Mojave Desert was not possible without irrigating land for crops. Therefore, early in the development of the Great Basin and adjoining areas, a program of water allocation was devised to provide each household with enough water for general use (probably including garden lots, vineyards and orchards as well as use by humans and animals) as well as for the farm lands outside the village. According to Arrington and May (1975:18), the community was divided into wards with a bishop supervising each ward's irrigation system. The bishop then determined how much labor was required of each man in his ward based on "the extent of each person's holdings..." (Arrington and May 1975:18). After construction the bishop served as the watermaster and allocated the water supply to the people in his ward. As watermaster the bishop also served as arbiter in any disputes regarding the irrigation water.

Land allocation was accomplished on an equal basis by lottery. After the survey of the land to be used for the village and the fields, a lottery was held providing each man a chance to get acreage in the arable and marginal lands. The aerial photograph McCarty took of the bench and surrounding "bottom land" also shows the course of the Muddy River which has probably changed in the 117 years since the mission ended. However, the crop land used now was probably under cultivation then. Its proximity to the Muddy River guarantees a permanent water source and the use of an irrigation system increases the extent of land beyond the river which can be cultivated.

Although it appears that a sizable city was surveyed at Sandy Town A, the locations
of the structures built there cluster in some areas. Because the land on the bench varied by degrees from sand to gravel caliche with a combination of the two, it is possible that these clusters represent what was considered the best for initial settlement; that is, the lots most accessible to the irrigation canal until the land was further developed. The clusters could also represent the results of the lottery.

The structures present another aspect of equality on the Muddy River. Although there are a variety of floor plans from the houses examined at Sandy Town A and B (see McCarty 1981:125-27), the basic pattern is for two squares or rectangles with divisions. It is possible that the divisions were made with partial walls added later. Shepperson and Warren indicate that only load bearing interior walls had foundations, usually the central wall, so it is probable that they did not provide support for the roof; walls with fireplaces would have been built to the roof to provide a chimney but did not necessarily have foundations except under the fireplace itself. Everyone built a basic pattern making modifications on the interior determined by individual needs and preferences.

Those structures with apparent additions, determined by the obvious difference in additional walls and brick quality, can be indicative of an increase in family size. It is possible that the husband took another wife and built the addition for her and her family, or it could be that an adult son took a wife and chose to live with the family rather than build a separate house. Another supposition could be that the husband brought another wife and her family to the settlement from a northern home. This would represent a consolidation of resources, the increased wealth of an individual or the desire to have another family nearby.

Equality in housing could also be seen in the use of adobe bricks for building structures. Pitman notes that the Mormons were the first "Anglo-American subculture to incorporate fully the use of adobe as a favored and important element in their own material culture" (1973:22). Furthermore, this use showed there were no "social class
limitations" (Pitman 1973:25); adobe was used for the homes of the wealthy as well as the poor and public and Church structures.

To further develop the idea regarding the acquisition of material things on earth to achieve equal acquisition in heaven, the Mormons at New St. Joseph definitely proved that they had acquired 'earthly things' prior to the fire. Although many of the artifacts recovered are unidentifiable, those that are show that some of these people had a modest wealth prior to coming to the Muddy River. The variety of ceramics in itself suggests that the acquisition of transfer printed wares and white ironstone were important, either because of their aesthetic quality or their indicators of 'material well-being'.

Among the artifacts recovered from the two sites, the ceramics, particularly the stoneware, ironstone and other related wares, serve as indices of wealth. According to Miller (1980:14:1), by the late 18th century, England had taken over the ceramics market. The wares sold were finely made and evolved from a classification by ware to one by decoration. Miller notes that status cannot be determined by the classification of wares; rather, it is by the manner of decoration. He examined the surviving price lists from the Staffordshire potteries dating from 1770 to 1846. With the exception of creamware, which apparently described undecorated items, no other ware was specified on the lists.

Miller devised four categories based on the lists which he notes as levels. The first level was the undecorated vessels, the creamware. The white ironstone or stone china, popular in the 1850s, is not included in this category because it was priced higher than the creamware. The second level was comprised of vessels with minimal decoration by unskilled or minimally skilled workers. These included the "shell edge, sponge decorated, banded, mochar, and 'common cable' (finger tailed slip)" (Miller 1980:14:3-4). The techniques of decoration varied even between vessels of the same size and shape. Miller notes that these were the least expensive of the decorated wares.
The third level included all of the painted wares, from those which required moderate skill in painting to maintain pattern consistency within services to those decorated by highly skilled painters. This level reflects a range in pricing based on the type of painting done, from very inexpensive to amongst the most expensive ceramics available. Information not available on the price lists consulted, though, is the cost of items decorated by the combination of painting and printing, with the print used as an outline.

The fourth level was transfer prints. Miller states that this was "one of the great English innovations in decorated ceramics" (1980:14:4). Introduced in the late 18th century, the unglazed transfer print decorations allowed for more intricate designs and exact duplication for a lower cost than comparable hand painted vessels. Miller also notes that in the 1790s the price of a transfer print item was "three to five times more expensive than undecorated CC [creamware] vessels, but the price differential of printed and CC vessels decreased to between one and a half to two times . . . by the mid-19th century" (1980:14:4). He indicates that the price of "CC vessels" remained reasonably steady through the 19th century establishing a scale of measure for showing price variations in other ceramics (Miller 1980:14:15).

One pattern, the willow pattern which is based on Chinese patterns, was one of the least expensive of transfer prints. The prices of others, though not based on color, would increase if they were "flow printed patterns". The increase in inexpensive transfer printed wares, however, made them very popular in the early 19th century.

By the 1850s the white ironstone started its popularity with the world, priced comparably with transfer print decorated items of the same size and shape. Between ca. 1855 to ca. 1880 the undecorated white ironstone appears to have replaced the transfer printed tablewares. Further, the cost of an item as determined by whether it was decorated apparently was less important in the second half of the 19th century.
Prices were also dictated by how many middlemen were between the pottery and the consumer. Miller found that it could range from one to many with each middleman increasing the price commensurate with their profit margin. Furthermore, prices were either retail or wholesale, also based on the middleman who could be the potter, a jobber, who sold the wares purchased from the potter at a "jobbers wholesale price", or a retail merchant (Miller 1980:14:5).

Finally, the cost of transportation, tariffs, the current economic situation (i.e., a recession, or depression), shifts in currency rates and degree of technology all played a part in the cost of the ceramics. These coupled with the status of the vessels themselves add to the intricacies of the items. Miller notes, though, that these intricacies as well as the small part ceramics play in world economics accounts for the paucity of available studies on prices.

The ceramics recovered at New St. Joseph and Sandy Town B are divided into three categories: earthenware, stoneware and porcelain. In his *Handbook for Historic Archaeology* Cotter (1968) placed these into two categories, permeable and impermeable wares. Permeable ware is a soft paste ware in which the paste does not fuse well because of the clay and temper used. It is generally a heavy, thick ware which is porous and has to be glazed to protect the body. Earthenware falls into this category. Impermeable ware is a hard paste ware in which the paste is fused in high temperatures making it non-porous and vitreous (something which resembles glass in color, texture, brittleness and sheen). Porcelain and stoneware fall into this category (Cotter 1968:8). A detailed analysis of the three types of ceramic recovered at New St. Joseph and Sandy Town B and illustrations are in Appendix B.

**Earthenware.** The earthenware was the only ceramic manufactured by Mormons. According to Nancy H. Richards (Personal communication 1977), between 1847 and 1869 there were as many as 30 potters working in Salt Lake. Not all were successful,
worked continuously or independently. However, two factories which developed during this period and marked their wares were the "Eardley Bros. Deseret Pottery (or just B. Eardley) and Croxall & Cartwright" (Richards, personal communication 1977). She indicates that the ware of these two factories was found throughout Utah and that historical documents provide data that the potters extended their market by selling in settlements far from their shops.

John Eardley, an emigrant from Massachusetts, established his pottery shop in Salt Lake City in 1861. Apparently he and his two brothers experimented with the available clay and glazes and produced well-glazed pieces.

In either 1867 or 1868 Eardley was called to St. George. According to Larson, he experimented with the clays in the St. George area until he found that the unused Old Virgin Ditch was the best source. Eardley later established a shop and kiln near the old Highway 91 on the eastern edge of St. George. Larson further observes that Eardley provided the settlers of the Cotton Mission with their earthenware storage jars, bowls and other dishware. However, Richards stated that, although she had found pots with the Eardley Bros. mark from the Salt Lake factory, there were none with just John Eardley's name. It is possible that he found it unnecessary to mark his work in St. George with fewer other potters in the region (Richards, personal communication 1977: Larson 1961:273-75).

The earthenware from New St. Joseph and Sandy Town B is divided into three color types, red, buff and grey, with further divisions based upon glaze. There is also a miscellaneous category for those wares which do not fit into the three main ones either because of a different paste color or no use of glaze (Warren n.d.:1). The illustrated sherds will be used to exemplify a particular design element or a function, such as a bowl or bottle base (see Appendix B).
I. Red ware

A. No glaze (24) - New St. Joseph.
B. Clear glaze (83) - New St. Joseph; (7) - Sandy Town B.
C. Clear glaze (2) - New St. Joseph.
D. Marble glaze (57) - New St. Joseph.
E. Green-brown glaze (38) - New St. Joseph.
F. Brown glaze (58) - New St. Joseph.
G. Clear glazed intermediate crockery (3) - New St. Joseph.
H. Clear glazed heavy crockery (5) - New St. Joseph.

II. Buff ware

All sherds in this typology were recovered at New St. Joseph.
A. No glaze (6).
B. Amber glaze (22).
C. Amber-green glaze (11).
D. Green glaze (13).
E. Green-brown mottled glaze (5).
F. Green and grey glaze (1).
G. Blue-green glaze (17).
H. Yellow glaze (4).

III. Grey ware

All sherds of this ware were recovered at New St. Joseph.
A. No glaze (4).
B. Green glaze (9).
C. Green and brown marble glaze (71).
D. Green and brown mottled glaze (1).
E. Blue-grey and brown marble glaze (4).
F. Brown glaze (4).
G. Brown glaze (2).
H. Blue glaze (1).

IV. Miscellaneous

Mottled green and brown glaze (1) - New St. Joseph.

Stoneware. Stoneware is a vitreous ceramic which is impervious to liquids and is resilient. An early patent for stoneware production in England was taken out by Abraham Cullyn and Thomas Rius in 1626 for the purpose of making stone jugs and pots. John Dwight was given a patent in 1671 for making a "transparent earthenware." Later he tried to prevent stoneware production outside of Fulham where his kiln and shop were located (Godden 1965:xi-xii).

There were several developments in the stoneware industry after its initial introduction in England. Of these developments the most important was the making of ironstone. Ironstone, which comprises the majority of ceramics found at New St. Joseph and Sandy Town B, is a durable yet attractive stoneware that was first patented by the Turners ca. 1800. Their wares had a red-colored mark, "Turner's Patent", and were sometimes imperceptibly translucent. The Turners suffered financial difficulties not long after the introduction of the new stoneware and apparently sold the patent rights to Josiah Spode ca. 1805 (Godden 1965:xi-xii).

Spode's ironstone was sold as 'Stone China' or 'New Stone'. For many years he made dinner and dessert ware and tea services. Others who produced the accepted ware between 1810 and 1830 also used the term 'Stone China' as well as 'Semi-porcelain'.

The first appearance of the term 'Ironstone' was in 1813 when Charles Mason patented his ware (Godden 1963:105). The term 'Ironstone China' was appropriate because it implied strength as well as a certain delicacy found in china. The term was adopted by other potters who made similar ware. 'Granite' was incorporated into the
general term in the 1840s because it was part of the temper used in ironstone (Godden 1965:xxiii-xxiv). All white ironstone, however, did not appear in the market until after 1840 (Wetherbee 1980:37).

American potters produced ironstone and other stoneware during the period of occupation at the Muddy Mission. However, it was not as widely used as the English wares were until the latter half of the 19th century. The following is a list of the marks from stoneware found at New St. Joseph and Sandy Town B (the description and illustrations are in Appendix B). The identifiable potters' marks are from kilns in Staffordshire and Yorkshire.

A. James Edwards and Son (1) - New St. Joseph
B. Mayer Pottery (1) - New St. Joseph
C. J (Joseph) Twigg and Company (1) - New St. Joseph
D. C. Meigh and Son (1) - New St. Joseph
E. John Alcock (2) - New St. Joseph
F. Partial Registration Mark (3) - New St. Joseph
G. Miscellaneous Marks (18) - New St. Joseph; (1) - Sandy Town B

The pottery marks cover a period from ca. 1813 until ca. 1900. A mean period of twenty years, from ca. 1846 to 1866, would appear to include most of the stoneware found at New St. Joseph and Sandy Town B.

Analysis of the stoneware included a classification based on color, decoration, ware (where it was possible to identify, i.e., porcelain, pearlware, ironstone).

I. White glazed stoneware

A. Undecorated ironstone (1851) - New St. Joseph; (39) - Sandy Town B.
B. Decorated ironstone (368) - New St. Joseph; (5) - Sandy Town B.
   1. Trim (56) - New St. Joseph
2. Border designs
   a. Trim with indistinguishable design (14) - New St. Joseph.
   c. Leaf designs (22) - New St. Joseph; (3) - Sandy Town B.
   d. Floral designs (6) - New St. Joseph.
   e. Fluted designs (29) - New St. Joseph.
   f. Ribbed designs (51) - New St. Joseph.
   g. Scroll designs (9) - New St. Joseph.
   h. Panel designs (10) - New St. Joseph.
   i. Scalloped designs (10) - New St. Joseph.
   j. Soft embossed designs (69) - New St. Joseph.

3. Polygonal shapes

4. Miscellaneous
   These have been counted under the above categories but are included to
   illustrate other examples of decorating found on handles and showing the shape of lids,
bases and platter liners.

   Except where specifically stated otherwise, the following ceramics were recovered
   from New St. Joseph.

II. Blue on white glazed stoneware
   A. Spongeware (149) - New St. Joseph; (8) - Sandy Town B.
   B. Transfer print, Pearlware (39).
   C. Dark blue: Handpainted, two patterns (30).
D. Transfer print, two patterns (14).
E. Handpainted (6).
F. Transfer print (1).
G. Transfer print (1).
H. Transfer print (1).
I. Handpainted (2).
J. Handpainted print (1).
K. Transfer print, possible semi-porcelain (1).
L. Transfer print (3).
M. Transfer print (1).
N. Transfer print (1).
O. Transfer print (3).
P. Splatterware or spongeware (4).
Q. Splatterware (4).
R. Splatterware (2).
S. Transfer print, possible semi-porcelain (1).
T. Shell-edge (2).
U. Handpainted (2).
V. Handpainted, variation of II U (2).
W. Handpainted, variation of II U (2).
X. No pattern (8).

III. Blue on blue stoneware

A. Appears to be a combination of handpainted and spongeware (1).
B. Spongeware, possible (1).
C. Transfer print (1).
D. Handpainted, possible (3).
IV. Purple on white
   A. Transfer print (2).
   B. Transfer print (1).
   C. Transfer print (1).

V. Brown on white stoneware
   A. Transfer print (19).
   B. Transfer print (7).
   C. Transfer print (9).
   D. Transfer print - Miscellaneous patterns (7).

VI. Black-grey on white stoneware
   A. Transfer print (10).
   B. Transfer print (9).
   C. Transfer print, light and dark black/grey (5).
   D. Transfer print, possible (4).
   E. Splatterware (3).
   F. Splatterware (6).
   G. Splatterware (1).
   H. Splatterware (2).

VII. Gold on white stoneware/semi-porcelain
    A. Handpainted (1).
    B. Handpainted (3).
    C. Handpainted (1).
    D. Handpainted (1).

VIII. Vermillion on white glazed stoneware
      A. Handpainted, embossed design (1).
      B. Handpainted (6).
IX. Vermillion and black on white glazed stoneware
   A. Handpainted (2).
   B. Handpainted (1).
   C. Handpainted (3).

X. Vermillion and green glazed stoneware
   Handpainted semi-porcelain (1).

XI. Vermillion, green and black on white glazed stoneware
    Handpainted spongeware (11).

XII. Vermillion and grey-green on white glazed stoneware
    A. Handpainted spongeware (6).
    B. Handpainted spongeware (2).

XIII. Blue and green on white glazed stoneware
    A. Transfer print with handpainted wash (1).
    B. Transfer print with handpainted wash (1).
    C. Handpainted (1).

XIV. Green on white glazed stoneware
    A. Handpainted (6).
    B. Handpainted (3).

XV. Green and black on white glazed stoneware
    A. Handpainted splatterware (1).
    B. Handpainted (1).

XVI. White with various colors glazed stoneware
    A. Handpainted (1).
    B. Handpainted (1).
    C. Handpainted (5).

XVII. White with bands of color, white and another color glazed stoneware.
A. Underglaze of raised, thick dark blue horizontal bands (10).

B. Underglaze of raised, thick medium blue bands (5).

C. Underglaze of raised, thick blue (in varying shades and degree of flow effect) horizontal bands (11).

D. Medium blue horizontal bands and a solid base (3).

E. Underglaze of raised light blue horizontal bands in varying widths (10).

F. Underglaze of solid medium blue (2).

G. Underglaze of raised, thick blue-green horizontal bands, a medium blue solid body and a white base (4).

H. Underglaze of raised, thick grey-blue (with flow effect) horizontal bands and a body of solid grey-green (4).

I. Underglaze of raised, thick grey-green (with flow effect) horizontal bands above a lower body of solid medium blue (2).

J. Underglaze of raised, thick dark blue horizontal bands and a lower body of solid mustard (2).

K. Underglaze of solid mustard, raised, thick dark blue horizontal bands, and a white glaze base (1).

L. Underglaze of raised, thick olive green horizontal bands from rim to above white base (5).

M. Underglaze of solid olive green with no bands or base (1).

XVIII. Black-grey on white with overglaze highlighting stoneware

Handpainted spongeware (2).

XIX. Blue and black on white glazed stoneware

Handpainted splatterware (1).

XX. Blue-green glazed stoneware

Underglaze of color (robin's egg blue) on the interior with a cream white glaze on
the exterior (1).

XXI. Green and tan glazed stoneware

Green interior and tan exterior under glazes (1).

Porcelain. Porcelain is fired at higher temperatures than stoneware, although some stoneware shows a glassy texture. Porcelain has a bright white paste and is translucent.

Porcelain originated in China with the earliest examples dating during the Sung dynasty (A.D. 960 - 1267). The word porcelain probably derives from "porcellana, a cowry shell, and it was formerly applied to shell-like substances, of which porcelain was one" (Chaffers ca. 1930:318). It first appears in Europe in the mid-16th century in Florence, Italy. Other countries developed their own porcelain potteries much later in the mid-18th century. The porcelain found at New St. Joseph is probably from an English pottery, although no makers' marks were found on any of the sherds recovered.

I. Plain porcelain

White glaze on both the interior and exterior (3).

II. Decorated porcelain

A. Handpainted gilt (3).

B. Handpainted (1).

Using this information in conjunction with the analysis of ceramics recovered at New St. Joseph and Sandy Town B some comments can be made regarding the economic status of the settlers. First, white ironstone comprises the greatest number of ceramic sherds recovered at both sites. It can be surmised that the owners of the vessels liked the white ironstone and could afford to buy it. Transportation costs would have been high due to shipment by wagon from a major center, such as St. Louis, Missouri, in addition to transportation costs from England to New York or New Orleans and then...
Figure 12. Temple of Nauvoo commemorative plate (courtesy of Latter-day Saints Historical Archives, Salt Lake City).
Second, of the decorated wares, the most prevalent was the Amish Snowflake (II A), a spongeware (Miller's second level) which undoubtedly cost less, but again transportation costs would increase its final sale price. The same can be said for the other items. Miller notes that the cost of the transfer printed ceramics was high, in some cases, because the designs were not always kept for long, not attaining the same popularity as the willow pattern (II D). The limited number of sherds with the willow pattern may indicate that few liked the pattern, or that the services did not suffer the same amount of breakage as did the other vessel sherds found.

Third, there were fragments of three to five commemorative Temple of Nauvoo plates (II B) (Figure 12, p. 141) recovered at New St. Joseph. The importance of this particular plate is twofold; it memorialized the first temple built by the Mormons and is a specialty plate. The market for this commemorative plate was limited, therefore, it is probable that its cost would be higher than that of a comparable transfer printed commemorative pearlware plate. However, it is also possible that much of the cost was assumed by the Church so that a discount was made available to further encourage sale of the 150 dozen plates.

Fourth, the variety of transfer printed vessels, along with the large number of white ironstone fragments, provide a picture of Mormon life before coming to the Muddy. When compared with the number of earthenware fragments, the large number of stoneware sherds suggests that at one time the settlers on the Muddy were financially able to purchase relatively costly items. Without price lists for items transported to Salt Lake City, as well as definitive dates for a much larger percentage of the ceramic vessels, it is impossible to ascertain the economic background of these settlers. Yet, based on Miller's work and the prevalence of ceramics that might be of some value it is possible that these excavated houses represent some of those Bennett considered to be the
wealthier of the New St. Joseph community.

To examine that point an analysis by location was done on the decorated stoneware found at New St. Joseph. This category was selected because of the number and variety of sherds recovered which fit into the upper three levels of Miller's list.

The analysis was done by unit. No consideration was taken of depth, partly because artifacts in the lower strata eventually surface through wind and water erosion. The units were divided according to their association with particular structures, both interior and exterior, and by a specific area, i.e., the bulldozed area, fort interior, fort exterior. An arbitrary number of units was established to cover the exterior of each structure:

1) Houses 1 and 6 extended three units beyond the northern end, 2) each structure extended one full unit to each side, unless there was an associated feature beyond that limit, 3) each structure extended one unit between it and the next structure, except in the case of a shared unit, 4) Houses 3 and 4 were analyzed together due to incomplete information regarding where each structure ends, 5) damaged house remains in areas where the surface has been bulldozed, scraped or built on were designated as Areas 1, 2 and 3 with units extending beyond the immediate area of the fort and 6) areas not directly associated with structures were considered Fort Interior—between the house rows—or Fort Exterior.

The method of analysis, by unit, proved to be the best approach because of various problems associated with the data. Not all of the site was excavated, parts of it were surface collected, other parts were both surface collected and excavated. Excavated areas included complete and partial structure excavation and excavation of a prehistoric structure. The sherds recovered from the bulldozed areas could not be analyzed by structural remains because of the nature of the damage.

Instead, the analysis was based on a comparison of the percentage of ranked sherd types recovered from Houses 1/Outbuilding 2, 2, 3/4, 5, 6, Outbuilding 1 and Areas 1.
2, 3, 4-Fort Interior and 5-Fort Exterior. Table 4 (pp. 145-49) presents the data by location, sherd type, count and percentage per location. Table 5 (pp. 150-51) presents the ranking of the sherd types following Miller's three upper levels of classification by decoration. Miller's article suggests that even within levels of classification there were sublevels based on skill, design and combination of decoration methods. Without data on prices, identification of patterns, and thus skill of the decorator, it is not possible to analyze these sherds any more finely than the basic three level system as it is presented by Miller. Two additional levels were added, 2/3 and 3/4, to account for those sherds decorated by two different methods, i.e., splatter or sponge and handpainting and handpainting and transfer print.

A general examination of the data below shows that every structure and area but Outbuilding 1 and Area 3 has sherds from all three levels. Ranks 2 and 4 predominate the site, with Rank 2 being the most prevalent. Table 6 (p. 150-51) shows the distribution of the sherd types at each structure and area by rank and percentage of appearance. Rank 2 appears most frequently in 8 of the 12 locations, i.e., Houses 1, 5, 6 and Outbuilding 1 and Areas 3, 4, 5 and the Cemetery, Rank 4 in House 3/4 and Areas 1 and 2 and Rank 3 in House 2.

With the exception of House 1 and the Cemetery, wherever Rank 2 or 4 are the greatest, the other is the next most frequently occurring. This suggests several situations: 1) the individuals liked vessels decorated with transfer print as well as by splatter, sponge, band, color glaze, shell-edge; 2) the percentages indicate that the individuals experienced times when they could afford to purchase the more expensive transfer printed wares but usually purchased the less expensive splatter, sponge and other related wares; or 3) the transfer printed wares could represent vessels received as gifts (i.e., wedding), inheritances or purchased second hand.

The high percentages of Rank 2 are accounted for by the presence of 149 sherds of
Table 4. Distribution and percentage of decorated sherd types by location.

<table>
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<th>Location</th>
<th>Sherd Type</th>
<th>Number of Sherd Types</th>
<th>Percentage</th>
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Table 5. Ranking of decorated sherd types.

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<tr>
<td>II I</td>
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<td>II J</td>
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<tr>
<td>II L</td>
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<tr>
<td>II M</td>
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<tr>
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<tr>
<td>II O</td>
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Table 6. Distribution of sherd types by rank and percentage.

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Table 6. Continued.

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<td>9.9</td>
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<td>100.1</td>
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the Amish Snowflake spongeware. This suggests that it was one of the favored patterns found at New St. Joseph. It was recovered at every location except Outbuilding 1 and the Cemetery and was the most frequent of the types in Rank 2. House 6 and Areas 4 and 5 had the greatest frequencies, all over 40 percent. The sherds recovered from Area 4 come from units closest to House 6, so there is a high indication that those units may represent a dumping area for that structure.

Reasons for its popularity are varied. It is possible that the low cost of the spongeware as well as its design created a larger market for it than most other of the wares in that level. Another possibility is that a large shipment was made available to a retailer and for a short period of time it was a best seller in the ceramic department. It could also have been a type of ware used on a daily basis, whereas the others were used for special occasions or when there were guests.

Sherd type II B is the second most prevalent ware on the site. It is the transfer print commemorative Temple of Nauvoo plate. It appears in Houses 5 and 6 and Areas 1, 2, 4, 5 and the Cemetery. The sherds recovered in Area 4 are from units closest to House 6 suggesting again the possibility of a dumping area for the structure's occupants. The one sherd recovered from Area 5 is associated with House 5 because of the unit's proximity to that structure.

Areas 1 and 2 have the greatest frequency of these sherds. The areas have the remains of at least four structures indicating that families in each house could have had a plate, but the examination of the plate sherds and their respective locations suggests that there are only four to five plates. Houses 5 and 6 each have the remains of one plate and Area 1 has the remains of two. The sherds from Area 2 and the Cemetery are most probably part of the two plates from Area 1, movement resulting from the construction of nearby roads and the airport. It is possible, however, that the sherds found in Area 2 are from a fifth plate.
The high frequency of Rank 3 decorated sherds recovered at House 2 suggests that this family preferred handpainting to other methods of decoration, although Rank 2 sherds were second in frequency. The prevalent pattern was II C, a simple handpainted design of blue bands. Although it was handpainted and prices are not available, it is very possible that this is an example of a lower level handpainted ware requiring minimal skill to decorate. With this in mind, it is possible that it is equal in rank with the Rank 2 wares.

A final point of discussion relating to this analysis is how the structures and areas rank in terms of levels of decorated wares. House 3/4 and Areas 1 and 2 show marked indications of a higher status based on the higher frequency of Rank 4 sherd types. For Areas 1 and 2 this corresponds with the historical data stating that the fire started on and burned most of the east side of the fort and Bennett's remark about the families who had lost the most. These families had been in the best circumstances materially, and many lost everything they owned. It is important, though, to remember that the information taken from these areas, and Area 3, is not accurate because of the impact from construction. Furthermore, it is not possible to place artifacts with the proper structure.

Conversely, those families living in Houses 1/Outbuilding 2, 5, 6 and Area 3 could be considered having less wealth based on the prevalence of Rank 2 sherd types. House 2 represents a middle status household because of the high frequency of Rank 3 sherd types.

This analysis is of a limited nature, but it shows that the decorated sherds can be used to demonstrate an index of wealth. To make it a more definitive analysis, price lists and pattern identification are necessary as well as the addition of the white ironstone. Even with this information, though, it is still impossible to locate households based on artifacts. For this historical records are needed to show where individuals lived.

The ivory silverware handles (Figures 13a and 13b, p. 157) and mother-of-pearl
Figure 13. Ivory silverware handles, New St. Joseph and mother-of-pearl ornament, Sandy Town B.
ornament (Figure 13c, p. 157) also point to the possibility of wealth, but definitely demonstrate a marked fancy for beautiful items. It is possible that these artifacts are the remains of an inheritance, where a family had acquired one or more costly objects, such as an ivory handled place setting or a tea set, and broke up the sets to give each child at least one of the prized possessions.

**Historical Evidence.** None of the Mormons whose journals and diaries have been used in this study made mention of water allocation other than the problems voiced by the residents of St. Thomas. Nor did they discuss land allocation. However, the building of the irrigation canals to St. Thomas and the bench received attention by both settlers and James Bleak, the Southern Mission historian. The problems associated with the canal to the bench proved it less beneficial than originally thought by the Church authorities.

With regard to equality in housing, Gibson wrote that he and his son built a two room adobe house on their city lot (Sandy Town A). John Franklin Brown, whose father Joseph Gurnsey Brown was called to the Muddy Mission in 1867, described the house to which his father brought his third wife's family. The first wife and six of her children lived "in a two room adobe house with a dirt floor and a flag roof. Flags are what we call cattails" (Franklin in Hollist, Brown, et al. 1979:210). With the arrival of the newcomers, three adults and eight children lived in the two room house. Unfortunately, Brown did not mention in which community they lived, nor if they lived on the bench. The Brown family's situation was probably not unique on the Muddy or elsewhere in developing Mormon communities, although one usually associates a certain amassing of wealth with the acquisition of additional wives.

There were examples of a husband building a separate house for each wife. Foote had two wives with him on the Muddy, Arremesia and Marie. Each had her own home
in both St. Joseph and St. Thomas, although the acquisition of the land and the building of Marie's home in St. Thomas did not occur until 1870 (Foote 1975:201, 205, 208).

Foote had, with the others moving to St. Thomas from St. Joseph, received a house lot and a two and one-half acre farm lot in 1866. By 1870 he had enough money, credit, or surplus goods, probably earned from running Leithead's grist mill, to purchase a second lot. He originally planned to use the lot for a vineyard and orchard and bought seedlings and cuttings, but Foote never indicated if he planted them before building Marie's house.

Bennett's remark to Snow about those hardest hit by the fire being those who had the most to lose serves as an indicator of wealth. Gibson supplied a list of the items he lost in the fire. It included several books, such as one large and six small volumes of Shakespeare, two Books of Mormon, two or three Bibles, two dictionaries, copies of Byron, Burns, Milton and Scott, clothing, furniture, food and tools (Gibson 1867:78).

Bennett noted that damages resulting from the fire were estimated to be several thousand dollars (Journal History 1867-1868:5). Clement wrote that Thomas Day "calculated his losses to be $725" (1868:2:1:11).

Other examples of equality include the cooperative industries discussed and established, Church public works construction and results of the immigration program. Clement wrote about the possible cooperative lumber mill, but did not indicate if the settlers agreed to its formation. However, Snow and Joseph W. Young successfully implemented Brigham Young's plan of making the Washington cotton factory and wool mill a cooperative for the Southern Mission with funds from the Muddy settlers as well as the other settlements in the mission.

Road construction from the Muddy to St. George is another area where the Church's public works programs found assistance from the Muddy River. The telegraph project was not as fortunate.

The immigration program was evident in the population on the Muddy. The
immigrants from England included Day, Gibson and Wood. Bonelli was from Switzerland and his wife, Ann, was from England. Other countries represented at the Muddy Mission were Scotland, Canada, Wales, Denmark and Sweden (Hafner 1967: St. Thomas Historical Records 1865-1870:n.p.). When they came to a mission like the Muddy those new Mormons had an equal chance at success as any of the others who also answered the call.

There appear to be no extensive records indicating stewardship of property. Journalists wrote of working in the fields, planting crops, building houses, taking salt to St. George or Pahranagat, the problems with water or the Indians, but no one mentioned that they were given any more than a house lot and two and one-half acres of land. Mention is made of the sale or exchange of property between people and the hiring of individuals to take control of property, such as the grist mill at Mill Point. Yet no one apparently requested and received an increase in the amount of land they tilled, based on their needs and abilities. The process was probably at work at the Muddy Mission, but it was not written of specifically.

Discussion. When people first arrived on the Muddy, equality would not necessarily have been present. Some settlers undoubtedly were wealthier than others. Gibson arrived with a library one could consider quite substantial for an isolated frontier settlement. Grattan notes that his wealth was also evident by his purchasing a house, wheat bin, pig sty and part of the furniture from a man named Angel upon his arrival to the valley. She neglects to show that he was planning to pay for it with cotton in the fall.

One way that wealth can be determined is by the acquisition of 'earthly things'. In this instance, only the analysis of the ceramics in terms of prices based on type and decoration can provide any indicator of wealth. It is not a major index on the world market but it does present information not available from the other artifacts. By this
reasoning, the people who owned the whole plates, bowls, cups, serving dishes from which these sherds came were modestly well-to-do as well as interested in acquiring pretty tableware.

It is very possible that the fire at New St. Joseph provided us with a much better picture of the people on the Muddy than might otherwise be possible. No exact numbers are available at this time, but it is very possible that the excavation of Houses 1 and 2 at New St. Joseph produced more ceramic sherds than the excavation of Houses 2 and 3 at Sandy Town B will. It is important to take into account the length of occupation at both sites, too. New St. Joseph had a longer period of occupation than did Sandy Town B by at least one year.

Equality showed up in other ways, too. One was the irrigation system. Without this vital program there would have been no farming in the valley. Determining the supply of water to each individual as well as construction and maintenance duties based on his property holdings was an equitable way of handling the situation. Unfortunately, the people on the bench had to clean the channel daily.

The allotment of land, the cooperative factory at Washington, other public works construction projects and the immigration program are other factors of equality. It is very apparent, though, that the idea of acquiring "earthly things" so that they would be able to acquire "heavenly things" was not necessarily possible for the Mormons on the Muddy River, except in the acquisition of land.

Equality as an ideal was apparent on the Muddy in the form of the immigration program, land and water allocation, public works construction projects and participation in cooperative industries. When people first arrived equality in individual status based on wealth and material goods would have been more apparent than in the last years of the mission. Those who stayed gained only in the work they put into the land. No one made money on the Muddy; too many factors were against its becoming an economic
success. Yet, many of these people must have acquired a sense of what Joseph Smith was aiming towards because they re-established the Order of Enoch in Long Valley in the 1870s. The problems, hardships and losses experienced while on the Muddy may have served as a reaffirmation of the ideals of the Church creating a desire to go back to that early communal style of living.
CHAPTER VII

CONCLUSIONS

I must say that I am well satisfied with this country and climate. It seems to agree with me, and I have felt and still feel to use all my influence and energy to sustain this mission, for I consider it a very important one, and I believe that the Muddy Valley will yet be settled with a dense population, and every acre of available land be brought into cultivation (Deseret News 1868:16:375).

Thus did Warren Foote express himself to George A. Smith in a letter published by the Deseret News. He was not alone in his feelings about the mission on the Muddy River. Yet, it did not continue to grow and develop as Foote envisioned it would during his stay there. The answers to why this was so are found in the testing of Arrington's seven principles as predicting real behavior recorded in the archaeological and historical data and if the real behavior was adaptive to the Mojave Desert.

Every principle was evident in one or both forms of recorded data. Their effectiveness was also addressed. It is clear that given the different geographical location adaptations were necessary for the successful application of some aspects of these principles. Also clear was the need for a less narrow purpose for the mission. Reducing its purpose to a single cash crop with a limited market in an isolated locale and having it provide support for a dream that never developed—the Colorado River trade—were deterrents to its success. Other problems encountered on and because of the Muddy added to this lack of success. So why did the people stay to try to accomplish their impossible goal? Further, was their real behavior representative of the ideal behavior summarized by the principles?
The economic system of the Mormon Church provides one key to understanding the development of the Muddy Mission. The Mormon leaders learned early that strict control of the membership was necessary for the survival of the movement. Only a unified, cooperative membership could build and maintain the church-state ideal. To survive and grow, the Church needed economic as well as spiritual and social control. The establishment of missions in outlying areas partially fulfilled that need by contributing towards territorial self-sufficiency and extending the territory under Mormon dominion (Arrington 1966:216). The Church rationalized its strictly controlled mission-building, branching out from the Great Salt Lake Valley, as Arrington writes:

... the church's prime obligation was to forward the building of the Kingdom, and that meant it had positive functions to perform in increasing the production of goods and services... church funds were used to promote many types of new enterprises... (1966:34).

However, there were still problems encountered by the missions. These outlying settlements were not always close to an economic center, thus preventing them from fully developing their own economic specialty, either in agriculture, mining or manufacturing. The settlements were also more inclined to experience difficulties with local Indians than larger ones because of their isolation. During the three periods of increased Indian conflict several areas had to be abandoned because they could not defend themselves. Other problems encountered by these outlying settlements included limited water supplies that could be diminished by drought or exacerbated by flooding, soil with minerals that limited the types of crops grown, grasshopper and worm infestations and harsh weather.

Ideally, village economy fostered self-sufficiency of the community, ensured contact with and loyalty to the governing body and demanded unity and cooperation among settlers. Yet, despite the acceptance and practice of this expected behavior, the isolation and hardships of communities such as those on the Muddy River kept them particularly...
dependent on the Church for supplies, manpower and markets for goods produced. Furthermore, the ideal of self-sufficiency implied very limited contact with and little or no dependency upon outsiders. After establishment, some villages were forced to be self-sufficient because of hardships and limited markets for their products—a fact which led to the failure of the Muddy Mission's original purpose.

The acquisition of Southern products such as cotton and tobacco, expensive in the best of times, became more difficult and expensive to obtain by the onset of the Civil War. Since the Mormons had previously experimented successfully with cotton cultivation, high prices and a disruption of the Southern market prompted them to establish a cotton mission. The doctrine of self-sufficiency and economics appeared to coincide in providing a new challenge for the Mormons (Barrett 1947:7-19)

The Church's economic policies continued to play an important part in the effectiveness of the leadership because of its role as both spiritual and temporal leader, even after the formation of the Utah Territorial government. The people believed in Church dogma and followed Church policies as they had since the 1830s. These economic policies became an essential part of the program for colonizing and developing regions considered unsuitable by others less willing to do the work necessary to subdue nature. The people on the Muddy accepted these policies, and, thus, strove to work towards achieving them.

Yet, there were other problems arising in the Muddy Mission associated with the ideals of the Mormon village and unity and cooperation. McCarty (1981:172-76) indicates that the Muddy Mission served as the new rallying point for improving the strength of the Church. The move to the Great Basin and the building of Salt Lake City had served that purpose in the 1840s and early 1850s providing a new and challenging environment to subdue. The leadership saw the Muddy River Valley as another Great Salt Lake Valley to be conquered, thus renewing the spirit of the Church and
strengthening the people's belief in its ideals. This becomes apparent with the continual push for developing the bench as a new center despite the repeated warnings of its deficiencies.

In addition to the difficulties in subduing the environment of the bench were the problems associated with getting water there through irrigation. No other irrigation canal created as much work to build or maintain as did the one to the bench. It represents a technological achievement for the Mormons to have built the canal as they did, but water evaporation, seepage and the continuous aeolian deposition reduced its efficacy. Furthermore, to maintain it required more manpower than was available.

The Mormon population of the Muddy River Valley never exceeded 650. Of these, 100 were men, the rest were women and children. McCarty determined that the bench communities had a maximum of 53 men, with a minimum of 15 when the heat, sickness, travel north or problems with the Indians occurred. In the usual manner of doing public works construction a man could expect to be called about "once or twice a week", yet this limited number of men was unable to effectively develop a small community let alone a proposed center (McCarty 1981:167-68).

Finally, despite a second move and the presence of the Church's programs to assist in its success, the development of Sand Bench failed. McCarty attributes it to the reasons expressed above as well as the unsuccessful application of the technology developed in the Great Basin. With this loss, the Muddy Mission lost a significant symbol the leadership felt was necessary to help them continue the battle of subduing the Mojave Desert.

Cooperation as both ideal and real behavior functioned without apparent difficulty on the Muddy. Men assisted each other in building the irrigation system, their homes, joining and supporting cooperative industries, forming new communities in an isolated region. Unity, on the other hand, underwent severe trials on the Muddy. It appeared in
the various groups arriving there, in specific communities built there, but it did not appear to be consistent throughout the mission or between each new group of missionaries. It is unknown if the behavior exhibited by various groups on the Muddy was also evident amongst other groups settling the southern communities of Utah. If it was an isolated incidence, then it might be attributed to the bad reports about the area despite the many glowing letters printed in the Deseret News. Yet, despite the problems occurring in forming a unified society on the Muddy River, the people overcame differences and established a very unified and cooperative community in Long Valley, Utah.

Outside events played an equal part in the problems experienced by the settlers on the Muddy. The failure of the Colorado River trade, the opening of the transcontinental railroad and the drop in cotton prices all exerted devastating havoc on the economic strategies of the mission. Moreover, the possibility of being within the jurisdiction of Nevada caused the need for resurveying the boundaries of Nevada and Utah and Arizona Territories. It also brought Brigham Young to the mission. His negative response to all that the settlers had done and the area where they had spent time and energy building a new home must have proved more devastating than anything else that occurred in those last months. The word that the Muddy River Valley was a part of Nevada and that back taxes paid in coin were expected by the state caused the people to petition for leniency from the state, especially as they had paid taxes to both Utah and Arizona and were an agricultural community, not mining (Leavitt 1936:101-3; Ellsworth 1985:25-27).

Unfortunately, they were unsuccessful and were directed to vote on the outcome of the mission. At least one settler saw the ending of the mission as the Church deserting him.

The challenge of building a city on the Muddy River, as seen by McCarty, presents an interesting interpretation of the principles and ideal and real behavior. The leadership saw the Mojave Desert as a new environment to conquer. They viewed the environment in much the same way as they did the Great Basin taking little account of the differences.
It is possible to manipulate an environment, to a limited degree, if it is known. Lacking an awareness of what to expect, the leadership determined that the bench, seemingly similar to those found in the north, would be more than adequate for building a City of Zion. Here, their ideal behavior could not correspond to the real. What they envisioned was not possible to complete without a water supply or soil for cultivation.

The flexibility to change and adapt apparent in the early years of the Church seemed to have disappeared after the arrival to the Great Basin. Besides the challenges presented by building a City of Zion on the Muddy and strengthening the morale of the Church, the leadership should have seen that the Muddy also demonstrated the need for an awareness of loosening strict adherence to other ideals. The reasons for the ideal of self-sufficiency were sound, but in an area where survival was contingent upon trade with anyone, creating a mission with a single cash crop was not an economically sound decision. This is particularly true when the market, in this case cotton, was limited and never brought in substantial profits.

A brief summary of each principle, including results of the examination of ideal and real behavior provided by the evidence, is presented to show how they all fared on the Muddy.

The Gathering—the ideal and real behavior implied by this principle appear in the records as the establishment of a mission on the Muddy River in 1865.

The Mormon Village—the ideal behavior was building a community according to Joseph Smith's Plat of the City of Zion. The real behavior was dictated by the environment. The Virgin River Basin, including the Muddy River region, has long, narrow valleys, limited water resources and arable land. Communities were built to fit this environment but retained as much of the ideal as was possible to adapt. An attempt to build a city on Sand Bench proved unsuccessful because the irrigation system did not function properly and the sandy soil had limited potential for cultivation.
Property as Stewardship—the ideal behavior entailed that every man receive a house lot, acreage for vineyards and orchards and farming. Ten percent of the surplus property went to the Church for its various programs and projects. Land was surveyed and then allotted by lottery to ensure an equal chance of receiving arable and marginal land. The distribution of land, as described in the records of St. Thomas and St. Joseph, followed this format. Additional lots could be purchased by anyone with the means to do so.

Redeeming the Earth—ideally, the Mormon settlers would come into a new region, build their homes, plant their fields, raise their livestock, identify and use local resources making the area blossom and teem with life. The reality of the Muddy River Valley was not too dissimilar. Cotton, grains, fruit trees and vineyards fared well in the soil with the assistance of the irrigation system. Local grasses were plentiful enough to feed grazing livestock. The major drawback of the valley was the lack of timber. Another problem was inadequate technology for developing an effective irrigation system to the bench. Even if the Mormons could have brought water to the bench, the soil could not be cultivated as suggested by the principle. Furthermore, the development of the bench could have overused the available water supply and created greater problems for the communities in the lower valley.

Frugality and Economic Independence—the program of self-sufficiency played an important part in the ideal behavior of this principle. Each mission would become self-sufficient, relying on the purpose of the mission, i.e., agriculture, mining or manufacturing, as well as developed regional resources. Unfortunately, the real behavior of the Muddy Mission could not achieve this. The mission was too far from markets for the cotton lint and other goods, the cotton markets were limited, the single cash crop was a bad economic decision for the area given its isolation, there was limited assistance from Church funded projects, and the Colorado River trade did not develop as expected.

Unity and Cooperation—the ideal of this principle stressed oneness of the group and
the acceptance of direction by Church leaders. Cooperation was required to build and
develop the Kingdom and unity was needed to maintain the strength of the Church. On
the Muddy cooperation appeared wherever needed, to build and maintain irrigation canals,
homes, other buildings, fund projects. Unity was apparent in segments of the larger
group of settlers, but did not appear to create a single, harmonious population.

Equality—ideal behavior implied that everyone was equal in acquisition of land,
water, and obtaining other earthly things. Some did acquire more than others, but the
original idea of equal allocation of land and water, working on public works projects and
the immigration program remained as part of the Church's procedures. Another
demonstration of equality was seen in the similarity of house design and use of adobe
bricks. These served as an effective means of creating unity and a sense of equality
among a group of such socially, economically and culturally diverse people as those who
came to the Great Basin. On the Muddy, everyone began with an equal allotment of land
and water and everyone built their homes of adobe brick. Some coming to the Muddy
apparently had more material wealth than others, but each had the chance to increase their
wealth while there. Unfortunately, increasing one's economic status was not easily
accomplished because of the isolated nature of the mission, the single cash crop and
limited economic stimulus provided by the Church. Land appeared to be the only means
of increasing wealth, and that was lost when the settlers left in 1871.

The resettlement of the valley by Mormons in the late 1870s showed that it could be
an economic success. However, for the Mormons striving to build a part of the Kingdom
of God on the Muddy in the 1860s it was a display of their strengths and abilities that they
did as well as they did and continued to live there as long as they did. Their acceptance of
Church dictates suggests that the Muddy Mission continued as a matter of faith.
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Each of the structures surveyed and excavated at New St. Joseph and Sandy Town B presents information on construction techniques, architectural style and floor plan and construction material. Basic similarities were followed in the construction of most of the structures, but a few, such as House 4, exhibited unusual or different techniques. (See Chapter IV, Archaeological Elements, p. 61 for a summary of the basic characteristics of the Mormon structures found on the Muddy between 1865 and 1871.) Below is a detailed description and illustration of each structure completely or partially excavated at New St. Joseph and Sandy Town B.

New St. Joseph:

House 1. The structure follows the traditional Mormon construction pattern of square units (usually 16 ft by 16 ft) or combinations and variations of the units. House 1 (Figure 14, p. 181) consisted of two rectangular units making a larger rectangle of about 44.0 ft by 14.75 ft (exterior measurements). The units were divided into two living areas comprised of three rooms: the north unit was used for kitchen and storage and the south unit was used for general living and sleeping space. The units are mirror images with the central rooms (Rooms A and E) separated from the smaller rooms (Rooms B and C in the south, Rooms F and G in the north) by a wall and a fireplace. The fireplace in Room A was made of adobe bricks and large flagstones, and the fireplace in Room E was made of adobe bricks and small flagstones.

Unlike most of the other structures excavated at both sites, House 1 had an unusual
Figure 14. House 1 with cross section, New St. Joseph.
addition built about midway on the east side. This room, with compartments D and D1, is rectangular with the smaller compartment formed by a curved single brick wall abutting both the main structure and the addition. Other unusual features of Room D include the two double brick thick walls (east and south) and the single brick north wall. The south wall also appears to have a small entranceway. However, the most important feature of Room D is the adobe brick floor with one flagstone. This is unusual as the rest of the structure had a poured adobe floor.

The main entrance was through the north unit on the west side of the structure, in Room E, where adobe brick steps were found. A possible second entrance might be located on the east side of Room A where Room D joins the main structure. A third entrance was at the north end through Room F.

Exterior features associated with House 1 include a hearth/oven and patio area, one pit, and a rock alignment to the east and an outbuilding to the southwest. The hearth/oven was made of adobe bricks with a rock wind break. The pit, located near the northeastern corner of the building contained refuse material. A rock alignment is located on the eastern and western sides of the pit.

Outbuilding 2. The outbuilding (Figure 15, p. 183) is situated on the southwest side of House 1. It measured 7.18 ft by 5.88 ft (exterior measurements). Both rock and adobe bricks were used in the construction of this structure. There appear to be two sections, the larger composed entirely of rock, including the floor, the smaller composed of adobe brick. The adobe bricks form one complete wall (southwest) with two shorter single brick walls abutting it with spacing between and on the outside of each. The conjecture is that this outbuilding was used as a chicken coop with the smaller section of adobe bricks representing the nesting area. The rocks may have been the foundation for a mesquite wall, whereas the rock floor may have been laid to prevent the chickens from digging out of the structure (Verdow 1977:n.p.).
Figure 15. Outbuilding 2, New St. Joseph.
House 2. This structure (Figure 16, p. 185) does not follow the same pattern as House 1. Instead of two small squares or rectangles joined to make a larger, it was originally one rectangle with an addition constructed later. It was not completely excavated so it is difficult to determine if the addition represents a mirror image of the original structure. The structure measured approximately 41.0 ft by 14.15 ft (exterior measurements).

The difference between this structure and House 1 in layout appears in the placement of the fireplaces. One was built in the north wall (excavated - Room A) and south wall (unexcavated - Room F) rather than in an inside wall. The north fireplace had a coarse cobblestone hearth. A second fireplace, located at the south end of the structure, was not excavated. The fact that the second fireplace was built at the opposite end of the structure indicates that the mirror image construction technique was followed here as well as in House 1.

If the mirror image was present, then the layout of the structure, on both ends, would be a large room, possibly used for both living and kitchen activities, with a fireplace located at the extreme ends of the structure. Towards the inside are the sleeping and storage rooms. Two discrepancies are apparent as the original structure had three rooms (Rooms B, C and D), whereas the addition shows only two (Rooms E and F). Further, the entranceway is located in the southeast corner of Room G instead of the southwest corner as in Room A.

An interesting aspect to the wall construction of House 2, which further promoted the notion that Rooms E, F and G were part of an addition, was that the south wall of Rooms B and D was constructed of double brick of poor quality. Abutting this wall was another of single brick of better quality, thus creating a three brick wall and tying Rooms E, F and G to the existing structure. Another difference confirming that this was an addition was the lack of a rock foundation. Broken and whole adobe bricks were used.
Figure 16. House 2, New St. Joseph.
in lieu of rocks (Claude N. Warren, personal communication 1988), suggesting that the addition may have been built in haste. This, then, presents the possibility of a polygynous household with the second family coming after the structure had been built and possibly occupied.

Another interesting difference in House 2 relates to floors. Room C, unlike the other rooms, had a concave, or basin-shaped, floor of adobe rather than a somewhat evenly scraped floor with poured adobe. The adobe was cracked, giving the appearance of tiles, and badly broken in some places. The floor of Room D was also cracked and broken, though more even.

House 2's associated outside features include two rock piles, two rows of rock, an adobe wall collapse and a hearth area. One rock pile, in the northeast corner, was from the chimney in Room A. The other rock piles lies near the two rows of rock on the northwest corner, or fort exterior side, of House 2. The rock rows are separated from the house's foundation by a small space. Running west from the house, they are fronted by a single row of adobe bricks laid lengthwise. No conjecture has been made at this time as to what this could be.

The adobe wall collapse is located at the northwest corner of the building or the fort exterior side. Its proximity to House 2 would suggest that it might be from the structure. The possible refuse pit, located on the interior side of the fort, is near the northeast corner of the house. It was originally thought to have been a hearth area; however, no evidence uncovered at the time indicates that a hearth existed there. Instead, the artifacts recovered and the large amount of charcoal, and resulting soil discoloration, would seem to indicate that it was a refuse pit where ashes from the house's fireplace were dumped. The idea of a refuse pit on the fort interior side is corroborated by those found at the north end of House 1.

Another point of interest regarding the excavation done on the exterior of House 2
regards outside activity. At the north end of the structure, on both the fort's interior and exterior, the occupants of House 2 engaged in a great deal of activity, particularly on the exterior side. This is especially so as the entrance to this part of the structure was located on the fort exterior side.

Outbuilding 1. Excavation was conducted on both the interior and exterior of this structure (Figure 17, p. 188). Foundation construction followed the same format as with the other structures, i.e., local rocks with an adobe mortar and capped by adobe bricks. The rocks were laid one course high, with large stones, usually rectangular or square, placed as the corner stones. However, the pattern found in the north and south walls appeared to be lacking in the east and west walls. The west wall, in particular, appears to be lacking in a rock base, leaving the adobe to rest on blow sand (White 1976:n.p.).

Although badly damaged, the north wall, and an associated extension, provide construction indications of a possibly entrance to the structure. The extension runs perpendicular in a north direction from the western half of the north wall. It is constructed of two layers of stone with an adobe mortar and lies on blow sand and caliche. No such construction feature appears on the eastern half of the north wall.

Outbuilding 1 consists of a single room, approximately 8.5 ft by 6.3 ft (exterior measurements). It was originally thought that this structure might be an "outhouse", but excavation of the interior did not provide data to support that idea. The artifacts recovered, as well as soil profiles, indicate that it might have been used for either food storage or as a smokehouse.

An important aspect regarding Outbuilding 1 is that it is located on the fort exterior side. Furthermore, it is approximately 90 ft southwest from House 2. If it was used as a smokehouse, distance from other structures would be necessary, as with outhouses. However, if it was used for another purpose, the distance factor becomes a puzzle as
Figure 17. Outbuilding 1, New St. Joseph.
well.

**House 4.** This structure (Figure 18, p. 190) differs greatly from those previously described in two ways. First, it was laid out east-west instead of north-south (end to end) as the other structures in the fort. Second, the room layout consists of three rooms set in a linear pattern, a variation of a floorplan suggested by McCarty (1981:125-127). The structure measures 15.4 ft by 7.0 ft (exterior).

Another way House 4 differs from the other New St. Joseph structures is in construction technique. Unlike the characteristic trench found elsewhere, the foundation for House 4 was set up on a poured adobe slab of 2 to 3 in. Finally, there appears to have been a substantial amount wattle and daub and wall plaster recovered. No explanation has been offered regarding this construction feature; however, the recovery of a large number of seeds (cotton and other seeds, possibly pumpkin or melon) and burned cloth fragments associated with cotton seeds suggests that Room E, where these were found and which still had plaster on the west wall, probably served as a storage area for seeds. One possible explanation might be that the Mormons found it necessary to include wattle and daub in building storage rooms for seeds. Another possible explanation might be that wattle and daub was a construction feature used throughout by the individual who built this structure. It is apparent, however, that House 4 was used for storage and as a granary.

The exterior of the structure was characterized by extensive collapsed wall fragments. These were found on the northwest and northeast (fort interior) corners and along the west (fort exterior) wall.

**House 5.** Unlike the other structures, only a surficial excavation was conducted to ascertain the dimensions and floorplan of House 5 (Figure 19, p. 191). This structure presented another floorplan along with a few architectural differences. There is no mirror image in the layout. Instead, it appears to be four rectangles joined to form a...
Figure 19. House 5, New St. Joseph.
larger one of 58.6 ft by 15.0 ft (exterior measurements). The rooms at either end
(Rooms B and F) have smaller rooms (Rooms A and E) located in their southwest
corners.

Room B is separated from Room C by a three brick thick wall which has an adobe
brick fireplace located approximately in the center on either side. The design of the two
fireplaces is similar, with a square rather than flaring opening.

Room F had another unusual feature. At the south end is a 3.0 ft wall (seven bricks
laid lengthwise). It is unusual because the wall is not perpendicular to the south wall,
yet it does not appear to be part of a collapsed wall. It is difficult to ascertain what its
relation is to the south wall due to the extreme deterioration of the south wall. This holds
ture for the east and west walls as well.

When examining the layout of the structure and the wall construction, two
suppositions present themselves. The first is that the original structure included Rooms
C, D and, if not all of F, at least part of the walls, including the east wall of Room E.
Rooms A and B were added at a later date, hence the fireplaces on either side of a three
brick wall. The wall facing Room B would have been added during construction, as
was seen in House 2 for Rooms E and F. The second supposition is that Room F may
have been used for keeping animals, with Room E used for storage of feed or possibly
keeping smaller animals. The architectural information derived from an examination of
the south wall of Room E, i.e., the three brick thick wall which is not perpendicular to
the west wall, seems to indicate that it was added at a later date. The row of bricks from
the exterior south wall of Room F, as well as no indication of a fireplace in that wall,
suggests that that might have been an entrance with a guiding wall.

It will be necessary, at a future date, to conduct an excavation of House 5 to
determine the location of entranceways, and the foundation and walls of Room F.

House 6. This structure was not fully excavated; however, the general outline of the
structure was apparent (Figure 20, p. 194). It measured 33.0 ft by 13.0 ft, part of which was an addition (approximately 7.3 ft by 10.0 ft) at the north end. This addition, narrower than the original structure, created a significantly different layout than that usually found at these sites.

Surface examination, as well as excavation, showed indications of a hearth in the north end of the structure. Excavation of an exposed interior wall indicated there were at least two rooms (Rooms I and II) in the structure. Further excavation will provide data on entranceways, room interiors, unusual features of and associated with the structure.

During the work on House 1, the excavators made a profile of the floor. It is interesting to note that it slopes upward from north to south. Apparently, during construction the builders had to accommodate for this disparity in the level of each room's floor. This problem of floor levels appears to have occurred in other houses, however, no other floor profiles were made during excavation to indicate the differences.

Sandy Town:

House 2. This structure follows the traditional layout of two squares joined to form a larger rectangle of approximately 29.7 ft by 16.5 ft (from the inside measurements of 9 m by 5 m) (Figure 21, p. 195). The north half of the structure was divided into four smaller rooms. Each side represented the mirror image of the other.

The south half contained a chicken coop in a portion of the west wall. The coop measured 3.3 ft by 6.6 ft (1 m by 2 m). A fireplace situated in the south wall was near the west wall of the chicken coop.

Excavation of a collapsed wall provided the general location of a doorway inside the structure (Figure 22, p. 196). This was located midway opening from the south half to the north.

House 3. This structure (Figure 23, p. 197) deviated significantly from the basic layout
Figure 20. House 6, New St. Joseph.
Figure 21. House 2, Sandy Town B
Figure 23. House 3, Sandy Town B.
of square units. It would appear that originally the structure was constructed as a 16.5 ft (5 m) square, but the addition of a rectangular unit (approximately 23.1 ft by 16.5 ft or 7+ m by 5+ m) at the south end created a distinctly asymmetrical building, atypical of Mormon construction. No fireplace or hearth was located during excavation. Nor were any entranceways located.

In an unpublished report, Baumkratz, Coughtry and Kimball (1983) interpreted the available data to indicate that this structure was not built as a house but as a communal building with multiple use, hence the atypical construction and lack of heating facilities. Furthermore, they asserted that:

The proximity of the water channel indicates a central location [of House 3], for the channel terminated within 5 meters [16.5 ft] of the northwest corner of the building. The channel, although never used, may have been designed to serve only a centrally located, communal structure (Baumkratz, Coughtry and Kimball 1983:5-8).
APPENDIX B
CERAMIC ANALYSIS

The analysis of the ceramics recovered at New St. Joseph and Sandy Town B follows the format originated by Claude N. Warren (n.d.) following the first field school held at New St. Joseph in 1975. Changes were made during the course of the analysis as more ceramic sherds were recovered and exhibited greater variety between and within the classification types of white ironstone and decorated wares. In addition to the identification of the Temple of Nauvoo commemorative plate, two other patterns were identified, the Amish Snowflake spongeware and the Blue Willow.

The descriptions that follow include the numerical information presented in Chapter VI, Man and Society, pp. 132-40. Illustrations of the earthenware exemplify a particular design element or function. Illustrations of the white ironstone, decorated ware and porcelain, although not complete, exemplify design elements and shapes. To assist in understanding terminology an illustration of a plate and bowl identifying the parts used in describing design elements is included (Figure 24, p. 200).

Earthenware. There are three classes of color, red, buff and grey with subclasses based upon the appearance of glazes. A miscellaneous class is for those wares that do not fit into the three primary classes.

I. Red ware

This ware is red to red-buff in color and varies in thickness and shape. Many of the sherds are glazed, although some are either glazed on one side or unglazed. The vessels were thrown on a potter's wheel and have a smooth surface with exterior striations and
Figure 24. Parts of a plate and bowl (after Ketchum 1983:23).
ridges which also appear on the rim or lip.

The ware typology is determined by the use or lack of glaze and the color of the glaze.

A. No glaze (24) - New St. Joseph.

B. Clear glaze (83) - New St. Joseph; (7) - Sandy Town B. The glaze color can be clear, amber or green-brown, is translucent and occurs on one or both sides (Figure 25a, p. 200). A high glossy veneer is created by the glaze except where the glaze has broken "over the clay body becoming matte or dull and revealing the slightly rough clay surface" (Baumkratz, Coughtry and Kimball 1983:14).

C. Clear glaze (2) - New St. Joseph. Unlike B, this subclass glaze is not glossy and appears only on the interior of the vessel (Figure 25b and 25c, p. 202). The exterior is decorated by rows of impressed squares.

D. Marble glaze (57) - New St. Joseph. The glaze color is either mottled clear or opaque brown and occurs on both sides of the sherd. Four of the sherds are decorated on the exterior with two to three lines of little squares (Figure 25d, p. 202).

E. Green-brown glaze (38) - New St. Joseph. The glaze has a high gloss and is on both sides. A few of the sherds have a cut groove on the exterior. One is the base of a bottle (Figure 25e, p. 202).

F. Brown glaze (58) - New St. Joseph. The coloring on the sherds with this glaze varies in appearance. The range includes a dark brown exterior with an interior of clear glaze with brown spots, and a red-brown glaze interior and a light brown glaze with a darker brown spotting effect. The latter glaze appears on both sides.

G. Clear glazed intermediate crockery (3) - New St. Joseph. The clear glaze is on both sides of the sherds. The sherds in this category are from crocks with heavy flat bottoms and straight moderately thick walls.

H. Clear glazed heavy crockery (5) - New St. Joseph. The clear glaze appears only
Figure 25. Red ware sherds with specific design elements and shapes.
on the interior of these sherds. The sherds are from crocks with very thick, straight walls.

II. Buff ware

This ware is similar to the red ware except that the coloring is lighter with a range from red-buff to yellow-grey. There is a possibility that the red and buff wares are the same ware. However, the division is necessary because the buff ware has glazes that do not appear on the red ware. All sherds in this typology were recovered at New St. Joseph.

A. No glaze (6). The paste is a yellow-grey color.

B. Amber glaze (22). The glaze color changes from amber to dark brown, is usually translucent and can be mottled. The glaze is on the interior only. One sherd has horizontal striations on the interior (Figure 26a and 26b, p. 204). Three other sherds are part of a bowl (Figure 26c, p. 204).

C. Amber-green glaze (4). The glaze color is greenish amber and is either flecked with brown or mottled because of an uneven application of the glaze (Figure 27, p. 205). The glaze appears on either one or both sides.

D. Green glaze (13). The glaze color is a translucent green.

E. Green-brown mottled glaze (5). The glaze color is translucent green flecked with brown and appears on both sides. Four of the sherds form the bottom of a crock or jar (Figure 28a, p. 206).

F. Green and grey glaze (1). The glaze color is an opaque mottled green and dark blue-grey. The exterior is unglazed and the interior glaze has a rough, irregular texture.

G. Blue-green glaze (17). The glaze color is an opaque turquoise-green that appears only on the interior.

H. Yellow glaze (4). The glaze color is an opaque yellow appearing on both the interior and exterior of the sherds.
Figure 26. Buff ware sherds with specific design elements and shapes.
Figure 27. Buff ware, amber-green glaze bowl, side and basal views.
III. Grey ware

The grey ware varies in color from a light grey to a dark brownish-grey. All sherds of this ware were recovered at New St. Joseph.

A. No glaze (4). The paste is a yellow-grey color.

B. Green glaze (9). The glaze color is an opaque green.

C. Green and brown marble glaze (71). The glaze color is varied. The exterior color is green, whereas the interior is a mottled brown and green.

D. Green and brown mottled glaze (1). This sherd has an unglazed exterior which is decorated. The interior is a mottled green and brown with dark brown spots (Figure 28b).

E. Blue-grey and brown marble glaze (4). The glaze appears on both the interior

Figure 28. Buff ware, green-brown mottled glaze jar base and grey ware, green and brown mottled glaze decorated sherd.
and exterior sides.

F. Brown glaze (4). The glaze color is brown and crazed. The crazing is a result of improper firing.

G. Brown glaze (2). This glaze is a darker brown with no streaking or spotting or crazing. It appears on both sides.

H. Blue glaze (1). The glaze is opaque and appears on both the interior and exterior.

IV. Miscellaneous

The sherd (1) which falls into this category has a brown paste and is glazed a mottled green and brown. This sherd was recovered at New St. Joseph.

Stoneware. The following is a list and description of the marks from stoneware found at New S.t. Joseph and Sandy Town B. The identifiable potters' marks are from kilns in Staffordshire and Yorkshire.

A. James Edwards and Son (1) - New St. Joseph

The first mark for these potters appeared as early as 1842 in Fenton, where they remained until 1875 (Figure 29a, p. 208). The design of the mark is elaborate with the Royal Arms of England, the name of the company and the ceramic type. The ceramic type appears on most of the marks from ca. 1851 until 1882. "Dalehall" (Dole Hall) is a suburb of Burslem appears on most of the marks used by this firm. (Godden 1963:129; Godden 1964:230-31; Godden 1968:22; Thorn 1947:80; Kovel and Kovel 1953:71).

B. Mayer Pottery (1) - New St. Joseph

Not enough of the mark is available for a definitive identification (Figure 28b, p. 208). 'MAYER' could be the pattern name; 'OTTER' undoubtedly means potter or pottery; 'NST' could be part of the town name Tunstall, another Staffordshire ceramic manufacturing community. Impressed are the letters 'NS', also unidentifiable. A tentative date would place the mark between 1829 and 1855, the years the two Mayer
Figure 29. Makers' marks, identified and unidentified.

C. J (Joseph) Twigg and Company (1) - New St. Joseph

This Yorkshire County company, located near Swinton, used this mark only from ca. 1846 (Figure 29c, p. 208). It was still known as the Twigg Brothers during this period 1841 to 1846, so this might be considered a rare mark (Godden 1964:628; Thorn 1947:84; Chaffers ca. 1930: 807-8). Although the name John appears in most sources rather than Joseph, the information for this particular mark shows the potters as Joseph Twigg and Bros., proprietors of Kilnhurst Pottery from 1839-1861 (Journal History of the Church 1929:n.p.). The pottery name and dates coincide with other sources.

Sometime during 1846, the company was commissioned by Lucius Scovill, on mission in England, to make 150 dozen commemorative plates of the Temple of Nauvoo, Illinois, with the names of President Brigham Young, his twelve apostles (Heber C. Kimball, Orson Hyde, Parley P. Pratt, Orson Pratt, William Richards, Wilford Woodruff, John Taylor, George A. Smith, Amasa Lyman and Ezra Benson), President of the High Priest Quorum George Miller, President of the Aaronic Priesthood Newell K. Whitney and Patriarch John Smith. Beneath the rim was the following inscription:


Some plates included the name of the architect, William Weeks, as "Wm Weeks - Architect" (Smith 1986). The plates were made in three colors, brown, green and blue-grey on white.
D. C. Meigh and Son (1) - New St. Joseph

The mark the company used between 1851 and March 1861 recorded the name of the individual pattern and included the Royal Arms (Figure 29d, p. 208). The firm was located at the Old Hall Pottery in the Hanley District of Staffordshire--Charles Meigh, owner (Chaffers ca. 1930:699-700; Godden 1964:428-29; Godden 1968:91).

E. John Alcock (2) - New St. Joseph

The Alcock company, Cobridge, Staffordshire, had two different company names. From 1839 to 1846 the name was J & G Alcock and they used an impressed mark (Figures 29e and 29f, p. 208). The second period, as J & S, Jr., used a printed or impressed mark from ca. 1848 to 1850 (Godden 1964:27-28). There are two examples of this mark, both of which are not complete. However, enough shows on both to provide some indications of how the original mark looked. It used the Royal Arms with the lion and unicorn couchant-gardant (lying down with head erect and facing the viewer [Whitmore 1968:33, 40, 43]) with a quartered shield in between. Below this are the words 'IMPERIAL' (from 'ERIAL'), 'IRONSTONE CHINA' (from 'STONE CHINA') and 'JOHN ALCOCK'.

F. Partial Registration Mark (3) - New St. Joseph

Registration marks were used during two periods, 1842 to 1867 and 1868 to 1883 (Figures 29g and 29h, p. 208). The cycle for 1842 to 1867 had the code letter for the year, the day, parcel or bundle number for registrant of the mark and the letters 'R' (see Figure for a reproduction of complete mark). The years of manufacture for the patterns were: 1. 1849 on the third day of an unknown month. The only other writing on the sherd were the letters 'NS' which may be part of the registrant's mark used in addition to the registration mark. 2. Sometime in 1856. 3. Unlike the other two marks, this was incised and has 'REGISTERED' printed above the lozenge or diamond. The 'IV' incising ceramic is easy to see, but the letter for the year could be one of four--B, E, F, or R--placing the year of registration between 1847 and 1861 inclusive (Kovel and Kovel...
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G. Miscellaneous Marks (18) - New St. Joseph (1) - Sandy Town B

1. There are several examples of parts of the Royal Arms. The Royal Arms includes a shield with the coat of arms and a crown in between the lion and unicorn. The lion and unicorn can be rampant (standing on their hind legs facing the shield), passant (standing on one front leg up facing the shield), crouching (lying down with head erect facing the shield), crouching-gardant (lying down with head erect facing the viewer) or crouching-regardant (lying down with head erect and turned back to look at the shield) (Whitmore 1968:33, 40, 43, 50). Examples of all except crouching-regardant were found at the sites.

2. Two sherds had words and letters. One had the word "Pottery" and the letters are 'OL'. It is unidentifiable, although it is possible that 'OL' are part of 'DALE HOLE', an early spelling of the town Dalehall (Shaw 1970:33-44). The second (Figure 30c, p. 212)
Figure 30. Makers' marks, unidentified.
is part of the word 'Dalehall' but the pottery name is not available for definite identification. The third has the letter 'J' with part of a indistinguishable design above. The fourth sherd had the word 'FORM' written in blue ink and a letter 'M' impressed (Figure 30d, p. 212).

3. One mark has two circles with the word 'CHICAGO' imprinted inside (Figure 30e, p. 212). The center has indistinguishable writing.

4. One mark with part of the Royal Arms has a rampant unicorn with a shield and crown. The shield, though, is different than the others because it is square instead of oval (Figure 30f, p. 212). It is possible that this represents the mark of an American potter.

5. A mark that differs from the other printed marks is a square within a square (Figure 30g, p. 212). Inside the second square are a series of lines representing Chinese characters. It is possible that it is a mark used by Miles Mason on his "Willow (and other Chinese) type patterns" (Godden 1965:419). His name may or may not appear with the mark. The company is the Islington Pottery of Liverpool, Staffordshire for the years ca. 1792 to 1816 (the marks date from ca. 1800 to 1816).

6. There are seven incised marks. Most are either in a circle/garter or an oval. One has words in the outside garter with the letters 'MYON' in the center. Another is oval with 'COOK' and 'CO' inside. Above the oval is the number '6'. Another oval mark had the letters 'RDS, Y' inside (Figure 30h, p. 212). Letters for another mark are 'SON' (Figure 30i, p. 212). The remainder are two indistinguishable.

Analysis of the stoneware included a classification based on color, decoration, ware (where it was possible to identify, i.e., porcelain, pearlware, ironstone).

I. White glazed stoneware

A. Undecorated ironstone (1851) - New St. Joseph; (39) - Sandy Town B. This is the predominante stoneware recovered from both New St. Joseph and Sandy Town B. Sherds appear clean, i.e., with no discoloration, abrasions, or exhibit a crazing effect
resulting from improper firing whether accidental or deliberate, or a discoloration resulting from chemical reactions to the soil and other unidentified organic materials or scorching. Some sherds also have a blue tint to the underglaze. This occurred during firing from an excessive amount of cobalt in the white glaze.

B. Decorated ironstone (368) - New St. Joseph; (5) - Sandy Town B. Many embossed and incised designs made this type of ironstone very popular. Unfortunately, not enough remains of many sherds to identify particular patterns. Most of the identifiable designs are the less elaborate rim designs such as scalloped edges. The classification is based on exterior or interior design (trim, border design) and polygonal shapes.

1. Trim found on either side of the rim can be a single or many embossed, incised or raised lines. There is is no other decoration, although trim does appear with decorations in other categories.

2. Border designs vary from trim with an indistinguishable design, a plant, leaf or floral design to fluting, ribbing, scrolls, panels, scalloping, soft embossing—a design that is felt but not seen easily—to designs easily seen but still indistinguishable. These are found on both the exterior and interior of vessels.

3. Polygonal shapes include scalloped rims, polygonal rims and polygonal vessels, usually eight-sided. Some of the sherds in this category have design elements from the other two categories.

A breakdown of each of the categories with specific counts follows:

A. Trim (56) - New St. Joseph

There was no distinction made between the number of horizontal lines involved in these trims. The only distinction made was if the trim appeared on the interior or exterior. An exception was a sherd with both horizontal and vertical trim. Interior trim numbered 40 and exterior 16.

B. Border designs
These will be further divided by type.

1. Trim with indistinguishable design (14) - New St. Joseph. Usually, there is only one horizontal line of trim with any design. Most of these appeared on the interior with one on the exterior.

2. Plant designs (62) - New St. Joseph. This category includes any design distinguishable as a plant, such as stalks of grain or grass, but contains more than just leaves or flowers (Figures 31a-h, p. 216). One of the prevalent patterns in this category includes three trim lines which arc down into the border, staggered, with tiny buds at the end. Another pattern has the plant arcing vertically in opposite directions. A third distinctive design has ribbing and a plant. Most of the other patterns have the plants lying horizontally. Included in this category are a plant design with scalloped and scrolled edging. There are 38 interior and 24 exterior examples of this design type.

3. Leaf designs (22) - New St. Joseph; (3) - Sandy Town B. This category includes leaves of various sizes and shapes, including diffenbachia and fronds with lateral leaves, laid out in a horizontal line (Figures 32a-c, p. 217). Most of this design type appeared on the exterior (18) with 7 appearing on the interior.

4. Floral designs (6) - New St. Joseph. Most of the flowers are bell-shaped, although some are circular with either slightly defined or separated petals (Figures 33a-c, p. 218). Leaves are included as an element of the design. These are equally divided for appearing on the interior or exterior.

5. Fluted designs (29) - New St. Joseph. One of the common design elements in the border of plates or the body of bowls or cups, fluting is created by making vertical incision, embossed or raised lines at specified intervals with slightly rounded or square top and bottom edges (Figures 33d and 33e, p. 218). It can occur with other design elements, such as a scroll. Most of these were interior (27).

6. Ribbed designs (51) - New St. Joseph. Similar to the fluted design, this
Figure 31. White ironstone decorated with unidentified plant designs.
Figure 32. White ironstone decorated with leaf designs.
Figure 33. White ironstone decorated with floral designs, fluting and ribbing.
vertical design is formed by incision, embossing or raised lines at narrower intervals with rounded top and bottom edges (Figures 33f-h, p. 218). In some of the samples examined, there appears to be a possible combination of fluting and ribbing, but these were placed in the ribbed category. Six of the sherds had an addition horizontal trim. Another has horizontal trim and three teardrops. Nineteen sherds have interior designs, 32 have exterior.

7. Scroll designs (9) - New St. Joseph. This design element is formed by incising or embossing a series of lines into a scroll (Figure 34a and 34b, p. 220). Most of these lie horizontally. Two sherds with the scroll design have a scalloped rim with the design made underneath the lip of the vessel (Figures 34c, p. 220). The above two sherds are the only ones appearing on the exterior.

8. Panel designs (10) - New St. Joseph. This design is similar to the fluted but the sections are longer (Figures 34d and 34e, p. 220 and Figure 35a, p. 221). They are formed in the same fashion, by incision, embossing or raised lines. One sherd has a scalloped rim. All but two appear on the interior.

9. Scalloped designs (10) - New St. Joseph. This design is another formed by embossing, incision and raised lines. Unlike the others, the lines are arced, either downward or upward, producing a scalloped edge. One sherd had the pie crust design component inbetween the scalloped edges. Another has an inverted scallop. All of these appear on the interior.

10. Soft embossed designs (69) - New St. Joseph. These are sherds with designs that can be felt and not seen, unless they are placed under light at an angle that produces shadows showing the design. Some embossing is easy to see, but the design does not fit into any of the above categories. In this design, 31 appear on the interior and 38 on the exterior.

C. Polygonal shapes
Figure 34. White ironstone decorated with scrolls and panels.
Figure 35. White ironstone decorated with panels and polygonal shapes.
These fall into two subcategories: plain and decorated. All appear on the exterior of the vessels. The interior is smooth with no indication of multiple sides. There are two sherds in this category which are plate rim sherds.

1. Polygonal shapes—plain (15) - New St. Joseph. These vessels are formed by creating eight sides (Figures 35b and 35c, p. 221). Most of the ones represented in this collection appear to be serving vessels.

2. Polygonal shapes—decorated (4) - New St. Joseph. These vessels have additional elements added to the polygonal shape. One has horizontal trim with an indistinguishable design. Another has a scalloped edge and a soft embossed design. A third has ribbing in the sides (Figure 36a, p. 223). The fourth decorated polygonal sherd has horizontal trim with a cross and a leaf design (Figure 36b, p. 223). A fifth sherd has incised ribbing with an incised horizontal band (Figure 36c, p. 223).

D. Miscellaneous. These are included to illustrate decorations on handles (Figures 36d-g, p. 223), shapes of a platter liner (Figure 36h, p. 223), bases (Figures 37a and 37b, p. 224), and lids (Figures 37c and 37d, p. 224 and Figures 38a and 38b, p. 225) Figure 38a is decorated with a plant design.

The following are descriptions and illustrations of the decorated wares.

II. Blue on white glazed stoneware

A. Spongeware (163) - New St. Joseph; (8) - Sandy Town. Amish, Amish Snowflake, or Snowflake pattern (Figure 39a, p. 226). A blue band runs along the rim edge with two rows of chevrons, in blue with + signs under the second row of chevrons. This is then followed by a border and body design of snowflakes (6 prongs). Some are flow blue (the color flows from the pattern) and others have a more defined design.

B. Transfer print, Pearlware (39) - New St. Joseph. Temple of Nauvoo Commemorative Plate (LDS) with Brigham Young, Twelve Apostles and the Patriarch (Figures 39b-d, p. 226). Only one name is distinguishable on the recovered sherds,
Figure 36. White ironstone decorated with polygonal shapes and designs, miscellaneous decorated handles and a platter liner.
Figure 37. White ironstone miscellaneous bases and lids.
Figure 38. White ironstone, miscellaneous lids.
Figure 39. Decorated sherds, blue on white glazed stoneware.
'Heber C. Kimball'. Other letters and words are 'ING', 'H', 'House of the Lord Built By the', '[S]AINTS CO', 'ATR'. Several plates are represented. Rim - the edge decoration is a clover design, continuous with lines projecting inward and interjected with half circles of blue and blue lines with leaves and chevrons. Names are in the border area, in blue. Interior rim - the design is geometric, diamonds with three prongs extending from one point—every other prong has a plus +, with every fifth topped by three circles, side-by-side, the middle of which has a teardrop with three dots extending into the interior of the plate. The interior scene is the Temple of Nauvoo with clouds, an Angel Moroni weathervane and rose bushes. Around the outside of the interior is an inscription stating who had built the temple and the year. Potter’s mark is in blue on the back of one sherd (see above for information regarding potter).

C. Dark blue: Handpainted, two patterns (31) - New St. Joseph. Plate: the interior is white with vertical blue bands radiating outward from the interior rim to rim edge (Figure 40a, p. 228). The exterior is white. Bowl or Cup: rim is flared, the exterior has vertical blue band on white extending from the rim edge downward to meet a horizontal blue band just above the base (Figure 40b, p. 228). The interior is white with a thin blue line (horizontal) in the border.

D. Transfer print, two patterns (14) - New St. Joseph. Blue Willow Pattern with Traditional border and center (interior) (Figure 40c, p. 228). The pattern has several design components. Rim edge has a blue line with irregularly shaped boxes (not quite square) of white with a blue dot inside, up to eight rows of diamonds, blue with white interior, and a small blue diamond in the outer point, circles with different geometric designs, leaves with bunched circles, probably representing fruit, and more stylized leaves with elaborate shading. One sherd is an interior border with a diamond design in blue with white interior and a small diamond in the outer point, thick dark blue line and blue boxes with concave sides and a white dot in the center. Another sherd from the interior of the
Figure 40. Decorated sherds, blue on white glazed stoneware.
plate has what might be part of a maker's mark on the exterior side. It appears to be a curlique, possibly part of a "C" and is in blue ink. There are eight sherds of another plate or series of plates which represent another style of the Blue Willow pattern (Figures 40d and 40e, p. 228). It appears to be semi-porcelain. The design on these sherds is light and dark blue on white with shading determined by the darker blue. There is a tree in dark blue, a bush in lighter blue, clouds and, on one sherd, what appears to be a post similar to the one depicted on the bridge in some of the designs shown in the Blue Willow Book (Gaston 1983). One of the sherds also has a partial maker's mark on the exterior. It is an imitation Chinese mark, but does not correspond to any presented in books showing makers' marks.

E. Handpainted (6) - New St. Joseph. Located at the rim edge, the pattern on the interior is composed of white glaze, a thick horizontal band, white glaze, a thinner horizontal band, white glaze (Figure 40f, p. 228). Because only rim sherds were recovered, there is no means of determining an interior design. The exterior is white.

F. Transfer print (1) - New St. Joseph. The pattern is a possible floral design with a background of parallel wavy blue lines on the interior (Figure 40g, p. 228). The exterior is white with a blue print of a series of buildings which might be part of a castle with walls and towers.

G. Transfer print (1) - New St. Joseph. The pattern is a floral design with a background of parallel wavy lines in light to medium blue (Figure 41a, p. 230). It has a fluted rim. The exterior is white with a mark in blue which looks like a semi-colon. This could be a workman's or an artist's mark (Thom 1947:63).

H. Transfer print (1) - New St. Joseph. Both the interior and exterior have a blue glaze. On the interior, from the rim to the border, it appears to be part of a border panel of a pictorial decoration with a floral frame (Figure 41b, p. 230). The decoration is a picture of a structure. There are horizontal lines contiguous to the pictures. The exterior on the
Figure 41. Decorated sherds, blue on white glazed stoneware.
rim edge is a geometric pattern of arcs and dots, short vertical lines and a Mayan-like pyramidal shape. A floral design is below this. The rim is flared.

I. Handpainted (2) - New St. Joseph. The interior has a floral design in two shades of blue (Figure 41c, p. 230). This design is of leaf outlines and runs from the border to the center of the vessel. The blue has been allowed to flow. The exterior is white.

J. Transfer print (1) - New St. Joseph. This pattern, in a darker blue than most of the other designs found, which flows (Figure 41d, p. 230). It is a large floral design and another design with geometric and non-geometric components. There is not enough of the design present to identify it. The exterior is white with the letters 'FORM', which could be a word or part of a word, and a single letter 'M' printed in blue. The 'M' may be an artist's or workman's initial (Thom 1947:63).

K. Transfer print, possible semi-porcelain (1) - New St. Joseph. The pattern appears on both the interior and exterior of the sherd. It is a series of circles representing leaves in a joined and unjoined fashion (Figure 41e, p. 230). The pattern does not appear to cover the entire vessel on either side.

L. Transfer print (3) - New St. Joseph. The pattern includes loops in connecting stems in a floral/leaf design. Other design elements are not extensive enough to determine what they are. It does not have blue underglaze on the exterior.

M. Transfer print (1) - New St. Joseph. The interior is white, and the exterior is decorated. The pattern includes a scene; however, not enough is available to determine what it is (Figure 41f, p. 230). The base has some blue markings--again not enough to determine exactly what they represent. It appears to be a serving vessel with no basal rim. There is wear on the edge where the vessel rested on the table.

N. Transfer print or Handpainted (1) - New St. Joseph. It is dark blue and the pattern includes part of a structure (Figure 41g, p. 230). There is an arch or window comprised of well-defined bricks. It could be the interior (center) of a plate or platter.
O. Transfer print (3) - New St. Joseph. The interior is white, and the exterior is decorated. The pattern is hard to determine.

P. Splatterware, possible (4) - New St. Joseph. The interior is dark blue with no apparent design. The exterior is blue-on-white with no discernible design (Figure 41h, p. 230).

Q. Splatterware (4) - New St. Joseph. There is no design. It is a rim sherd with blue on both the exterior and interior (Figure 41i, p.230). The shape of the rim is not flared as a cup rim, but it might be from a sugar bowl or a dish with a cover. Another sherd might be part of a cup (it is a body sherd). The exterior is decorated with a splatter design and the interior looks like it might have some blue. Of the other sherds, one has an indentation before a flaring of the vessel which might be part of a basal rim.

R. Splatterware (2) - New St. Joseph. The interior has a coarse-textured splatter design on the border. The exterior is white.

S. Transfer print, possible semi-porcelain (1) - New St. Joseph. The interior has a floral design in the border with the flow blue phenomenon (Figure 42a, p. 233). The exterior is white.

T. Shell-edged rim (2) - New St. Joseph. The interior, along the rim, is dark blue (Figure 42b, p. 233). The rest of the vessel interior and exterior is white. It might possibly be a platter.

U. Handpainted (2) - New St. Joseph. The interior is flow blue with a pattern in dark and medium blue along the rim. The pattern is floral in the border and a variant rope design with a nob at the bottom of the rope loop (Figure 42c, p. 233). The exterior has a light blue underglaze from the rim down part of the border with the remainder of the vessel white. This coloring might be a result of too much cobalt when making the white glaze.

V. Handpainted, variation of II U (2) - New St. Joseph. The interior has dark blue on a light blue glaze, although it might be a result of flow blue. The design element is
Figure 42. Decorated sherds, blue on white, blue on blue, purple on white and brown on white glazed stoneware.
comprised of lines, some forming something of which little remains to be identifiable (Figure 42d, p. 233). There is shading on one side of the object which does not appear to be geometric—rather a plant or some other object. The exterior is white.

W. Handpainted, variation of II U (2) - New St. Joseph. The interior has shading in blue with flow blue. The pattern is comprised of a leaf design with shading and a loop connecting stems. The exterior has been chipped off.

X. No pattern (8) - New St. Joseph. The exterior and interior may or may not have a blue underglaze. These could represent those parts of vessels with no design but the flow blue effect found in the Amish Snowflake group. Some of the sherds are broken so that the paste is visible.

III. Blue on blue Stoneware

A. Appears to be a combination of Transfer print and Spongeware (1) - New St. Joseph. The pattern is on the upper border (rim edge down). Along the rim edge is a dark blue line. Below this is a design which might be done with a sponge. It is a leaf and loop design in dark blue with flow (Figure 42e, p. 233). On the inner border (closer to the plate interior) might be a transfer print. It is a leaf design, though not as bold as the rim/border design and is medium blue instead of dark blue. The exterior is light blue.

B. Spongeware, possible (1) - New St. Joseph. The interior has a pattern with the flow blue phenomenon. The pattern is in medium blue and is a circle and cloverleaf design; however, there is not enough to be certain (Figure 42f, p. 233). There appears to be another pattern on the interior of the plate, but not enough remains to be identifiable. The exterior is light blue.

C. Transfer print (1) - New St. Joseph. Two design elements are found in the border. First is a geometric design composed of horizontal lines in varying thicknesses with medium sized dots evenly spaced on the thicker lines (Figure 42g, p. 233). These thicker lines and dots are a darker blue than the thinner lines. Below this is a leaf design.
Unfortunately, not enough of this design is available to know if it is only leaves. The exterior is light blue.

D. Handpainted, possible (3) - New St. Joseph. This might have a pattern; however, not enough of it remains to make it out. There definitely is something that is of a dark blue on a medium blue glaze. It is possible that the design has been obscured because of the flow blue phenomenon. The exterior is light blue.

IV. Purple on white

A. Transfer print (2) - New St. Joseph. The border pattern has a combination of geometric and floral design elements (Figure 42h, p. 233). The geometric has a band of purple with continuous white lines in the shape of diamonds. Above this is a combination of a dark purple area, a floral design with shading in light purple. Below is a thin purple line with another floral design, then an undecorated area to the interior. The exterior is white.

B. Transfer print (1) - New St. Joseph. This may not be associated with the above sherds because the print covers the border to the interior. The pattern is a solid purple with three rows of wavy horizontal dot lines (Figure 42i, p. 233). There is a break in the pattern until the interior of the plate and then the short wavy lines continue. There are other lines on a slant as well as solid lines. It gives the impression of water. The exterior is white.

C. Transfer print (1) - New St. Joseph. This may not be associated with the above sherds. It has a pattern of continuous horizontal wavy dot lines from the border to the interior. In the interior, there is a space of white in the lines of dots. It could be part of a design, but not enough is available to identify. The exterior is white.

V. Brown on white stoneware

A. Transfer print (19) - New St. Joseph. The rim edge has plus + signs in between a four-leaf clover design (Figures 42j and 42h, p. 233). The border has a floral design and
stippling in brown and brown lines in arcs. There is shading around the circles and arcs. There is some variation in the rim edge design. One sherd did not have the four-leaf clover design, rather, it was open instead of closed. The border is fluted. The interior border has one scalloped line in brown with a second line of fleur d'lys shaded by stippling with open circles at each tip. Between each fleur d'lys is an open circle with parallel lines with opposing curvilinear ends with circles or circles and a 'v'. The interior has a pattern; however, all that is visible are leaves from a tree. The exterior is white.

B. Transfer print (7) - New St. Joseph. It has a scalloped rim design on the rim edge with geometric shapes of triangles and circles (Figure 43a, p. 237). Two parallel lines follow the scallop fluting with brown dots along the inner line. The border has an elaborate floral and geometric design. The design motifs are: 1) Medium brown shaded area with leaves and flowers; 2) Diamond design with circles and lines on a white background surrounded by flowers and leaves with shading in medium and dark brown. Along the interior border is a floral design. The interior has a scene (commemorative pattern?) of which part is water (lake or pond) with three men in sailor uniforms (19th century) in a small boat, two of whom are standing and laying out a net and the third is seated (steering the craft?).

C. Transfer print (9) - New St. Joseph. No rim sherds were found, so there is no idea of the border and rim designs. The interior design is a scene which includes a church-like or castle-like structure with towers, trees and fronds, with a border/interior design element of flowers and leaves which flow into the interior element (Figure 43b, p. 237). One sherd, border/interior, has a deep curve, suggesting that it might be a deep dish plate. Three other sherds have basal rims. The exterior is white with one sherd with a partial maker's mark, a lion's paw, but not enough is available for identification.

D. Transfer print (7) - New St. Joseph. Miscellaneous patterns which may represent a third interior scene or may be part of one of the above. There is no border design on any
Figure 43. Decorated sherds, brown on white and black-grey on white glazed stoneware.
sherd to use as a determining factor. These sherds include the following designs: 1) A partial scene of a man and woman near a grove of trees and a small structure, possibly at the edge of a pond (there is a partial maker's mark, a lion en garde, which is unidentifiable). 2) Part of a structure, possibly a castle, with at least two towers, the top of the one to the right is cone-shaped with a rampart. The other, taller tower, which is six-sided, also has a rampart, with at least one shorter tower in front. To the left of this appears to be another tower-like part of the structure with more elaborate exterior decoration, e.g., a column with slanted lines or bands and a wall with a geometric design of two vertical zig-zag lines. In the background are branches of a tree. (Two sherds.) 3) The uppermost and tips of branches of a tree with clouds, made by stippling, above. 4) Clouds made by stippling, which could be from the same plate as #3. 5) This sherd has at least three different species of tree represented as well as what might be a bush. 6) A branch of a tree. The exteriors are white.

VI. Black-grey on white stoneware

A. Transfer print (10) - New St. Joseph. The border has a geometric and floral leaf design (Figure 43c, p. 237). The geometric element is comprised of vertical and horizontal lines. The areas with vertical lines have two widths with additional thick black horizontal lines between extant horizontal and vertical lines. The vertical line design component consists of one thin, two thick, one thin lines. The design ends just into the interior with leaves separated by a horizontal line with a circle. Stippling provides shading on the exterior of the design. The interior scene has trees. The rest of the scene has not been recovered at this time. It is discernible where the transfer print does not match. The exterior is white.

B. Transfer print (9) - New St. Joseph. The rim is fluted and the pattern border component consists of horizontal lines with a floral and leaf design (Figure 44, p. 239). This component continues into the interior; however, not enough of the interior was
Figure 44. Decorated sherds, black-grey on white glazed stoneware.
recovered to know if it covers the entire plate. Stippling around the leaf design provides shading. It is discernible where the transfer print does not match. The exterior is white.

C. Transfer print, light and dark black/grey (5) - New St. Joseph. No rim sherds; however, it is a possible platter. The interior pattern is a scene of a structure, possibly a castle with water, willow trees and clouds (Figures 44b-e, p. 239). It could be a commemorative plate or part of a specific service pattern. The exterior is white and has the letters 'FB' impressed and the number '15' printed in blue on one of the sherds. The initials could be those of the artist and the number a workman's mark (Thom 1947:62). Another has an impressed triangle. One of the potteries, Minton's, used such marks to indicate the year (Macdonald-Taylor 1962:250). A third sherd has, in black, a partial registration mark (see above for more detail).

D. Transfer print, possible (4) - New St. Joseph. The pattern is on the interior and interior/exterior. The rim pattern is composed of continuous joined arcs (Figure 44f, p. 239). Where they join are three dots set in an inverted triangle. The remainder of the pattern is a series of black lines; the primary connecting lines have varying thicknesses, and shorter, thinner lines appear to be like tree branches.

E. Splatterware (3) - New St. Joseph. The rim edge is scalloped with coloring on both the interior and exterior. The border is fluted with single dots of color over the interior with no apparent design.

F. Splatterware (6) - New St. Joseph. These are distinguished from the above by "pitted spots" where the "potter didn't glaze carefully" (Wetherbee 1980:141). One sherd is a rim sherd, another appears to be part of the body of a cup because of the way it is curved. Its interior is white, whereas the others are decorated on both sides.

G. Splatterware (1) - New St. Joseph. A pitcher handle molded with a leaf design in the branch form, possibly ear-shaped and appears to attach just below the rim of the vessel (Figure 45a, p. 241). Mold lines are visible and the exterior has an indented or recessed
Figure 45. Decorated sherds, black-grey on white, gold on white, vermillion on white, vermillion and black on white, vermillion and green on white glazed stoneware.
portion extending upward from the leaf. There is no specific pattern to the splatter. There
is some reddish-brown, probably discoloration due to a reaction to the soil.

H. Splatterware (2) - New St. Joseph. Splatter is found on the rim and bottom of the
collar on the exterior and from the rim to the interior of the top of the collar. The interior
has a slight indication remaining of where a lid would rest. It is probably from a sugar
bowl or creamer.

VII. Gold on white stoneware/semi-porcelain

A. Handpainted (1) - New St. Joseph. A cup or mug. The exterior is decorated with
cursive lettering: 'M', 'indiscernible', 'Indiscernible' (a capital letter). The interior is
white (Figure 45b, p. 241).

B. Handpainted (3) - New St. Joseph. The gold is used as gilt on these sherds. One
sherd appears to be part of a lid (Figure 45c, p. 241). The gilt, on the underside, is almost
gone due to excessive wear on the rim edge. A second sherd has gilt on the exterior of the
vessel (Figure 45d, p. 241). Following the curves of the sherd, the gold band is above
what might be a shaped base. The vessel exterior is designed to give the illusion of a
polygonal shape, whereas, the interior does not. The last shed does not have any gilt;
however, the glaze and paste are the same as the others and the shape is similar to the
previously described sherd.

C. Handpainted (1) - New St. Joseph. The item is from a mold. The gold is used as
edging gilt on the exterior. A part of the item has broken off from the top surface. It might
be a 'foot' to a serving dish. The surface has embossed marks which include a series of
raised circles just below the gilt. The foot has three 'toes' made by two evenly spaced
indentations. The underside is glazed but undecorated.

D. Handpainted (1) - New St. Joseph. Both the exterior and interior are white glazed
with one side (cannot determine if interior or exterior) painted with a band of gold. The
paint has a dull finish.
VIII. Vermillion on white glazed stoneware

A. Handpainted, embossed design (1) - New St. Joseph. It is a rim sherd with grey tinting possible resulting from discoloration or burning. A raised petal design is painted vermillion except for the stamen which has a small circular indentation (Figure 45e, p. 241). The border is short in length to the interior rim, but it may be a narrow border for a bowl or saucer.

B. Handpainted (6) - New St. Joseph. The only design on these sherds is a band of vermillion below the rim on the interior. The exterior is white.

IX. Vermillion and black on white glazed stoneware

A. Handpainted (2) - New St. Joseph. The pattern has two design components. The interior rim edge, which is slightly flared, is decorated with a thin band of black. The exterior is decorated with flame 'licks' in vermilion with shading created by the intensity of the color (Figure 45f, p. 241). The other sherd, which appears to be the interior of a plate or platter, indicates that for these vessels the flame 'licks' are on the interior. Unfortunately, there is no rim sherd for the plate, so it is not known at this time if the exterior rim edge has the thin black band.

B. Handpainted (1) - New St. Joseph. The interior border has a design of three vermilion circles in triangular format with the point closest to the rim (Figure 45g, p. 241). Below this is an indistinguishable design element in black. The exterior is white.

C. Handpainted (3) - New St. Joseph. The interior rim design is a thick horizontal band of vermilion shaded by a grey wash. Below this the border appears to have a wash of grey, possibly resulting from the firing rather than a deliberate feature of the pattern. It might also result from being burned or discolored by chemical reaction to the soil. The border design, in black, appears to be a series of lines, circles and dots (Figure 45h, p. 241). The lines are set in two ways: 1. circular shapes made of short, thin vertical
lines; and 2. a single long, thick line with two shorter, thicker lines coming off to the left like a capital 'V'. Opposite the v-shape are two dots. A circle is within two of the line circular shapes. Part of the design is covered by the vermillion band. The exterior is white.

X. Vermillion and green glazed stoneware

Handpainted semi-porcelain (1) - New St. Joseph. A saucer rim sherd. The interior design has three elements (Figure 45i, p. 241). The green appears as two little spatters. The vermillion, in two shades, represent different design elements. The darker vermillion looks like part of a ribbon tied in an elongated and elaborate bow. The lighter, more brown, color is comprised of four intersecting, arcing lines. The exterior is white. An interesting note regarding this sherd is the shortness in length from the rim to the interior (and basal rim). It possible is part of a child's saucer.

XI. Vermillion, green and black on white glazed stoneware

Handpainted spongeware (11) - New St. Joseph. Below the rim is a band of vermillion (Figure 46a, p. 245). A wide strip of the border is painted green and decorated with black flowers applied with a sponge. Below this is a space of white and then another band of vermillion. The exterior is white.

XII. Vermillion and grey-green on white glazed stoneware

A. Handpainted spongeware (6) - New St. Joseph. The rim on both the exterior and interior have a painted thick, horizontal band of vermillion (Figure 46b, p. 245). The rest of the interior is white. The exterior has a design made by sponge in grey-green. The design is not easily discernible but does not appear to be of any specific shape.

B. Handpainted spongeware (2) - New St. Joseph. The vermillion bands appear lower down the body below the grey-green sponge design. The interior is white.
Figure 46. Decorated sherds, vermillion, green and black on white, vermillion and grey-green on white and blue-green on white glazed stoneware.
XIII. Blue and green on white glazed stoneware

A. Transfer print with handpainted wash (1) - New St. Joseph. This sherd may have a scalloped rim; it does have an arc (Figure 46c, p. 245). The interior has a slight depression on a slant from the rim. The dark blue displays elements of a design, one part of which appears to be a flower. The exterior has blue lines in leaf designs. One design is filled in with a light wash of green. The sherd appears to be from a flat vessel, such as a platter.

B. Transfer print with handpainted wash (1) - New St. Joseph. The interior is dark and medium blue. The dark blue apparently forms a design (Figure 46d, p. 245). The medium blue, as a line, forms a border design of loops and arcs. The exterior has more design components: leaves, one washed with green, lines, with and without circles, in addition to the design formed by the dark blue. Part of the exterior has been chipped.

C. Handpainted (1) - New St. Joseph. The interior has a design of blue lines branching off much like a tree or bush (Figure 46e, p. 245). Not enough of the design is available to indicate what other elements it has. The exterior has a raised section with a definite angle suggesting it might have a polygonal rather than circular border usually encountered. The design is composed of thick, blue wavy lines with a green wash over part of the blue.

XIV. Green on white glazed stoneware

A. Handpainted (6) - New St. Joseph. The interior has a leaf pattern of green. The exterior is white.

B. Handpainted (3) - New St. Joseph. One sherd has a single band of green. The other two have a horizontal, embossed design with a vertical green band. All three have a grey discoloration, possibly resulting from being burned.

XV. Green and black on white glazed stoneware

A. Handpainted splatterware (1) - New St. Joseph. The interior has green splatter
Figure 47. Decorated sherds, green and black on white, white with various colors, white with bands of color, white and another color and black-grey on white glazed stoneware.
with two black lines (Figure 47a, p. 247). The black lines are arced and appear to be part of a design. The exterior is white.

B. Handpainted (1) - New St. Joseph. The exterior design is comprised of leaf patterns in green connected by black stems. The interior is white.

XVI. White with various colors glazed stoneware

A. Handpainted (1) - New St. Joseph. The vessel may have been a tureen or bowl with feet. The exterior is white with an embossed design (Figure 47, p. 247). Above the foot and design is a handpainted pattern comprised of the following: two thick blue lines with curves and arcs in a vertical design; a vermillion horizontal line that splits in two with each new line going in arc in opposite directions. Above and to the left of the red lines is a hint of blue, possibly part of the thick blue design. Directly below the blue (and is contact with it) and vermillion are two horizontal violet lines. Over the vessel near and below this handpainted pattern are black spots indicating splattering. Where the foot is painted black there appears to be no overglaze as it appears on the rest of the vessel. It is possible that it wore off from use or weathering. The interior is white.

B. Handpainted (1) - New St. Joseph. The exterior has a handpainted as well as an embossed design (Figure 47c, p. 247). The embossed design element is two rounded, raised dots occurring at an indented curve. It is impossible to determine where in the body the curve is located. The handpainted design has several components in various colors. A connecting line of brown joins the other colors. The brown splits at one end with a slash of blue-green in the split. Above the split is a simple leaf shape in grey-green; a similar shape in tan was painted from the bottom side of the split. At the other end is a bell-shaped design component split into two colors, blue-green on top and grey-green on the bottom. The interior is white.

XVII. White with bands of color, white and another color glazed stoneware. This category includes 13 discernible examples (some may actually go together, but without a
fuller body sherd displaying all color components it is difficult to 'lump' together sherds with the same or similar color) (Figures 47d-k, p. 247). There appear to be four basic patterns: 1) raised horizontal bands (with consistent or varying widths) covering the vessel exterior from the rim to the base; 2) raised horizontal bands covering part of the vessel exterior from the rim to about the center with the remainder glazed in one of three colors (variation appears in two of the colors) to above the base, which is white; 3) same as #2 except that the horizontal bands are not raised; and 4) only one sherd showed this pattern; it is reversed with the solid glaze from the rim to the center and raised horizontal bands down to just above the white glazed base. The interior is white. These probably represent cups and bowls: the width of the bands and solid components, if both show, indicate a cup or bowl. All were recovered at New St. Joseph.

A. Underglaze of raised, thick dark blue horizontal bands (10). There is some of the flow blue phenomenon without obscuring the definition of the band edges.

B. Underglaze of raised, thick medium blue bands (5). There is some of the flow blue phenomenon without obscuring the definition of the band edges.

C. Underglaze of raised, thick blue (in varying shades and degree of flow blue) horizontal bands (11). Below this is a body of solid blue-grey. One sherd curves slightly inward, possibly to the base of the vessel and is white.

D. Medium blue horizontal bands and a solid base (3).

E. Underglaze of raised light blue horizontal bands in varying widths (10). Three sherds are based of bowls or cups and two are rim sherds. The bands appear to run the length of the vessel body.

F. Underglaze of solid medium blue (2).

G. Underglaze of raised, thick blue-green horizontal bands, a medium blue solid body and a white base (4). One sherd is chipped on the interior.

H. Underglaze of three raised, thick grey-blue (with flow blue) horizontal bands
above a lower body of solid grey-green (4). The short width of the band component suggests these are cup sherds.

I. Underglaze of raised, thick grey-green (with flow effect) horizontal bands above a lower body of solid medium blue (2).

J. Underglaze of three raised, thick dark blue horizontal bands above a lower body of solid mustard suggesting another set of cup sherds (2).

K. Underglaze of solid mustard for the top portion with at least two raised, thick dark blue horizontal bands below followed by the white glaze base (1).

L. Underglaze of raised, thick olive green horizontal bands from rim to above the base, which is white (5). Two of the sherds are actually the exterior glaze and paste of a third.

M. Underglaze of solid olive green with no bands or base (1). It is part of the vessel body.

XVIII. Black-grey on white with overglaze highlighting Stoneware

Spongeware (2) - New St. Joseph. The underglaze has the flow blue phenomenon (Figures 47l and 47m, p. 247). The pattern, appearing on the interior, has a border/interior geometric design and a floral design in the interior. The geometric design components are two sets of two lines as borders. Inside are a series of elliptic leaf shapes with a slash mark on either side. The leaves are arranged in groups of four, set up so that they form an "X", but without touching. The floral design components include several three-lobed cup-shaped petals (they appear to be distinct, that is, separate from each other and joined at the base). Red and yellow overglaze color the edges of the petals. Black/grey shades other parts of the design, but not enough is available to identify it. The one discernible leaf is notched and has lines following its curve, possibly representing veins. One sherd has a basal rim. The exterior is white.
Figure 48. Decorated sherd, blue and black on white glazed stoneware and decorated porcelain, gold on white.
XIX. Blue and black on white glazed stoneware

Handpainted splatterware (1) - New St. Joseph. This appears to be a cup handle with an interior decorative flare near the bottom of the handle (Figure 48a, p. 251). On the exterior, along the raised mold line, is a painted blue line of varying thickness. The base of the handle is painted black and black splatter covers mostly the exterior with a few splatter marks on the interior.

XX. Blue-green glazed stoneware

Underglaze of color (robin's egg blue) on the interior with a cream white glaze on the exterior (1) - New St. Joseph. It has a basal rim which suggests a bowl or a cup. There is no apparent decoration.

XXI. Green and tan glazed stoneware

The interior is tinted green. The exterior is tan.

Porcelain. There was very little porcelain recovered from New St. Joseph and none from Sandy Town B. There are only two classes, plain and decorated.

I. Plain porcelain

This porcelain has a white glaze on both the interior and exterior (3). There is no surficial decoration of any kind.

II. Decorated porcelain

A. Handpainted gilt (2) - New St. Joseph. A saucer. The interior is decorated with a horizontal band of gold just below the rim edge (Figure 48b, p. 251). The border is fluted. A thin gold band decorates the raised edge of the border/interior with another thin band in the center of the interior. The exterior is white. The sherds are discolored, probably due to a chemical reaction to the soil.

B. Handpainted (1) - New St. Joseph. This sherd has an interior decoration of two painted lines, one in yellow and the other green on white. The exterior is white.
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Figure 4. New St. Joseph.

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UMI
Figure 5a. Sandy Town B (Revision of site map).
on of site map).
Adobe Foundation
Rock Foundation
House Mound
Excavated Channel
Berm

Scale
0 5 10 meters

Main Bench Canal

ON

70E

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Figure 4. New St. Joseph.

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