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CONTRIBUTIONS TO THE STUDY OF CULTURAL RESOURCES

ARCHAEOLOGY OF THE

OLD SPANISH TRAIL/MORMON ROAD

From Las Vegas, Nevada to the California Border

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ABSTRACT

A portion of the *Old Spanish Trail/Mormon Road* from Las Vegas to the California border was intensively examined by BLM archaeologists between 1987 and 1989. Historic research indicates that this trail was forged in 1844 and utilized as an immigration route until 1905, with some localized traffic until the 1940s. In spite of disturbance from off-road activities and contemporary urban construction in one of the fastest growing areas in the nation, some sections of the trail in southern Nevada retain some degree of integrity. With the exception of 19 miles where paved highway has covered the trail, artifacts still remain along the historic route. About 30 miles were walked and artifacts recorded. Seventy-five selectively collected artifacts were descriptively analyzed and indicate most use of the trail occurred from the 1880s up to the first decade of the 20th century. Archaeology of the trail yielded information on transportation, artifact distribution and subsistence practices of the trail users. Approximately 25 percent of the trail remains relatively undisturbed and 35 percent is only partially disturbed from off-road vehicles. Almost 60 percent, then, yet exists in some fashion as a trail. Recommendations for management of the trail include promotion of a feasibility study for nomination of the route as a National Historic Trail and use of sections for interpretive exhibits-in-place.



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The idea to walk 30 miles of the *Old Spanish Trail/Mormon Road* was conceived by Stan and I during our intensive inspection of 1.5 miles of trail for a compliance-based inventory. Stan Rolf and I were aware that the trail crossed west Las Vegas Valley, but we did not know if any relatively pristine portions remained. Time and funding are at a premium and the fieldwork and initial report on the project required two years to complete. This final document is the result of help from several folks.

The project received heavy support from the BLM Las Vegas District Management. Ben Collins, District Manager, and Runore Wycoff, Stateline Resource Area Manager, solicited and received continuing updates on the development of the fieldwork and initial report writing. Gary Ryan, Associate District Manager, and Pete Christensen, Chief of Resources, arrived during the later stages of this project and also followed our progress.

Once the fieldwork was completed, the intensive process of documenting the results was necessary. Two individuals played crucial roles in this step. Bill White, presently Preservation Planner for the Nevada State Historic Preservation Office, worked as the graduate intern archaeologist during my cooperative Cultural Resource Management Internship Course with UNLV. As one of two assigned research projects, Bill analyzed the entire collection of artifacts from the trail. With his submission of the comprehensive draft of the descriptive artifact analysis, I felt responsible to distribute to the interested public as quickly as possible our data on the archaeology and proposed general management of the trail. The other individual who aided in getting the document completed within my projected time frame is Tim Smith, Supervisory Outdoor Recreation Planner, and my immediate supervisor. Tim requested I make this task a priority, and gathered information on the National Historic Trails Act. His support and decision on keeping the project a priority continues.

Several individuals at the Nevada State Office applauded our efforts on completion of the initial report, including Steve Smith and John Chappell. Maxine Shane initiated the process of moving this report into the Technical Series and also performed the tedious tasks of getting samples of my chapters printed. Pat Barker, Nevada BLM State Archaeologist offered Stan and I varying kinds of advice, in particular the importance of involving interested parties, and he also made the "cut" to authorize publication.

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Keith Myhrer
February 1990

CHAPTER ONE

INTRODUCTION TO AN HISTORIC TRAIL

In 1844, John Fremont forged a new route across southern Nevada. This alignment became part of a larger path that had connected Santa Fe, New Mexico and San Gabriel, California. This new portion through southern Nevada and Las Vegas Valley was used for about five years as one alignment of the *Old Spanish Trail* and for another 55 years as the *Mormon Road*. Thousands of travelers navigated this route for immigration and trade across an arid and often environmentally hostile terrain. The trail established the importance of Las Vegas Springs at the time as an environmental oasis. About 135 miles of the trail diagonally cross southern Nevada.

There is some contention whether the term *Old Spanish Trail* is appropriate for the route that cuts through this region. If the trail was mainly utilized by traders on horseback and in pack trains searching for new routes between Santa Fe and southern California prior to 1850, then the term is inadequate. If the course was mostly used for transport of people and supplies between Salt Lake City and San Bernardino after 1850, then the name *Mormon Road* is more fitting. We know that the historic trail that crosses Las Vegas Valley and cuts through the Spring Mountains was mainly used for transport of freight and humans for more than 50 years after 1848. Yet, it earlier served for a short time as a trader's horse and mule path and has been referred to by historians for this phase as the *Old Spanish Trail*. As a measure to identify both periods of use the historic route in this area is referred to as the *Old Spanish Trail/Mormon Road* (26CK3848/BLM 53-4969).

From May, 1987 to April, 1989, Keith Myhrer and Stanton Rolf, archaeologists for the Las Vegas District Bureau of Land Management (BLM), intensively examined the route of the *Old Spanish Trail/Mormon Road* from Las Vegas to the California border. A total of 77 artifacts including cans, glass and metal were collected and curated. The artifacts were descriptively analyzed in April, 1989 by William White, graduate intern archaeologist and presently Preservation Planner for the Nevada State Historic Preservation Office. Examination of the trail and associated objects yielded abundant information concerning chronology and living and subsistence behavior of the travelers.

The intensive survey of the trail had three objectives. First, the actual route on the ground needed to be identified and documented on appropriate maps by archaeologists. Second, an archaeological investigation including artifact analysis had never been accomplished on an historic trail in this particular area. Third, an evaluation for National Register eligibility of specific portions of the trail was warranted. The determination compliments recommendations for proactive management including a discussion of the potential of conducting a feasibility study to designate the route as a National Historic Trail. The results of the survey include appropriate 7.5 minute series United States Geological Survey (USGS) topographic maps with delineation of the route, descriptive archaeological research of the artifacts, a recommendation for an eligibility determination for two portions, and recommendations for managing the trail.

General Location and Environment

The route that is considered the *Old Spanish Trail* in this document originated in Santa Fe, New Mexico, and proceeded northwest into Utah. The trail crossed the Green River north of Moab and cut east and then south along the east side of the Wasatch Mountains. The *Mormon Road* originated in Salt Lake City and joined the Old Spanish Trail along the Sevier River in the middle of the present state of Utah. The route continued to the present location of Cedar City and to



Littlefield, Arizona, where it connected with the Virgin River near today's Mesquite and Bunkerville.

From the Virgin River south of St. George, the trail headed to the springs of the Muddy River at the approximate location of the present townsite of Moapa. The section from Moapa to Las Vegas was a 50-mile waterless run, perhaps the harshest on the trip. From Las Vegas, it cut through Potosi Pass in the Spring Mountains, through the Pahrump Valley into California, through Emigrant Pass, and to Bitter Springs. The remaining trail to San Bernardino and San Gabriel lies within California.

There is debate concerning the initial year that the *Old Spanish Trail* actually cut west across Las Vegas Valley and through the Spring Mountains. Some historians have used the year 1829 as the date of the forging of the route. It is more likely that from 1829 to 1844 there were at least two other paths to traverse this area. These are presently considered as unidentified traces. This topic is further discussed in Chapter Two. The last route of the *Old Spanish Trail*, and final years of this trailblazing phase, was forged by Fremont in 1844 when he crossed southern Nevada from Moapa to Stump Spring. This path was then adopted for the immigration and trade phase as the *Mormon Road*.

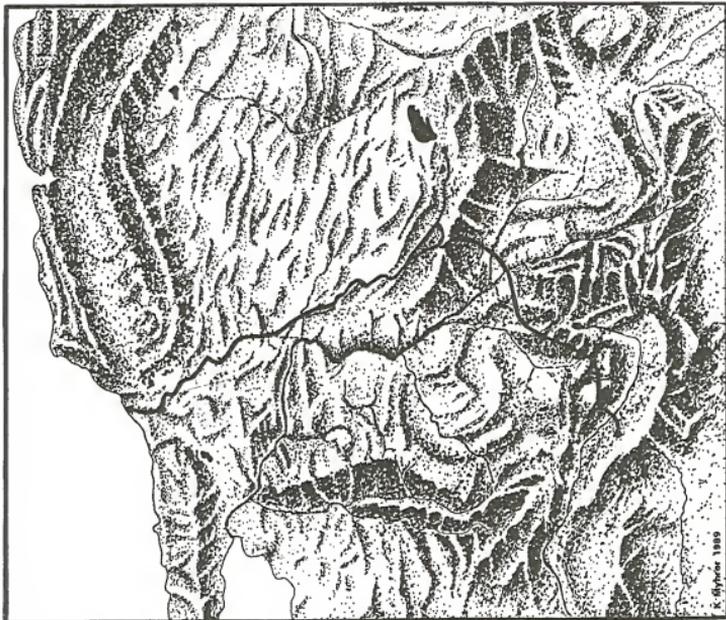
Figure 1 shows the alignment of the trail on a relief map of the southwestern United States without delineation of state boundaries. Figure 2 is a relief map with locational labeling. The general environment of southern Nevada pertaining to geology, topography, climate and vegetation is discussed below. Land ownership and general legal locations are also described.

Geology and Topography. Longwell *et al.* (1965) is referenced for information on geology of Clark County. The portion of the trail that dissected southern Nevada is varied concerning geology and topography. Figure 3 identifies the route on a relief map of the area.

The trail entered Nevada from the east and paralleled the Virgin River on the north side. To the southeast, the Virgin Mountains, composed of a base of Precambrian rocks, granite, gneiss and schist, and dolomite and limestone deposits above, rise 8000 feet. The trail surface is composed of Muddy Creek Formation sandstone in the Virgin River drainage at an elevation of about 1500 feet, and in sandstone alluvium on Mormon Mesa at an elevation of 2200 feet. The trail is about 11 miles in length from the stop at the present townsite of Littlefield, Arizona to an area near today's Riverside, Nevada. From this point it headed west, crossing Meadow Valley Wash and the springs at the headwaters of the Muddy River, a distance of 23 miles and an elevation of 1500 feet. With the exception of the rise from the floodplain to the top of Mormon Mesa, travel should have been relatively even and gradual in the sandy gravels.

From the water sources in the Moapa Valley, the trail continued south into the alluvial Dry Lake Valley, above 2000 feet in elevation. The section of trail from Moapa to Las Vegas Springs was about 50 miles long. There were no springs along this portion of the route and all water had to be carried. Following the north-south trend of the alluvial valley, the trail crossed the alkali bed of Dry Lake on the east side. The North Muddy Mountains rise 3000 feet on the east and the Arrow Canyon Range climbs 5000 feet on the west. Both ranges are primarily composed of limestone. The trail entered the pass at about 2500 feet near the present railroad siding of Apex. Limestone formations of the Dry Lake and the Las Vegas Ranges rise 3000 feet on the east and 6000 feet in elevation on the west respectively. The surface is cut by a heavy pattern of east-west washes which likely made travel somewhat rough. The trail then dropped about 300 feet to end the dry section at Las Vegas Springs.

The route cut through the northwest-southeast trending Las Vegas Valley, an area composed of alluvial deposits at an elevation of about 1950 feet. Although the valley is nearly flat in its interior, rugged mountain ranges frame the exterior. The McCullough Range lines the south, Frenchman



KEY:



Old Spanish Trail/Mormon Road

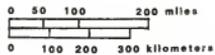


Figure 1. Relief map of the Old Spanish Trail/Mormon Road.

and Sunrise Mountains the east, and the Spring Mountains stretch in a northwest to southeast direction along the west side of the valley.

The trail proceeded from Las Vegas Springs 18.7 miles southwest to Cottonwood Spring at the present town of Blue Diamond along the east alluvial fan piedmont of the Spring Mountains. On the east are the Wilson Cliffs rising at an elevation of about 6500 feet and composed of Aztec Sandstone. The trail cut through low hills of dolomite and limestone. Elevation on the alluvial surface of the trail increases from 1950 feet at Las Vegas Springs to 3300 feet at Cottonwood Spring. This was likely one of the two roughest portions of the trail in southern Nevada. The limestone bedrock between springs poses an unyielding surface for animal, human and wagon.

From Cottonwood Spring the trail ran west through Cottonwood Valley and abruptly rose in elevation through Potosi Pass to Mountain Springs at an elevation of about 5300 feet. This section is 8.7 miles long. Potosi Mountain, like the Spring Mountains, is primarily composed of limestone and dolomite.

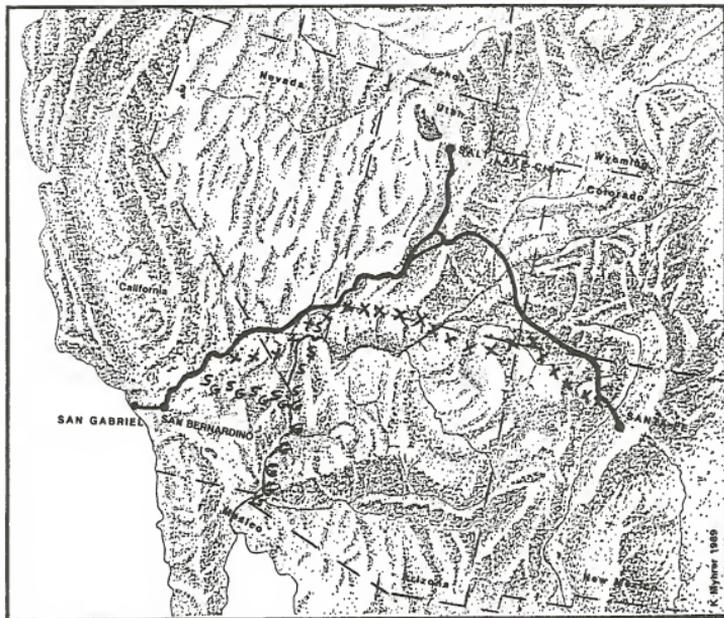
From Mountain Springs the trail dropped into the alluvial sands of Pahrump Valley to reach Stump Spring at 2800 feet elevation, a distance of 18.9 miles. This is perhaps the most difficult section for visually following the trail because the route cut through silty dunes about two miles east of Stump Spring. The trail then crossed the Nevada/California border, through Emigrant Pass in the Nopah Range, and headed to Resting Springs at 1900 feet elevation in the southeast end of the Resting Springs Range. This is a distance of 21 miles.

In summary, there is some geologic variation along the route of the *Old Spanish Trail/Mormon Road* in southern Nevada. The trail entered the east portion of the state in sandstone deposits, cut southwest in limestone alluvial fill, traversed the alluvium in Las Vegas Valley, ascended the limestone bedrock of Potosi Pass, and reached the California border in a stretch of alluvial fill from the Spring Mountains.

There is considerable more variation in the topography of the trail. Table 1 shows differences in elevation along the route through southern Nevada. The greatest climb and drop in elevation occurred in the stretch from Cottonwood Spring to Mountain Springs, with a 2000 feet ascension, and then to Stump Spring with a 2500 foot drop. The average distance between springs from Littlefield, Arizona to Resting Spring, California is 22 miles. With the removal of the 50-mile dry stretch between Moapa and Las Vegas from the data, the average distance is 17 miles. The span from Cottonwood to Mountain Springs is only 9.7 miles, but the 2000 foot climb likely doubled the distance, at least in real time expended. The 50-mile trek between Moapa Valley and Las Vegas Springs is the roughest in terms of the absence of springs along the route rather than differences in elevation.

Climate. Summers in southern Nevada are long, hot and arid. Winters are mild. The average temperature is 46 to 47 degrees F in winter and 87 degrees F in summer. Average relative humidity is about 20 percent. Normal annual precipitation is four inches, and often occurs in cloudbursts that cause flash flooding in ephemeral washes (USDA 1980:5; USDA 1985:3).

Vegetation. With the exception of Mountain Springs, elevation on the trail ranges between 1500 and 3300 feet. This environment is within the Creosote Bush Community. Creosote bush (*Larrea tridentata*) is the dominant shrub on the broad alluvial fans. Salt-tolerant species such as saltbush (*Atriplex canescens*), cacti such as prickley pear (*Opuntia* spp.), and yuccas such as barrel cactus (*Ferocactus acanthodes*) and Mojave cactus (*Yucca shidigera*) are common. Plants along the rivers are usually salt-tolerant species, willows, and trees such as mesquite (*Prosopis juliflora* and *Prosopis pubescens*). At an elevation above 5000 feet, pinyon pine (*Pinus monophylla*) and juniper (*Juniperus osteosperma*) are found.



KEY:

 Old Spanish Trail/Mormon Road

XXX Armijo's route

SSS Smith trace

GGG Garces route

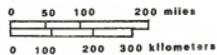


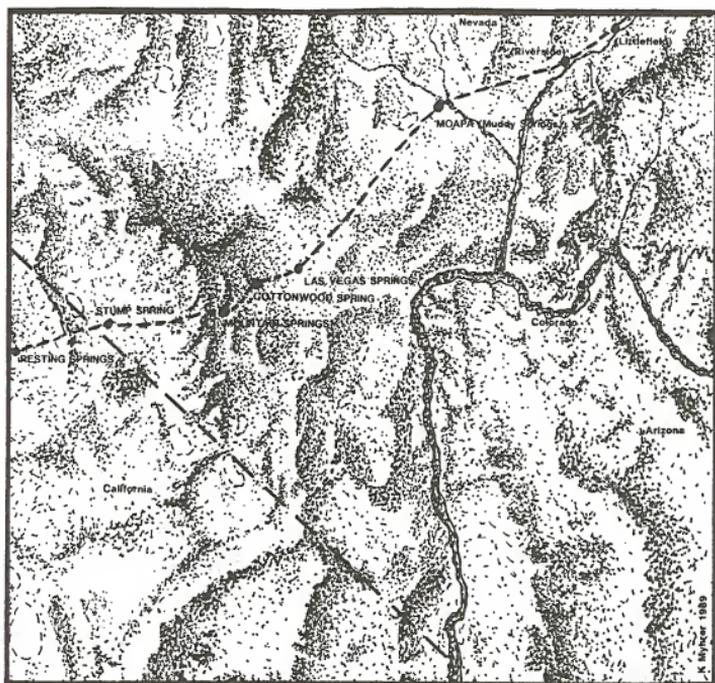
Figure 2. Relief and locational map of the Old Spanish Trail/Mormon Road.

Table 1. Variation in elevation on the *Old Spanish Trail/Mormon Road* in southern Nevada.

Location	Elevation	Elevation Difference	Distance from Spring to Spring
Littlefield, Arizona	1700 feet		
Virgin River/Riverside	1500 feet	200 feet	10.8 miles
Mormon Mesa	2200 feet	700 feet	
Muddy River Springs	1500 feet	700 feet	23.0 miles
Dry Lake Valley	2000 feet	500 feet	
Apex Siding	2500 feet	500 feet	
Las Vegas Springs	1950 feet	550 feet	50.0 miles
Cottonwood Spring	3300 feet	1350 feet	18.7 miles
Mountain Springs	5300 feet	2000 feet	8.7 miles
Pahrump Valley: Stump Spring	2800 feet	2500 feet	18.9 miles
California: Resting Springs	1900 feet	900 feet	21.1 miles
		Total	152.2 miles

Land Location and Ownership. The linear trail from Las Vegas Springs to the Nevada/California border dissects portions of cadastrally surveyed townships and ranges. Land areas crossed by the route are legally described as T.20.S., R.60E., Section 36; T.20.S., R.61E., Section 31; T.21.S., R.59E., Sections 24, 25, 26 and 34; T.21.S., R.60E., Sections 1, 2, 3, 8, 9, 10, 17 and 18; T.22.S., R.55E., Section 34; T.22.S., R.56E., Sections 33 and 34; T.22.S., R.57E., Sections 28, 29 and 36; T.22.S., R.58E., Section 24; T.22.S., R.59E., Sections 3, 17, 18 and 19; and T.23.S., R.55E., Sections 5 and 6. The route was plotted on USGS topographic maps duplicated in Appendix One. With the exception of the Goodsprings 15 minute 1952 quad, all topographic maps are in the 7.5 minute series: Blue Diamond (1972), Blue Diamond NE (1972), Blue Diamond SE (1972), Green Monster Mine (1984), Las Vegas NW (1972), Lost Cabin Spring (1984), Mountain Springs ((1984), and Stump Spring (1984).

Lands that are presently in private ownership include 8.5 miles of urban construction south of Las Vegas Springs. A one-mile long portion that starts 4.2 miles north of Blue Diamond was inventoried in 1987 for the 1989 Red Rock/Summa Land Exchange. Other lands in private ownership include the area surrounding Cottonwood Spring, the patented property owned by the gypsum mine northeast of Blue Diamond (T.22S., R.59E., Sections 7 and 8), and much land around Mountain Springs (T.22S., R.58E., Section 20). Private land covers about 10.9 miles of the 45.8 mile trail. About six miles (T.22S., R.57E., Sections 22, 23, 24 and 27; T.22S., R.58E. Sections 29, 20 and 29) of the route through Potosi Pass that is under paved highway is public land that was managed by BLM at the time of the inventory but is presently managed by the United States Forest Service. The remaining land on which the *Old Spanish Trail/Mormon Road* lies is public and managed by BLM.



KEY:

----- Old Spanish Trail/Mormon Road



Figure 3. Route of the Old Spanish Trail/Mormon Road through southern Nevada.

CHAPTER TWO WALKING THE TRAIL

by Keith Myhrer and Stanton D. Rolf

Three major historic trails crossed southern Nevada. The *Mojave Road* dates to Garces crossing of the Colorado River in 1776, with most use occurring in the 1880s. A short portion of the trail entered Nevada at its southern tip to connect Ft. Tejon, California with the Mojave Villages on the east side of the Colorado River. In 1962, Dennis Casebier inaugurated steps to reopen the *Mojave Road* in order to "...save it from the slow death it had been suffering since the 1880s" (Casebier 1983:9). The means of reopening the trail involved driving the route in off-road vehicles and marking the path with rock cairns. Out of this desire to save the trail, an historic group called the *Friends of the Mojave Road* was initiated. Another trail is the *Arrowhead Trail*, a motor route through Valley of Fire and along the west side of the present I-15 highway north of Las Vegas. Inventory of the portion on BLM has not been accomplished.

The other historic trail that crossed southern Nevada is the *Old Spanish Trail/Mormon Road*. The goals at the outset of the contemporary investigation of this trail differed somewhat from the goals Casebier held for the *Mojave Road*. The purpose of the inventory was to document the state of preservation and recommend for management the kinds of use options that remain. The method chosen for this inventory was similar and yet slightly different from Casebier's. Archaeologists would walk a long, yet manageable, section of the trail to determine whether there are any portions that retain integrity. Also, selected artifacts would be collected for laboratory analysis, curation, and use for a community historic heritage display.

Selecting a Section of the Trail

As a result of a compliance driven inventory for a land exchange in Las Vegas Valley, 1.5 miles of the *Old Spanish Trail/Mormon Road* were surveyed in 1987 by BLM Archaeologists Keith Myhrer and Stanton Rolf. The investigators noted that even though the trail in this area had been used for a long time as a jeep road, numerous artifacts along the sides and in the trail remained. Also, short, pristine portions could be found where topography had induced modern off-road drivers to a slightly different course.

Due to the amount of data believed to be yet available and the potential for longer pristine portions to be located, the archaeologists determined that the trail needed to be inventoried for management direction. Funding would be provided by the primary cultural resource program of the Las Vegas District BLM. Due to the limited amount of funding, only a portion of the 152 mile section of trail in southern Nevada could be surveyed.

A section of trail that is 48.3 miles in length from Las Vegas Springs to the California border was selected. It was chosen for two reasons. First, the expansion of Las Vegas through recent construction and trash dumping had affected pristine land mainly in the southwest part of the valley. Second, the archaeologists had already walked 1.5 miles in this portion and 10 additional miles had been driven in a reconnaissance survey during the initial land-exchange inventory. The section of the trail selected for this walking inventory began at the southwest edge of Las Vegas urban construction and ended at the Nevada/California border.

Prior to physically walking the route, library research was conducted to determine chronology and historical accuracy of the account of the trail. The literature review is discussed below. The research design that was subsequently developed utilized historical data and archaeological methodology to conduct the laboratory and fieldwork in a scientific manner.

Literature Review: Trailblazers

Three sources are used to discuss the history of the trailblazing and uses of the trail. Joseph Hill (1930) traces the path of what some can refer to as the original "Old and Spanish" trail. Historians LeRoy and Ann Hafen documented much of the history of the West in a series of chronicles including one book on the *Old Spanish Trail* (Hafen and Hafen 1954). Elizabeth Warren (1974) focused on the Armijo Expedition and the nature of its crossing of Las Vegas Valley. The following discussion is divided into three sections that are referred to as "The Old and the Spanish Trail," "The Popular Old Spanish Trail," and "Fremont's Old Spanish Trail/Mormon Road". Table 2 lists the chronological history of these explorers in the region.

The Old and the Spanish Trail. The trailblazers in this phase were Spanish and were the relatively old in a historical sense. The era of exploration in this portion of the continent began with two Franciscan friars in the latter part of the 19th century. S.B. Dominguez, S.V. De Escalante and a party of 10 men left Santa Fe, New Mexico on July 29, 1776 for the purpose of establishing a mission at Monterey, California. This trip constituted the first exploration into the Great Basin by non-Indians. The group traveled northwest through Gunnison, Colorado, crossed the Green River, headed to Utah Lake and eventually reached the Sevier River. Due to perceived difficulties in crossing the Sierra Nevada Mountains, the Sevier River became the new destination. Never reaching any farther west, the group initiated Spanish-Indian trade with the Utes. This route became in reality the original *Old Spanish Trail* and evolved into an exchange route for the trade of woven textiles, fur pelts and Indian slaves (Hill 1930:11-13, 17). This trade continued until the region was settled by non-Indians.

The return trip to Santa Fe was by a different path. "The further route of the Escalante party concerns us but little here, for instead of heading southwest in the direction of our later Spanish Trail they traveled south and then southeast" (Hafen and Hafen 1954:72). Based on the historical data, it is evident that on Escalante's return trip to Santa Fe he reached the junction of the Virgin River near the present site of Hurricane, Utah and at this point crossed what would become the popularly referred to *Old Spanish Trail*.

Also in the year 1776 another Spanish padre, Father Francisco Garces, entered the region. On an exploratory trek that began on Feb. 14, 1776, from Mission San Xavier del Bac near Tucson, Arizona, Garces departed the Yuma villages on the Gila River with a destination of the mission at San Gabriel, California. He traveled up the Colorado River and reached the Mojave villages north of present day Needles, California. From this point he crossed the extreme southern tip of Nevada and trekked across the Mojave Desert to arrive at Mission San Gabriel. "Garces thus becomes the discoverer of the trail the Mohaves led him along in 1776. In any event, he was the first white man to traverse the Mohave River segment of the Old Spanish Trail" (Hafen and Hafen 1954:79). On Garces' return trip east from the mission at San Gabriel he used the same route to cross the Mojave Desert to reach the Colorado River. "Arrived at the Mohave towns, he continued down the Colorado to the Yumas and then returned to Mission San Xavier del Bac in Southern Arizona" (Hafen and Hafen 1954:80).

Table 2. Historical review of trailblazers of the *Old Spanish Trail/Mormon Road*.

<i>Year</i>	<i>Individual</i>	<i>Trail Destination</i>	<i>Citation</i>
<i>The Old and the Spanish Trail</i>			
1776	S.V. De Escalante S.B. Dominguez	From Santa Fe, New Mexico to Monterey, California. Trip ends at Sevier River; returns via Arizona Strip.	Hill 1930:11-13 Hafen and Hafen 1954:59-73
1776	Francisco Garces	From Mojave Villages, Arizona to San Gabriel, California. Discoverer of the "Mojave River" segment of the Old Spanish Trail.	Hafen and Hafen 1930:79-80
<i>The Popular Old Spanish Trail</i>			
1826- 1827	Jedediah Smith	From Great Salt Lake, Utah to San Gabriel, California.	Hafen and Hafen 1930:129
1829- 1830	Antonio Armijo	From Abiquiu, New Mexico to San Gabriel, California, via Las Vegas Wash, Goodsprings Valley, Mojave River.	Hafen and Hafen 1930:166-167 Warren 1974:66-71
1830- 1831	William Wolfskill George Yount	From Abiquiu, New Mexico to San Gabriel, California.	Warren 1974:92-93
1844	John Fremont	From Mojave River, near Barstow, California to Great Salt Lake, Utah. He was the first to travel through Pahrump, Las Vegas and Moapa Valleys.	Hafen and Hafen 1930:288 Warren 1974: 154-183
<i>Fremont's Old Spanish Trail/Mormon Road</i>			
1848- 1850s	Travelers	The route of the <i>Old Spanish Trail/Mormon Road</i> as known today.	Hafen and Hafen 1930:288 Warren 1974

In summary, the trailblazers of the "Old and the Spanish Trail" era were Gárces, Dominguez and Escalante. The Escalante route was actually an independent trade trail that connected Santa Fe with the Great Basin, and is not part of the commonly considered *Old Spanish Trail*. In contrast, Garces forged the Mojave segment of the popular *Old Spanish Trail*. Based on Hill's (1930) historical data, it can be argued that the only real portion of our popular route that is of the *Old Spanish Trail*, meaning "old" and "Spanish", is that segment from Santa Fe to the Sevier River. Why, then, was the name *Old Spanish Trail* also given to the entire path, of which portions would not be blazed for another half century, from Santa Fe to San Gabriel? Perhaps this data is buried in the historical documents, but at this point we can speculate that the name continued when the second half of the route was initiated.

The Popular Old Spanish Trail. The "old" and "Spanish" influence ends. The trailblazers in this more relatively recent phase were Mexican and American. Perhaps most importantly, the *Old Spanish Trail* somewhat fulfills the original intention of the Escalante party, it connects Santa Fe with California.

In 1826 Jedediah Smith, an American, left the Great Salt Lake, Utah with a party of 15 men. He followed the path of Escalante and Dominguez from Utah Lake to the Sevier River. "Continuing in Escalante's tracks along the natural route between Pine Valley Mountain and the Hurricane Fault, he undoubtedly descended Ash Creek to reach the Virgin River near Hurricane" (Hafen and Hafén 1954:115). He then followed the Virgin River down to its confluence with the Muddy River, presently an area beneath the waters of Lake Mead. Smith then continued south to the Colorado River, which he called "the Seedskeeder". Five miles south of this point he described the large salt mine cave, worked both by prehistoric Native Americans and historic settlers, located near the historic townsite of St. Thomas, also presently covered by Lake Mead. From this point, Smith wrote, "I crossed the Seedskeeder and went down it four days a south east course." (Dale In Hafen and Hafén 1954:185-186). He had now reached the Mohave Indian villages that Father Garces visited in March, 1776. The route that Smith had opened was the long awaited connecting link between the trails of Escalante and Garces (Hafen and Hafén 1954:118-119). From this point Smith followed Garces' route into California and the San Gabriel Mission. Therefore, as Hafen and Hafén state, "...this greatest of all Mountain Men explorers had tied together the routes of Padres Escalante and Garces; he had completed the general course of the Great Spanish Trail" (Hafen and Hafén 1954:129).

In 1829 Antonio Armijo, a Mexican, and a party of 31 men departed Abiquiu, New Mexico to find a trade route to California. On this westward trip Armijo first entered the region at the Virgin River near Hurricane, Utah. Here he followed Smith's trail of 1826-1827 to the Colorado River. Yet, "Instead of crossing the Colorado at the mouth of the Virgin, as Smith had done, Armijo continued along the north side of the stream to the point where Las Vegas Wash comes in from the north and where the Colorado turns abruptly to cut its narrow channel southward through Boulder and Black Canyons" (Hafen and Hafén 1954:168). This is the present locale of Boulder or Hoover Dam. After establishing a base camp at Las Vegas Wash, Armijo sent a scout ahead to find a route across the Mojave Desert to the southwest. Scout Rafael Riviera returned to Armijo's base camp with news that the path was dotted with springs all the way to the Mojave River.

At this point a major disagreement exists in route descriptions between Warren's research and Hafen and Hafén's book. Hafen and Hafén (1954:167) cite the account of the expedition leaving Las Vegas Wash. "The first night they camped at a salty arroyo; the second night at a dry lake; and on the third reached 'the little spring of the turtle'." The Hafens considered 'the little spring of the turtle' to be Cottonwood Spring, at the present town of Blue Diamond. This interpretation seems unlikely.

Warren (1974) researched diary accounts of this route and contends that the referenced "salty arroyo" was Duck Creek and the dry lake Jean Lake. A path that passes Duck Creek and Jean Dry Lake would have taken Armijo's party on a southwesterly direction to Goodsprings Valley and then through Wilson Pass on their way to the crossing of the Mojave River. Warren states, "...an excellent spring of water erupted from the valley floor in the center of Goodsprings Valley. At this spring, Armijo apparently found a desert tortoise," explaining the name "the little spring of the turtle" (Warren 1974:71).

In a logistical sense, it also seems unlikely that it would have taken up to three days to travel 31 miles to Cottonwood Spring. According to the diary of Orville C. Pratt, a traveler on the trail in 1848, distances of 30 and 35 miles in one day were common (Hafen and Hafén 1954). Although this does not imply that the purposes and expected distances of trail travelers in 1829 were the same, it does seem that three days to ride 31 miles is somewhat long. Based on this data, Warren's (1974) interpretation of the locational trace by Armijo's party through southern Nevada is accepted for this document.

In 1830 two Americans, William Wolfskill and George Yount left Albuquerque, New Mexico with a destination of San Gabriel, California. Their route differed from both Smith's and Armijo's. It is important to note here that the Wolfskill-Yount party was the first to travel the entire distance, with one exception, from Santa Fe to San Gabriel over the path that is commonly referred to as the *Old Spanish Trail*. This exception is the portion that crosses southern Nevada. They neither rode Armijo's trace nor did they take the alignment through southern Nevada that is documented in our maps (Appendix 2). Concerning the Wolfskill-Yount deviation from Armijo's alignment, Warren states that "Together these men blazed still another route to California, leaving Abiquiu, New Mexico but traveling more northerly than had Armijo along a path that later became the regular route of the *Old Spanish Trail*" (1974:92-93). In addition, rather than crossing the Colorado River as Smith had, Wolfskill and Yount proceeded down the north bank of the Colorado River, and "...followed it until they reached again the tribe of the Mahavies, and pitched their camp in neighborhood of their upper village" (Warren 1974:93).

In summary, the culmination of routes of "The Popular Old Spanish Trail" basically originated in Santa Fe, headed to the Sevier River in Utah, cut a south course to the Virgin River, usually followed in some manner the Virgin and Colorado Rivers to the Mojave Villages, or cut southern Nevada from Las Vegas Wash to Wilson Pass, traversed the Mojave Desert, and ended at the Mission of San Gabriel. The trail and its geographic deviations had as its purpose trade and was rode by pack trains.

Fremont's Old Spanish Trail/Mormon Road. This route utilizes more than half of the alignment of the "popular" *Old Spanish Trail*, adds a portion in Utah, and imbeds the commonly accepted historic segment in southern Nevada. The *Old Spanish Trail* ends early in this phase, but opens with what would become the heavily-used *Mormon Road*. This phase is definitely American-oriented.

Warren (1974) contends that in 1844 John Fremont, an American, was the first to travel west to east through Las Vegas Valley. This trip is one of four expeditions Fremont conducted in the West during this period. His seemingly winding forays are aptly discussed in both Hafén and Hafén (1954) and Warren (1974). Fremont initiates his trip on the popular *Old Spanish Trail* near the present town of Barstow, California (Hafén and Hafén 1954:288). Warren (1974) believes Fremont took a route differing from Wolfskill and Yount from Bitter Spring north of the crossing of the Mojave River. Fremont's path continued through Stump Spring, Mountain Springs, Cottonwood Spring, Las Vegas Springs, and then north to Moapa on a 50-mile dry stretch. This was the first trip through southern Nevada on the *Old Spanish Trail* as mapped by Hafén and Hafén (1954) and as commonly referred to by residents of the region.

Fremont published his maps and notes in 1845 in a United States Congressional document titled *Report of the Expedition to the Rocky Mountains, etc.* It is assumed that until Fremont's notes were published and widely distributed, travelers on the *Old Spanish Trail* took one of at least two other routes through this region. One was the Wolfskill-Yount trace along the east side of the Colorado River to the Mojave Villages near the present town of Needles, then to the Mojave River near Barstow. The other route was Armijo's path along the west side of the Colorado to Las Vegas Wash, south towards Jean Lake, west through Goodsprings Valley and Wilson Pass, and then to Bitter Spring.

After the availability of Fremont's maps and notes in 1845, travelers had choice of a new route that crossed the Virgin River and headed towards Moapa, stretched to Las Vegas Springs, Cottonwood Spring, Mountain Springs, Stump Spring and into California south to Bitter Spring. Even if Armijo had traveled from Las Vegas Wash to Cottonwood Spring, there is no evidence his party ever rode the route from the Arizona border, through Moapa, to Las Vegas Springs. Consequently, the entire route in southern Nevada from Moapa to Cottonwood Spring and beyond is considered to have been blazed by Fremont. Warren believes that once Fremont's maps were available, a greater percentage of travelers used his route.

Use of the *Old Spanish Trail* as a path from Santa Fe to San Gabriel ended before 1850 when easier routes across the north and south parts of the country were implemented. At this point in time, the portion of the trail from central Utah to San Bernardino, California was adopted as part of the *Mormon Road*. Warren notes the first wagon train to utilize the trail was in 1848. By 1850 the *Mormon Road* was in steady use. This route was used for carrying mail, freight and immigrants between Salt Lake City and southern California. Use of the *Mormon Road* as a path from Utah to California was phased out around 1905 when railroad construction was completed through southern Nevada. From the historic period of 1905 to the 1940s when the present highway was built, the route was presumably used by local ranchers or travelers heading back and forth from Pahrump Valley and beyond.

Based on this literature review, it seems that all of the portion in southern Nevada from the Arizona to California borders, considered to be the route of the *Old Spanish Trail* by historians and residents in the area, was not used until Fremont's trip in 1844. One primary difference between the *Old Spanish Trail* and the *Mormon Road* was the nature of the respective travelers. The first was mainly used by explorers and traders on horses and pack mules, while the latter was a road for emigrants and traders with wagons, horses and mules. As far as the percentages of people using the route during either time period, it is likely that more than 95 percent of the travel on the trail occurred after 1850 during the *Mormon Road* use.

Trail Research Design

The framework for the historic trail research design is guided by Lynce's discussion of Mormon colonization in the Nevada State Historic Preservation Plan (Lynce's 1982) and Hardesty's (1986) research guide on historic trails and archaeology in Nevada. Based on the literature review on the route of the *Old Spanish Trail/Mormon Road* through southern Nevada, two kinds of manifestations can be expected from use of this trail. These are the presence of material objects and remnants of impacts to the environment.

Material objects are defined as those fashioned for food and liquid storage, and those that facilitate transport of people and their possessions. These include wooden artifacts (i.e. shafts from wagons), metal objects (i.e. framework for wagon rigging, barrel hoops), leather material (i.e. harness), or food/liquid containers and use objects (i.e. metal cans, glass, ceramics, pots/pans). Impacts to the environment include wagon ruts and parallel linear paths where vegetation has changed from moving animals and vehicles. Four research questions were derived that could best provide information on the physical nature of the remains of the trail, on chronology of use of the route, and on the cultural processes of the lifestyles of the trail travelers.

Research Question 1: Impacts to the Environment. Do any sections of pristine trail remain, and if so, what is the nature of the surface? It was expected that short portions of pristine trail should remain where contemporary jeep roads deviate from the original trail.

Research Question 2: Travel Patterns. Did the travelers move from spring to spring, or where there dry camps along the way? Expectations were that only very temporary camps, probably the results of breakdowns, would be found. The travelers would normally have attempted to reach a spring by the end of the day.

Research Question 3: Chronology. What do the artifacts tell us about time of use of the trail? Based on the literature review, use of this trail occurred from a possible early date of 1829, but more likely date of 1844. Use continued to 1905 when the Union Pacific Railroad was completed through southern Nevada, and up to the 1940s when the Mountain Springs to Pahrump highway was paved.

If artifacts can be chronologically assigned to the period 1829 to 1844, the year Fremont entered Las Vegas Valley, then Hafén and Hafén's (1954) assumption that Armijo crossed the valley from Las Vegas to Cottonwood Spring can be substantiated. Because a relatively low number of travelers would have traveled the trail, with few or no artifacts dropped, the absence of artifacts from the period prior to Fremont's publication does not negate the assumption. It is also likely that such artifacts, if present, would have been noticed and collected by recent users. Recovered artifacts were expected to be chronologically assigned to times after 1850.

Research Question 4: Cultural Processes. What do the artifacts tell us about eating, drinking and living practices of the trail users? Expectations were that horseshoes, wagon parts, and food and drink containers should be found. These objects can yield information on subsistence and lifestyles of people on the trail.

Survey and plotting of the route on topographic maps was expected to record the nature of impacts to the environment from wagons, people, animals and recent vehicles during travel on the trail. Survey would also serve to record and describe material objects found on or along the trail. Analyses of the artifacts, the trail route, features and its environment were expected to address the research questions.

Field Methods

Field inventory for the *Old Spanish Trail/Mormon Road* was initiated in May, 1987 with the compliance driven survey to identify significant cultural resources for the Red Rock/Summa Land Exchange (USDI 1987). Archaeologists Keith Myhrer and Stanton Rolf walked one on either side of the trail. Artifacts were selectively collected.

Similar field methods were used for the remainder of the survey from Las Vegas to the California border. Two methods were used to determine the exact location of the trail. First, topographic maps of the area printed prior to the 1980s plotted the trail as jeep roads. Provisional 7.5 minute series USGS maps drafted in 1984 also exhibit the name "Old Spanish Trail" adjacent to the jeep road markings in some areas. Second, in observance of the 1964 Nevada Centennial, Scoop Garside, a local history buff, arranged for installation of several cement monoliths which mark the trail through southern Nevada. These markers can be found at various points along the jeep roads that are identified on topographic maps as the "Old Spanish Trail." Scoop also placed wooden stakes along some portions of the trail. Stakes were sometimes observed along the alignment.

Portions of the trail have been altered. Paved roads cover some sections and urban construction has thoroughly changed the environments at Las Vegas, Cottonwood and Mountain Springs. Urban construction covers 8.5 miles. A total of 7.8 miles are under paved highway. A dismantled railroad section associated with the large gypsum mining project northeast of Blue Diamond disturbed 3.2 miles of the trail. Nineteen miles of the trail have been used as jeep roads.

As a measure to get a feeling for the trail in other parts of southern Nevada, Myhrer and Rolf conducted an intuitive vehicular reconnaissance survey of random sections of the trail. Two cans considered similar to others collected in the southern portion were collected from a section north of Las Vegas near Apex.

Following the distribution of Las Vegas District Cultural Resource Report 5-1950(P), the forerunner of this document, cultural resource management placed greater emphasis on identifying the trail on the ground. During inventory for a linear right-of-way, archaeologists from Brigham Young University recorded several miles of the historic trail 30 miles north of Las Vegas. In December, 1989, Myhrer and Rolf visited this portion of the trail with the recording archaeologists, and determined this section

exhibits attributes of the *Mormon Road* that include a representation of artifacts and surface features present in sections south of Las Vegas. The identified route in this area matches well with the projected locational alignment. The section was relatively undisturbed and will be evaluated for eligibility in 1990.

Where it was obvious that the trail had been covered by a paved road, such as through the relatively narrow Potosi Pass, the archaeologists drove these sections at slow speed. Paved portions of the trail were considered to have little or no potential for recovering data beyond plotting of the route. In sections where the trail had been bladed for easier access the archaeologists walked or drove in a four-wheel drive vehicle at 2 mph or less. Bladed sections were considered to have little or moderate potential for recovering data. All other sections were walked with one archaeologist on either side.

The collection policy that had been established during the land exchange survey was adopted for the entire trail. This policy selected for artifacts based on two factors. The first was the estimated potential of gathering additional information through laboratory analysis. In other words, the older and more complex the object, the more likely it would be collected. The second collection factor was aesthetic and interpretive potential for an heritage display. These artifacts are described in the following chapter. Artifacts not collected were noted by code on the field maps and are discussed in quantity in Chapter Four.

A Discussion of Exclusive Routes and Authenticity

We do not believe that the alignment referred to in this document is the only route of either the *Old Spanish Trail* or *Mormon Road*. The path that is discussed is an historic trail and based on the dating of artifacts and the direction of the alignment it fits the locational definitions of both routes. We argue that the purpose of an historic route or trail was to allow people to arrive at a specific destination and possibly to access along the way homes and stores. Locations of access points and perhaps even destinations changed through time as the environment or users of the land changed. In response, use of certain alignments were abandoned and other paths initiated.

Descriptions in this document of the alignment of the *Mormon Road* are considered accurate. Settlements at Las Vegas Springs, West Point, Bunkerville and Mesquite were all stops at various points in time on the *Mormon Road*, and the route that is plotted in this document draws lines between these ranches. There were surely deviations for various purposes from the major alignment of the *Mormon Road*.

For instance, local historian Elizabeth Warren (Personal Communication 1990) believes that at some points in time *Mormon Road* travelers headed from the Mormon Fort at Las Vegas Springs to ranches in the area presently managed by BLM as Red Rock Recreation Lands via a path from Big Springs directly west, and then south along the Red Rock escarpment to Cottonwood Spring. Without further research there is not any substantial documentation on this alignment.

In terms of the route of the *Old Spanish Trail*, it can be argued that the portion we identified in southern Nevada was only one of several. We agree that the *Old Spanish Trail* in this region had at least three alignments. One path is plotted in this study and believed to have only been used for about four years, from 1844 to 1848, as a route from Santa Fe to San Gabriel. Another was along the Virgin and Colorado Rivers to the Mojave Villages. A third might have been a path that headed from Las Vegas Wash on a southwest trend along portions of what is now the alignment of the present I-15 highway.

The determination that the specific path discussed in this study is the alignment of the *Old Spanish Trail* is based on definitions by historians Hafén and Hafén (1954), and by subsequent references by

residents to this alignment through southern Nevada as the "Old Spanish Trail". One historic reference that supports our argument is the diary of Orville C. Pratt, a traveler in 1848 on what the Hafens call the "Old Spanish Trail". The record is reproduced in Hafen and Hafen (1954). Pratt refers to the "Muddy" (Moapa), the "Vegas" (Las Vegas), Pearl Spring (Cottonwood Spring), Piute Spring (Mountain Spring) and Escarbadó (Stump Spring) in his journal. These are all locations plotted on our alignment.

Warren feels the "Old Spanish Trail" portion of the *Old Spanish Trail/Mormon Road* name should be deleted (Personal Communication 1989). Warren feels that the trail that is present on the land shows evidence of use by wagons and even automobiles. This, she contends, cannot be considered a "trail", and must be called a "road." There are also problems in "proving" the route was the *Old Spanish Trail*. Artifacts from this period were likely few, and would have been the first to have been collected from the trail by local artifact hounds. If the *Mormon Road* followed one of the alignments of the *Old Spanish Trail*, as argued in this document, then the evidence on the ground would be slight and difficult to separate from later use.

In contrast to Warren's belief that the Fremont segment through southern Nevada was basically the *Mormon Road*, the argument can be made that the "real" *Old Spanish Trail* came nowhere near southern Nevada. The documentation by Hill (1930) that is discussed above implies the original *Old Spanish Trail* was limited to a route from Santa Fe to the Sevier River in Utah. The route of the popular *Old Spanish Trail* is then misnamed. Discovery of misnomers is a byproduct of historical research, but the tracing of history does not usually change present-day uses of titles that have emerged. That is why we have separated the *Old Spanish Trail* title into two categories. Concerning the route through this region, we state two assumptions. Assumption One is that there was an historic route through southern Nevada that is considered to have been the "popular" *Old Spanish Trail*. Assumption Two is that Fremont headed through this region on a general direction and path of what is considered to have been the "popular" *Old Spanish Trail*. The culmination of these assumptions is that Fremont forged a new section, albeit one that was primarily used in the *Mormon Road*, of the *Old Spanish Trail*.

As discussed above, we believe this alignment is not the exclusive route of either the *Old Spanish Trail* or the *Mormon Road*. But based on historic references, analysis of artifacts, walking survey, and plotting of the linear path that is present on the land, we consider this alignment to have been used for both trails. The linear alignment also represents an efficient method of gaining more distance in the shortest time by traveling the conceptual hypotenuse of the triangle from the Virgin River to Las Vegas to Emigrant Pass in California. It is reasonable to consider this alignment as one of the most heavily used during historic travel across southern Nevada from 1844 to 1905. Consequently, the alignment as described in this document is considered to have been a well-traveled route for the *Old Spanish Trail* and perhaps the best traveled path for the *Mormon Road*, and is treated in terms of cultural resource management as the best representative sample of each trail.

CHAPTER THREE ARTIFACT ANALYSIS

by William G. White

The collection policy established for the *Old Spanish Trail/Mormon Road* inventory emphasized the selection of artifacts that could yield information concerning chronology or cultural processes through laboratory analysis and research. A total of 77 artifacts, including two from a portion of the trail near Apex north of Las Vegas, were collected for curation and display. The artifacts were analyzed in May, 1989 and are described below. Provenience and catalog number assignments are listed in Appendix Two. Illustrations were drafted by Keith Myhrer.

Introduction

A classification system is a tool which assists the archaeologist in the analysis of cultural material. It allows the investigator to analyze the whole collection by breaking it down into manageable parts. Information obtained by researching parts is reassembled to form the basis of interpretation of the whole.

Several classification schemes are available for use by archaeologists. Prehistorians usually use a classification scheme based primarily on the material of manufacture. Historical archaeologists are fortunate to deal with cultural material that is of a relatively familiar form. The form of historical artifacts implies use, and use implies function (Blee 1988:29). Functional categories are most often used by historical archaeologists in the analysis of historic cultural material.

Prominent archaeologists, both prehistoric and historical, argue for the use of classification systems that are based on functional categories. Binford (1965:205) states, "Our categories should be justifiable in terms of possessing common structural or functional properties in the normal operation of cultural systems." South (1977:93) promotes a scheme using groups which reflect the functional activities of humans. Sprague (1980: 255) finds that the functional classification system is an approach to historical cultural analysis that works. The functional classification system, as used here, is intended to "reflect some degree of cultural reality..." (Brauner 1979:129) of those people who used and disposed of the cultural material that lies scattered along the *Old Spanish Trail/Mormon Road*.

The objective of this cultural material analysis is threefold:

- 1) to identify and describe the material culture,
- 2) to present the data in a form that can be of assistance to other researchers in the identification of historic artifacts from similar trail sites and periods, and
- 3) to offer a chronological and cultural interpretation as reflected in the limited cultural material collection associated with this particular trail.

Artifact Classification

The artifact collection consists of 77 objects. These specimens of cultural material are arranged according to functional classification based on three categories: group, class and type. Table 3 lists the objects in the collection by class. Each artifact is described with particular attention given to diagnostic attributes. Technological innovations in 19th and 20th century industry caused major and

minor changes in product form. These changes resulted in distinguishable characteristics in manufacturing techniques which allow the investigator to establish a relative chronology to aid in the final interpretation. Measurements for this study are given in feet, inches and fractions of an inch, the measurements common for the time.

Artifact Groups

The **Domestic** class represents those artifacts that relate mostly to the storage, preparation, and consumption of food or beverage products. This group is characterized by the following subclasses: Beverage, Food Serving, Food Storage and Water Storage.

The **Personal** class consists of objects owned and used by individuals. The following subclasses characterize this group: Clothing, Indulgences, and Pharmaceutical.

Table 3. Classification and total assemblage of collected artifacts from the *Old Spanish Trail/Mormon Road* from Las Vegas to the California border.

<i>Group</i>	<i>Class</i>	<i>Type</i>	<i>Number of Items</i>
Domestic	Beverage	Bottle	7 (Neck fragments)
			5 (Body fragments)
			11 (Base fragments)
			1 (Complete bottle)
	Food Serving	Ceramic	1 (Body fragment)
	Food Storage	Can	11 (Cylindrical)
			4 (Rectangular/Square)
		Can lid	1
Can related		2	
Water Storage	Barrel hoop	1	
Personal	Clothing	Clasp	1
	Indulgences	Tobacco tin	8
	Pharmaceutical/Patent	Bottle	2 (Body fragments)
			1 (Neck fragment)
Activities	Hunting/Warfare	Cartridge	1
	Husbandry	Horse/Muleshoes	8
Unclassifiable	Whatsits	Metal	8
		Metal	2
		Wood	<u>2</u>
Total recovered artifacts			77

The Activities class relates to specific and specialized activities other than those listed in the domestic group. The subclasses of Hunting/Warfare and Husbandry represent artifacts in this group.

Unclassifiable includes artifacts in which function cannot be determined. This class is divided into two subclasses. Whatsits (Blee 1989:35) represent items that are not immediately identifiable in the present study but may be recognized by someone else. The subclass of Fat Chance (Dawna Ferris: Personal Communications April 1989) includes items of unknown function, and it would certainly be a "fat chance" if functions are ever identified. Objects within these two subclasses are typed by material and described in form.

Artifact Descriptions

The artifact subclasses are first discussed in terms of literature research. Each artifact is then described. The catalog provenience number is noted by the code "MT", meaning "Mormon Trail," and is listed in Appendix One.

I. Domestic. There are 44 objects described within this class. They include beverage, food serving, food storage and water storage artifacts.

A. Beverage. Artifacts within this subclass are confined to a "bottle" group that includes 24 neck, body and basal bottle fragments and one complete bottle. Today, as in the past, glass bottles are used as containers for food products, medicines, and alcoholic beverages. Bottles are convenient containers but are very fragile and subject to breakage. Also, they are disposable once the contents are removed. The fragile and disposable natures of bottles resulted in the past deposition along the trail of numerous large and small glass container fragments for future recordation in the archaeological record.

Table 4. Major chronological changes in the bottle manufacturing industry.

Decades:	1850	1860	1870	1880	1890	1900	1910	1920
Color								
Aqua					■	■	■	■
Amethyst					■	■	■	■
Dark Green	■	■	■	■	■	■	tt
Amber		■	■	■	■	■	■	tt
Embossing	■	■	■	■	■	■	■
Bottle-making Machine								
Semi-automatic					■	■	■
Automatic							■	tt

Key: = Invented but not widely used; ■ = Period of major use of invention; tt = Time of continued use.

Based on physical attributes of glass color, embossing, and mold seams on neck and base fragments in the collection, it is possible to estimate the time range in which the bottles were manufactured and composition of the containers' contents. Table 4 lists chronological data on technological changes in the bottle manufacturing industry.

The most apparent physical attribute of glass sherds is color. Four basic colors are represented in this collection: amber/brown, amethyst, aqua, and dark or olive green. The natural color of glass is aqua or light green. Various chemical compounds are added to standard ingredients to give glass its specific finished color. Fike (1987:13) warns that color is not necessarily indicative of chronology or use but that "general analogies can be posited."

Amber or brown glass is closely associated with medicinal and alcoholic products. This color guards well against light penetration and spoilage. Because of this unique quality, amber glass had replaced aqua-colored alcohol and medicine containers by the turn of the century (Broilo 1977:240). Fike (1987:13) suggests that amber glass had a general application and that it was widely used after ca. 1860. Today amber glass is most often associated with the alcoholic product of beer.

Amethyst, or "purple", glass is clear glass that has turned color as a result of exposure to sunlight. Manganese is the chemical compound that is responsible for this color change (Hunt 1959:10). Glass manufacturers added manganese to their ingredients from the 1880s to World War I (Broilo 1977:240; Rock 1980:16). In general, clear glass had wide application for different products especially after 1875 (Fike 1987:13).

Aqua, a natural colored glass, had a general and versatile product application. "It was commonly used in nearly all the product categories since the introduction of glass bottles" (Fike 1987:13). Broilo (1977:240) suggests, however, that the relative date for aqua glass is from 1880-1910. From 1865 or earlier, green glass, like aqua, had a general and versatile use (Fike 1987:13). Broilo (1977:240) suggests a period of use for dark green glass from 1815 to 1885. Today, dark green glass color is most often associated with the better brands of champagne and traditional wines.

Evolution in the glass industry included many changes in manufacturing techniques that left identifiable marks on bottles. These marks, fingerprints, or lack of marks are useful dating aids and can yield tentative dates of manufacture. Datable attributes of bottles include method of finish application, embossing and mold seams. The technique of manufacture is suggested by the presence, absence, and location of seams left by molds. The use of molds also permitted the development of indented panels and personalized embossing.

Embossing was a common practice on less than 40 percent of all glass bottles by the mid-nineteenth century (Fike 1987:4). A suggested time range for embossing of the bottle body is from 1865 to 1915 (Broilo 1977:235). Applied labels soon replaced body embossing. Embossed trade marks, plant of production, and/or production lot numbers are often located on bottle bases (Broilo 1977:230). Prior to the invention of the automatic bottle machine finishing of the neck was accomplished by hand and a lipping tool.

The 1880s saw the development of the semi-automatic bottle making machine but the practice did not see wide use (Lorrain 1968:42-43). Owens developed and patented the fully automatic bottle making machine in 1903. Bottles made after this date have mold seams that run the entire length of the bottle from base to lip rim (Lorrain 1968:43).

I. Bottles. Twenty-two bottle fragments are classified and described according to their relative position on the bottle: neck, body and base.

Ia. Necks. There are eight glass fragments representing five necks.

1a1. MT-66. Color: Amber/brown. The bottle neck is represented by three fragments. Neck length: Unknown. Finish length: Unknown. Rim diameter: Unknown. Finish type: Wine/brandy or straight wine/brandy (Fike 1987:8). Mold marks: None observed. Finish was applied by a lipping tool. Horizontal swirl marks are visible on the finish fragment. Probable contents: Alcoholic beverage. Probable date of manufacture: Lipping tool for finish application indicates a range of 1850-1903.

1a2. MT-64. Color: Amethyst. Neck length (shoulder to rim): 1 9/16 inch. Finish length: 1 inch. Rim diameter: 7/8 inch. Inside rim diameter: 9/16 inch. Finish type: Straight brandy or wine (Fike 1987:8). Mold marks: Two opposing verticle mold seams which appear directly below the base of the finish. A lipping tool applied the finish. Faint horizontal swirl marks are visible on finish. Closure type: Cork stopper. Probable contents: Alcoholic beverage (brandy or whiskey). The small size of the neck suggests that the bottle was a hip flask. Probable date of manufacture: Lipping tool use, 1850-1903; Amethyst color, 1880-1917. Combining the two time ranges results in an overlapping of years between 1880 and 1903. This purple neck is illustrated as Figure 4b.

1a3. MT-20. Color: Aqua. Neck length (shoulder to rim): 4 1/8 inch. Finish length: 3/4 inch. Rim diameter: 1 inch. Inside rim diameter: 3/4 inch. Finish type: Ring finish (Fike 1987:8). Mold marks: Two opposing verticle mold seams that twist slightly counter clockwise 3/8 inch below the bottom of the finish indicate the finish was applied with a lipping tool. Closure type: Cork stopper. The cork is in place. Probable contents: Alcoholic beverage (whiskey). Probable date of manufacture: Aqua glass, 1880 to 1910 (Broilo 1977:240); Lipping tool, 1850-1903. Overlapping dates suggest a time range from 1880-1903. The artifact is illustrated as Figure 4c.

1a4. MT-23. Color: Amber/brown. Neck length (shoulder to rim): Unknown, shoulder missing. Finish length: 5/8 inch. Rim diameter: 1 inch. Inside rim diameter: 5/8 inch. Finish type: Crown finish (Fike 1987:8). Mold marks: Two opposing verticle mold seams which disappear 3/4 inch below base of finish. A lipping tool applied the finish thus erasing the upper mold marks. Horizontal swirl marks are visible on the finish. Closure type: Crown cap. Probable contents: Alcoholic beverage (beer). Probable date of manufacture: Lipping tool for applying finish, 1850-1903 (Broilo 1977:236); Crown cap, 1892-present (Rock 1980:12). By combining these two bits of information a range of dates of manufacture is from 1892-1903. The object is illustrated as Figure 4a.

1a5. MT-21. Color: Amethyst. Neck length (shoulder to rim): Unknown. Shoulder missing. Finish length: 9/16 inch. Rim diameter: Unknown. Complete rim missing. Inside rim diameter: Unknown. Finish type: Similar to double oil or mineral finish (Fike 1987:8). Mold marks: This broken fragment has a single verticle mold seam that continues up the finish. Directly below the finish is a horizontal mold seam. Closure type: On the inside of the mouth is a small ledge 1/4 inch down from the rim. This ledge probably acted as a stopping platform for a cork stopper. Probable contents: Beverage or mineral/cooking oil. Probable date of manufacture: The verticle and horizontal mold seams are common to automatic machine-produced with commercial bottle production beginning after 1903 (Miller and Sullivan 1984:23-24); Amethyst glass, 1880-1917. Resulting overlap of years suggests a range of 1903-1917.

1b. Body. Five specimens are described.

1b1. MT-14 and MT-15. Color: Amber/brown. There are two specimens in this category. Both represent portions of a cylindrical bodied bottle. No diagnostic marks are visible. One sherd surface is highly corroded due to the chemical decomposition

of alkalis in the glass. This decomposition is characteristic to some glass bottles made before 1903 (Hunt 1959:34).

1b2. MT-22. Color: Amethyst. This single sherd represents a body sherd at the shoulder. No diagnostic attributes are found. Color alone suggests a date of manufacture between the years 1880 to 1917.

1b3. MT-67. Color: Light aqua. There are two sherds in this category. Both fragments represent portions of a cylindrical bottle. No diagnostic marks are visible. Slight surface decomposition is characteristic of some bottle glass manufactured before turn of the century. One sherd is extremely thick while the second is comparatively thin.

1c. Bases. Eleven base fragments representing nine bottle bases are discussed.

1c1. MT-24 and MT-30. Two specimens representing two separate bases. Color: Amber/brown. Base diameter: 3 inches and unknown. Base shape: Both are from cylindrical bottles. Base profiles: Concave. Mold marks: There are no apparent mold seams on either specimen. It is possible that both bottles were manufactured using a snap case. Use of the snap case leaves no marks on the base (Broilo 1977:231; Lorrain 1968:40). The snap case holder saw use from 1857 to 1913 (Broilo 1977:231). Embossing: None present. Probable contents: Alcoholic beverages. Probable date of manufacture: Snap case, 1857-1913; both fragments have highly corroded surfaces due to chemical decomposition suggesting a pre-1903 date. Probable date range: 1857-1903.

1c2. MT-46. Color: Dark green. Base diameter: 3 3/8 inch. Base shape: Cylindrical. Base profile: Extremely concave. This base has a kick-up that measures 2 1/8 inches deep. Mold marks: None observed. The bottle was probably turned in the mold to erase mold seams. A high polish resulted from this technique (Lorrain 1968:40; Rock 1980:3). Embossing: None. Probable contents: Champagne or wine. Probable date of manufacture: Broilo (1977:231) suggests that kick-ups were used in wine bottles up to the 1900s. The turn mold technique was popular in the 1870s to as late as the 1920s (Rock 1980:3). Overlapping dates suggest a narrowed range of 1870-1900+. The artifact is shown as Figure 5b.

1c3. MT-18 and MT-19. Two sherds representing a single base. Color: Aqua. Base diameter: Unknown. Base shape: Cylindrical. Base profile: Concave. Mold marks: Faint trace of a circular mold seam on the base 5/16 inch from edge. Embossing: One fragment has the letter "R". The other fragment has the letters "CO" in a straight line arrangement. Probable contents: Alcoholic beverage. Probable date of manufacture: The circular mold seam hints at a machine made bottle but is too faint to be certain. The embossed "R" and "CO" suggest one of several possible companies as found in Toulouse (1971:438-440). Those possibilities are: a) R & Co - Roth & Co., San Francisco, CA, ca. 1879-1888 (whiskey bottle shapes), b) R & Co - Unknown maker, ca. 1880-1900+ (imported beer shape), c) RB&GCo - Unknown maker, ca. 1880s, Bottle & Glass popular phrase in use, d) RB&GCo - Unknown maker, ca. 1900s, Glass Bottle popular phrase in use, e) RGCo - Renton Glass Co., Renton, Washington, ca. 1911. The time range based on the embossing spans 1879-1911. The circular mold seam would narrow that range to the early 1900s. The base is shown as Figure 6d.

1c4. MT-17. Color: Amber/brown. Base diameter: Unknown. Incomplete base. Base shape: Cylindrical. Base profile: Concave. Mold marks: Ring seam along inner and outer edges of the base. Embossing: "Ghost" letters spelling "WOOSTER" in straight

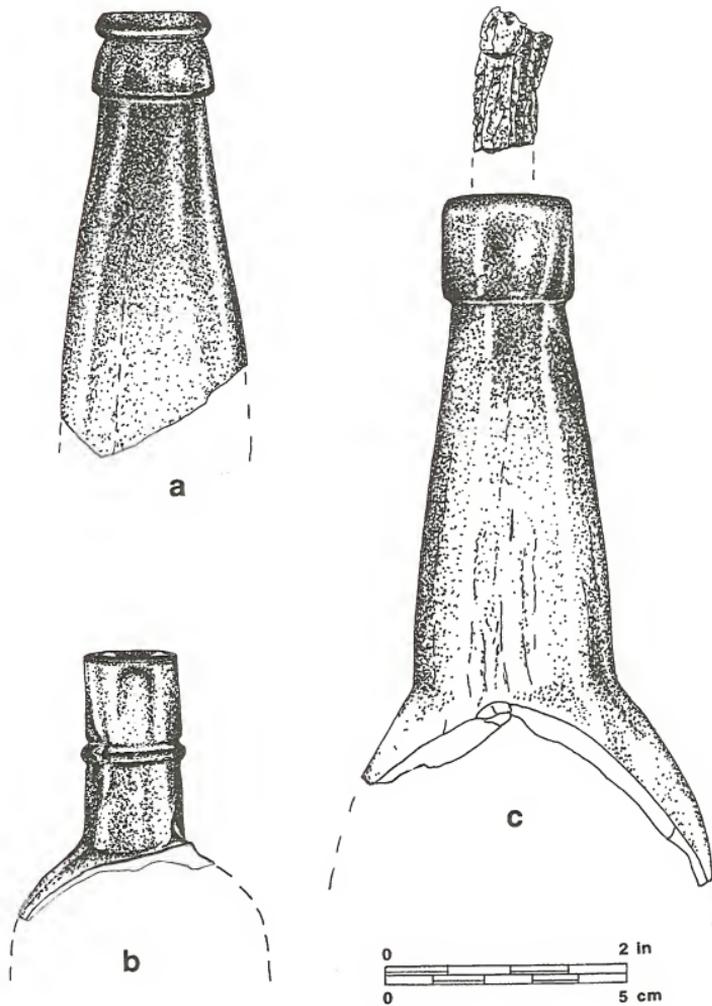


Figure 4. Bottle necks.

arrangement across base with a raised number "2" below. Probable contents: Alcoholic beverage (beer). Probable date of manufacture: Ream seam, 1903 to present; "WOOSTER" represents Wooster Glass Co. of Wooster, Ohio. This company produced bottles with this particular trade mark from circa 1900 to 1904 (Toulouse 1971:543). Combined information results in a tight date of 1903-1904. The artifact is illustrated as Figure 6b.

1c5. MT-12. Color: Aqua. Base diameter: 3 inches. Base shape: Cylindrical. Base profile: Concave. Mold marks: Circular ring seam in center of base with a diameter measurement of 1 7/8 inches. Two opposing seams radiate out from the ring seam. This type of seam is common for a post-bottom mold (Berge 1980:64). Embossing: Two large letters "A B" are found on the base. The "B" is slanted and incorporated as part of the right leg of the "A". Below these two letters is embossed "D 9" which is probably a plant number. Probable contents: Alcoholic beverage. Probable date of manufacture: The distinctive "A B" embossing belongs to Adolphus Busch Glass Manufacturing Co. This trade mark was used circa 1904-1907 (Toulouse 1971:26). Based on this information the probable date is relatively tight, 1904-1907. The aqua base is illustrated as Figure 6c.

1c6. MT-38. Color: Aqua. Base diameter: Unknown. Base shape: Cylindrical. Base profile: Concave. Mold marks: Ring seam and a portion of a single verticle mold seam. Embossing: Several letters are present in a semicircular fashion along a portion of the indented base. Starting with "A", followed by missing letters, it continues with "M. CO." The number "14", in the center of the base is preceded by either a letter or number. The number is probably a plant designation. Probable contents: Alcoholic beverage. Probable date of manufacture: Ring seam, post-1903. The embossed trade mark probably represents ABGMCO., BG being the missing letters. These letters are the trade mark of Adolphus Busch Glass Manufacturing Co., circa 1886-1928 (Toulouse 1971:26). This bottle was manufactured between the years 1903-1928. The base is illustrated as Figure 5a.

1c7. MT-39. Two sherds representing one base. Color: Amber/brown. Base diameter: 2 9/16 inch. Base shape: Cylindrical. Base profile: Concave. The center of the base is slightly depressed in relation to the outer rim. Mold marks: There is a ring seam along the outer edge of the base as well as one verticle mold seam. There is also evidence of a "ghost" seam at a slight angle to the ring seam. Embossing: The letter and number "A 7" are embossed in the indented portion of the base. No reference was found for "A 7" and probably represents a numbered glass production plant rather than a trade mark of a particular company. Probable contents: Alcoholic beverage (beer). Probable date of manufacture: Ring and "ghost" seams are characteristic of machine made bottles (Broilo 1977:231; Miller and Sullivan 1984:93). A time range is from 1903 to present. The base is illustrated as Figure 6a.

1c8. MT-70. Color: Light green. Base diameter: 4 inches. Base shape: Cylindrical. Base profile: Concave. Mold marks: Circular ring seam in center of base with a diameter measurement of 3 3/16 inches. Two opposing seams radiate out from the ring seam. This type of seam is common for a post-bottom mold (Berge 1980:64). Embossing: Six letters, all 5/16 inches in height, "M B & G CO" are found on the base. Below the letters is embossed "20" which is probably a plant number. Probable contents: Alcoholic beverage (beer). Probable date of manufacture: The circular mold seam implies manufacture by a machine made bottle with a range of the early 1900s. The embossed letters are the trade mark of Massillon Bottle & Glass Company (Toulouse 1971:343). This bottle was manufactured between the years 1900-1904.

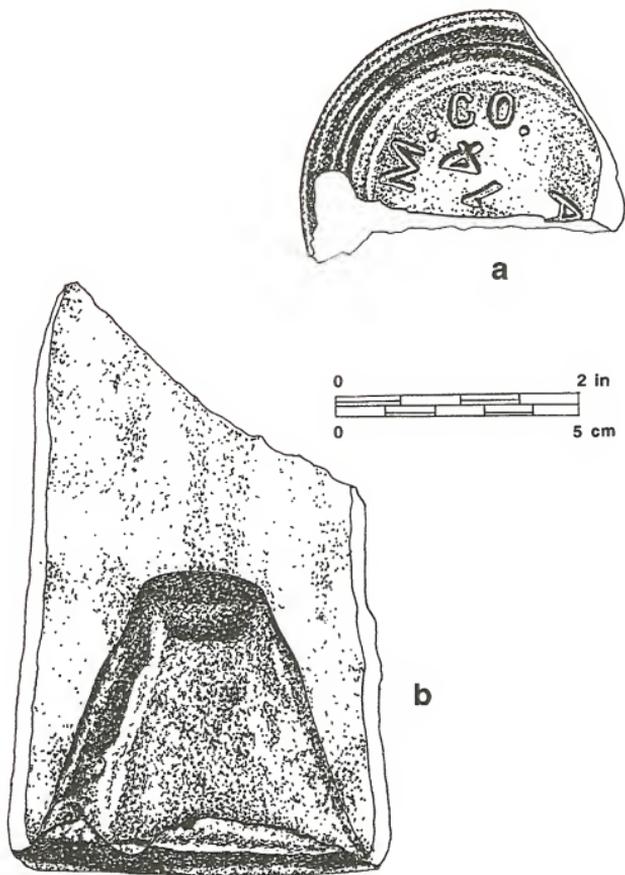


Figure 5. Embossed bottle base and a kick-up.

1d. Complete bottle. One complete bottle was recovered along the trail and is shown as Figure 7.

1da. MT-71. Color: Amethyst. This bottle was referred to as a "picnic flask" or "pumpkin seed flask". Neck length (shoulder to rim): 1 1/2 inches. Finish length: 1/2 inch. Rim diameter: 1 1/8 inches. Inside rim diameter: Varies from 9/16 to 5/8 inch. Finish type: Double ring (Fike 1987:8). Closure type: Cork stopper. Base size: 2 1/8 X 3 1/4 inches. Base shape: Elliptical. Base profile: Concave. Mold marks: Two vertical side seams are located on opposing sides, originating at the base and ending at the bottom of the neck. The finish was applied by the use of a lipping tool. Embossing: None. Indentation: Indented panel centered on the front side suggests a paper label was used. Diameter of indentation measures 3 11/16. Probable contents: Most often used for whiskey but sometimes for drugs or medicinals (Wilson and Wilson 1968:161). Probable date of manufacture: Amethyst color 1880-1917; lipping tool for finish application 1850-1903; overlapping dates are 1880-1903. Wilson and Wilson (1968:161) show profiles of 11 different clear picnic flasks, and front views of four of these. A good match is #8, of which a date of ca. 1885 is given.

B. Food Serving. One artifact is classified within this subclass.

1. Ceramic (MT-9). This is a single fragment of plain, utilitarian white ironstone. Johnson (In IMACS 1982:Section 473) suggests that white ironstone dates in the U.S. from the 1850s to the 1890s. Paste: White. Paste texture: Fine and hard. Surface treatment: Clear glaze and undecorated. The fragment measures 1 1/2 by 1 3/8 inches. It is a body sherd with a small part of the base rim in place. The base rim shows extensive ware. The curvature of the body away from the base rim is at such a steep angle to suggest that the fragment is from a bowl rather than a plate.

C. Food Storage. There are 18 items within this subclass consisting of 15 cans, a can lid and two can related items.

1. Cans. There are 11 cylindrical and four rectangular/square artifacts in this group. Cans are containers that can store foods for relatively long periods of time. The can industry, like the glass container industry, saw a period of rapid development with numerous technological innovations during the 19th and early 20th centuries. England initiated the canning of food products in 1810, and America began commercial canning in 1819 (Busch 1981:96). Table 5 lists the chronological changes in the canning industry.

The first metal cans were cut out, shaped, and soldered by hand. The contents entered the can through a hole cut in the center of one end. A cap was then soldered in place thus sealing the can with its contents. These first cans are known as hole-and-cap cans (Rock 1984:99). A small venting hole in the center of the cap was an added improvement to the hole-and-cap cans. This venting hole allowed the filled and sealed containers to be heated as a method of driving off excess moisture and air. Once this was done, the hole was sealed with a drop of solder. This type of can is referred to as the hole-in-cap (Rock 1984:99).

Hole-in-cap cans saw use from 1820 to 1930 (Rock 1987:12). Rock (1987:48) states, "From the 1860s, until the early 1900s, nearly all fruits and vegetables were experimented with and sold in hole-in-cap tins." Venthole cans or hole-in-top cans were developed after 1900 for use as evaporated milk tins. Other types of products were also canned in this fashion. This type of can exhibits a single "match-stick" filler hole placed in the center of a one-piece, stamped can end. The filler hole is closed by a drop of solder (Rock 1984:101). Hole-and-cap, hole-in-cap, and hole-in-top are used interchangeably in the literature to describe cans in general but, in reality, are distinct manufacturing innovations. That distinction is recognized and maintained in this discussion.

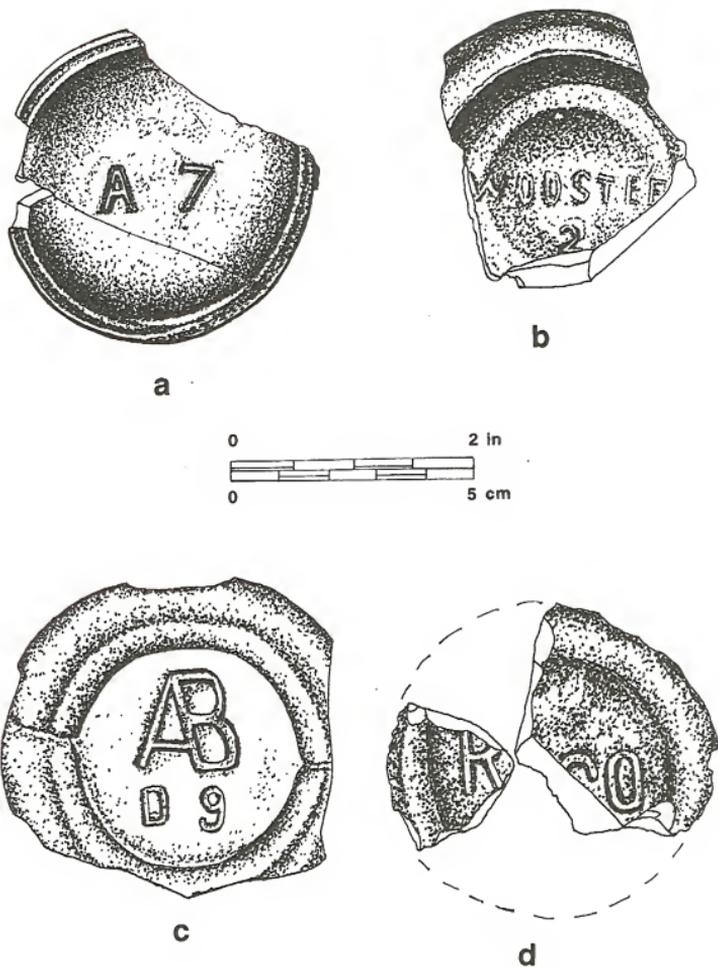


Figure 6. Embossed bottle bases.

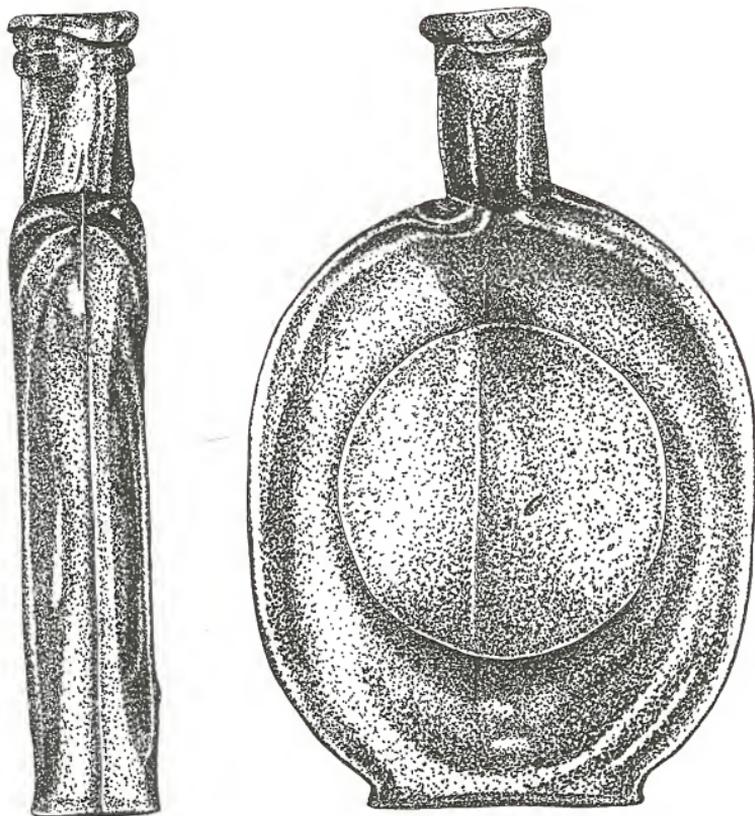


Figure 7. Side and front profiles of picnic flask.

have been around since 1869 (Rock 1987:109). Cans are used as containers for numerous food and non-food products. Food products include vegetables, fruits, liquids, and meats/fish. Simple puncture marks, caused by any sharp object, are usually signs that a can contained a liquid of some type. Cans that have crosses, triangles, and semicircular cuts, with the resulting metal flaps folded back, indicate the can held a food product that could not be easily extracted without major modification to the can (i.e., fruits, vegetables, and some meats). Cans exhibiting a uniform, linear, and smooth cut along the top or side are probably opened with a key-wind strip. Such cans contained meat/fish or hermetically sealed products such as coffee.

Fifteen food cans are present in the collection. The cans are arranged according to shape, cylindrical or rectangular/square, and in descending order by volume. Cylinder volume is calculated by the standard formula of $\pi (3.14) \times \text{radius squared} \times \text{height}$. Rectangular/square can volumes are calculated by the formula of $\text{length} \times \text{width} \times \text{depth}$. Measurements are given in inches. Some of the cans are distorted due to crushing and resulting measurements are reconstructed approximations. Only medium and small cans are represented in the collection.

The suggested dates of manufacture are relative dates and are to be used with caution. There are no positive beginning and ending dates for several can manufacturing techniques. Manufacturers were sometimes slow in switching over to new technologies. At the same time, several innovations endured side-by-side. Hole-in-cap cans existed for 110 years, with approximately 40 of these years during the time the sanitary can was being developed and accepted by the canning industry and the public.

1a. Cylindrical. Eleven small and medium items are described below and listed in Table 6.

1a1. Medium (Volume 60 - 40 cubic inches). Five cans are medium in size.

Table 6. Basic data on cylindrical cans in the collection.

<i>Description</i>	<i>Can Type</i>	<i>Diameter</i>	<i>Height</i>	<i>Volume</i>	<i>Cap Dia.</i>
1a1a. MT- 7	Hole-in-cap	3 5/8 in.	4 11/16 in.	48 cu. in.	1 3/8 in.
1a1b. MT-11	Hole-in-cap	4 in.	4 11/16 in.	59 cu. in.	2 1/4 in.
1a1c. MT-44	Hole-in-cap	4 in.	4 11/16 in.	59 cu. in.	2 1/4 in.
1a1d. MT-58	Hole-in-cap	4 in.	4 11/16 in.	59 cu. in.	2 5/8 in.
1a1e. MT-63	Hole-in-cap	3 3/8 in.	4 11/16 in.	42 cu. in.	1 1/2 in.
1a2a. MT-57	Hole-in-cap	2 5/8 in.	4 in.	22 cu. in.	1 5/8 in.
1a2b. MT-41	Hole-in-cap	2 5/8 in.	4 5/16 in.	24 cu. in.	1 1/2 in.
1a2c. MT-26	Hole-in-top	2 7/8 in.	4 11/16 in.	30 cu. in.	Not Present
1a2d. MT-51	Hole-in-top	4 in.	2 2/2 in.	31 cu. in.	Not Present
1a2e. MT-10	Hole-in-top	3 in.	1 1/16 in.	7 cu. in.	Not Present
1a2f. MT-37	Hole-in-cap	2 1/2 in.	2 1/2 in.	12 cu. in.	3/4 in.

1a1a. MT-7. Type of can: Hole-in-cap. Diameter: 3 5/8 inches (reconstructed). Height: 4 11/16 inches (reconstructed). Volume: 48 cubic inches. Manufacturer's size: Similar to a No. 2 can size (Rock 1987). Ends: Probable stamped ends overlapping can body. End cap measures 1 3/8 inches with a venthole off-center to one side. Seam: One verticle lap side seam. All seams are hand soldered. Rock (1987:7) states, "Hand applied solder left a ridge that was not uniform and might have as much as 1/8 (inch) relief." Method of opening: The cut metal around the rim and a portion of the metal flap is irregular and jagged suggesting that a knife or other sharp object was used to get at the contents. The open end is opposite the capped end. Probable contents: Fruits or vegetables. Probable date of manufacture: Lap seam 1840-1904; hand-solder seams 1820-1880+; stamped ends 1847-1900+. Overlapping dates suggest a range of 1847-1880+. Other information: This can is constructed of comparatively heavy gauge metal and exhibits a greenish hue. The outline of a pine tree is scratched on the side of the can. Top view of crushed can is illustrated as Figure 9a.

1a1b. MT-11. Type of can: Hole-in-cap. Diameter: 4 inches. Height: 4 11/16 inches. Volume: 59 cubic inches. Manufacturer's size: No. 2 1/2 (Rock 1987:92). Ends: Stamped ends overlapping the body. End cap measures 2 1/4 inches with a venthole in the center. Seam: One verticle lock side seam resulting in an interior rib that is perpendicular to the can wall. All seams are machine soldered. Method of opening: Puncture and mechanical. A single puncture hole was made in the top possibly to drain off a liquid. A semi-circular cut along the can rim was made using a mechanical device. The cut was accomplished counter-clockwise on the end opposite the capped end. The metal flap was folded back. Probable contents: Fruits or vegetables. Probable date of manufacture: Hole-in-cap 1820-1930; machine solder 1880-1904; lock side seam 1869-1900+ (Rock 1984). Overlapping dates suggest a range of manufacture from 1880-1904. Top view of can is illustrated as Figure 8a.

1a1c. MT-44. Type of can: Hole-in-cap. Diameter: 4 inches. Height: 4 11/16 inches. Volume: 59 cubic inches. Manufacturer's size: No. 2 1/2. Ends: Stamped ends overlapping the body. End cap measures 2 1/4 inches with a venthole in the center. Seam: One verticle double-seam. All seams are machine soldered. Method of opening: A mechanical device was used to remove the entire lid. The opening was made on the end opposite the capped end. Probable contents: Fruits or vegetables. Probable date of manufacture: Double-seam 1888-1900+ (Rock 1987).

1a1d. MT-58. Type of can: Hole-in-cap. Diameter: 4 inches. Height: 4 11/16 inches. Volume: 59 cubic inches. Manufacturer's size: No. 2 1/2. Ends: Stamped ends overlapping the body. End cap measures 2 5/8 inches with a venthole in the center. Seam: One verticle lap side seam. All seams are machine soldered. Method of opening: Cross cut with a mechanical device. The first cut is across the diameter. The second and third cuts were made up to the first. The four triangular tabs were then folded back. The cut was made on the end opposite the cap end. Probable contents: Fruits or vegetables. Probable date of manufacture: Hole-in-cap 1820-1930; machine solder 1880-1900+; lap side seam 1840-1904. Suggested range 1880-1904. Hole-in-cap is illustrated as Figure 8b.

1a1e. MT-63. Type of can: Hole-in-cap. Diameter: 3 3/8 inches (reconstructed). Height: 4 11/16 inches (reconstructed). Volume: 42 cubic inches. Manufacturer's size: No. 2 (Rock 1987:92). Ends: Stamped ends overlapping the can body. End cap measures 1 1/2 inches with a centered venthole. Seam: One verticle lock side seam which forms an internal rib perpendicular to the can wall. All seams are machine soldered. Method of opening: A mechanical device was used to make a cross cut. The triangular metal flaps were then folded back. Open end is opposite the capped end. Probable contents: Fruits or vegetables. Probable date of manufacture: Machine solder 1880-1900+; lock side seam 1869-1904. Resulting overlap of dates suggests a time range of 1880-1904. Other information: A very even and regular swath with a width of 1 3/16 inches has been pressed across the can, indicating that a wagon wheel may have run it over. The can with a view of the pressed side is illustrated as Figure 9b.

1a2. Small (Volume 40 - 5 cubic inches). Six cans are placed into the small category.

1a2a. MT-57. Type of can: Hole-in-cap. Diameter: 2 5/8 inches. Height: 4 inches. Volume: 22 cubic inches. Manufacturer's size: Similar to No. 1 can size (Rock 1987:97). Ends: Stamped ends overlapping body. End cap measures 1 5/8 inches with a centered venthole. Seam: One verticle lap side seam. All seams are machine soldered. Method of opening: A mechanical device was used to make a semicircular cut in a clockwise fashion along the rim. The flap was then folded back. Probable contents: Fruits or vegetables. Probable date of manufacture: Lap side seam 1840-1904; stamped end 1847-1900+. Suggested range 1847-1904. This small can is illustrated as Figure 10a.

1a2b. MT-41. Type of can: Hole-in-cap. Diameter: 2 7/8 inches (reconstructed). Height: 4 11/16 inches (reconstructed). Volume: 24 cubic inches. Manufacturer's size: No similar can size found. Ends: Stamped ends which overlap the body. End cap measures 1 1/2 inches with a centered venthole. Seam: One verticle double-seam. All seams are machine soldered. Method of opening: A mechanical device was used to make a semicircular cut along the rim. The cut was made in a clockwise motion on the capped end. The resulting flap was then folded back. Probable contents: Fruits or vegetables. Probable date of manufacture: Double-seam 1880-1900+.

1a2c. MT-26. Type of can: Hole-in-top (venthole). Diameter: 2 7/8 inches (reconstructed). Height: 4 11/16 inches (reconstructed). Volume: 30 cubic inches. Manufacturer's size: No similar size can found. Ends: Stamped ends which overlap body. A centered venthole is on the opened end. Seam: One verticle lap side seam. All seams are machine soldered. Method of opening: A cross cut was made with a mechanical device and the triangular flaps folded back. Probable contents: Even though the venthole can was developed for liquids (canned milk products), the method used to open this can suggests bulky contents. The previous can, which had a hole-in-top end, contained meat. Processing of bulky food items in a sealed can such as this would require that the contents be placed in the can, end soldered in place, and the can heat tested. The final step would be to seal the venthole. Liquids, on the other hand, were added through the venthole after the end had been soldered in place. Possible contents include fruits, vegetables, or

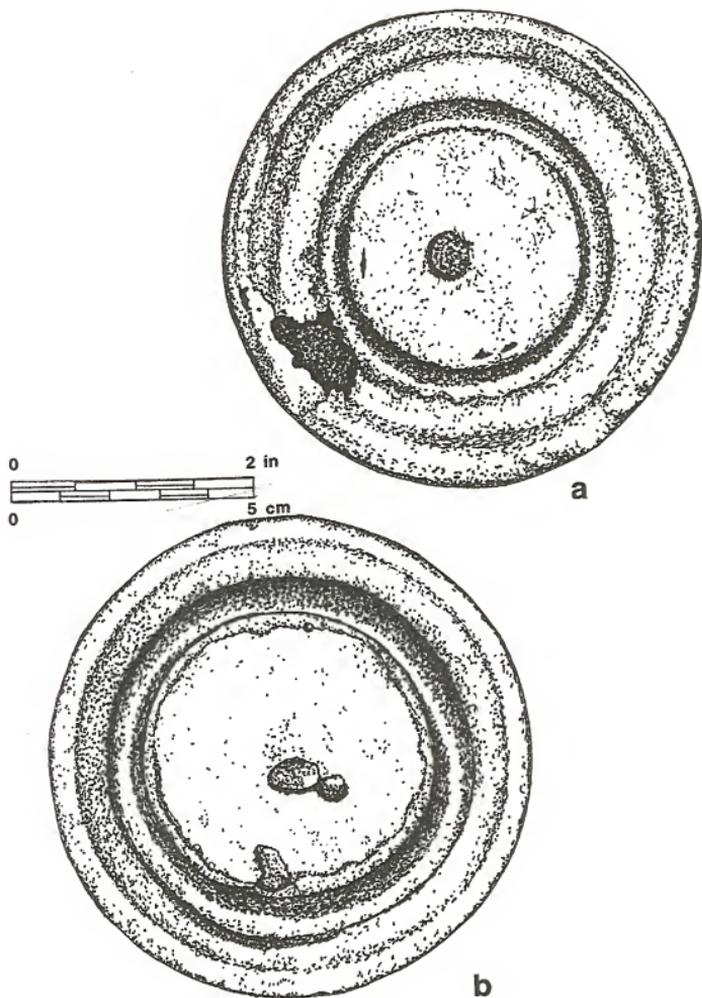


Figure 8. Hole-in-cap views of medium-sized cans.

meats. Probable date of manufacture: Lap side seam 1840-1904; hole-in-top 1900+. Suggested range is 1900-1904.

1a2d. MT-51. Type of can: Hole-in-top (venthole). Diameter: 4 inches. Height: 2 1/2 inches. Volume: 31 cubic inches. Manufacturer's size: Similar to No. 1 1/4 Special (Rock 1987:99). Ends: Stamped ends overlapping the can body. Venthole is in the center of the unopened end. Seam: One verticle lap side seam. All seams are machine soldered. Method of opening: A mechanical device removed the entire end. Probable contents: Similar size cans held 1 pound of chipped beef or 1 pound flat roast beef (Rock 1987:91). Probable date of manufacture: Lap side seam 1840-1904; hole-in-top 1900+. Suggested age range is 1900-1904.

1a2e. MT-10. Type of can: Hole-in-top (venthole). Diameter: 3 inches. Height: 1 11/16 inches. Volume: 7 cubic inches. Manufacturer's size: No similar can found. Ends: This can consists of one end that has been stamped to overlap the body. A single venthole is located adjacent to the rim. Seam: The body and one end were formed in a single stamping process eliminating a side seam. The one end was soldered to the body in a machine process. Method of opening: A knife or other sharp object was used to make an irregular, jagged and semicircular cut around the rim. The flap was folded back. Probable contents: Meat spread, fish or specialty product. Probable date of manufacture: 1900-1904. The artifact is illustrated as Figure 10b.

1a2f. MT-37. Type of can: Hole-in-cap. Diameter: 2 1/2 inches (reconstructed). Height: 4 11/16 inches (reconstructed). Volume: 12 cubic inches. Manufacturer's size: Similar size not located, however, Bitting describes a "baby can" of such dimensions for canned milk products (In Rock 1987:45). Ends: Stamped ends overlapping can body. End cap measures 3/4 inches with a centered venthole. Seam: One verticle double-seam. All seams are machine soldered. Method of opening: Because of the crushed nature of this can only one puncture hole is visible. The puncture was made on the end opposite the capped end. Probable contents: Evaporated milk. Unlike condensed milk, which requires a larger opening because of its thicker consistency, evaporated milk will flow when the can is punctured on opposite sides (Rock 1987:47). Probable date of manufacture: Evaporated milk within hole-in-cap cans 1898-1918 (Rock 1987:46-47).

1b. Rectangular/square. Four cans fit this category and dimensions are listed in Table 7.

Table 7. Basic data on rectangular/square cans in the collection.

<i>Description</i>	<i>Can Type</i>	<i>Diameter</i>	<i>Height</i>	<i>Volume</i>	<i>Cap Dia.</i>
1b1a. MT-27	Lap side seam	3 in.	2 in.	3 in.	18 cu. in.
1b1b. MT- 8	Sanitary	3 3/8 in.	3 3/8 in.	3 3/4 in.	43 cu. in.
1b2a. MT-60	Sardine	3 7/8 in.	2 1/2 in.	1 3/16 in.	8 cu. in.
1b2b. MT-42	Sardine	3 1/2 in.	3 in.	3/4 in.	8 cu. in.

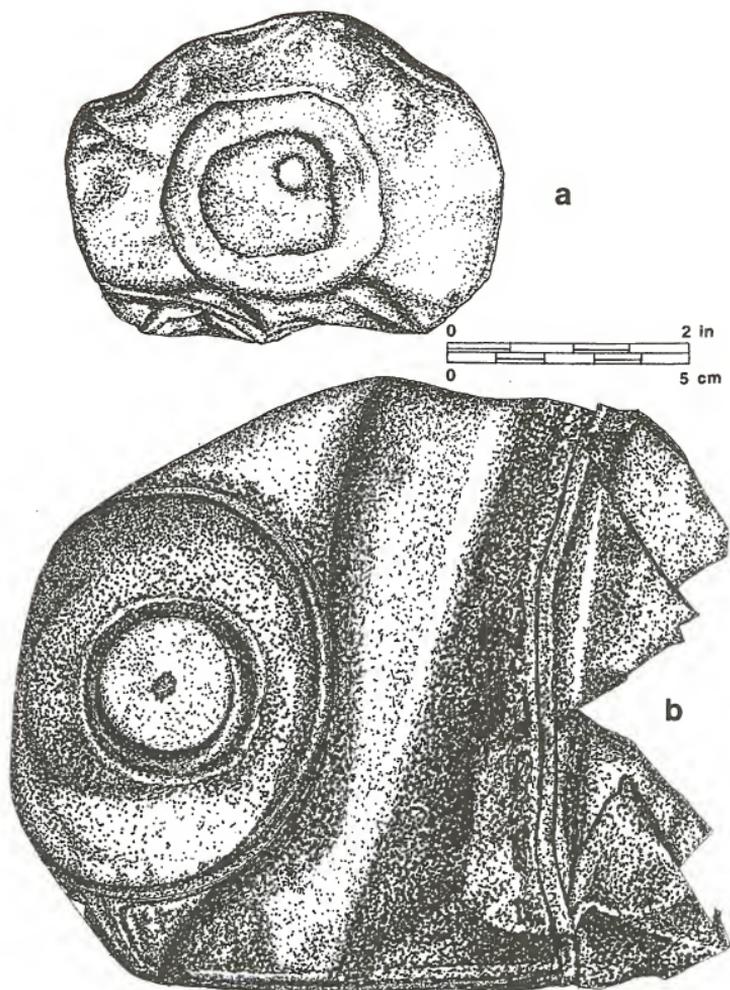


Figure 9. Hole-in-cap views of heavy can and can run over by wagon wheel.

1b1. Medium (Volume 45 - 15 cubic inches). Two specimens are medium sized.

1b1a. MT-27. Type of can: Lap side seam. Length: 3 inches (reconstructed). Width: 2 inches (reconstructed). Depth: 3 inches (reconstructed). Volume: 18 cubic inches. Manufacturer's size: Undetermined. Ends: The single end is stamped and overlaps the body. Seam: One verticle lap side seam on the width side of body. All seams are machine soldered. Method of opening: Key-wind strip. A torn portion of the scored strip remains attached on the verticle seam side of the can. The scored strip was removed in a clockwise fashion. Probable contents: Meat or speciality product (coffee?). Probable date of manufacture: Lap side seam 1840-1904; machine solder 1880-1900+. Suggested range is 1880-1904. Other information: The can is made of a comparatively heavy gauge metal.

1b1b. MT-8. Type of can: Sanitary can. Length: 3 3/8 inches (reconstructed). Width: 3 3/8 inches (reconstructed). Depth: 3 3/4 inches (actual). Volume: 43 cubic inches. Manufacturer's size: Similar to a No. 1 square (Buckles in IMACS 1982:Section 471.4). Ends: The one remaining end is stamped and overlaps the body. This end is embossed with the words "LIPTON'S DELICIOUS TEAS & COFFEES." Seams: One verticle double-seam on side of can. The end is attached to the body in the double-seam method. Method of opening: Key-wind strip. To eliminate spillage, it is probable that the key-wind strip was removed near the top, thus putting the embossed end at the bottom after opening. Probable contents: Coffee or tea. Probable date of manufacture: This can was described in the initial report on the Mormon Road (USDI 1987). Embossed Lipton container 1890-1930s (Personal Communication, Edyth Masten, Thos. J. Lipton Co., June, 1987). This embossed can is illustrated as Figure 11a.

1b2. Small (Volume 15 - 5 cubic inches). Two small specimens are described.

1b2a. MT-60. Type of can: Sardine. Length: 3 7/8 inches (reconstructed). Width: 2 1/2 inches (actual). Depth: 1 3/16 inch (actual). Volume: 8 cubic inches. Manufacturer's size: Undetermined. Ends: Both top and bottom ends are stamped and overlap the body. The top is embossed with a circule measuring 1 1/4 inches in diameter. The bottom has an embossed indentation in the shape of a key. Seam: One verticle lap side seam on one width side. Top, bottom, and side seams are all machine soldered. Method of opening: Key-wind open top. The entire top would have been removed with the use of a key which was attached to the bottom of the can. The key, however, was lost before the contents could be consumed. The can was opened with some mechanical device. The cut was made down one long side, across a short side, and up the other long side with the metal flap folded back. The cut is clockwise. Probable contents: Sardine. Probable date of manufacture: The American sardine canning industry began in the 1870s. Drawn sardine cans (body and base are one piece) came into production in 1897 (Rock 1987:58-59). Suggested range is 1870s-1897. Top and bottom views of this sardine can are illustrated as Figure 12.

1b2b. MT-42. Type of can: Sardine. Length: 3 1/2 inches (reconstructed). Width: 3 inches (reconstructed). Depth: 3/4 inch (actual). Volume: 8 cubic

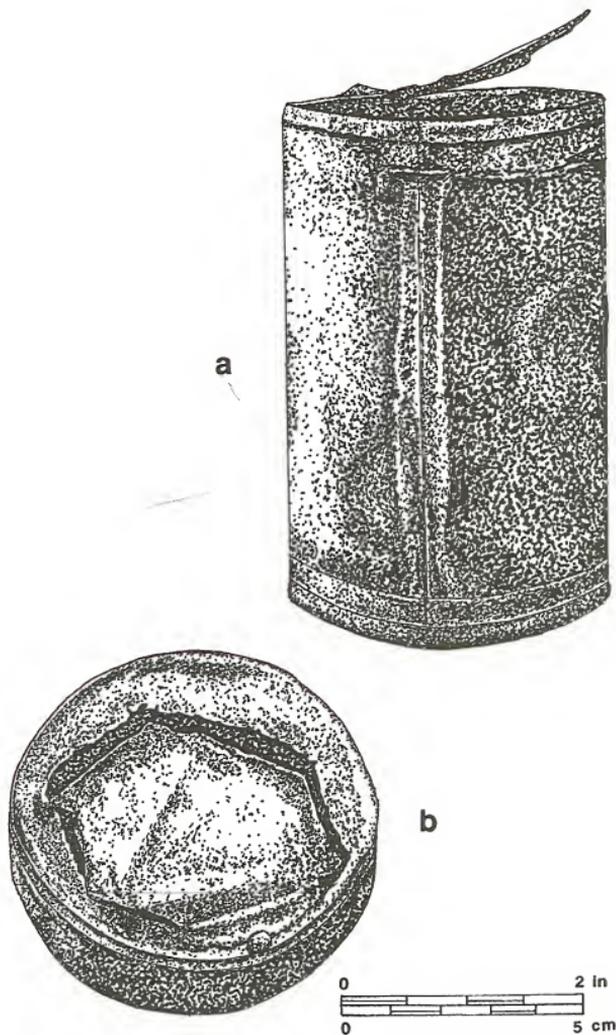


Figure 10. Small cylindrical cans.

inches. Manufacturer's size: Undetermined. Ends: The body and base are stamped from one piece of metal. The top end was stamped and scored for opening. Seam: Joining of the top and body is by double sanitary seam. Method of opening: Key-wind open top. The key removed a portion of the scored top. A clean cut lip of metal remains around the edge. Probable contents: Sardines. Probable date of manufacture: Drawn can bodies 1897; double-seam sanitary 1904-present. Rock (1987:59) states, "The 'open-top' style, double-seam can was first successfully produced in 1918 and it was quickly adopted." Suggested range is 1904-1918+.

2. Can Lid. One can lid is described.

2a. MT-56. Type of lid: External friction cap. Diameter: 3 inches. Width of lip: 3/4 inch. Embossing: The cap is embossed with the following words: "FULL WEIGHT" (top semicircle)/"12 OZ." (upper center, straight)/"ROYAL BAKING" (over) "POWDER" (center straight)/"ABSOLUTELY PURE" (lower semicircle). Other information: Rock (1987:28) suggests that Royal Baking Powder originated in the late 1860s with hand made cans. It was not until 1899 that they became incorporated. In 1897, the firm was selling the product in various sized cans. Embossed lids were used until 1934 when the company switched to an internal friction lid fiber can. Probable date of manufacture: 1860s-1934. This embossed can is illustrated as Figure 11b.

3. Can Related. Two objects from cans are described.

3a. MT-36. Type: Key-wind strip. Length: 12 inches (reconstructed). Width: 3/8 inch (actual). Other information: This is a metal strip from a key-wind opened can. A small drop of solder is located on one end where it was attached to the can. Probable date of manufacture: Key-wind opening from 1866-present.

3b. MT-65. Type: Metal disk. Diameter: 1 9/16 inches. Other information: This disk has a spot of solder along one edge where it was attached to a can (IMACS 1982:Section 471).

D. Water Storage. A hoop that presumably aided in holding a water barrel intact is described.

1. Barrel Hoop (MT-68). Type: Metal. Length: 71 inches if unfastened. An overlap of 4 inches is a result of fastening of the ends together. Width: 1 3/4 inches. Diameter: 18 inches (reconstructed). Fasteners: Two metal fasteners with heads 3/8 inch in diameter hold the ends together. Flat ends on the fasteners on the inside of the hoop are 1/2 inch in diameter. Probable function: Heavy gauge metal and the size indicate this was a barrel hoop.

II. Personal. Eleven specimens are analyzed in subclasses of clothing, indulgences and pharmaceutical/patent.

A. Clothing. One item that is considered a clothing accessory is described.

1. Clasp. MT-4. Length: 1 5/16 inches. Width: 5/8 inch. Other information: This piece of metal was stamp-cut from flat stock. The lower portion exhibits a semi-oval shape. The sides flare out to full length. The top was creased length-wise and folded over to form a tube shape. It is apparent that on the reverse side two metal tabs, one at each end, complete the tube. It is probable that a wire passed through the tube allowing the metal piece to rotate on this hinge. Also, on the reverse side, a tab of metal 7/8 inch in length is fashioned in a scalloped pattern. This pattern results in six teeth. On both sides there is evidence of plating of the basic metal piece with a shiny metal. Probable function: This metal clasp functioned as part of a larger clothing item. The scalloped teeth probably

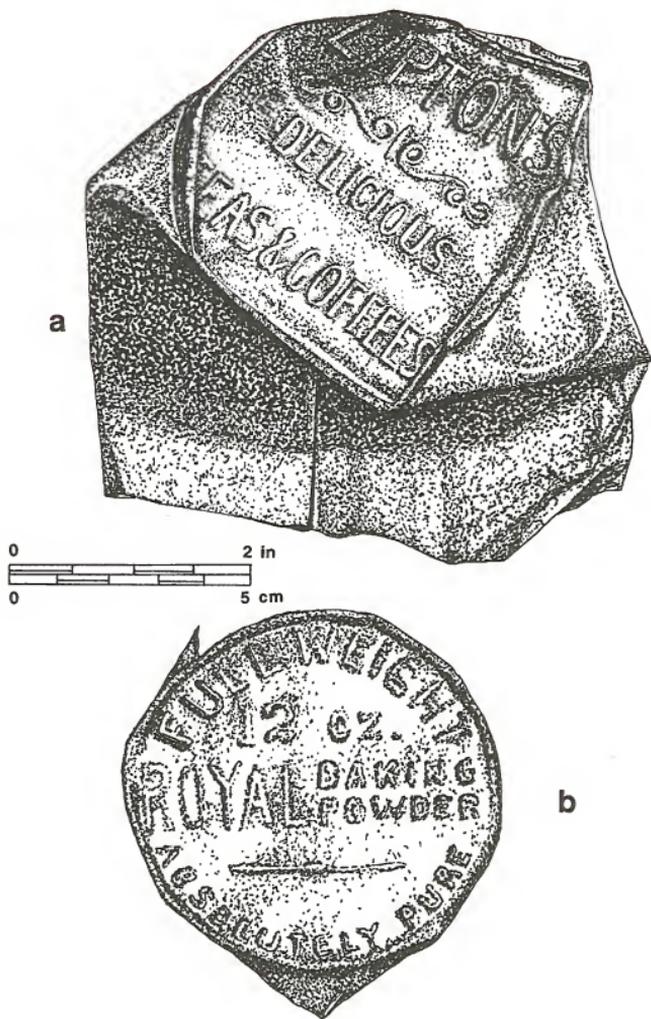


Figure 11. Lipton Tea can and baking powder can lid.

secured the larger item to cloth. The clasp might have been the adjustment securing mechanism on suspenders. The clasp is illustrated as Figure 13a.

B. Indulgences. The subclass of indulgences is limited in this collection to tobacco tins, of which there are eight.

1. Tobacco Tin. Even though England had been using tobacco tins since 1764, tobacco was not sold in tin boxes in America until 1892. The first tobacco tins laid flat but were small enough to be carried in the pocket. The upright pocket tin was introduced by Tuxedo Tobacco after 1896. Prince Albert tobacco was sold in upright pocket tins in 1908 and modified in 1913. Velvet tobacco was placed on the market in standard size pocket tobacco tins in 1912, and subsequently saw many label changes (Rock 1987: 62-63).

Tobacco was also sold in other types of tins. During the 1920s and 1930s, several tobacco companies introduced "flat fifties" to sell cigarettes. From the turn of the century tobacco could also be purchased in large tins that could be used as lunch boxes after they were emptied. Efforts to conserve materials during World War II probably brought an end to both the flat fifties and lunch box tobacco tins (Rock 1987:64-65). Three kinds of tobacco containers are present in the collection and described below.

1a. Upright Pocket. MT-25, 43, 47, 48, 49, and 55. Six specimens. Length: 4 3/16 inches. Width: 3 1/8 inches. Thickness: 1 inch. Closure: Hinged external friction lid. Seam: One verticle double-seam on the narrow side. When the tins are viewed with the hinge towards the back, five of the specimens have the side seam on the left. A single tin has the side seam on the right. On all tins the bottoms are attached to the body with a double-seam. Embossing: On three of the tins the bottoms are embossed with 28 lines that are 5/16 inch in length. These embossed lines present a surface on which to strike a match. Two tins do not have this strike match surface, and the last is an unknown due to its flattened condition. Lithography: One tin (MT-25) exhibits the following method of labeling. The product name reads "VELVET / PIPE AND CIGARETTE / TOBACCO." A shield is in the center of the label. The other cans are rusted. Probable date of manufacture: Double-seam construction 1888-1900+; tobacco in upright pocket tins 1896-present. Suggested range is 1896-present. The single identifiable Velvet tobacco tin has a shield as part of the labeling. This particular label was introduced in 1926 (Rock 1987:63). Specimen MT-49 is illustrated as Figure 13b.

1b. Lunch Box Tobacco Tin. MT-40. One specimen. Length: 7 3/4 inches. Width: 5 1/8 inches. Height: 3 7/8 inches. Closure: Hinged external friction lid. The lid is missing. The lid was hinged on one width side. On the opposite width end there is a hinged hook attached to the body with a wire staple which would have hooked over the lid to hold it in place. Seam: One verticle side double-seam is located at one rounded corner. The bottom is stamped metal and is attached to the body by the double-seam method. Probable date of manufacture: Range of 1900-1940s (Rock 1987:64-65).

1c. Flat Cigarette Tin. MT-52. One specimen. Length: 3 1/2 inches. Width: 3 1/4 inches. Height: 1/2 inch. Closure: Hinged external friction lid. The lid overlaps the body by 1/8 inch. Seam: No seams are present. Both the body and the lid are stamped metal and are attached by a wire hinge. Lithography: Where the metal has been protected from exposure to the elements there is evidence that the tin was painted red, at least partially. The interior is partially silver in color. On the interior portion of the lid there is evidence of the letters "NG" and a small "E" at a lower location. Probable date of manufacture: Flat cigarette tins similar to this, but in larger sizes (flat fifties), are known to have been manufactured from the 1920s through 1940s (Rock 1987:64). This cigarette tin is illustrated as Figure 13c.

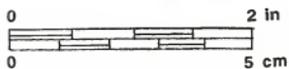
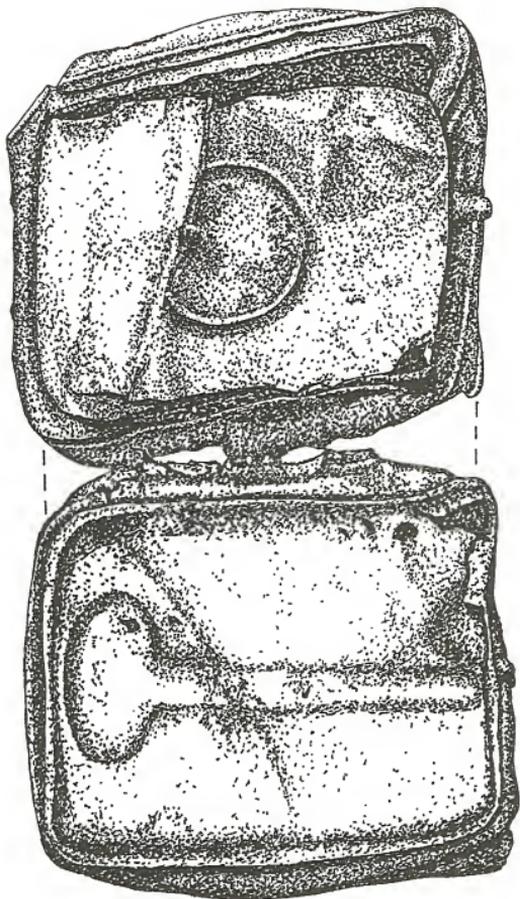


Figure 12. Top and bottom views of opened sardine can.

C. Pharmaceutical/Patent. Two bottles are described within this subclass.

Prior to the Pure Food and Drug Act in 1906, shrewd opportunists presumably took advantage of unprotected citizens seeking cures for what ailed them. Fike (1987:3) states,

The period of 1850 to 1900 is considered the peak of fraud and misrepresentation. The medicine business was lucrative and the public was ready and vulnerable. Anything could be bottled, advertized, and sold. Manufacturers swindled the public with medicines claiming extravagant therapeutic results and guarantees.

In the late 19th and 20th centuries, liquid health cures were sold and bought either in prescribed or unprescribed form. Prescribed and patent medicines were sold in plain and embossed bottles. Both types of bottles featured indented panels. Plain bottles contained paper labels. Prescribed medicine bottles were mainly amber in color with an occasional green, blue, or clear container in later years. Patent medicine bottles were consistently aqua or light green in color. Both forms of medicine bottles utilized cork closures (Munsey in IMACS 1982:Section 472:6).

Innovations in the development of sophisticated molds allowed bottles to be manufactured with indented and embossed panels. Plate molds which permitted personalized lettered paneling were patented in 1867 but were probably in use prior to that date (Fike 1987:4). Lorrain (1968:44) lists the dates of the patent medicine craze from 1860 to 1900.

I. Bottle. Three specimens are described.

1a. MT-61. Type of bottle: Indented panel. Color: Aqua. Seam: One verticle mold seam is visible on the side corner. Embossing: None visible. Other information: This corner fragment is near the base. The probable basic shape of the complete bottle is a Blake, variant 1 (Fike 1987:10). There is evidence of the beginnings of at least one front or back indented panel and a partial sjde panel. Probable contents: Patent medicine "cure". Probable date of manufacture: Range from 1860-1906.

1b. MT-69. Color: Aqua. Neck length (shoulder to rim): 2 1/4 inches. Finish length: 7/8 inch. Rim diameter: 15/16 inch. Inside rim diameter: 3/4 inch. Finish type: Ring finish (Fike 1987:8). Mold marks: Two opposing verticle mold seams that twist slightly counter clockwise end 1/4 inch above the bottom of the neck indicate the finish was applied with a lipping tool. Closure type: Cork stopper. Probable contents: Medicinal. Probable date of manufacture: Aqua glass, 1880 to 1910 (Broilo 1977:240); Lipping tool, 1850-1903. Overlapping dates suggest a time range from 1880-1903.

1c. MT-33. Type of bottle: Embossed. Color: Amethyst. Seam: None visible. Embossing: There are several embossed letters in two rows. Unfortunately, not enough of the fragment remains of this glass sherd to decipher the letters. Other information: This fragment is from a circular bottle. Probable contents: Medicine. Probable date of manufacture: Amethyst glass 1880-1917; Embossing 1860-1906. Suggested range is 1880-1906.

III. Activities. The class of activities includes artifacts within the hunting/warfare and husbandry subclasses. Nine specimens are discussed below.

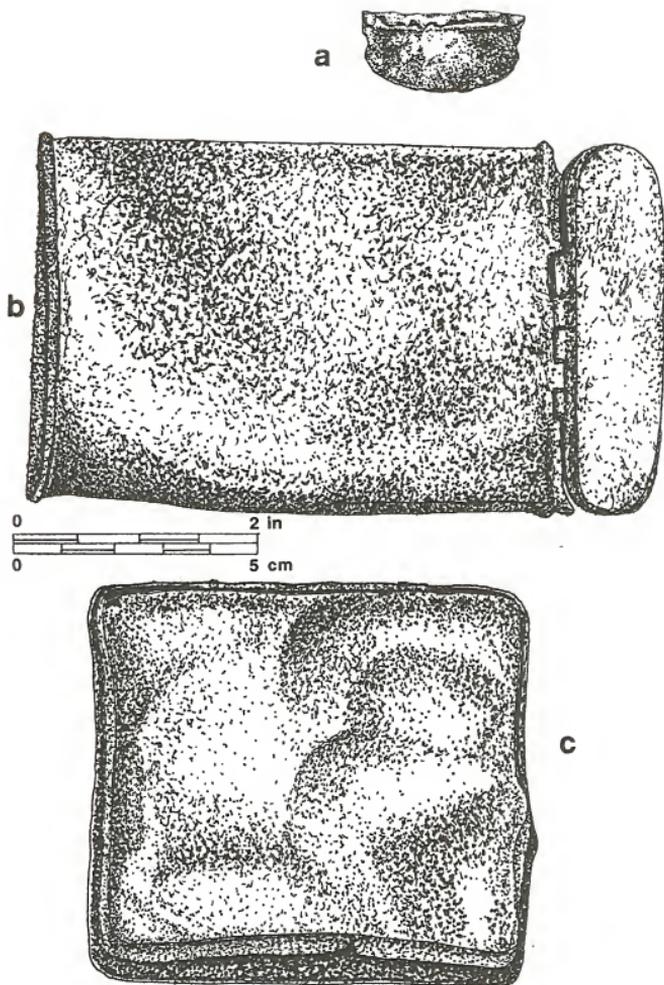


Figure 13. Clasp, tobacco tin and cigarette tin.

A. **Hunting/Warfare.** This subclass contains one cartridge from a presumed 35 caliber rifle.

1. **Cartridge.** MT-50. Type of cartridge: Center fire, internal primer. Headstamp marking: "SUPER SPEED / 35 REM." Caliber: 35. Manufacturer: Remington Arms. Probable type of weapon: Rifle. Probable date of manufacture: 1911 to present (Berge 1980:224).

B. **Husbandry.** Eight items remaining from the care of horses and mules are placed into this subclass.

1. **Horse/Muleshoes.** Eight specimens are described and illustrated in Figures 13, 14 and 15. The shoeing of the domesticated horse had its start approximately in the first century A.D. When humans removed the horse from its natural environment to serve their needs it was necessary to develop an artificial means to prevent excessive hoof wear from hard and physically demanding surfaces (Berge 1980:232-234). Thus, over the centuries shoeing became a precise art.

As a husbandry art, each shoe must be fit to the individual hoof since the shape of the hoof determines the shape of the shoe. A normal shoe is in the form of a constricted arc. Front shoes differ from hind shoes in that they are more nearly circular at the toe and are wider at the heels. Hind shoes are more pointed at the toe and narrower in the heel portion. Mule shoes differ from horseshoes in that narrow widths are maintained (Berge 1980:235-239). Christie Leavitt of the Barrick Museum of Natural History, University of Nevada, Las Vegas provided information on shoe attributes and identification of shoes as to horse or mule.

1a. **Horseshoes.** Three artifacts are described.

1a1. MT-2. Type of horseshoe: Draft horse. Length: 6 inches. Width: 5 7/8 inches. Width between heels: 3 1/16 inches. Position on horse: Front. Other information: This shoe is equipped with forged calks, one on each heel. The calks are used for gripping the ground surface to assist the animal in pulling loads. There are a total of eight nail holes, four in each fuller (crease). Two nail heads remain rusted in place. Wear is most pronounced slightly off center at the toe. The flat side of the horseshoe is illustrated as Figure 14a.

1a2. MT-28. Type of horseshoe: Saddle horse. Length: 5 inches. Other measurements are not made as only one half of the shoe remains intact. Position on horse: Position on the horse was determined by the evidence of roundness of the remaining toe area of the shoe. Extensive wear is present at the toe. One fuller is present with four nail holes. One clinched nail remains rusted in place. Illustration 14b shows the artifact.

1a3. MT-31. Type of horseshoe: Saddle horse. Length: 5 inches. Width: 4 3/8 inches. Width between heels: 2 1/4 inches. Position on horse: Rear. Other information: This shoe is extremely worn with both fullers missing. A total of eight nail holes are visible. The shoe is illustrated as Figure 15a.

1b. **Muleshoes.** Five specimens are described.

1b1. MT-13. Type of muleshoe: Saddle or pack mule. Length: 4 1/2 inches. Other measurements are not obtainable. Position on mule: Unknown. Other information: Extreme wear is at the toe. Fuller is slightly visible. Four nail holes are present with two nail heads rusted in place. The shoe is illustrated as Figure 15b.

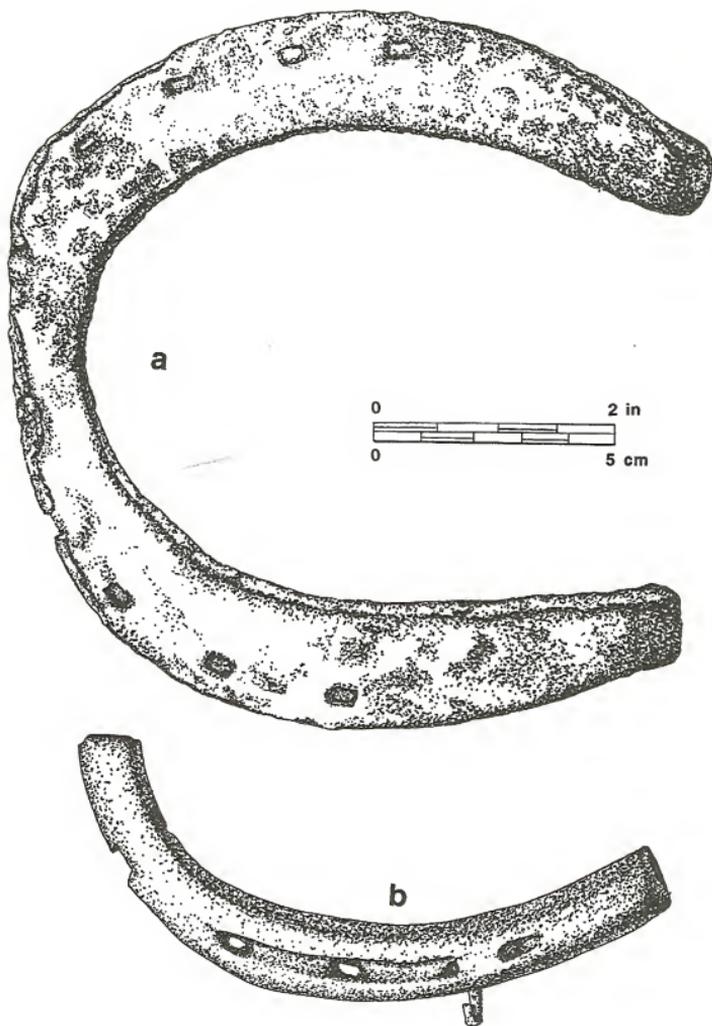


Figure 14. Complete horseshoe and fragment.

1b2. MT-1. Type of muleshoe: Saddle or pack mule. Length: 4 7/8 inches. Other measurements are not obtainable. Position on mule: Unknown. Other information: This shoe was extremely worn with most wear at the toe. The fuller is barely visible as a result of wear. Four nail holes are present. The flat side of the specimen is illustrated as Figure 15c.

1b3. MT-32. Type of muleshoe: Draft mule. Length: 4 7/8 inches. Other measurements not obtainable. Position on mule: Unknown. Other information: A forged calk is located at the heel. One nail head and one nail are present along with two other nail holes in the fuller. Wear is at the toe. The artifact is shown as Figure 16a.

1b4. MT-15. Type of muleshoe: Draft mule. Length: 5 inches. Other measurements are not made as only a portion of the shoe remains intact. Position on mule: Unknown. Other information: A forged calk is located at the heel. Four nail holes are visible in the fuller. Wear is at the toe. The muleshoe is illustrated as Figure 16b.

1b5. MT-29. Type of muleshoe: Saddle or pack mule. Length: 5 inches. Width: 4 1/8 inches. Width between heels: 1 5/8 inches. Position on mule: Unknown. Other information: Wear is at the toe. The shoe was probably lost as the result of metal failure at one fuller which has completely broken off. The remaining fuller shows signs of cracking. The shoe has a total of eight nail holes. The muleshoe is illustrated as Figure 16c.

IV. *Unclassifiable.*

A. **Whatsits.** Dates and functions on these 12 cultural objects are unknown.

1. **Metal.** Eight specimens in seven descriptions are presented.

1a. MT-34. This item is a piece of strap metal that is 4 1/8 inches in length and 1 7/16 inches in width. A single 3/16 inch hole was punched through the metal near the edge of one end. Both ends appear to have been bent back and forth until metal fatigue broke off the outside pieces.

1b. MT-5. This item is strap metal that measures 4 11/16 inches in length and 5/8 inches in width. Four holes are present, two at each end. The holes each measure 1/16 inch and are 1/4 inch apart. The metal is bent in a slight arc. The metal item is illustrated as Figure 17a.

1c. MT-54. Two metal rivets join overlapping ends on this piece of metal. This artifact is 5 1/2 inches in length and 2 1/4 inches in width. One end overlaps the other by 3/4 inch. The edges of one end appear to be crimped over by 1/8 inch. At one time this piece probably fit over a circular object.

1d. MT-16. Constructed of strap metal, this object is approximately two feet long and one inch wide. A metal pin or rivet is located near one end. The end appears to have been bent back and forth until metal fatigue broke off the opposite ends. This item is bent approximately in half. The open end is wrapped several times with a heavy gauge wire.

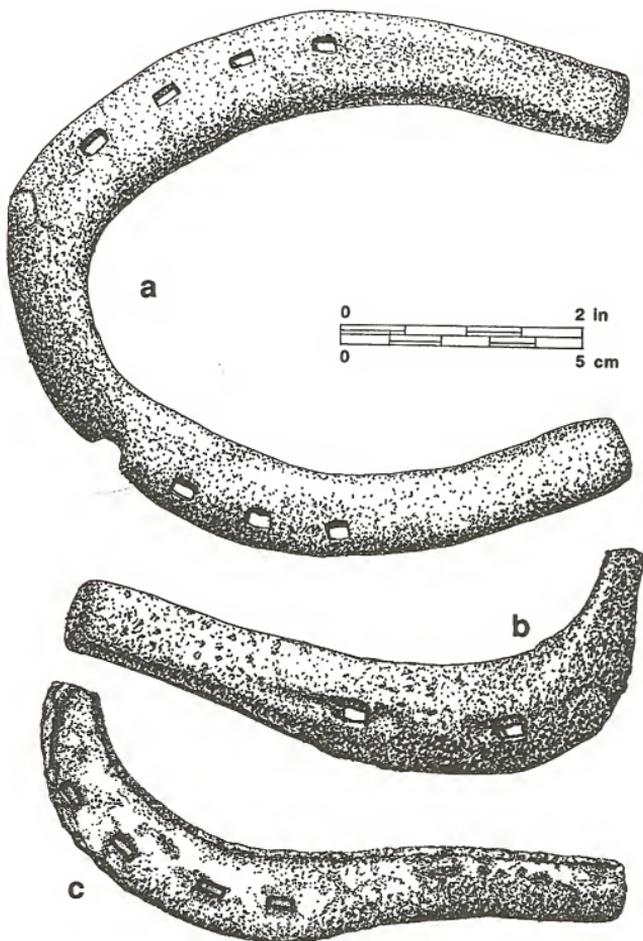


Figure 15. Complete horseshoe and muleshoe fragments.

1e. MT-6. A pin, 1/4 inch in diameter by 2 1/8 inches in length, is part of the collection. The pin is bent to a 45 degree angle. One end is flattened on four sides and flares slightly at the tip. The opposite end also flares slightly and exhibits a small lip at the extreme end. The pin is illustrated as Figure 17b.

1f. MT-35. Two opposing metal objects comprise this artifact. Each mirror image half is 9 inches in length, 7/16 inches in width at the wide end tapers down to 3/8 inch at the opposite end. Both pieces exhibit a semicircular trough in a rectangular C-shaped metal half. On the exterior side of both pieces is visual evidence in the form of rusting that these two halves were once wrapped with wire. It is probable that a soft object was enclosed by these pieces and the assembly was wrapped with wire to hold the object together.

1g. MT-53. The outside diameter of this washer-like item is 1 5/16 inches. One quarter of an inch in from the edge the metal is turned down to form a recession. At the bottom of the bowl is a hexagonal pattern which measures 5/16 inch on a side. One corner of this pattern is torn from metal failure probably caused from excessive strain. It is probable that a hex-head nut or bolt head rested in the depression and that strain deformed this washer-like object. The artifact is plated with a shiny metal.

B. Fat Chance. Dates and function on these four cultural objects are unknown.

1. Metal. MT-62 and MT-67. These two specimens are comprised of heavy metal and severely rusted.

2. Wood. Two specimens are discussed.

2a. MT-3. This piece of wood measures 2 1/4 inches in length by 3/4 inch in width and 1/2 inch in thickness. The following description is taken from the 1987 report (USDI 1987). One side has been pressed in a 3/8 inch wide swath as if a piece of metal had been bound against it. The exterior flat sides exhibit a sienna-colored stain, possibly rust.

2b. MT-59. It appears that this piece of wood is a broken fragment of milled lumber. The length is 10 inches, 1 1/8 inches at the widest portion, and 3/4 inch thick. This fragment contains and broke around a knothole with knot. This wood fragment is extremely weathered. It is illustrated as Figure 17c.

Chronological Interpretations

A relative chronology was established for a majority of the artifacts contained in this collection and is graphically represented in Tables 8 and 9. This chronology is based on the presence of diagnostic attributes that are the result of changing manufacturing processes and techniques in the evolution of certain industries. Glass and metal containers are perhaps the best means for determining the age of a particular historic site, in this case, a linear historic trail. As cautioned earlier, the dates suggested in this document are relative and based on several sources which do not often agree. The graphic representation of time lines can be misleading. For example, within the subclass of beverage containers, specific manufacturing techniques of most bottle fragments either appears to end or begin in 1903, the year that automatic bottle machines started production. In reality, many glass bottle manufacturers probably continued making bottles by older methods as they switched over to new techniques. Thus, ending and beginning dates are not written in stone.

Several observations can be made concerning the chronology of the artifacts. The earliest suggested probable date for an artifact in this collection is attributed to a dark amber bottle neck (MT-66). The

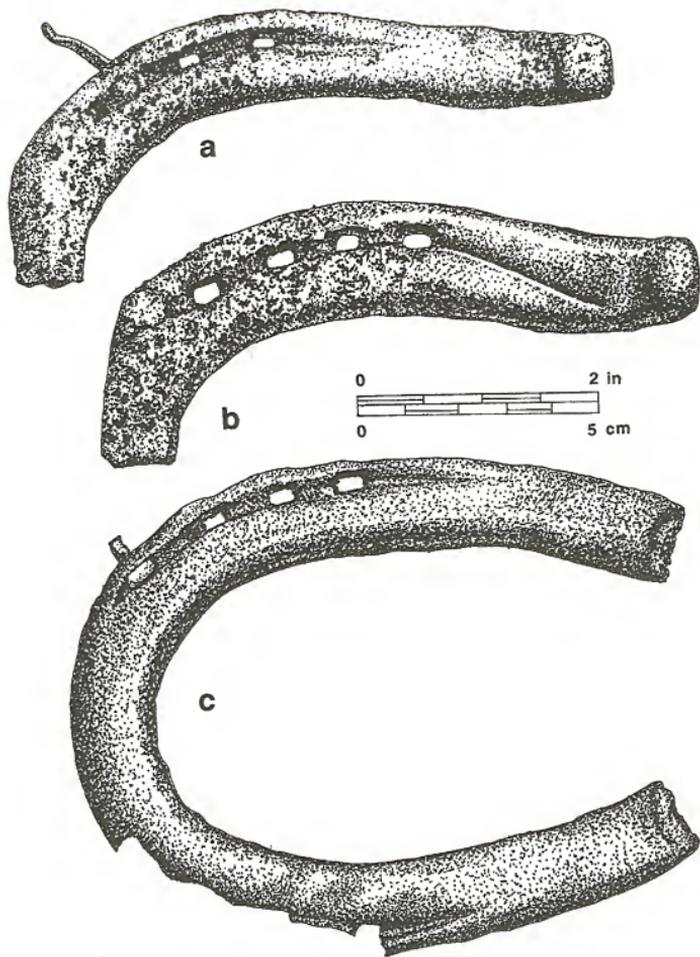


Figure 16. Two muleshoe fragments and a complete muleshoe.

finish application technique on this bottle neck was developed in the 1850s. The most recent dates are found on a bottle base (MT-38), a single cartridge (MT-50), seven tobacco tins (MT-25,43,47,48,49,52,55), and the flat cigarette case (MT-52). Tobacco tins were developed after 1896 and have remained relatively unchanged to the present. The single identifiable "VELVET" tobacco tin (MT-25) was introduced in 1926.

It is reasonable to assume that the trail was used by local ranchers, farmers and miners after 1905 when the railroad came to Las Vegas Valley. Historic use likely continued until the Mountain Springs highway (SR-160) was constructed in the 1940s. A few bottle fragments, some metal cans, tobacco tins and a cartridge are all considered manufactured after 1900. Based on this data, all of the post-1905 dateable artifacts in this collection fit within a time frame that coincides with historic use of the trail and are thus associated with the trail.

Cultural Processes

Behavior of those people who used the trail is also revealed in the artifacts. For instance, the presence of a presumed lost suspender clasp in the collection implies that one person on the trail ride was suddenly forced to hold up her/his garments in an unplanned fashion. Cans litter the length of the trail, evidence of food consumption that included fruits, vegetables, some meats and sardines. Food and beverage containers make up 56 percent of the collection. In order to procure the contents of the cans, it was necessary to open the containers in varying fashions. Holes were punched, tops torn with mechanical devices, and keys removed scored strips. Some can tops were opened in a clockwise fashion while others were opened counter-clockwise. Are these indications of left- versus right-handedness? Baking powder and evaporated milk containers suggest that baking was also part of a trail diet.

At the personal level, some trail users indulged in smoking and chewing tobacco to pass the time. For what ailed them, a few managed to down an occasional bottle of medicinal "cure". With relative ease, a cork stopper could be eased from its position in the neck of an alcohol bottle and the contents consumed to kill the pain and boredom of a long, dry haul on the trail. Once the food or drink was consumed, bottles, like cans and other disposable items, were tossed to the side of the trail to be later observed by other trail users or collected by archaeologists.

Traveling from spring to spring on rocky and rough surfaces meant that one could encounter trouble with the team animals or wagons. On difficult stretches of the trail a horse or mule would occasionally throw a shoe. To add to the teamster's problems, a wagon could break down or lose a part here and there. Both horses and mules were used to haul wagons and their loads. Artifacts in the unclassifiable group are probably associated with parts of the wagon assemblage.

By comparing the artifacts observed along today's modern transportation routes (linear archaeology) with those in this study it is possible to observe similarities. Only the level of technology has changed the product form over the past decades. Car and truck parts have replaced horse/muleshoes and wagon parts on the surface of the land. Along with glass bottles, aluminum cans have been added to the class of disposable items found along contemporary highways. Metal cans that once held food products are quickly being outnumbered by fast-food cardboard and styrofoam containers. Clothing items and the relatively recent products of disposable diapers are occasionally lost or dropped. The items may change but the cultural processes remain the same through time.

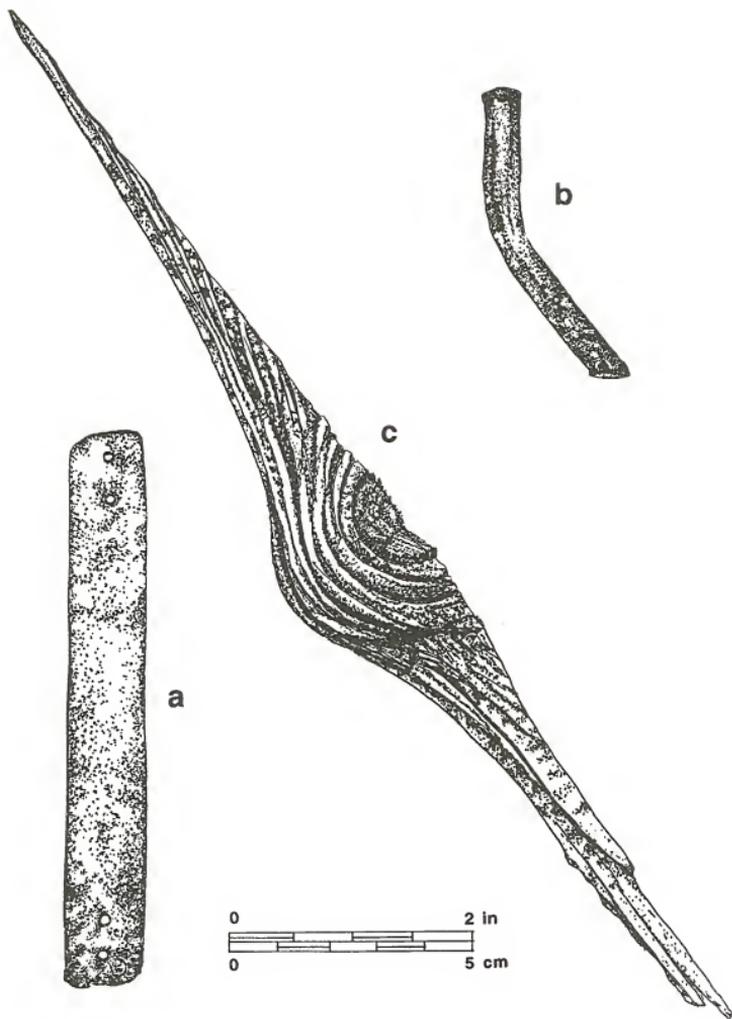


Figure 17. Piece of strap metal, pin and a wood fragment.

Table 8. Chronological positions of the estimated dates of collected artifacts on the *Old Spanish Trail/Mormon Road* from Las Vegas to the California border, by class and subclass.

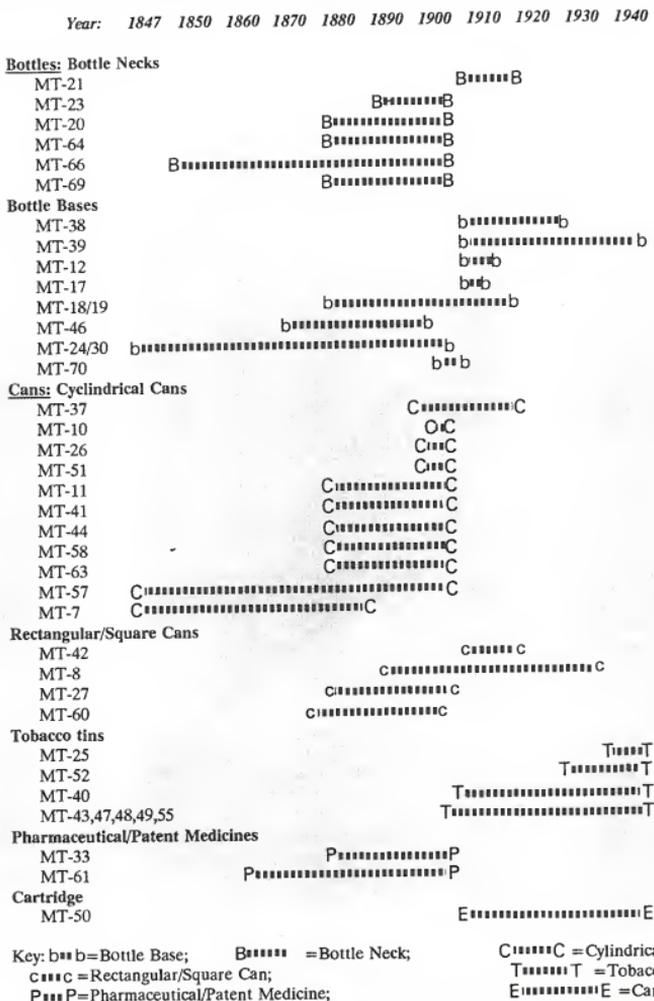


Table 9. Chronological positions of the estimated dates of collected artifacts on the *Old Spanish Trail/Mormon Road* from Las Vegas to the California border.

Year:	1847	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940
<i>Objects</i>											
MT-25										T	.....T
MT-52										T	.....T
MT-50									E	.....E	
MT-38									B	.....B	
MT-39									B	.....B	
MT-42									c	.....c	
MT-21									b	.....b	
MT-12									B	..B	
MT-17									B	..B	
MT-40									T	.....T	
MT-37									C	.....C	
MT-43									T	.....T	
MT-47									T	.....T	
MT-48									T	.....T	
MT-49									T	.....T	
MT-55									T	.....T	
MT-8									C	.....C	
MT-10									C	..C	
MT-26									C	..C	
MT-51									C	..C	
MT-23									b	.....b	
MT-20									b	.....b	
MT-64									b	.....b	
MT-11									C	.....C	
MT-41									C	.....C	
MT-44									C	.....C	
MT-58									C	.....C	
MT-63									C	.....C	
MT-27									c	.....c	
MT-33									P	.....P	
MT-18/19									B	.....B	
MT-60									c	.....c	
MT-46									B	.....B	
MT-61									P	.....P	
MT-66									b	.....b	
MT-7	C	.....C									
MT-24/30	B	.....B									
MT-57	C	.....C									

Key: B..B = Bottle Base; b.....b = Bottle Neck;
 C..C = Rectangular/Square Can;
 P..P = Pharmaceutical/Patent Medicine;

C.....C = Cylindrical Can;
 T.....T = Tobacco Tin;
 E.....E = Cartridge.

CHAPTER FOUR TRACES OF THE PAST

The portion of the *Old Spanish Trail/Mormon Road* from Las Vegas to the Nevada/California border was archaeologically surveyed between May, 1987 and April, 1989. The location of the route of the trail and proveniences of observed and collected artifacts were plotted on 7.5 minute USGS topographic maps and are duplicated in Appendix One. Eight days were spent surveying the route.

The section of the trail intensively examined in southern Nevada is 28.8 miles in length. Eleven additional miles are under paved highway and were reconnaissance surveyed by vehicle. Urban construction in Las Vegas Valley covers another 8.5 miles. Because the trail alignment presently cuts through numerous houses and lawns in Las Vegas Valley, the route under urban construction was not inspected. The width examined was an average of six to seven feet on the trail and approximately six feet on either side, with a total of about 20 feet wide by 28.8 miles surveyed. This totals about 70 acres of intensive survey of the trail. Figure 18 shows the average width of the trail.

Inventory Results

Results of the intensive examination of the trail and analysis of collected artifacts demonstrates that an historic trail did indeed dissect the southern portion of Nevada. This field and literature research is used to address the study questions posed in Chapter Two.

Research Question 1: Impacts to the Environment. Do any sections of pristine trail remain, and if so, what is the nature of the surface? Expectations were that short portions deviating from the original trail could be identified in those sections being driven by off-road vehicles.

Results of the Inventory: It is apparent that the trail at least minimally changed the environmental setting. Use of the alignment by modern vehicles continues through much of the route. About 55 percent of the non-paved portions are used as modern jeep roads and delineated in Appendix One:Maps 1 through 16. Continued driving on the route during contemporary times has incurred both positive and negative results. It has preserved the alignment while at the same time inhibited integrity of design, workmanship and association. Yet, not all parts of the trail used for jeep roads have been extensively driven by modern off-road vehicles.

At several points, pristine portions of the original route can be seen deviating from the modern jeep road (Appendix One:Maps 11, 12 and 13). These sections range from distances of 50 to 300 feet in length. They usually branch off the modern route on to higher terraces. These pristine portions are difficult to notice when driving in a vehicle, but after visual identification during walking of the trail can be easily spotted. These older sections usually exhibit lighter-colored, finer-ground sandy surfaces in parallel columns and are often absent of typical vegetation.

Evidence of the trail can be seen in impacts to the surface. Possible ruts were noted on a portion of limestone bedrock (Appendix One:Map 12). A six inch drop from one ledge to another is present when facing south at this point, and the ruts seem to have been cut into the surface up to two inches deep. The parallel ruts are 6.5 feet apart. It is possible they are evidence of repeated wagon crossings at this particular spot. Yet, because the limestone weathers in a seemingly random fashion in this locale, it is difficult to positively identify these grooves as wagon ruts.



Figure 18. BLM Archaeologist Keith Myhrer on a relatively pristine portion of the Old Spanish Trail/Mormon Road south of Cottonwood Spring.

Two separate portions that equal about 15 percent of the trail lack evidence of repeated recent driving. Most notable is a portion approximately 4.1 miles in length that heads across a major wash south from Blue Diamond to the paved highway. The vegetation change from previous use of the trail is subtle but clear when sighting in on the alignment. This section is considered the most pristine and is also visible in the photograph in Figure 18. During the initial recordation of this segment, archaeologists noted three points where entry from the wash had occurred, all joining within 100 feet of the edge of the wash. The differing points of entry are likely due to cut and fill episodes through time in the wash.

After completion of the initial cultural resource report (USDI 1989), the predecessor of this document, the archaeologists revisited selected portions of the trail for additional photographic recordation. On the day of winter solstice, Dec. 21, 1989, Stan Rolf encountered a parallel portion about 75 feet to the north (Appendix One:Map 11, location of MT-71). This portion enters a small valley from the wash south of Blue Diamond at a different point from the other three noted previously. The segment, one-half mile in length, follows a terrace about 10 feet higher in elevation than the initially recorded portion. The surface of this higher portion appears even more pristine than the lower segment. For instance, vegetation has recaptured small areas of the route, making it difficult for lengths of 20 to 30 feet to determine where the trail lies. Also, one rutted side of the trail has been more heavily inscribed into the surface than the other. This is considered a result of a natural course of water erosion on this particular slope, an indication the surface had not been altered for a relatively long period. Most dramatic of this discovery was the finding of an *in situ*, complete, purple-colored "picnic flask" (MT-71) glass bottle, another indication this portion had not been recently visited. Based on the surface morphology and comparisons with the relatively pristine segments of trail recorded by the archaeologists, this one-half mile long portion is considered to have never been used by a motorized vehicle. Figure 19a is a photo of Rolf holding the bottle on this "trace" alignment.

The section that exhibits the next best condition is 5.7 miles long and located in the Pahrump Valley from the "Old Spanish Trail" marker and crossing of the Frontier 500 race course to Stump Spring. Perhaps the major reason why this section does not show evidence of extensive modern off-road driving is the nature of the silty, dune-like surface that inhibits easy following of the trail. The trail seems so ephemeral in some places that during the inventory the archaeologists wondered at times whether the original alignment was yet intact. Discovery of several historic glass fragments at one turn in the trail validated the integrity of location of the route.

In summary, about 15 percent of the trail from Las Vegas to California, or two sections that are 4.1 and 5.7 miles in length, can be considered somewhat pristine. The nature of the surface is different between the two undisturbed sections. A narrow band of brighter vegetation has grown in the once intensively utilized trail alignment southwest of Blue Diamond. Near Stump Spring the silty dune surface has inhibited recent traffic by making identification of the trail alignment quite difficult.

An additional field observation concerns the directional nature of the alignment of the trail. Rolf noted that when possible the route was usually straight in direction in order to presumably provide travelers with a topographic point of destination. For instance, between Cottonwood Spring and the base of the Spring Mountains the peak of Mount Potosi is consistently straight ahead. We speculate that straight alignments would have been easiest to follow and lessened the chance of users getting lost down a wrong wash. This luxury did not always afford traveling the path of least resistance. In contrast, modern off-road users attempt to follow the surface topography and usually create winding, meandering trails. Figure 19b is an overview taken from a hill of a portion of the trail between Cottonwood Spring and Mt. Potosi. The photo shows the straightness of the alignment in contrast to contemporary jeep roads that wind around the road.



Figure 19. a) Stanton Rolf with bottle found on the alternate trace alignment (arrow) of the Old Spanish Trail/Mormon Road south of Cottonwood Spring; b) Overview of a portion of the section between Cottonwood Spring and Mount Potosi. Arrows point to the trail with jeep road winding around it.

Research Question 2: Travel Patterns. *Did the travelers move from spring to spring, or where there dry camps along the way?* It was expected that in this region most travelers would attempt to reach a spring by end of day. It was only expected that a few small, dry camps in cases of breakdowns should be found.

Results of the Inventory: Temporary dry camps between springs were not found in association with the trail. It is assumed that users of the trail expected to travel from spring to spring in one day. Breakdowns were possibly quickly repaired with the help of other travelers.

An historic corral/water camp was found along Lovell Wash by Robert Leavitt, contracting archaeologist for the Nevada Department of Transportation, but it is located about a quarter of a mile north of the trail. Two large containers were possibly used for watering of horses. A nail from a railroad tie had that had been used to construct the corral had been embossed with the date "1924," and it is assumed that the site was constructed sometime around 1930 when the ties were presumably taken from a dismantled railroad line. In any case, the camp is not considered associated with use of the trail.

A small boulder wall alignment (about 4 X 4 feet X 3 feet high) without artifacts or subsurface deposition is located next to the trail between Las Vegas and Cottonwood Springs (Appendix One: Map 12). The proposition that this was a water storage structure for a dry camp was entertained, but the absence of artifacts and the presence of several "prospects" and associated mining roads within 30 feet of the feature implies this was a post-Mormon Road mining structure possibly used for a brief time as a mining related explosives storage unit. It is not considered a dry camp trail feature.

Research Question 3: Chronology. *What do the artifacts tell us about time of use of the trail?* It was expected that artifacts would be found dating to a period from about 1850 through 1905.

Results of the Inventory: The results of the artifact analysis indicate an earliest probable date in the 1840s, with a chronological distribution to recent times. Most manufacturing dates of glass artifacts occur from 1880 to 1910. Can dates are clustered between 1880 and 1905. The two medicine containers are dated between 1860 and 1905. Three tobacco tins are assigned to a range from 1895 to 1940.

Even when caution is used in interpreting chronology based on dating techniques for glass and cans, as emphasized by White in Chapter Three, it is apparent that no artifacts were found dating to the early phase of the *Old Spanish Trail* from 1829-1844. Although this does not negate the assumption that Armijo entered Las Vegas Valley, it does lend credibility to Warren's (1974) conviction that Fremont in 1844 was the first to travel from Las Vegas Springs to Cottonwood Spring and beyond. Based on Table 9 in Chapter Three, most artifacts were likely deposited on the trail between 1880 and 1905. Because the Union Pacific Railroad was running in 1905, these dates correlate well with predicted results. There are several artifacts that were deposited after 1905 and before 1940. This is not surprising considering that the ranching community of Pahrump was not accessed into the railroad, and the route would have been necessary for transport of supplies.

Research Question 4: Cultural Processes. *What do the artifacts tell us about eating, drinking and living practices of the trail users?* Expectations were that food and liquid containers, wagon parts, and associated equipment would be found.

Results of the Inventory: Evidence of food consumption is reflected in the analysis of 18 cans and can fragments. In Chapter Three, White interprets variations in the opened tops of cans as possibly related to left- or right-handedness of the persons opening the containers. Baking powder and evaporated milk cans imply some baking was conducted on the trail. Tobacco was chewed and smoked. Alcoholic beverages and medicinal "cures" were consumed from bottles. The presence of

horseshoes, muleshoes, and parts from wagons indicates that breakdowns occurred over rough stretches of the route.

It is interesting to note the clustered locations of artifacts such as horseshoes and muleshoes. This observation initiates a new research question that is discussed below. *Does the distribution of artifacts imply anything about other processes along the trail?*

Artifact Distribution

In addition to the 75 artifacts collected from Las Vegas to the California border (two artifacts were found north of Las Vegas), 19 glass scatters, eight soldered cans, five pieces of metal and one piece of wire were recorded. This is a total of 89 artifacts and 19 glass scatters. An average of five artifacts are estimated per uncollected glass scatter, with a total of 95 artifacts total for all recorded scatters. A total of 184 artifacts are estimated as present on the trail at the time of the survey. The locations of the artifacts, excluding the two cans collected near Apex north of Las Vegas, are shown in Appendix One: Maps 2 through 16. There are some interesting associations concerning numbers and kinds of artifacts and their locations.

Distribution Groupings from Spring to Spring. An estimated total of 132 artifacts were observed or collected in the portion of the trail from the edge of urban construction in southwest Las Vegas to the gypsum mine northeast of Cottonwood Spring, a distance of 7.0 miles. This is 72 percent of the sum of artifacts.

Twenty-seven artifacts were found from Cottonwood Spring to the paved highway east of Mountain Springs, a total of 5.5 miles. This is 15 percent of the total.

Twenty-five artifacts were found from the paved portion of the trail west of Mountain Springs to the California border, a total of 16.4 miles. Only 13 percent of the artifacts observed and collected were found in this relatively long portion of the trail. It is unfortunate that the section of the route under the Mountain Springs highway was never archaeologically surveyed for comparative data prior to construction.

Based on the uneven distribution of artifact clusters from Las Vegas to the California border, a proposition is made concerning the stocking of supplies at designated centers along the historic route. The location of Las Vegas Springs may have been a supply center on the *Mormon Road*. Use of the artifact distribution in this manner is based on the assumption that most travelers were heading south from Utah to California. It is possible that certain points along the trail were used for storing of large quantities of canned and bottled foodstuffs for redistribution to the travelers. Las Vegas Springs may have been stocked from a larger center in Utah, and another spring stop in southern California stocked from San Bernardino. Based on the post-1860s dates of most recovered artifacts, such a supply center was likely not in place until at least the last two decades of the 19th century.

The following is a possible scenario concerning the redistribution of foods to travelers along the *Mormon Road*. Fresh fruits and vegetables were likely available from any spring site where there were residents. Dried foods procured at the points of origin may have been kept by the travelers in large bins strapped into wagons. Some canned and bottled goods were also stored at the beginning of the trip. When sojourners reached spring stops along the way, fresh fruits and vegetables were bought. Certain spring stops had also been previously stocked for procurement of canned foods and bottled drinks by travelers. When the travelers left these supply centers, the canned foods were probably eaten first as a means of reducing weight that would be carried by pack mules or in wagons. In this portion of the trail, a light load would be best for the climb up Potosi Pass. An argument for the quick consumption of bottled liquids is related to the high potential

of bottle breakage on the rough ride. By the time the travelers had left Mountain Springs, it is likely that dried food was the remaining source of carried sustenance.

From this proposition and scenario, generated from analysis of artifact distribution from Las Vegas to the California border, a simple predictive model that can be used for exploration of other sections of the trail is derived. The model predicts that most artifacts associated with canning and bottling of foods and liquids should be found in the portion of trail between the spring designated as a supply center (Spring 1) to the next spring (Spring 2). Artifact numbers should decrease from Spring 2 to Spring 3, the next spring down the line, and probably reach a stable numerical plateau within a few miles.

Glass Distribution. Twenty-four glass fragments and one complete bottle were collected and an estimated 95 pieces recorded in scatters for a total of 119 glass fragments and one bottle present along the trail. Fifteen artifacts were found from Mountain Springs to Stump Spring. Twenty-one were present between Cottonwood Spring and the Mountain Springs highway. Eighty-three fragments were found between Las Vegas and Cottonwood Springs. This distributional data also supports the supply center proposition that bottles were available in large supply at Las Vegas Springs but not at Cottonwood or Mountain Springs.

Horseshoe Distribution. Eight horse/muleshoes were found and collected along the trail. All were present in a five-mile portion from the edge of Las Vegas heading south toward Cottonwood Spring. This area is relatively rough in terms of the presence of deep, cross-grain wash cuts. The wash cuts are strewn with large limestone cobbles and boulders. It is likely that for travelers heading south, the terrain in this section would have been problematic for horses and mules. Randomly-placed loose boulders would have facilitated the breaking of animals' shoes. It is also likely that the climb up Mount Potosi Pass would have incurred the same number of breakdowns. As previously stated, the trail is under paved highway and no data was procured prior to construction.

Tobacco Can Distribution. Eight tobacco containers were found along the trail. Five had been discarded within a two mile-stretch south of Cottonwood Spring. If Las Vegas Springs was a supply center at which tobacco was purchased, the proveniences of the five tobacco tins indicates that it took a chewer/smoker a distance of about 18 miles from Las Vegas Springs to use one can of tobacco. It is assumed that one or more days were spent at Las Vegas Springs, and at least one day at Cottonwood Spring.

Summary of artifact distribution. Besides the indication that Las Vegas Springs may have been a supply center, does the distribution of artifacts imply anything about other cultural processes along the trail? Yes, it implies that the rough wash cutting of Red Rock Wash southwest of Las Vegas Springs took a toll on the shoes of horses and mules. Finally, based on the distance from Las Vegas Springs to the median distribution point for five of eight tobacco cans, the contents of one can of tobacco may have lasted for about 18 miles.

Archaeological Synthesis

The portion of the *Old Spanish Trail/Mormon Road* from Las Vegas to the California border was intensively examined by two archaeologists. In spite of disturbance from off-road activities and contemporary urban construction in one of the fastest growing cities in the nation, some sections of the trail in southern Nevada retain some degree of integrity. With the exception of sections where paved highway has covered the trail, artifacts still remain along the historic route.

The portion that ran through southern Nevada was likely one of the roughest due to the sparse spacing of springs. Distance between springs averages over 17 miles. Based on the absence of

recorded dry camps, the trail users probably attempted to make it from one spring to another within one day. Perhaps after enduring an exhausting day between springs, they recovered both physically and emotionally for a day or two before attempting the next 17 to 20 mile section.

The artifacts reveal information concerning its users and time of use of the trail. During a period from about the 1840s to the early 1900s, the travelers consumed fruits and meats from cans and swallowed medicinal or alcoholic beverages from bottles. The presence of a baking powder can lid implies meals were baked on the trail. Newly acquired tobacco may have lasted for about 18 miles from Las Vegas Springs just beyond Cottonwood Spring. Based on the uneven distribution of artifacts along the trail, Las Vegas Springs may have been a supply center from which canned foods and bottled drinks were available for trade.

A cluster of horseshoes and muleshoes south of Las Vegas Springs indicates that this was a rough section to traverse. Deeply cut, cross-grain washes posed traps in the form of loose cobbles and boulders. Numerous animals probably needed new shoes while walking through this area.

In summary, enough of the trail remains to allow both the users of public land and archaeologists to gain a sense of the nature of the trail. The distance, the environment and indications of the behavior of the people traveling the route can yet be revealed through the field experience and the archaeology of the trail. The managers of this portion of public land have responsibility to both preserve and make available for proper public uses the route of the *Old Spanish Trail/Mormon Road*. Methods and directions for managing the trail are discussed in the following chapter.

CHAPTER FIVE TRAIL REMAINS

The route of the *Old Spanish Trail/Mormon Road* that runs through southern Nevada was assigned in 1987 archaeological site numbers 26CK3848/BLM 53-4969. The first step in management of the trail as a cultural resource is evaluation for eligibility for nomination to the National Register of Historic Places. The second step involves recommendations to management for the best uses of the route according to BLM manual guidelines.

Field inventory of the *Old Spanish Trail/Mormon Road* from Las Vegas to the Nevada/California border, conducted from May, 1987 to April, 1989, resulted in identification and subsequent classification of three states of preservation of the trail. The first state of preservation is called **Totally disturbed**. One long portion has been paved and is incorporated into the modern highway system. The next state of preservation is **Partially disturbed**. Some portions have been extensively driven by contemporary offroad vehicles and other parts bladed. The remaining class of preservation is called **Relatively Undisturbed**. Two sections show little evidence of recent vehicular use and retain some degree of integrity. Table 10 shows the distribution of disturbance of the trail from section to section.

Evaluation for National Register Eligibility

Section 106 of the National Historic Preservation Act of 1966, as amended, describes procedures to provide for preservation of significant cultural resources. To determine significance, objects, archaeological sites or cultural traditions require evaluation of eligibility for nomination to the National Register of Historic Places.

A cultural resource such as a trail or similar linear route poses unique problems for evaluation of significance. Evaluation criteria are found in 36 CFR 60.4. An eligible site must initially possess integrity of location, design, setting, materials, workmanship, feeling and association. Construction projects, recreational use and erosion have impacted only portions of the linear trail. Other parts remain relatively unaffected. Consequently, only some portions of this trail retain integrity.

Long sections of the trail classified as **Totally disturbed** do not meet integrity criteria and are not considered eligible for nomination to the National Register. A total of 19.5 miles are severely disturbed. Long sections that have been repeatedly used by recent off-road vehicles and classified as **Partially disturbed** possess integrity of location but lack integrity of design, setting, materials, workmanship, feeling and association. A total of 19.0 miles are partially disturbed. These sections do not meet all integrity criteria and are not considered eligible.

Two relatively long sections of the trail classified as **Relatively undisturbed** retain integrity. Most notable is a portion that heads south from Cottonwood Spring towards Mountain Springs within half a mile north of the highway. This section is 4.1 miles long. The vegetation change from previous use of the trail is subtle, but clear when sighting the alignment. This section is considered the most pristine. Figure 20 shows two photographs of relatively undisturbed trail south of Cottonwood Spring. The other section that retains integrity is located in the Pahrump Valley from the "Old Spanish Trail" marker and crossing of the Frontier 500 race course to Stump Spring. This section is 5.7 miles long. The silty, dune environment has inhibited repeated use by contemporary vehicles due to the problematic nature of constantly relocating the trail on the surface.



Figure 20. Relatively pristine section of the Old Spanish Trail/Mormon Road between Cottonwood Spring and Mount Potosi. a) Facing west with Potosi in background; b) Looking east.

Table 10. Disturbance by sections of the *Old Spanish Trail/Mormon Road* from Las Vegas to the California border.

	<i>Totally Disturbed</i>	<i>Partially Undisturbed</i>	<i>Relatively Undisturbed</i>	<i>Total Miles</i>
Las Vegas Springs to Cottonwood Spring	8.5 miles* 3.2 miles**	7.0 miles+		18.7
Cottonwood Spring to Mountain Springs	3.2 miles***	1.4 miles+	4.1 miles	8.7
Mountain Springs to Stump Spring	4.6 miles***	4.8 miles++ 3.8 miles+	5.7 miles	18.9
Stump Spring to Nevada/California border		2.0 miles+		2.0
Totals by Disturbance Category	19.5 miles	19.0 miles	9.8 miles	48.3

KEY: *=Urban Construction; **=RR tracks/gypsum mine; ***=Paved highway; +=Jeep road; ++=Jeep road/bladed.

Small segments from 30 to 200 meters in length that deviate from the contemporary jeep road sections were evaluated for integrity criteria and noted on the maps. These segments are relatively short and are usually adjacent within 10 meters to the contemporary jeep trail. They possess integrity of location, design, materials and workmanship, but in relationship to the disturbed portions have lost integrity of feeling and association. These short segments are not considered eligible for nomination.

The next step in the evaluation process is meeting at least one of four additional criteria specified in 36 CFR 60.4. The two *Relatively undisturbed* sections possess integrity of location, design, setting, materials, workmanship, feeling, and association and also meet criterion a. (are associated with events that have made a significant contribution to the broad patterns of our history). The trail provided a route for transportation of freight and for human settling of the region. As a whole it is considered significant in the broad patterns of our history. The two sections classified as *Relatively undisturbed* are considered by BLM eligible for nomination to the National Register of Historic Places.

Evaluation for Uses Under BLM Manual Guidelines

The next step in management of the trail specifically involves those portions considered eligible for nomination to the National Register, but also deals with treatment of the trail as a whole. BLM Manual 8111.21 describes several cultural resource use categories to be used for management.

The two sections of the trail classified as Relatively undisturbed and considered significant are recommended for two categories. It is anticipated that local historic groups will perceive the trail as possessing attributes that contribute to maintaining the heritage of that group's members. Such a status places the historic property into the Socio-cultural use category. The two portions of the trail that retain integrity are also recommended for the Public use category. The sections are appropriate for consideration as interpretive exhibits-in-place. Both categories require avoidance and restraints on competing land use.

Sections of the trail classified as Totally disturbed and not considered significant are recommended for the Discharged use category. The locations of the trail in these areas no longer prevents or constrains management on competing land uses.

The sections of the trail classified as Partially disturbed are also not considered significant due to the failure to retain all integrity criteria. The absence of significance could place these sections into the Discharged use category. In contrast, these sections possess potential for interpretive uses in the Public use category. For instance, portions of the sections are accessible for turnoffs from paved highways are also ideal for contemporary off-road driving. Although integrity has been compromised due to repeated driving and even blading, location remains, and it can be argued that the "feeling of being on the trail" can yet be experienced. The photographs in Figure 21 show two partially sections that are ideal for interpretive exhibits-in-place. Consequently, the "Partially disturbed" sections are also recommended for the Public use category.

In summary, the sections of the trail classified by disturbance levels can also be placed into one or more of three BLM cultural resource use categories. All of the Totally disturbed portions are recommended for the Discharged use category. No further field work can be justified. The Partially disturbed sections fit into the Public use category and are considered as potential exhibits-in-place. The Relatively undisturbed portions are recommended for both the Public use and the Socio-cultural use categories as parts of a trail that possess attributes that contribute to maintaining the heritage of an historic group's members and that have potential as exhibits-in-place.

National Historic Trail Evaluation

The National Trails System Act of 1987 provides for establishment of a system that includes both recreational, scenic and historic trails. A national historic extended trail must possess several qualities for designation as a national historic trail. First, it must be at least 100 miles in length and as closely as possible follow the original route. The *Old Spanish Trail/Mormon Road* is about 1000 miles in length from Santa Fe to San Gabriel, and about 650 miles in length from Salt Lake City to San Bernardino. The trail in southern Nevada is 152 miles in length and the mapped route closely follows the original path.

Second, it must meet three criteria, briefly summarized below. First, it must be a trail or route established by historic use and be historically significant as a result of that use. Second, the trail must be of national significance with respect to any of several broad facets of American history, such as trade and commerce, exploration, migration and settlement, or military campaigns. Finally, it must have significant potential for public recreation use or historical interest based on historic interpretation and appreciation.

The *Old Spanish Trail* in this region was established in 1829 and used until 1848 or 1850. The *Mormon Road* is dated from about 1850 and was used into the first decade of the 20th century. Historic use by local settlers continued into the 1930s or 1940s. The trail meets significance criteria under the National Historic Preservation Act of 1966, as amended. Its significance is linked to exploration, migration/settlement, and trade/commerce as related to population expansion of the western United States in the latter half of the 19th century. Two segments of the historic trail in

southern Nevada between Las Vegas and the California border are considered to have retained integrity and have potential for interpretive uses. These uses include walking trails, primitive campsites and interpretive displays. The *Old Spanish Trail/Mormon Road* in southern Nevada, as discussed above, meets the established criteria in the National Trails System Act of 1987.

Finally, it must also be practical, both physically and financially, to develop a trail along the route being studied. With the exception of urban/developed areas, it is physically possible to map and follow the trail through southern Nevada. The financial practicality cannot be addressed in this document. According to the Trails Act, a trail must be evaluated by Congress as a feasibility study. If Congress does accept this project for evaluation, we believe it would be most practical to study development of the *Old Spanish Trail/Mormon Road* as a national trail in cooperation with the adjacent states of Utah, California and Arizona.

Summary of the Trail's Significance Potential

The *Old Spanish Trail/Mormon Road* is considered a trail of national significance linked to exploration, migration/settlement and trade/commerce as related to population expansion of the western United States in the latter half of the 19th century.

Two segments of the trail retain integrity and meet significance criteria under the National Historic Preservation Act of 1966, as amended, and are considered eligible for nomination to the National Register of Historic Places. These segments and three additional sections, for a total of 28.8 miles, are considered eligible for the Public use category under BLM Manual 8111.21. This includes interpretive uses. The trail also qualifies for nomination to Congress as a study project to determine the feasibility of establishing the *Old Spanish Trail/Mormon Road* as a National Historic Trail under the National Trails System Act of 1987.

Review of the Trail's Significance by Interested Parties

Documentation for a determination of eligibility for nomination to the National Register of Historic Places for two sections of the trail, as described in this report, was submitted by the Las Vegas District Bureau of Land Management to the Nevada State Historic Preservation Office in September, 1989. Concurrence that the two segments are eligible for nomination was received in October, 1989.

The justification for selected collection of artifacts on the trail included the plans for developing a community heritage display. An exhibit on the archaeology of the *Old Spanish Trail/Mormon Road* was designed and constructed in January, 1990 by Corinne Escobar of the Barrick Museum of Natural History Museum, University of Nevada, Las Vegas. This display was initially placed into the lobby of the Las Vegas District BLM, with intentions by the BLM of loaning the exhibit to regional museums or institutions.

The initial report *Archaeology of the Old Spanish Trail/Mormon Road from Las Vegas, Nevada to the California Border* was written as Las Vegas District Cultural Resource Report 5-1950 (USD1 1989) in September, 1989. Interested parties in southern Nevada, southern California, southwestern Utah, and northwestern Arizona were furnished copies of the report for review and comments. These interested parties included professional historians and archaeologists, Nevada State Museum, Clark County Museum, Special Collections of the University of Nevada, Las Vegas, Bureau of Land Management and Bureau of Reclamation agency archaeologists in adjacent area offices, Clark County Planning Commission, and the Historical Department of the Mormon Church. Positive comments were received from numerous recipients including a letter from the Mormon Church. Local historian Elizabeth Warren talked with Keith Myhrer concerning alternate routes and views



Figure 21. Two partially disturbed sections of the Old Spanish Trail/Mormon Road. a) Facing west at the east toe of Potosi Mountain; b) Facing west with Pahrump Valley in far background.

on the name of the trail. Responses to her concerns are discussed in Chapter Two. No negative comments were received. Based on these reviews, the Stateline Resource Area Manager, Las Vegas District, accepted the methodology of the inventory, evaluations of the route, and the direction discussed above for management of the trail. The present recommendations and further management direction will be incorporated into the Stateline Resource Area Resource Management Plan proposed for completion in 1991.

CHAPTER SIX THE SUM OF THE TRAIL

Eighty-five years have elapsed since construction of the Union Pacific Railroad through southern Nevada. This technological change in transportation marked the beginning of an end for the *Old Spanish Trail/Mormon Road*. The trail was likely used by some travelers into the following decades, especially local settlers and miners who needed to reach areas in the surrounding valleys and mountains. Contemporary off-road vehicles continue to follow many portions of the trail. After about 150 years of mixed use of this transportation route, what does the trail mean to archaeologists, historians and owners of the public land?

From May, 1987 to April, 1989, archaeologists for the BLM walked the trail from Las Vegas to the Nevada/California border. The route was plotted on topographic maps, artifacts collected and a literature review completed. The artifacts were subjected to a laboratory analysis and the data on the trail documented. Finally, the trail was evaluated for significance under two Federal laws and reviewed for management uses. This is the sum of the trail.

History of the Trail

After a literature review using three major sources on the *Old Spanish Trail* in this region, it was determined that although Antonio Armijo's expedition was the first to enter Las Vegas Valley in 1829, it did not cross southern Nevada on the route presently considered the *Old Spanish Trail*. Instead, the expedition closely followed the west side of the Virgin River to Las Vegas Wash, then headed southwest, passing Jean Dry Lake and west to Bitter Spring in California. In 1844 John Fremont was the first to traverse southern Nevada from Stump Spring to Mountain Springs, Cottonwood Spring, Las Vegas Springs and north through Moapa and into Arizona/Utah. Fremont published his maps and notes in 1845 and it has been documented that his route, which has traditionally been referred to as the *Old Spanish Trail* in this region, was subsequently used by most travelers (Warren 1974). At about 1848 the trail that was used to connect Santa Fe to San Gabriel was replaced by better and safer routes in the north and south portions of the United States. Consequently, the *Old Spanish Trail* in southern Nevada that is documented in this report, plotted on topographic maps, and discussed in Hafen and Hafen (1954), had a lifetime from 1844 to 1848.

The trail did not lie dormant after 1848. People desiring a transportation and immigration route from Salt Lake City to San Bernardino, including that stretch within southern Nevada, merged about half the distance of the trail, from south-central Utah to San Bernardino, into the *Mormon Road*. Use of the *Mormon Road* was initiated about 1848 (Warren 1974) and slowly ended after construction of the railroad in 1905. Local settlers and miners likely rode the trail into the 1940s. Modern off-road vehicles continue to drive sections. Table 11 charts historic and recent uses of the trail in southern Nevada. Historic use of the trail is considered from 1844 into the 1940s.

Archaeology of the Trail

From May, 1987 to April, 1989, Keith Myhrer and Stanton Rolf, archaeologists for the BLM intensively surveyed remaining portions of the trail from Las Vegas to the Nevada/California border. The trail was plotted on maps and artifacts collected. In April, 1989, William White conducted a laboratory analysis of the artifacts.

History Plus Archaeology

Archaeological investigation in the field and laboratory supports the historical research that use of the *Old Spanish Trail/Mormon Road* occurred from 1844 to the early 1900s, with heaviest traffic between the 1860s and the early 1900s. Humans, horses, mules and wagons crossed the deserts of New Mexico, Colorado, Utah, Arizona, Nevada and California.

If the sample portion of 48 miles examined in southern Nevada is representative of the remainder of the route, or even the portions in the Mojave Desert, then approximately 20 percent of the trail remains relatively undisturbed. About 40 percent is partially disturbed from off-road vehicles. Almost 60 percent, then, yet exists in some fashion as a trail.

Future of the Trail

Urban expansion in southern Nevada is encroaching on land that was only recently considered as isolated desert. Within this isolated desert, caught in the process of becoming streets and lawns, is the route of the *Old Spanish Trail/Mormon Road*. Certain portions have measurable amounts of integrity and should be managed as significant sections of a linear archaeological site. Use of these portions should be administered in the planning process for interpretive and historic/recreational uses. Some portions have changed as a result of repeated off-road use. Although not considered eligible for nomination to the National Register of Historic Places, these sections still have potential for interpretive use as part of the long trail.

Perhaps the best way to manage the entire trail is within the National Trails System as a National Historic Trail. Portions that are eligible for nomination to the National Register already have preservation protection and will receive treatment for appropriate uses in the planning process. Partially disturbed sections, considered lacking of sufficient integrity for preservation and protection as linear segments of an historically significant site, could then be considered in the planning process for recreational uses such as interpretive off-road drives and possibly even horse/mule authentic trail rides. Those sections that are beneath houses and highways can be appreciated in an historical sense from a plotted position on a topographic map, and maybe even with historical signs through the city.

The 150-year anniversary of Fremont's path through southern Nevada will occur in 1994. Three goals are proposed for cultural resource and recreation management of the *Old Spanish Trail/Mormon Road* in southern Nevada for the next few years.

Goal # 1: Archaeological Inspection of the Remaining Nevada Portion. A similar archaeological examination should be made of the remaining trail in southern Nevada. Of the total 152 miles of trail, 49 miles from Las Vegas Springs to the California border have been examined and discussed within this document. The city of Las Vegas covers approximately 23 miles in Las Vegas Valley, considered totally disturbed. About 65 miles of trail from north Las Vegas Valley to the Arizona border need reconnaissance inventory or intensive examination by qualified archaeologists. After inventory, eligibility determinations should be made for applicable portions. Implementation of similar inventories could be coordinated between this agency and archaeologists responsible for Cultural Resource Management of the trail in adjacent states.

Goal # 2: Nomination for National Trails Study. An interested historic group should nominate the route for a feasibility study by Congress for acceptance as a National Historic Trail. Land managing agencies in adjacent states should be invited to participate in planning and inventory procedures.

Goal # 3: Planning for Interpretive and Recreational Uses. Interpretive and recreational uses of the trail should be proposed and included within future planning studies by the appropriate land managing

agencies, in this case, BLM. Even if the trail is not accepted as a National Historic Trail, public uses such as interpretive exhibits can be planned for portions of the trail determined eligible.

The sum of the *Old Spanish Trail/Mormon Road* equals history plus archaeology plus appropriate uses. Goals designed to equate research with public participation are proposed in this document. The purpose of archaeology/anthropology is to study humans; to observe ourselves through observing the images left by people from the past. The trail is a dimensional medium in which the behaviors and lifestyles of those of the past yet remain in history, archaeology, and the environment. We are contemporary trail participants and our interpretations and experiences also reflect our behavior.

REFERENCES CITED

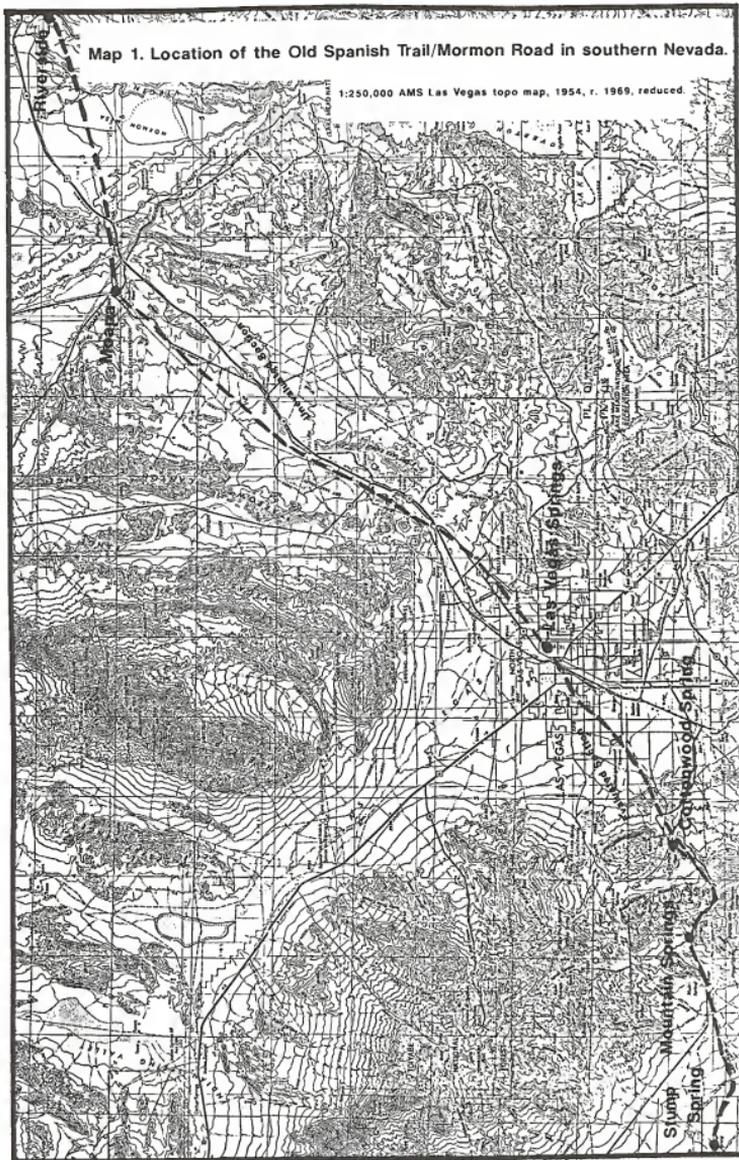
- Berge, Dale
1980 Simpson Springs Station: Historic Archaeology in Western Utah. *Cultural Resource Series No. 6*, Bureau of Land Management, Utah.
- Binford, Lewis
1965 Archaeological Systematics and the Study of Cultural Process. *American Antiquity* 31(2).
- Blee, Catherine
1988 The Moore Cabin and House. Klondike Gold Rush National Historic Park. *Archaeological Investigations in Skagway, Alaska Vol. 2*. U.S. Department of the Interior, National Park Service.
- Brauner, David
1979 Review of Fort Bowie Material Culture, by Robert Herskovitz. *Historical Archaeology* 13:128-130.
- Broilo, Frank
1977 *Settlement and Subsistence Along the Lower Chaco River: The GCP Survey*. The University of New Mexico Press.
- Busch, James
1981 An Introduction to the Tin Can. *Historical Archaeology* 15(1):95-104.
- Casebier, Dennis G.
1983 Reopening the Mojave Road: A Personal Narrative. *Tales of the Mojave Road No. 8*. Tales of the Mojave Road Publishing Company, Norco, California.
- Fike, Richard
1987 *The Bottle Book: A Comprehensive Guide to Historic, Embossed Medicine Bottles*. Peregrine Smith Books, Salt Lake City.
- Hafen, LeRoy R. and Ann W. Hafen
1954 The Old Spanish Trail. In *The Far West and Rockies Historical Series 1820-1875, Vol. I*. The Arthur Clark Co., Glendale.
- Hardesty, Donald L.
1986 Issues Regarding the Conduct of Historical Archaeology in Nevada. *Nevada Council of Professional Archaeologists Publication No. 1*. Nevada Council of Professional Archaeologists.
- Hill, Joseph
1930 Spanish Exploration and Trade Northwest from New Mexico into the Great Basin. *Utah Historical Quarterly*.
- Hunt, Charles B.
1959 Dating of Mining Camps With Tin Cans and Bottles. *Geotimes* 3(8).
- IMACS
1982 *Intermountain Antiquities Computer System*. University of Utah. Revised 1987.

- Longwell, C.R., E.H. Pampayan, B. Bowyer and R.J. Roberts
1965 *Geology and Mineral Deposits of Clark County, Nevada*. Mackay School of Mines, University of Nevada, Reno.
- Lorrain, Dessamae
1968 An Archaeologist's Guide to Nineteenth Century Glass. *Historical Archaeology* 5:35-44.
- Lyness, Margaret M.
1982 Mormon Colonization. In *An Archaeological Element for the Nevada Historic Preservation Plan*. University of Nevada, Las Vegas.
- Miller, George and Catherine Sullivan
1984 Machine-made Glass Containers and the End of Production for Mouth-blown Bottles. *Historical Archaeology* 18(2): 83-96.
- Rock, James
1980 *American Bottles: A Few Basics*. Klamath National Forest.
1984 Cans in the Countryside. *Historical Archaeology* 18(2): 97-111.
1987 A Brief Commentary on Cans. *Cultural Resources Management Report*. Klamath National Forest.
- South, Stanley A.
1977 *Method and Theory in Archaeology*. Academic Press, New York.
- Toulouse, Julian Harrison
1971. *Bottle Makers and Their Marks*. Thomas Nelson Inc., New York.
- United States Department of Agriculture
1980 *Soil Survey of Virgin River Area, Nevada - Arizona*. Soil Conservation Service, Washington, D.C.
1985 *Soil Survey of Las Vegas Valley Area, Nevada*. Soil Conservation Service, Washington, D.C.
- United States Department of the Interior
1987 *Class II Cultural Resource Inventory of Red Rock/Summa Exchange Land: Including Survey of a Section of the Historic Mormon Road*. Bureau of Land Management, Las Vegas District, CR 5-1935(P) (Keith Myhrer).
1989 *Archaeology of the Old Spanish Trail/Mormon Road From Las Vegas, Nevada to the California Border*. Bureau of Land Management, Las Vegas District, CR 5-1950 (Myhrer).
- Warren, Elizabeth Von Till
1974 *Armijo's Trace Revisited: A New Interpretation of the Impact of the Antonio Armijo Route of 1829-1830 on the Development of the Old Spanish Trail*. Unpublished Master's thesis, Department of History, University of Nevada, Las Vegas.
- Wilson, William and Betty Wilson
1968 *Spirits Bottles of the Old West*. Henington Publishing Co., Wolfe City, Texas.

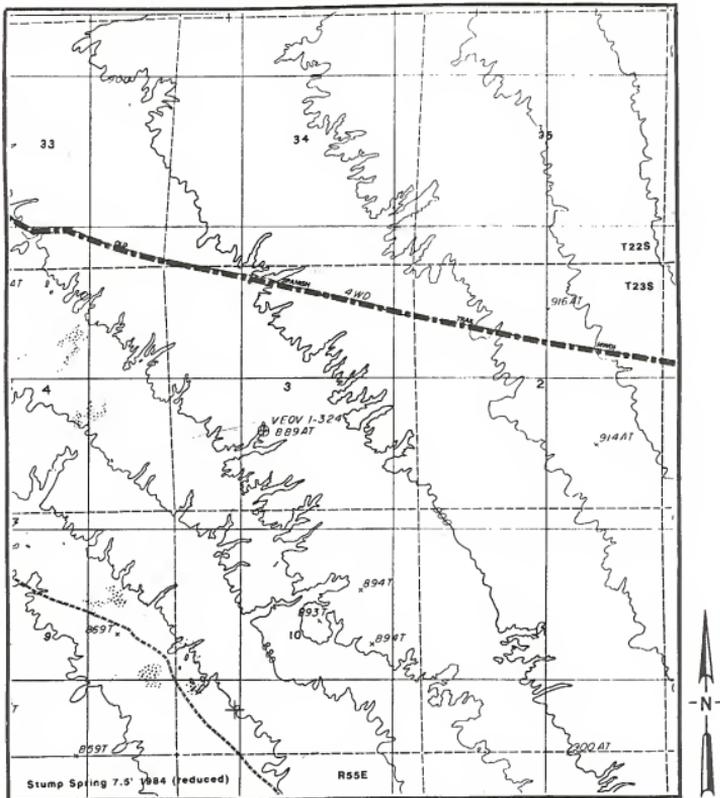
APPENDIX ONE
TOPOGRAPHIC MAPS OF THE OLD SPANISH TRAIL/
MORMON ROAD IN SOUTHERN NEVADA

The following sixteen maps are copies of regional topographic maps showing the plotted route of the *Old Spanish Trail/Mormon Road*. Map 1 is the trail through southern Nevada on a 1:250,000 scale Army Mapping Service topographic map. Maps 2 through 16 are individual sections of the route between Las Vegas and the Nevada/California border plotted on the most recent 7.5 minute United States Geological Survey topographic maps. The route was charted between May, 1987 and April, 1989.





Map 3. Location of the Old Spanish Trail/Mormon Road between Las Vegas and the Nevada/California border.



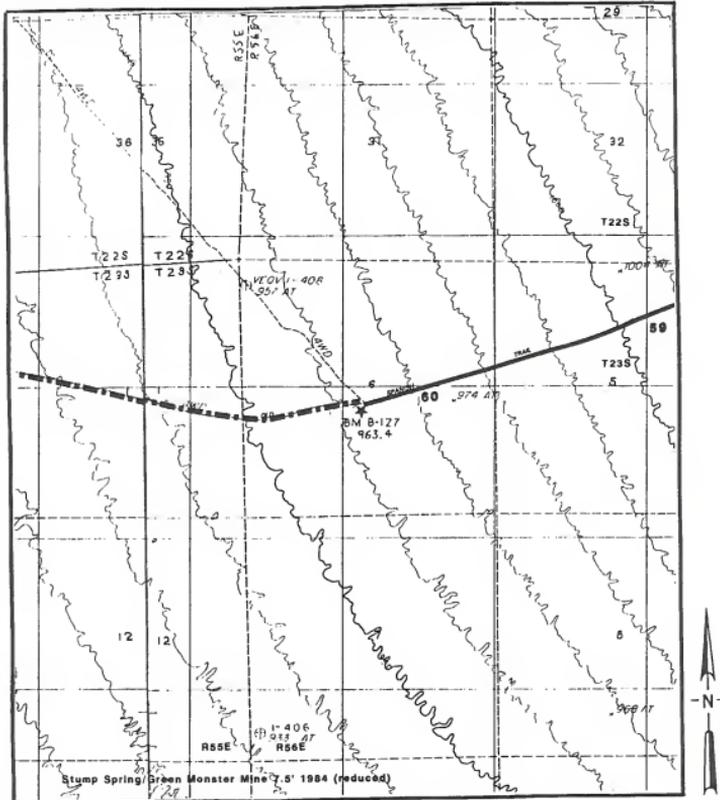
KEY:

- — — = Totally disturbed;
- = Partially disturbed;
- · - · - = Relatively undisturbed;

44 = Artifact location;

★ = 1964 "OST" marker;

Map 4. Location of the Old Spanish Trail/Mormon Road between Las Vegas and the Nevada/California border.



KEY:

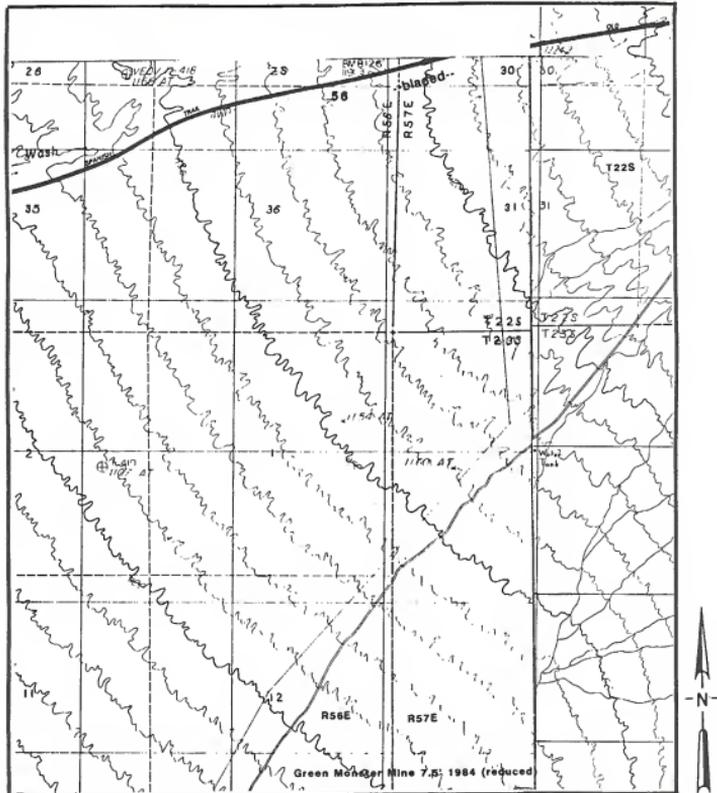
- = Totally disturbed;
- = Partially disturbed;
- - - = Relatively undisturbed;

44 = Artifact location;

★ = 1964 "OST" marker;



Map 6. Location of the Old Spanish Trail/Mormon Road between Las Vegas and the Nevada/California border.

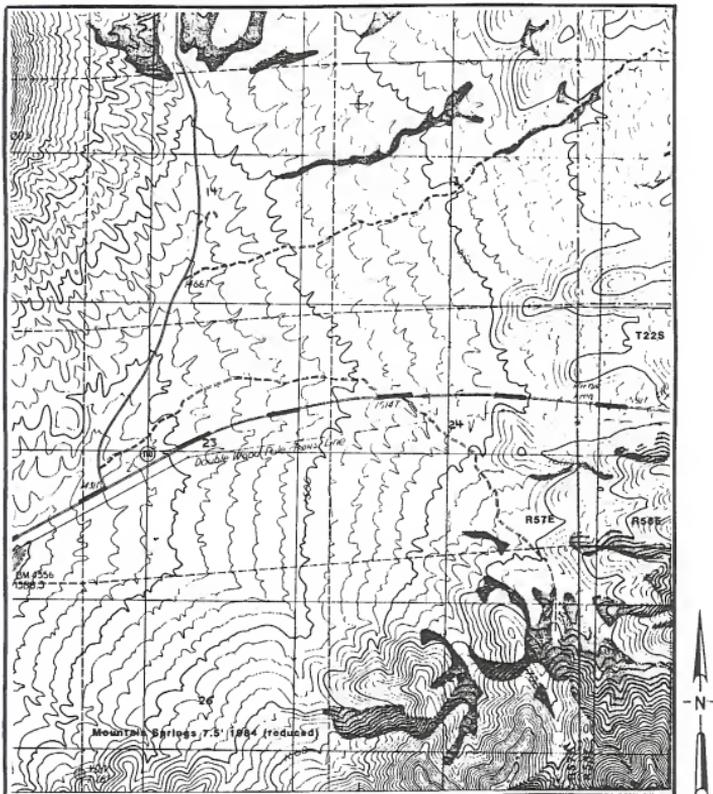


KEY:

-  = Totally disturbed;
-  = Partially disturbed;
-  = Relatively undisturbed;
- 44 = Artifact location;
-  = 1964 "OST" marker;



Map 8. Location of the Old Spanish Trail/Mormon Road between Las Vegas and the Nevada/California border.

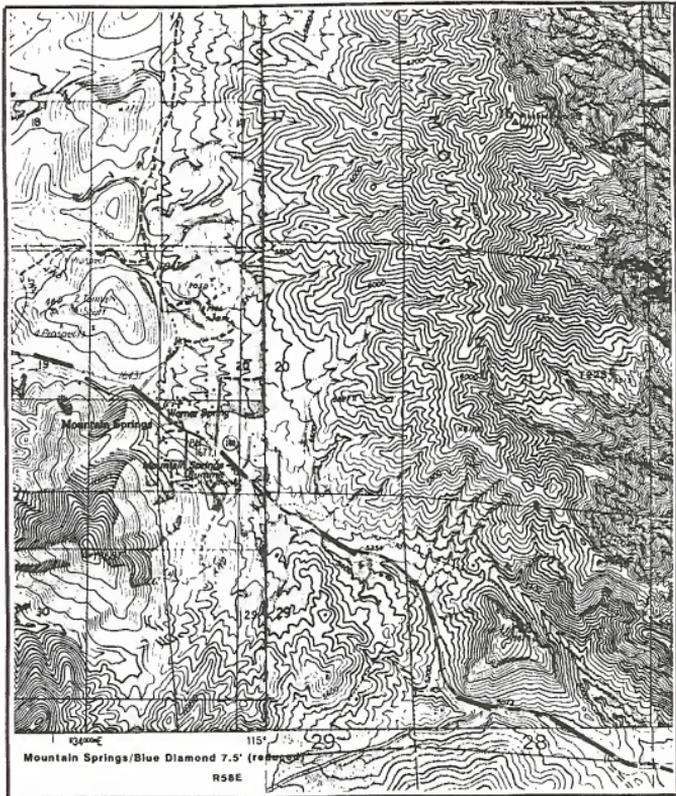


KEY:

- = Totally disturbed;
- = Partially disturbed;
- · — · —** = Relatively undisturbed;
- 44** = Artifact location;
- ★** = 1964 "OST" marker;



Map 9. Location of the Old Spanish Trill/Mormon Road between Las Vegas and the Nevada/California border.

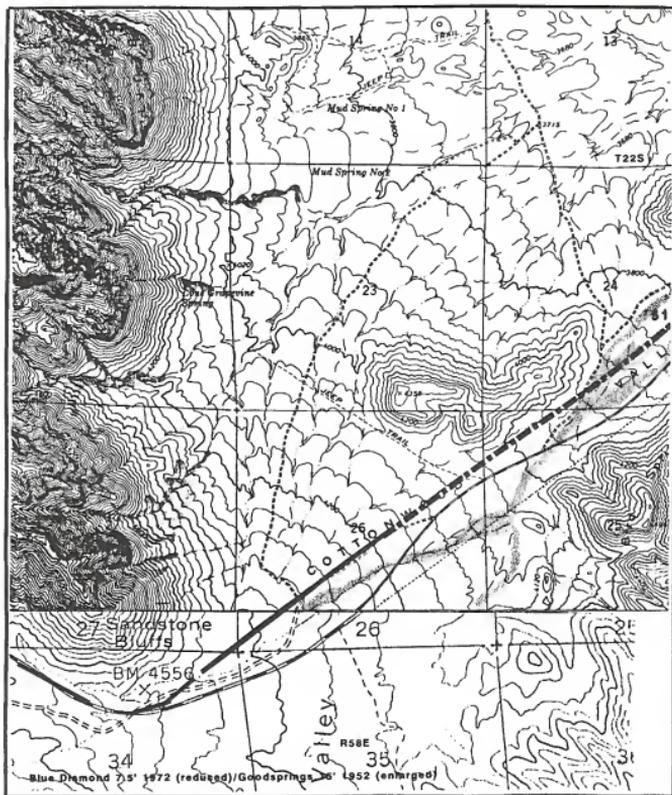


KEY:

- = Totally disturbed;
- = Partially disturbed;
- · — · — = Relatively undisturbed;
- 44 = Artifact location;
- ★ = 1964 "OST" marker;



Map 10. Location of the Old Spanish Trail/Mormon Road between Las Vegas and the Nevada/California border.



KEY:

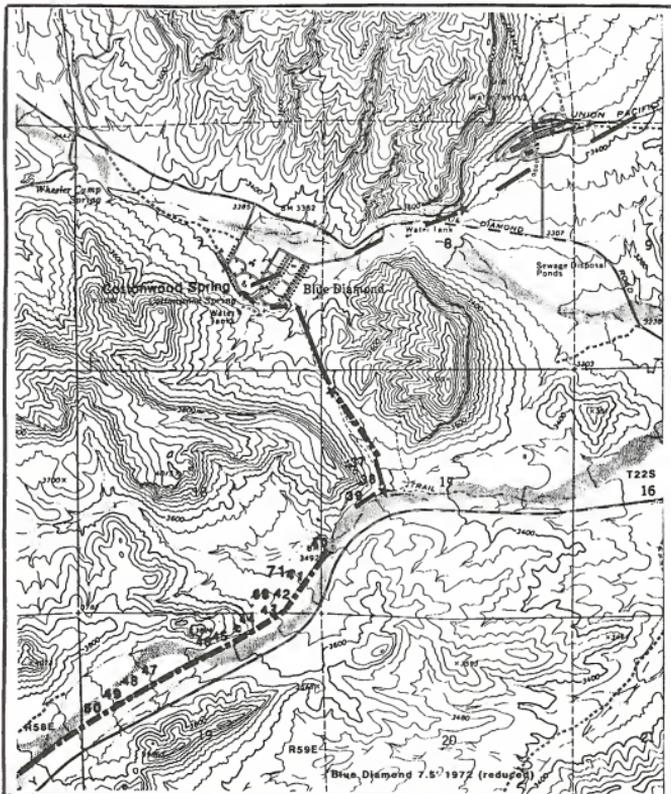
- = Totally disturbed;
- = Partially disturbed;
- - - = Relatively undisturbed;

44 = Artifact location;

★ = 1964 "OST" marker;

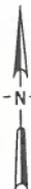


Map 11. Location of the Old Spanish Trail/Mormon Road between Las Vegas and the Nevada/California border.

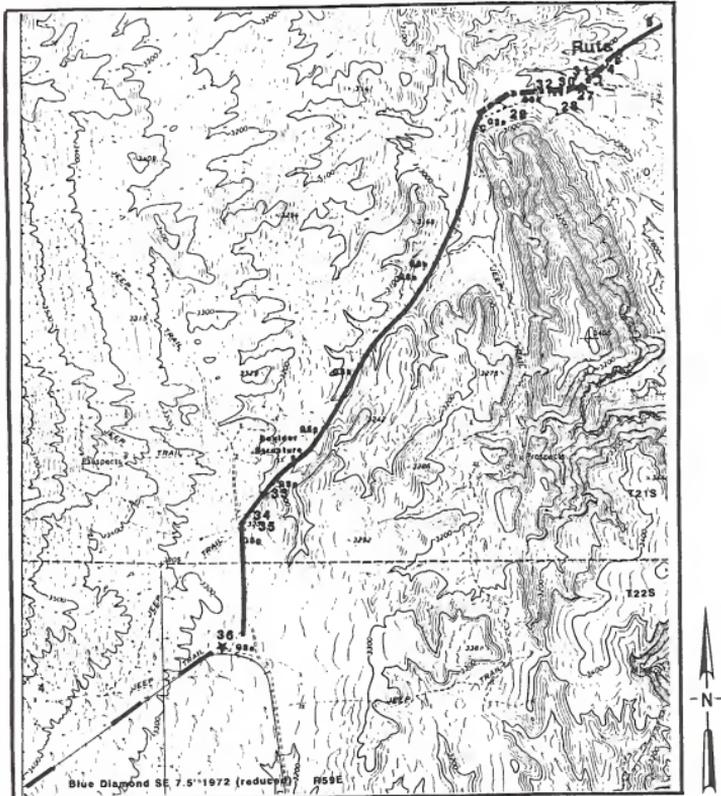


KEY:

- = Totally disturbed;
- — — = Partially disturbed;
- - - - = Relatively undisturbed;
- 44 = Artifact location;
- ★ = 1964 "OST" marker;



Map 12. Location of the Old Spanish Trail/Mormon Road between Las Vegas and the Nevada/California border.

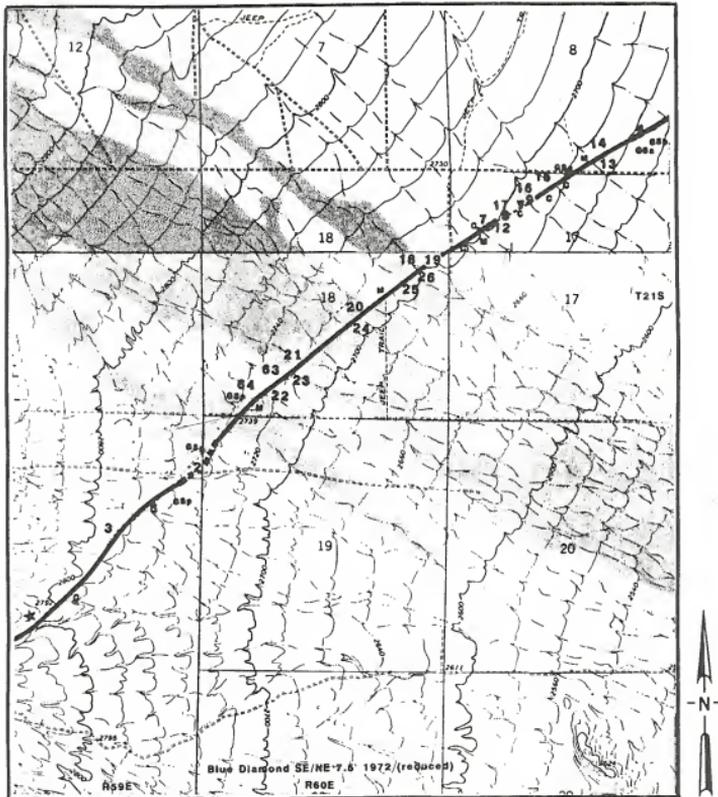


KEY:

-  = Totally disturbed;
-  = Partially disturbed;
-  = Relatively undisturbed;
- 44 = Artifact location;
-  = 1964 "OST" marker;



Map 13. Location of the Old Spanish Trail/Mormon Road between Las Vegas and the Nevada/California border.

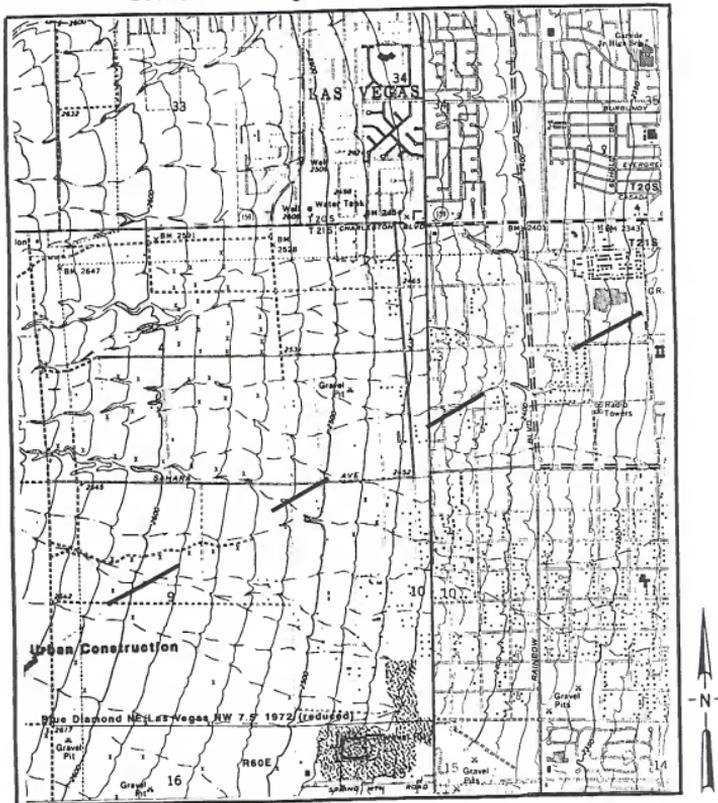


KEY:

- = Totally disturbed;
- = Partially disturbed;
- · — · — = Relatively undisturbed;
- 44 = Artifact location;
- ★ = 1964 "OST" marker;



Map 14. Location of the Old Spanish Trail/Mormon Road between Las Vegas and the Nevada/California border.

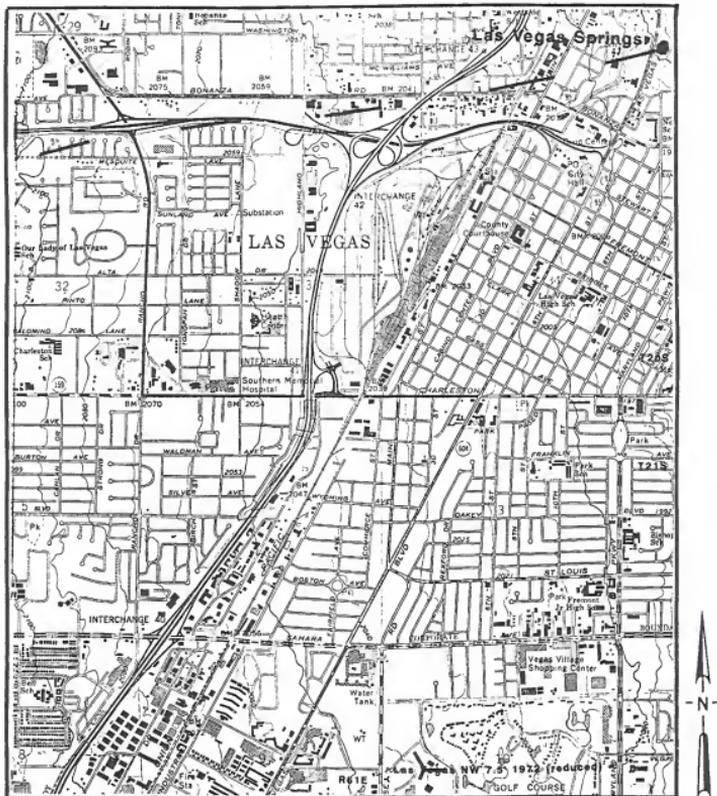


KEY:

- = Totally disturbed;
- = Partially disturbed;
- · — · — = Relatively undisturbed;
- 44 = Artifact location;
- ★ = 1964 "OST" marker;



Map 16. Location of the Old Spanish Trail/Mormon Road between Las Vegas and the Nevada/California border.



KEY:

- = Totally disturbed;
- = Partially disturbed;
- = Relatively undisturbed;

44 = Artifact location;

★ = 1964 "OST" marker;



APPENDIX TWO PROVENIENCE AND CATALOG RECORD

Artifacts from the Old Spanish Trail/Mormon Road

Site 26CK3848 / BLM 53-4969

Artifacts Collected by Keith Myhrer and Stanton Rolf
Archaeologists
Las Vegas District Bureau of Land Management

All Surface

Page 1 of 2

<i>Number</i>	<i>Object</i>	<i>Provenience</i>	<i>Date Collected</i>
MT- 1	Horseshoe	T21S R59E S25 NW1/4 NW1/4	6/87
MT- 2	Horseshoe	T21S R59E S24 NE1/4 NE1/4	6/87
MT- 3	Squared Wood	T21S R59E S24 SW1/4 NE1/4	6/87
MT- 4	Hasp/Clasp	T21S R59E S25 NW1/4 NW1/4	6/87
MT- 5	Metal Strip (4 holes)	T21S R59E S24 SW1/4 SW1/4	6/87
MT- 6	Shear Pin	T21S R59E S24 SE1/4 NE1/4	6/87
MT- 7	Can (round)	T21S R60E S17 SW1/4 NW1/4	6/87
MT- 8	Can (square)	T21S R60E S17 SW1/4 NW1/4	6/87
MT- 9	Ceramic	T21S R60E S17 NE1/4 NW1/4	6/87
MT-10	Can (small-round)	T19S R63E S 3 NW1/4 NW1/4	5/88
MT-11	Can (large-round)	T19S R63E S 3 NW1/4 NW1/4	5/88
MT-12	Glass-bottle-base	T21S R60E S8 SE1/4 SE1/4	11/87
MT-13	Horseshoe	T21S R60E S8 SW1/4 SE1/4	11/87
MT-14	Glass-bottle-side	T21S R60E S8 SW1/4 SE1/4	11/87
MT-15	Horseshoe	T21S R60E S17 NE1/4 NW1/4	11/87
MT-16	Metal Strip with wire	T21S R60E S17 NE1/4 NW1/4	11/87
MT-17	Glass-bottle-base	T21S R60E S17 NE1/4 NW1/4	11/87
MT-18	Glass-bottle-base (MT-17 & 18 found together)	T21S R60E S18 SW1/4 NE1/4	11/87
MT-19	Glass-bottle-base	T21S R60E S18 SW1/4 NE1/4	11/87
MT-20	Glass-bottle-neck w/finish	T21S R60E S18 NE1/4 NW1/4	11/87
MT-21	Glass-bottle with finish	T21S R60E S18 SE1/4 SW1/4	11/87
MT-22	Glass-bottle-sherd	T21S R60E S18 SE1/4 SW1/4	11/87
MT-23	Glass-bottle-neck w/finish	T21S R60E S18 SE1/4 SW1/4	11/87
MT-24	Glass-bottle-base	T21S R60E S18 NW1/4 SE1/4	11/87
MT-25	Tobacco tin	T21S R60E S18 SE1/4 NE1/4	11/87
MT-26	Can (round)	T21S R60E S18 SE1/4 NE1/4	11/87
MT-27	Can (square)	T21S R59E S26 NE1/4 NW1/4	11/2/88
MT-28	Horseshoe	T21S R59E S26 NE1/4 NW1/4	11/2/88
MT-29	Horseshoe	T21S R59E S26 NW1/4 NW1/4	11/2/88
MT-30	Glass-bottle-base	T21S R59E S26 NE1/4 NW1/4	11/2/88
MT-31	Horseshoe	T21S R59E S26 NE1/4 NW1/4	11/2/88
MT-32	Horseshoe	T21S R59E S26 NE1/4 NW1/4	11/2/88
MT-33	Glass-bottle-sherd	T21S R59E S34 E1/2 SW1/4	11/2/88
MT-34	Metal strap	T21S R59E S34 E1/2 SW1/4	11/2/88

Artifacts from the Old Spanish Trail/Mormon Road
Site 26CK3848/ BLM 53-4969

Page 2 of 2

Number	Object	Provenience	Date Collected
MT-35	Metal rods (2 hollow)	T22S R59E S3 SE1/4 NW1/4	11/2/88
MT-36	Metal strip	T22S R59E S3 SE1/4 NW1/4	11/2/88
MT-37	Can (small)	T21S R59E S34 E1/2 SW1/4	11/2/88
MT-38	Glass-bottle-base	T22S R59E S17 SW1/4 NW1/4	11/2/88
MT-39	Glass-bottle-base (2)	T22S R59E S17 NW1/4 SW1/4	11/9/88
MT-40	Tin box	T22S R59E S17 SW1/4 SW1/4	11/9/88
MT-41	Can (tall-round)	T22S R59E S18 SE1/4 SE1/4	11/9/88
MT-42	Can (sardine)	T22S R59E S18 SE1/4 SE1/4	11/9/88
MT-43	Tobacco can	T22S R59E S18 SE1/4 SE1/4	11/9/88
MT-44	Can (large-round)	T22S R59E S19 N1/2 NE1/4	11/9/88
MT-45	Glass-bottle-side	T22S R59E S19 N1/2 NE1/4	11/9/88
MT-46	Glass-bottle-base	T22S R59E S19 N1/2 NE1/4	11/9/88
MT-47	Tobacco can	T22S R59E S19 SW1/4 NW1/4	11/9/88
MT-48	Tobacco can	T22S R59E S19 SW1/4 NW1/4	11/9/88
MT-49	Tobacco can	T22S R59E S19 SW1/4 NW1/4	11/9/88
MT-50	Cartridge case	T22S R59E S19 SW1/4 NW1/4	11/9/88
MT-51	Can (round)	T22S R58E S24 N1/2 SE1/4	11/9/88
MT-52	Cigarette tin	T22S R56E S34 NW1/4 SE1/4	3/8/89
MT-53	Metal washer	T22S R56E S33 NE1/4 SE1/4	3/8/89
MT-54	Metal w/rivets	T22S R57E S29 NE1/4 SW1/4	3/22/89
MT-55	Tobacco tin	T22S R57E S29 NE1/4 SW1/4	3/22/89
MT-56	Tin cap	T22S R57E S36 NE1/4 NE1/4	3/22/89
MT-57	Can (small-round)	T22S R55E S34 NE1/4 NE1/4	3/22/89
MT-58	Can (large-round)	T23S R55E S5 NW1/4 NE1/4	3/22/89
MT-59	Wood-milled	T23S R55E S5 NE1/4 NE1/4	3/22/89
MT-60	Can-sardine	T23S R55E S6 NW1/4 SE1/4	3/22/89
MT-61	Glass-bottle-side	T23S R55E S5 NW1/4 NE1/4	3/22/89
MT-62	Metal-thick (2)	T23S R55E S5 NE1/4 NW1/4	3/22/89
MT-63	Can	T21S R60E S18 SW1/4 SW1/4	11/87
MT-64	Glass-bottle-neck	T21S R60E S18 SW1/4 SW1/4	11/87
MT-65	Metal-disk	T22S R57E S28 SE1/4 NW1/4	4/25/89
MT-66	Glass-bottle (3)	T22S R57E S28 SE1/4 NW1/4	4/25/89
MT-67	Glass-bottle (2)	T22S R57E S28 SE1/4 NW1/4	4/25/89
MT-68	Barrel Hoop	T22S R59E S18 SE1/4 SE1/4	11/9/88
MT-69	Glass-bottle-neck	T23S R55E S6 SE1/4 NE1/4	12/14/89
MT-70	Glass-bottle-base	T22S R59E S6 NE1/4 SE1/4	12/14/89
MT-71	Glass-bottle (complete)	T22S R59E S18 SE1/4 SE1/4	12/21/89

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