Historical and archaeological investigations at 26Pe2137: American Canyon, Pershing County, Nevada

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HISTORICAL AND ARCHAEOLOGICAL INVESTIGATIONS
AT 26PE2137: AMERICAN CANYON,
PERSHING COUNTY, NEVADA

by

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Bachelor of Arts/Bachelor of Arts
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A thesis submitted in partial fulfillment
of the requirements for the

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ABSTRACT

Historical and Archaeological Investigations at 26Pe2137: American Canyon, Pershing County, Nevada

by

David W. Valentine

Dr. Alan Simmons, Examination Committee Chair
Professor of Anthropology
University of Nevada, Las Vegas

Previous archaeological investigations concerning overseas Chinese in the United States have focused on artifact assemblages in an effort to determine the level of acculturation of Chinese into dominant Euroamerican cultures. These studies indicate that Chinese tenaciously clung to traditional diets and other aspects of their culture, but adapted some foreign technologies. What can other aspects of their culture, such as architecture and mining technology, tell us? Do ruins of dwellings and mines show adherence to Chinese tradition?

This thesis looks at architecture and mining technology in a Chinese placer mining site to determine levels of acculturation in these areas. The architectural remains in American Canyon suggest adherence to some traditional methods, but the study is inconclusive. The mining
technology in American Canyon indicates traditional Chinese mining methods were employed, suggesting that the Chinese imported more mining knowledge than previously thought.
# TABLE OF CONTENTS

ABSTRACT .................................................. iii

LIST OF FIGURES ........................................... vii

ACKNOWLEDGEMENTS .......................................... vii

CHAPTER 1 INTRODUCTION ..................................... 1

CHAPTER 2 THEORY AND METHOD ................................ 8
  Theoretical Background ....................................... 9
  Methods .................................................. 20

CHAPTER 3 HISTORY OF AMERICAN CANYON .................... 30
  Arriving in American Canyon .......................... 30
  Chinese Mining in American Canyon ............ 33
  The Chinese Community ................................ 36
  The American Canyon War .......................... 54
  Decline of the American Canyon Village ....... 57
  Post Chinese Activity ................................. 59
  Conclusions and Discussion ........................... 61

CHAPTER 4 THE ARCHAEOLOGY OF AMERICAN CANYON .......... 67
  The Physical Setting .................................. 69
  Archaeological Site 26PE2137 ......................... 71
    Locality A ........................................ 71
    Locality B ....................................... 75
    Locality C ....................................... 76
    Locality D ....................................... 76
    Locality E ....................................... 78
    Locality F ....................................... 78
    Locality G ....................................... 80
    Locality H ....................................... 82
    Locality I ....................................... 82
    Locality J ....................................... 82
    Locality K ....................................... 83
    Locality L ....................................... 87
    Locality M ....................................... 92
    Locality N ....................................... 94
  Chinese Water System .................................. 94
  Native American Remains ............................. 95
  Conclusion ............................................ 95

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### LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Map of Guangdong Province</td>
<td>2</td>
</tr>
<tr>
<td>Figure 2</td>
<td>American Canyon and Environns</td>
<td>5</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Certificate of Residence for Lee Sing Goy</td>
<td>24</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Certificate of Residence for Gim Lee</td>
<td>25</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Walter Scott (Death Valley Scotty) and Wong Kee in Rhyolite, Nevada</td>
<td>43</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Map of American Canyon Archaeological Site</td>
<td>68</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Map of Locality A.</td>
<td>In Pocket</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Overview of Placer Tailings, Locality A.</td>
<td>73</td>
</tr>
<tr>
<td>Figure 9</td>
<td>Chinese Whetstone</td>
<td>74</td>
</tr>
<tr>
<td>Figure 10</td>
<td>Plan Sketch of Locality C Dugout</td>
<td>77</td>
</tr>
<tr>
<td>Figure 11</td>
<td>Plan Sketch of Locality E Dugout</td>
<td>79</td>
</tr>
<tr>
<td>Figure 12</td>
<td>Plan Map of Locality G.</td>
<td>81</td>
</tr>
<tr>
<td>Figure 13</td>
<td>Plan Map of Locality K.</td>
<td>85</td>
</tr>
<tr>
<td>Figure 14</td>
<td>Plan Map of Locality L.</td>
<td>88</td>
</tr>
<tr>
<td>Figure 15</td>
<td>Plan Sketch of Outdoor Oven Feature, Locality M.</td>
<td>93</td>
</tr>
<tr>
<td>Figure 16</td>
<td>Iron Pipe Buried in Road, Remnants of the Chinese Ditch System</td>
<td>97</td>
</tr>
<tr>
<td>Figure 17</td>
<td>Chuandou, or Column-and-tie Building System</td>
<td>102</td>
</tr>
<tr>
<td>Figure 18</td>
<td>Chinese House Plans Based on One, Three, and Five Jian.</td>
<td>111</td>
</tr>
<tr>
<td>Figure 19</td>
<td>Layout of Farm House Courtyards</td>
<td>111</td>
</tr>
<tr>
<td>Figure 20</td>
<td>Hang-tu Building in DeLamar, Idaho</td>
<td>127</td>
</tr>
<tr>
<td>Figure 21</td>
<td>Overview Photograph of the Gold Creek Chinatown, Elko County, Nevada</td>
<td>138</td>
</tr>
<tr>
<td>Figure 22</td>
<td>Close-up of Two Chinese Houses in Gold Creek, Nevada</td>
<td>139</td>
</tr>
<tr>
<td>Figure 23</td>
<td>China Lem's Store, Gold Creek, Nevada</td>
<td>140</td>
</tr>
<tr>
<td>Figure 24</td>
<td>Chinese Structure in American Canyon</td>
<td>145</td>
</tr>
<tr>
<td>Figure 25</td>
<td>Small Rocker</td>
<td>151</td>
</tr>
<tr>
<td>Figure 26</td>
<td>Large Rocker</td>
<td>152</td>
</tr>
<tr>
<td>Figure 27</td>
<td>Chinese Placer Miner with Rocker</td>
<td>153</td>
</tr>
<tr>
<td>Figure 28</td>
<td>California Chinese Miners Using the Same Methods as in American Canyon</td>
<td>154</td>
</tr>
<tr>
<td>Figure 29</td>
<td>Notching in Sidewall of Mine Shaft</td>
<td>166</td>
</tr>
<tr>
<td>Figure 30</td>
<td>Shoring with Wooden Poles in Chinese Coal Mine</td>
<td>167</td>
</tr>
</tbody>
</table>
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CHAPTER 1

INTRODUCTION

The news of the gold strike at Sutter's mill in California quickly spread throughout the world. Chinese argonauts, working as independent miners, were quick to join the rush to California, which they named Gum San, or "Gold Mountain," and soon thousands of Chinese were arriving in the United States. Later, labor shortages brought Chinese over to work in agricultural and large construction projects (such as the transcontinental railroad). The Chinese did not limit themselves to California, and quickly spread to neighboring states as new employment opportunities became available and new mineral discoveries were made.

The vast majority of the Chinese that joined the gold rush, or labored to build the American West, came from Guangdong Province along the southeast coast of China (Chan 1991; Daniels 1988; Zhu 1997) (Figure 1). Scholars have long contended that the reason so many Guangdong residents left is that they were fleeing political and natural disasters in China during the 1800s. Some of these events include wars with foreign powers (Opium Wars 1840-1842 and 1856-1860),
Figure 1. Map of Guangdong Province, origin point of most of the Chinese emigrants (After Yung 1995:17)
civil war (Taiping Rebellion 1851-1864), clan wars (Punti-Hakka conflict, 1854-1867), floods, and famines. Recently, however, there is some speculation that Guangdong Province was not as hard hit by these events as previously believed. Instead, the hypothesis is that Guangdong residents were less reliant on agriculture, and more on commerce. They also had a long history of commerce with foreigners. This left them well connected for, and open to the idea of, taking advantage of different economic opportunities around the world (Chen 1997).

Regardless of the reasons for leaving, most of the early Chinese emigrants did not intend on staying in the United States for long. Though many were married, or became married just before leaving, they left their wives and children in China. This gave them incentive to return home, hopefully with sufficient funds for a comfortable retirement. Chinese society in the United States, then, was largely bachelor.

Though initially welcomed in the United States as a cheap labor source, the Chinese were eventually vilified. This is due to a downward turn in the economic prosperity of the western United States. Euroamerican labor organized itself and established a racist ideology against the Chinese. This resulted in anti-Chinese legislation culminating in the Chinese Exclusion Act of 1882 (Fong and Markham 1991).

Perhaps because they did not intend to stay, because of the racist attitudes they encountered in the United States, and/or a combination of the two, the Chinese lived together in
ghettos, or "Chinatowns." These Chinatowns were often on the fringes of large urban communities, however, they were also found in rural settings, especially isolated mining districts. Today, these mostly abandoned Chinatowns are rapidly disappearing through neglect and modern development.

Social scientists in the United States have viewed the immigrant experience in a specific way, and a model to explain assimilation of immigrants was created in the 1920s by sociologists at the University of Chicago. According to this model, there are three steps--contact, competition, and accommodation--that lead up to assimilation (Park 1993). The nineteenth century Chinese did not fit this model in that there was little if any assimilation, and thus have drawn the attention of social scientists since the 1920s (Chan 1996). Archaeologists became interested in the Chinese in the 1970s (Greenwood 1978). Though initial studies were largely descriptive, archaeological investigations eventually centered on trying to ascertain levels of adaptation, acculturation and assimilation by looking at the Chinese material culture (Staski 1990).

American Canyon is located in the Humboldt Range, Pershing County, Nevada (Figure 2). Between 1884 and 1906 it was the site of a bustling Chinese community with an economy based on placer gold mining. Though long abandoned and succumbing to erosion, neglect, and vandalism, the site has
Figure 2. Map of American Canyon and Environs (Base map U.S.G.S., Nevada, 1:500,000 topographic).
abundant historical and archaeological information that can yield information on the levels of adaptation, acculturation and assimilation of the Overseas Chinese in Nevada.

This thesis intends to ascertain the levels of adaptation, acculturation, and assimilation that the Chinese population of American Canyon reached, if any, by looking at the historic and archaeological records. Since many of the earlier archaeological works have focused on the material culture, the emphasis of this work will be on the architectural and mining technology remains of American Canyon.

This thesis is seven chapters long. The second chapter will outline the theoretical background used in the research and the methods used in acquiring historical and archaeological data. The third chapter presents the results of the historical research and outlines the history of American Canyon and many of its Chinese residents. The fourth chapter reports the results of archaeological inventory and testing in American Canyon, and describes the archaeological remains. The fifth chapter compares vernacular architecture from southeast China with architectural remains from overseas Chinese sites in the western United States, including American Canyon, and then draws conclusions concerning the "Chineseness" of the ruins in American Canyon. The sixth chapter discusses mining and mining technology from Guangdong Province and compares that information with the mining features in American Canyon. The seventh, and final, chapter
draws conclusions about the level of adaptation, assimilation, and acculturation of the Chinese occupants of American Canyon based on the historical and archaeological records.
Social scientists, including historical archaeologists, have long studied the effects of culture change. Why do people and their societies show distinct changes through time? Is it due to innovations and inventions within the society? Is it due to environmental factors, such as changes in weather patterns that force people to take up new survival strategies? Is it through contact with other groups who introduce new ideas and technologies? Or is it a combination of one or more of the above? Also important is the lack of culture change. Why are some aspects of a culture retained, even when those aspects no longer contribute to a society's fitness?

When two or more groups of people come into contact, cultural changes in the two groups are expected with the exchange of new ideas and technologies. Dominant cultures tend to absorb smaller ethnic groups, but some change is also commonly found in the larger group. The Chinese that came to the United States during the 19th century had a reputation for retaining their culture. Archaeologists have been studying the material culture of these early Chinese
determine diagnostic attributes of their culture and to use these diagnostic attributes as a measure of acculturation. This thesis is an attempt to determine if any diagnostic Chinese traits are present in the architectural and mining features of American Canyon. If so, are they useful indicators of conservatism or acculturation?

Theoretical Background

The Chinese who arrived in the United States in the 19th century kept their interaction with the dominant Euroamerican population to a minimum and worked hard at maintaining traditional lifeways. As such, they are representative of an ethnic minority, or a folk group. Glassie (1968:3) defines a folk group as a "homogenous, sacred, self-perpetuating, largely self-sufficient group isolated by any of many means, such as language or topography, from the larger society with which it moderately interacts."

Deetz (1977) equates folk groups to an archaeological tradition, in that it is "traditional and conservative," exhibiting great variation in space and relatively little change over time. The definition adopted by Staski (1990:122-123) states that an ethnic group is a type of social group whose members share common beliefs, values, attitudes, standards of behavior, as well as symbols that represent that group. The group's uniqueness is based on a
fixed membership (exclusive) in which the members are symbolically born (ascriptive). Membership further allows members to confine primary relationships to others within this subculture.

Historic archaeologists are able to identify many ethnic groups through their material culture—that is the artifacts and features that they leave behind. Glassie (1968) maintains that the form of an object is the most important in identifying an object as "folk," with material being of secondary importance. Deetz (1977) points out that persistent styles in an archaeological assemblage allow archaeologists to identify a tradition, or a specific culture, and trace it through time and space. These concepts apply equally to artifacts and architecture in identifying an ethnic group.

The Chinese have a very distinctive artifact assemblage that archaeologists use to identify their presence. This assemblage is dominated by ceramics manufactured in China and imported into the United States. Perhaps the most common of these is "utilitarian brownwares," which are undecorated brown-glazed stonewares. Vessel forms include liquor bottles, spouted jars, wide-mouthed jars, straight-sided jars, globular jars, barrel jars and pans (Wegars 1999). Decorated Chinese tableware bowls are also found on archaeological sites. Bowls with painted design motifs such as Double Happiness, Bamboo, and Four Seasons have all been
found on archaeological sites in the United States. Brief descriptions of the various styles are presented below.

Double Happiness is a hand-painted, blue pattern found on blue-gray stoneware bowls. It has pairs of the Chinese symbol for happiness repeated three times along with a swirled curvilinear design. It occurs on sites predating 1870 (Ritchie 1986; Wegars 1999).

Bamboo (also known as Three Circles and a Dragonfly, Blue Flower Ware, Swatow Ware and Three Circles and a Butterfly) is a pattern with four motifs on the outside of the bowl: three circles, a dragonfly, a marsh plant with big leaves, and a flowering plant with four wide leaves. The interior typically has rings and a comma-shaped mark in the center. The designs are all hand-painted in blue or gray-green under a clear glaze. Bowls are usually white-to-gray stoneware (Praetzellis and Praetzellis 1979).

Four Seasons, also known as Four Flowers, ceramics have four, polychrome, flowering plants hand-painted on the exterior. The plants are the flowering plum, lotus, peony, and chrysanthemum. Each plant represents one of the four seasons. The bowls are white porcelain with a clear to light blue-green glaze (Praetzellis and Praetzellis 1979).

Another ceramic type that is common on Chinese sites is celadon. Celadon is a monochromatic green porcelain. Celadon forms include bowls and spoons. There are generally no painted designs; however, many have hand-painted blue
maker's marks on the base (Praetzellis and Praetzellis 1979; Wegars 1999).

In addition to the ceramics, artifacts related to leisure activities are also diagnostic of a Chinese presence. Some of these artifacts are related to opium smoking and include opium cans (many embossed with Chinese characters or "cartouches"); ceramic and metal pipe bowls and connectors; opium needles; and opium lamp parts (Wegars 1999; Wylie and Pike 1993). Small white or black glass artifacts, about the size of a large button, used as counters in the traditional Chinese gambling game of fan tan are also found (Hoffman and Zeier 1979; Wegars 1999). Small glass medicine bottles (Wegars 1999), Chinese coins (Kingsbury 1995), and large rectangular cans with multiple soldered side-seams are other artifacts found on Chinese sites in the United States (Wegars 1999).

In conjunction with the study of artifacts, historic archaeologists also use the written record. These two sources of information are used to complement each other. Contradictions between the written and archaeological records force archaeologists to question assumptions about the past, and can lead to a better understanding of the past (Deetz 1977). There are basically two types of written sources that are used in historic archaeology. Primary sources are those things created by the participants, for example diaries, tax records, court documents, and newspaper
articles. Secondary sources are general histories of the subject understudy. Historic archaeologists utilize the written record of the population studied as much as the archaeological record. An often used definition of historic archaeology is that it is a study of "the cultural remains of literate societies that were capable of recording their own history" (Deetz 1977:5). This can be difficult in studying historic Overseas Chinese, since there is a distinct language barrier, and the written record of the Chinese in the United States has proven to be poorly preserved. As a result, studies of the overseas Chinese, including this thesis, rely heavily on historic documents produced by the dominant Euroamerican culture. Lightfoot (1995) points out that reliance on the written record of one society in a contact situation is dangerous. He maintains that the documents produced by the dominant culture need to be assessed in terms of the cultural context, nature of the historic documentation, training of the person creating the document, contact that person had with the other cultural group, and degree with which various documents corroborate one another (Lightfoot 1995).

Overseas Chinese sites in the United States have been drawing the attention of archaeologists since the 1970s. This was due in large part to Federal legislation, such as the National Historic Preservation Act (16 U.S.C. § 470). This law requires study of significant archaeological sites

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that will be destroyed by development if Federal money is involved or the site is on Federal lands. Redevelopment and construction impacting abandoned Chinatowns has initiated much of this research. Early studies concentrated on describing and identifying the unique artifact assemblages found at the sites (Greenwood 1978).

More recently, historical archaeological studies of overseas Chinese have shifted to studies of acculturation (Staski 1990). The United States was created through the immigration of numerous ethnic groups, at first mostly from Western Europe whose cultures merged into a larger, uniquely American culture. When ethnic groups come into contact with each other, there are often various levels of cultural change. When a minority group comes in contact with a larger society, it may begin to exhibit changes that eventually lead up to its incorporation into the larger society. This process is called assimilation and is defined as the absorption of a group into the ways of a dominant society with the resultant loss of the group's cultural distinctiveness (Garbarino 1977). Robert E. Park, a sociologist from the University of Chicago, first hypothesized this process in the 1920s. He identified a series of steps leading to assimilation: contacts, competition, and accommodation (Park 1993).

Another sociologist who pondered the question of assimilation of groups into the unique United States'
Society was Milton M. Gordon. He built his theories on the work of Park, but expanded the concept into three separate models. The first is "Anglo-conformity," in which an immigrant group totally discards their ancestral culture in favor of the United States' core Anglo-Saxon culture. The second is the "melting pot," in which an American culture is assembled from the blending of numerous other cultures. The third concept is "cultural plurism," where communal life and significant portions of an immigrant culture are preserved within the context of American citizenship and there is political and economic integration into American society. This later concept is relatively recent and based on observations of 20th century America (Gordon 1964).

Anthropologists also became interested in cultural changes during contact between groups (Bee 1974); however, the terms and definitions for the initial steps have changed. Instead of competition and accommodation, anthropologists speak of acculturation. Some anthropologists have defined acculturation as the process of culture change as a result of prolonged, face-to-face contact between two societies (Bee 1974; Haviland 1978). Staski (1990:123) defines acculturation as an aspect of assimilation that "eliminates particular behavioral and material patterns that symbolically distinguish those individuals who are members from those who are non-members of the ethnic population."
In contrast to the large number of Asian immigrants now coming to the United States, most of the Chinese who came to the United States in the nineteenth century did not intend on staying. Why they did not stay is a combination of their own mindset and resistance to their staying from the dominant Euroamerican culture.

One line of evidence of this duality is seen in the Chinese bachelor society that existed in the United States. This bachelor society was a key factor in the break up and return home of Chinese immigrant groups. Many of the Chinese who came over were married, with many marrying just prior to departure; however, very few men brought wives or families with them. Leaving wives and families behind was used as an incentive by Chinese society to ensure the eventual return of the departing men. Another reason for leaving women and children behind was the expense of travel that many of the Chinese simply could not afford (Chung 1998). Animosity from Euroamericans was also a major reason that families were left behind. Many men did not want to expose their families to the hostile, anti-Chinese environment prevalent in much of the United States. Anti-Chinese sentiment was also responsible for the creation of legal impediments to the immigration of Chinese women, such as the 1875 Page law (Chung 1998; Salyer 1995). Legislation in the United States did not stop with immigration restrictions on women; the Immigration Act of 1882 severely
restricted all Chinese immigration (Salyer 1995). Similar anti-Chinese legislation was passed throughout Pacific Rim countries (Wu 1974 [1926]).

Since they did not stay, the Chinese were not assimilated into the dominant Euroamerican society of the United States. It is extremely difficult, however, for two groups in close contact not to influence each other. Some change is expected in the Chinese who visited the United States. Just how much acculturation occurred, and how can determining the level of cultural change be determined in the archaeological record, are two fundamental questions of this thesis.

Since diet is an excellent indicator of ethnicity, early historical and archaeological studies concentrated on this aspect of Chinese culture (Staski 1990). Spier (1958) pointed out that the Chinese ate their customary foods after arriving in the United States, and that the manner the diet was supported and the techniques used to produce the food did not change.

The high percentage of Chinese ceramics at archaeological sites is interpreted as evidence of the maintenance of a traditional diet. This is because many of the ceramics were used for the importation of Chinese foodstuffs and the preparation and consumption of traditional foods (Greenwood 1980; LaLande 1981, 1982; Lister and Lister 1989).
Some attempts to confirm the Chinese allegiance to their diet have concentrated on faunal assemblages found at overseas Chinese sites. One example is Dansie (1979), who found that the Lovelock, Nevada, assemblage was strongly Chinese in character with a high proportion of pork and the use of cuttlefish and pond turtles. There was also, however, a consistent use of beef and sheep that was interpreted to represent some acculturation in the use of local Euroamerican food resources. There was also ample evidence of Chinese exploiting local wild game, such as jackrabbits and deer. In German Gulch, Montana, the faunal assemblage indicated that the Chinese adhered to their traditional diet as much as possible. Again, there was evidence of some use of non-traditional meats, such as beef, and the exploitation of wild game such as hares, deer, and grouse (Fredlund et al. 1991).

Other studies analyzing Chinese diet have looked at the written record in addition to archaeological deposits. LaLande (1982) looked at a ledger of an Euroamerican store that did business with the Chinese. He noted that many traditional Chinese foodstuffs were imported and sold to the Chinese. He observed some modifications of the diet. One modification was the purchase of more wheat flour than rice, a possible economic consideration since imported rice was comparatively expensive. Other unusual, but relatively rare, food purchases were rising agents (salaratus) and
butter. The purchase of powder and shot by one Chinese man was interpreted as evidence of hunting.

These and other methods of looking at levels of Chinese acculturation all show that in terms of diet there was very little cultural change during the 19th century. There was, however, variation in the levels of adaptation to local conditions (Schuyler 1980) and more recognized acculturation later in the 20th century (Schuyler 1980; Staski 1993).

Another valid way to examine ethnicity and acculturation is by looking at vernacular architecture. Glassie's (1968) discussion of folk art forms, their meanings, and distribution, includes buildings. Deetz (1977) considers vernacular architecture to be a reflection of a person's inner feelings and their ideas of what is suitable and what is not. Changes in an ethnic group's outlook and attitudes would be reflected in changes in vernacular architecture (Deetz 1977:93). According to Knapp (1986:90), "A dwelling is more than a vessel for daily life. It is a dynamic entity that expresses in varying degrees the organization, fortunes, aspirations, and status of those living within it."

A few archaeologists have attempted to use architecture as a means of identifying a Chinese presence (LaLande 1981; Ritchie 1986; Sisson 1993). These studies have met with limited success. American Canyon is a large site containing numerous architectural and mining features. Are there any
recognizable patterns of ethnicity or acculturation in the surviving architectural features in American Canyon?

The economy of American Canyon was based on placer mining. Mining technology is one area where the Chinese are reported to have experienced a high level of adaptation or acculturation, borrowing much of the technology and equipment from EuroAmericans (LaLande 1985; Rohe 1996). Did the Chinese really have little or no mining knowledge? Are mining features another form of vernacular architecture that can be used to identify an ethnic group?

Methods

An understanding of the history of American Canyon was needed to answer questions concerning the level of Chinese and Euroamerican interaction, to determine exactly when it was occupied, and the variety of activities that took place there. To that end, many secondary sources were accessed. These sources concern: the history and archaeology of Nevada; the archaeology, history, and natural history of northern Nevada and the immediate region; the mining history of the site, region and state; and the archaeology and history of Chinese in the United States, Nevada and the surrounding region. These sources were invaluable in providing a background understanding of the site and the Chinese experience.
A wide variety of primary sources were also accessed. American Canyon and the surrounding area are important mining areas, and have been for a number of years. Because of that, there are numerous geology and mining resources available. These run the gamut from formal scholarly bulletins published by the Nevada Bureau of Mines and Geology and the United States Geological Survey (U.S.G.S), to articles in period mining publications. These sources provide valuable information on the mining history of the site and region, on the mining technologies used, and the types of mineral commodities mined.

Another important source of information was period newspapers. Newspapers were published in Unionville, Winnemucca, and Lovelock during the period of Chinese occupation. These towns are the closest population and supply centers to American Canyon (Figure 2). All three towns are/were also county seats. Therefore, the newspapers from these towns often published gossip and articles concerning the Chinese and Euroamerican residents, mining activity, and social events from American Canyon and neighboring mining camps. The Unionville and Winnemucca newspapers have been indexed. This index is available at the Humboldt County library, and all articles pertaining to American Canyon were accessed. Other newspaper articles pertaining to specific events and/or persons were accessed when those persons or events were learned of. Newspaper
articles often provided clues for other avenues of research. For example, there was mention of an addition to the Chinese ditch system in one of the articles. This prompted an inquiry with the Nevada State Water Engineer. The Water Engineer had on file an application for the water rights (which includes a map of the ditches) made by an Euroamerican who purchased the ditch system from the Chinese.

County records also proved to be invaluable. Tax assessments, deed records, mining claim information, and death records were all examined. American Canyon is currently in Pershing County, which was created out of Humboldt County in 1919. Therefore, records were checked in both counties. With the exception of the death records, all of these sources proved to be valuable. They helped identify important American Canyon figures, provided better detailed information on their net worth and employment history, and aided in tracking their movements.

The United States Census manuscripts for American Canyon and surrounding areas were examined. Even though the manuscripts for 1890 are no longer available, there was sufficient information to aid in the tracking of the general Chinese population and several specific individuals. The census data also aided in identifying other activities that took place in American Canyon (e.g., stores and wood harvesting), and in establishing potential mining lease
arrangements. Overall census data for Nevada was important in establishing the relative importance of the Chinese community in American Canyon.

Historic maps, master title plats, and the original cadastral survey notes from the area were examined. Unfortunately, Chinese mining activity was over by the time most of these maps and documents were made. They provided little new information beyond identification of historic travel routes.

The Chinese in American Canyon had several dealings with the local legal system, and court records were also examined. This provided some interesting information that contrasted with newspaper articles. It also gave an idea of how the Chinese used, and were abused by, the legal system.

Two items of interest pertaining to American Canyon were found in Federal archives. One of these is a Chinese partnership file on one of the Chinese merchants in American Canyon (Figure 3). The other is a certificate of residency for one of the miners (Figure 4). The merchant was mentioned in a few other sources, but the certificate of residency is the only documentary evidence for that particular miner.

Archaeologically, American Canyon was inventoried between March 1992 and July 1993 to determine the extent of the Chinese site, and the number and nature of features present. One or two archaeologists walked numerous,
Lee Sing Goy, whose photograph and signature are hereto attached, being duly sworn according to law, deposes and says that he is and has been for 4 years a resident of Nevada County, State of Nevada.

That he is a Merchant and has been for 4 years a member of the firm of [firm name], Dealers in General Chinese Articles, doing business at [city].

That the following is a true list of all the members of the above named firm and their places of residence.

<table>
<thead>
<tr>
<th>Names</th>
<th>Residences</th>
<th>Interests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lee Kin</td>
<td>American Camp, Nevada</td>
<td>$1,000.00</td>
</tr>
<tr>
<td>Lee Sing Goy</td>
<td>About to depart for China</td>
<td>$1,666.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$5,000.00</td>
</tr>
</tbody>
</table>

Subscribed and sworn to before this day of [date], A. D. 1900.

Figure 3. Chinese Partnership file for Lee Sing Goy.
Figure 4. Certificate of Residence for Gim Lee, a Chinese miner from American Canyon.
parallel transects, no more than 10 m apart through the canyon bottom. It was assumed that the end of the Chinese placer mining site was reached when a distance of 60 m was covered without encountering any placer shafts, dugouts, Chinese ceramics, or other mining related artifacts or features.

Artifacts and features were described in detail with information recorded in field notes. No artifacts were collected during the inventory phase. Groupings of two or more features of similar function and/or age were lumped together and described as localities. Localities were plotted on the U.S.G.S. Fitting, Nevada, 7.5 minute topographic map. Plan maps were made of all habitation features using a compass and tape. Features were photographed when appropriate. An Intermountain Antiquities Computer System (IMACS) site form was prepared, along with an inventory report (Valentine 1993a). This report and the IMACS form are on file with the Winnemucca Field Office of the Bureau of Land Management (BLM) and with the State Historic Preservation Office in Carson City, Nevada.

Locality A consists of hundreds of closely spaced shafts excavated into the unconsolidated alluvium in the canyon bottom. Many of these shafts are deep, caving around the mouth, and/or are obscured by thick vegetation. This was a hazardous and difficult environment to work in. To
avoid working in this situation, a plan map of the area was created using aerial photography (Valentine and Kiser 1999).

Several features in Locality L were tested in August 1995. Excavation units, 1-x-1-m square, were excavated in three suspected dugout features and in a trash scatter. Levels were excavated in arbitrary 10-cm levels. Recovered artifacts were assigned field specimen numbers and bagged for removal to a laboratory. Additional artifacts were turned over to the BLM by modern miners working in the area.

In the lab, all artifacts were cleaned and cataloged. They were then sorted and classified using an artifact classification system developed by Sprague (1981) in which artifacts are classified according to function instead of material type. Since the focus of this thesis is on architecture and mining, and many of the artifacts were recovered in a haphazard manner from modern miners, little additional discussion on artifacts is presented. The classification of the artifacts described in the field at Locality L and all the collected artifacts are presented in Appendix A.

Lightfoot (1995:209) calls for broad background studies on "how different ethnic groups constructed, maintained, and abandoned space in their traditional homelands." This information can then be used for comparison with materials unearthed at archaeological sites in the United States and
used in the identification of ethnic affiliations. This makes sense in a study concerning Chinese architecture and mining practices.

To accomplish this, studies of Chinese architecture and mining were undertaken. These information-gathering forays focused on the vernacular architectural and mining practices from Guangdong Province. Books and journal articles from Euroamerican visitors to the region were the primary source, but English translations of Chinese works were also used when available. Data gathered from these studies were compared with information from historical and archaeological studies of other Chinese sites in the United States and the information gathered from the inventory and testing work completed in American Canyon.

Conclusion

Anthropologists have long sought to understand culture change and/or lack of culture change. Archaeologists need to explore these areas through the material culture left behind by a group. The material culture includes the artifacts made by the group, and the remains of their homes and other structures. Historic archaeologists can add the artifact of the historic record in their attempts to understand the past. This thesis will attempt to understand Chinese acculturation, or lack thereof, by looking primarily
at the architecture and mining technology of overseas Chinese in American Canyon.
CHAPTER 3

HISTORY OF AMERICAN CANYON

Arriving in American Canyon

Independent Chinese miners quickly made their way across the Pacific to join the California gold rush. As prospecting and mineral discoveries spread north and east from California, so did Chinese placer miners. The first Chinese placer miners appeared in the 1850s in that portion of the Utah Territory that later became Nevada, in the Gold Canyon District near Dayton. Dayton, before it received its current name, was known as Chinatown (Angel 1958[1881]; Mack 1936). By the mid 1870s, Chinese placer miners were operating across Nevada, located in the Island Mountain and Tuscarora Districts in Elko County; the Klondyke, Tule Canyon and Tokop Districts in Esmeralda County; the Bald Mountain District in White Pine County; and the Rebel Creek, Kings River, Rosebud, Sierra, Kennedy, and Indian Districts in Humboldt County (Pershing County was created out of Humboldt County in 1919) (Vanderburg 1983[1936]).

Chinese reached the Humboldt Range north of American Canyon in the 1860s. The earliest mention of Chinese in the area is a newspaper article from Unionville in 1863.
(J. P. Marden 1993, pers. comm.) (Figure 2). It is possible that some Chinese were working placer gold deposits found in Buena Vista Creek, the stream running through Unionville (Vanderburg 1983[1936]), even though the unreliable and often inaccurate 1870 census did not list any placer miners amongst the Chinese (United States Census Manuscript [USCM] 1870).

Some Chinese obtained work in the hard rock mining industry in Unionville. In an effort to reduce costs, John C. Fall of the Arizona mine hired Chinese labors to work in the mine mills. The cheaper labor allowed him to process ore previously determined to be unprofitable (Raymond 1870). The Euroamerican mining community perceived this as a threat.

Two Euroamerican miners, W. S. Bonnifield and L. F. Dunn, helped form the Workingman's Protective Union to "protect the interests of the white workingman against the encroachment of capital and Coolie labor, and to use all legal means of ridding the country of Chinamen." This Union was responsible for the armed expulsion of 46 Chinese from Unionville on January 1, 1869. When a federal jury charged Dunn and W. S. Bonnifield with the "crime of violation of the Burlingame Treaty between the Empire of China and the United States of America," M. S. Bonnifield, a lawyer serving in the State Senate at the time, rushed to his younger brother's defense. The charges against the two men
were eventually dropped, largely due to the refusal of local officials to follow through with any legal action and the fact that the treaty had not yet been ratified (Lingenfelter 1974, Rusco 1999).

The Workingman's Protective Union was unsuccessful in its efforts to rid Unionville of Chinese. The Chinese trickled back into town, and resumed work in the mill—sorting ore, feeding stamp batteries and attending amalgamation pans (Raymond 1870). The census enumerator in 1870 for the Buena Vista Township (Unionville) counted 55 Chinese. Only three listed as working in a quartz mill, while 32 were listed as laborers. Of the remaining 20, 14 were cooks, one was a waiter, one was a house servant, and four were women listed as having "no occupation."

In 1875 placer gold deposits were found in Spring Valley, roughly four miles north of American Canyon and 12 miles south of Unionville. Spring Valley was initially included within the boundaries of the Indian Mining District. After discovery of placer gold, and later hard rock gold and mercury deposits, the district was reorganized as the Spring Valley District (Johnson 1977; Vanderburg 1983[1936]). The Spring Valley placer deposits were soon being worked by about 30 Euroamericans and as many as 125 Chinese. They used a long tom (a modified sluice box) in the winter when water supplies were adequate. During the rest of the year, rockers were used. Newspaper accounts
from 1877 reported there were 200 Chinese in Spring Valley living in a camp that supported four stores (Silver State [SS] 17 January 1877:3). The 1880 Census counted 127 Chinese in Spring Valley with 100 listed as placer miners. In addition to miners, there were one merchant, two doctors, one woodchopper, three cooks, three mill workers and one laundryman. The occupations of 13 Chinese were not listed.

Placer deposits were found in American Canyon in 1881. They were first worked by Euroamerican miners who reportedly recovered one million dollars before beginning to lease claims to Chinese miners in 1884 (Vanderburg 1983[1936]). Hoback Kong was the first Chinese to lease a placer claim (from M. S. Bonnifield!) in American Canyon (Humboldt County Claim Records). Toi Lee, Wong Kee and Hong Hing soon followed suit in leasing claims. In addition to Bonnifield, claims were leased from L. F. Dunn, a miner and saloon operator from Spring Valley; Sam Jones, a blacksmith from Spring Valley; R. C. Ruddell, a prominent Lovelock rancher; and Thomas Harper, another miner (Bragg 1976; SS 17 May 1893:3; Humboldt County Contracts and Records Book A; American Mining District 1893).

Chinese Mining in American Canyon

Wong Kee appears to have been the principal leader of the Chinese placer mining in American Canyon. In addition to leasing placer claims, he was responsible in 1885 for
construction of ditches from the head of the canyon to the placer grounds (Nevada State Water Engineer 1909). An addition to Wong Kee's ditch system, consisting of a water tunnel in South American Canyon and ditch leading to American Canyon, was constructed in 1892 by Toi Lee in partnership with miner Thomas Harper (SS 18 January 1892:3).

Wong Kee's ditches provided up to six miner's inches of water (fifty-four gallons per minute [Wells 1973]). This was not sufficient to run a sluice box, but provided ample water for domestic use and for washing pay gravel with rockers (Nevada State Water Engineer 1909). Water distribution appears to have been implemented by selling buckets of water to individuals, as they needed it. The archaeological record shows the remains of a dugout alongside the ditch that contains dozens of large cans modified into buckets.

With the construction of ditches, large-scale placer mining began, and the Chinese population of the area began to shift from Spring Valley to American Canyon. By 1887, 100 Chinese were mining in American Canyon (SS 20 June 1887:3). The population increased to 120 for the years 1891 and 1892, with an additional five Chinese in neighboring Dry Gulch and a dozen remaining in Spring Valley (SS 21 August 1891:3; SS 18 January 1892:3). The reason so many Chinese decided to move south to American Canyon is not clear. It is possible that they exhausted all of the placer gold in
Spring Valley; however, Spring Valley continued to produce placer gold for many years, and was the site of the first gold dredge to operate in Nevada (Walker 1911). Another possible impetus for the exodus of Chinese from Spring Valley was increasing Euroamerican interest and presence there, caused by a switch from placer mining to hard rock gold, silver and mercury mining.

In American Canyon, Wong Kee, Toi Lee, Hong Hing and Hoback Kong subleased 20-x-20 ft. sections to individuals or small groups (Locke 1913; Vanderburg 1983[1936]). Household groupings listed in the United States Census manuscript (1900a) indicate that individual subleases were most likely the norm, but that groups of two to four individuals were common. Partners in these small groups often shared the same surname, indicating they were based on family, clan or district associations. Leases were reportedly assigned by a lottery (Emminger 1966). Shafts were excavated on each of the small leases. These shafts, many of which still exist, varied in depth from ten to 100 feet. Shallower shafts were located in the upper reaches of the canyon where depth to bedrock also is shallow. Depth to bedrock, and corresponding shaft depth, increased toward the mouth of the canyon. Drifts were dug along pay streaks on bedrock and false bedrock clay layers.

All mining by Chinese in American Canyon was by hand. Shovels, picks, pans and rockers were effectively used for
gold recovery. Over two miles of the canyon bottom are honeycombed with shafts and tunnels gouged through the tightly packed alluvial gravel. This work was dangerous, and at least two Chinese miners in Spring Valley and one in American Canyon were killed by cave-ins. The man killed in American Canyon was reported to be "green;" he did not understand the importance of shoring. This indicates that not all Chinese in American Canyon were experienced placer miners (SS 1 October 1880:3; SS 21 December 1892:3).

The Chinese Community

Various authors have placed the Chinese population in American Canyon during the period 1884 to 1895 from between 300 to 3,000 individuals (Basso 1970; Bragg 1976; Locke 1913; Mordy and McCaughey 1968; Paher 1970; Vanderburg 1983[1936]). It would appear that most, if not all, of these figures were exaggerated since exact counts of the Chinese were difficult to obtain. A tax collector visiting American Canyon around 1890 had to deal with Chinese hiding from him. He estimated, however, that there were 200 to 300 miners (Emminger 1966). The census count for the critical year of 1890 indicates that the entire Chinese population for Humboldt County was 377 (United States Department of the Interior, Census Bureau [USDI, CB] 1894). The census manuscripts for that year have been destroyed, and the exact population in American Canyon is unknown. Newspaper
articles report the population of American Canyon in 1887 to be 100, and in both 1891 and 1892, around 120. These figures include only six Chinese women (SS 21 August 1891:3; SS 18 January 1892). Articles in the Winnemucca, Nevada, newspaper Silver State also count additional Chinese in Spring Valley and Dry Gulch north of American Canyon and Chinese in Spaulding Canyon in the East Range, roughly 68 km to the northeast. It was reported that the Chinese were constantly coming and going. It is possible that several groups of Chinese were moving between American Canyon and other mining districts. The figure of three hundred for Chinese placer miners might be a reflection of the regional Chinese population.

This indicates that American Canyon was a very significant Nevada Chinese community during its Chinese between 1884 and 1906. During the period between 1880 and 1900, the total Chinese population of Nevada declined. Although the overall Chinese population of Nevada was diminishing, the ranking of the Chinese population in Humboldt County compared to the rest of the counties in the state was increasing. Humboldt County went from having the sixth highest number of Nevada Chinese in 1870 to the second highest in 1890 and 1900 (USDI, CB 1892; USDI, CB 1901). Before discoveries in American Canyon, the only other large Chinese population centers in Humboldt County were in two mining towns, Spring Valley and Unionville, and two railroad
towns, Lovelock and Winnemucca. Although the 1890 census manuscripts have been destroyed, an idea of the Chinese population of these communities can be determined by examining the census data for 1880 and 1900 and by looking at other sources. Lovelock's Chinese population increased from 31 in 1880 to 39 in 1900 (Rusco 1979). Most of the 127 Chinese in Spring Valley left, leaving less than a dozen in 1892 (SS 21 August 1891:3; SS 18 January 1892:3). Unionville's Chinese population plummeted from an estimated 76 in 1880 to none in 1900 (USCM 1900b). Winnemucca's Chinese population also declined, from 81 in 1880 to 58 in 1900 (Au 1993). American Canyon, with a population of 120 in 1891-92, was the largest Chinese community in Humboldt County during most of its existence.

Perhaps the best way to see the influence American Canyon had on Nevada communities is to follow the activities of some of its merchants and other businessmen. Commerce among the Chinese thrived in American Canyon, and from 1886 to 1903 at least two stores, and often as many as four, were operated by Chinese in American Canyon. These stores sold traditional Chinese goods (imported through San Francisco), lumber, and foodstuffs such as swine, chicken, wheat, tea, coffee, tobacco, ham, sardines, sugar, onions, and potatoes often purchased from Euroamerican Lovelock merchant S.R. Young. Euroamerican teamster Simon Billups shipped two
wagonloads of these goods to American Canyon once a week (SS 21 August 1891:3).

Hong (Hung) Hing owned one of the stores, operating it from 1890 through 1898. The Humboldt County tax rolls indicate that Hong Hing's store carried the most merchandise in American Canyon for most of the period of its operation (Humboldt County Assessor's Rolls [HCAR] 1876-1916). This indicates Hong was one of the wealthier Chinese in American Canyon.

In addition to running a store, Hong Hing leased mining claims from Euroamerican placer miners. On December 11, 1895, he leased the Spring Garden Placer claim from Sam L. Jones for $40.00. The lease was to run for 20 years unless "sooner forfit [sic]." On the same day, he leased an unnamed claim from S. Billup. This lease was to run for 20 years, but was considerably more expensive at $10 per foot for a 1,500 foot long claim (American Mining District 1893).

A Hong Hing also operated a store in Eureka, Nevada. While in Eureka, that Hong Hing was reported to be worth $40,000. He also challenged the Nevada opium laws in court after being arrested for possession of a pipe (LuAnn Caressi 1996, pers. comm.) While there is no proof (i.e. there is no census data on Hong Hing from American Canyon to compare with Eureka data) that the Eureka Hong Hing is the American Canyon Hong Hing, the Eureka Hong Hing left Eureka shortly before the American Canyon store was opened. To be able to

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operate one of the richest stores in American Canyon, and to lease claims costing $15,000, is something possible by someone worth $40,000.

It appears as though another merchant, Sin Yuen (Tuen), bought out Hong Hing and ran the store until 1903. Sin Yuen also dabbled in mining, and in partnership with Wing Lee, obtained a 40 year lease on two claims from Thomas Harper and Frank M. Fellows for $30 in 1898 (Humboldt County Contracts and Records Book B: 609). "Sin Yuen" appears to have been a business name, since in 1900 a Lee Long was enumerated as a storekeeper. Lee Long does not appear in the County Assessor's rolls or in any newspaper articles. Lee was a relative newcomer to the United States, arriving in 1885. In 1900, he was 44 years old and single.

Another of the major operators in American Canyon was Wong Kee. Wong Kee immigrated to the United States in 1873, at the age of 25. Contrary to Chinese custom, Wong Kee brought his wife, Ahe Ho, with him. He first arrived in American Canyon in 1885. He told census enumerators that his profession was placer miner (USCM 1910a), but other historic records reveal that he was a shrewd businessman with interests in many different activities.

Wong Kee built most of the water ditches in American Canyon, and eventually ended up owning them all (nearly seven miles). The main line of the ditch system was constructed between July and November of 1885 (Nevada State
Water Engineer 1909). This water allowed full-scale placer mining to take place in American Canyon. By owning the ditches and controlling the water, Wong Kee had considerable power amongst the Chinese placer miners.

Wong Kee sold the ditches to Euroamerican miner J. W. Wenzel in 1905 (Nevada State Water Engineer 1909). Wenzel apparently did not have the full purchase price, and Wong Kee carried the debt for several years under a mortgage agreement (HCAR 1905). Wenzel continued using the ditches for mining and domestic water purposes. The open ditches were eventually replaced with buried iron pipe.

Although newspaper accounts do not mention that Wong Kee ran a store, the Humboldt County Assessor taxed him for merchandise from 1896 through 1906. Wong Kee operated this store until he left American Canyon late in 1906. From 1904 until 1906, this was the only store in American Canyon (HCAR 1904-1906).

Wong Kee disappears from northern Nevada records for a short while, again surfacing in Lovelock in the spring of 1908. He purchased a lot from Fong Sing and his wife Ling Kao, and opened a laundry (Humboldt County Deeds Book 43: 415; HCAR 1908). This business must have been prosperous, because in 1914 Wong Kee constructed a two story concrete building to house his enterprise (Hart 1979).

Wong Kee sold his business interests in August of 1917 and left Lovelock (Humboldt County Deeds Book 51: 346).
Where he went has not been determined. The Nevada State Museum, Carson City, has a letter addressed to Wong Kee in Lovelock, postmarked May 15, 1916, in the Chinese Collection. This letter is from the Canton State Bank in San Francisco. Considering it was postmarked the year Wong Kee left northern Nevada for good, he probably was wrapping up his affairs for a move to San Francisco or back to south China via San Francisco.

What Wong Kee was doing during his hiatus from northern Nevada in 1907 and the early part of 1908 is unknown. However, in January of 1908, the residents of Rhyolite, Nevada, were excited by the visit of a Chinese businessman, a Wong Kee from Barstow, California, to their city. Euroamerican labor interests were concerned that he was there to scout locations for Chinese laundries or to provide cheap labor for the mines. Wong Kee was not there for any of those reasons—he had business with Walter Scott, the famous "Death Valley Scotty." He told reporters that he was there to warn Scotty that creditors attempting to recover their loans would hijack a special train Scott was promoting in Barstow. It was also reported that Scotty owed Wong Kee $300, and speculated that if Scotty could arrange a special train, he would have enough money to pay his debt to Wong Kee (Bullfrog Miner 1 February 1908: 8). While Wong Kee is a common name among Chinese, it is probable that the "Barstow" Wong Kee is the "American Canyon" Wong Kee.
Figure 5. Walter Scott (Death Valley Scotty) and Wong Kee in Rhyolite, Nevada.
The evidence that the two men are the same is compelling: 1) The "American Canyon" Wong Kee appears to be absent from northern Nevada from late in 1906 till April of 1908. The "Barstow" Wong Kee was in Rhyolite in January of 1908. 2) The "Barstow" Wong Kee was reported to be a businessman owning a restaurant, a general store and other interests in the area, all worth $50,000. The "American Canyon" Wong Kee owned a general store and had other diverse business interests. 3) Death Valley Scotty prospected in the Humboldt Range, the mountain chain where American Canyon is located. It is certain that he had dealings with the Chinese in American Canyon. Walter Scott was subpoenaed by the State of Nevada during a trial concerning American Canyon Chinese in 1893 (Union Township Justice Docket 1892-1893), and was present when the American Mining District was organized (American Mining District 1893-1905). 4) The "American Canyon" Wong Kee loaned money to an Euroamerican (J. W. Wenzel) while "Barstow" Wong Kee loaned Scotty money. Loans by Chinese to Euroamericans do not appear to have been common. 5) The 1910 Census (USCM 1910c) does not show a Wong Kee in Barstow; however, there was a Wong Yang working in a Chinese restaurant that came to this country in 1908. Is this Wong a trusted nephew brought here as a "paper son" to keep an eye on a portion of his uncle's far flung business empire?
While operating in Spring Valley, Chinese imported hogs from as far away as Paradise Valley (SS 13 December 1877:3), and they may have continued to do so while working in American Canyon. One Chinese man who may have been buying these hogs was Toi (Toy) Lee. In an 1891 newspaper article, Toi Lee was referred to as a "pioneer merchant" now engaged in the butcher business (SS 21 August 1891:3). The Humboldt County Assessor's rolls show a Toi Lee taxed for merchandise in 1887, but did not show him being taxed for merchandise at any other time (HCAR 1876-1916). He was taxed, however, for possession of hogs in 1891 and 1892, the mainstay of his butcher business.

Like other Chinese businessmen in American Canyon, Toi Lee had interests in mining. In addition to building an extension to the ditch system with Thomas Harper in 1892, he might have had an interest in a placer claim in Dry Gulch, a drainage between Spring Valley and American Canyon. The official claim record shows that the claim was staked by Thomas Harper and F. M. Fellows in 1893 (Humboldt County Mining Notices 1893), but it was named the Toy Lee Placer Mining Claim. This claim was one of the two leased to Sin Yuen and Wing Lee in 1898. Toi Lee, Harper and Fellows might have entered a gentlemen's agreement without bothering to record Toi Lee as a partial owner of the claim.

After making some money in American Canyon Toi Lee moved to Lovelock, Nevada, where he purchased lot 13, Block
22 from Kin Kee for $25 on October 11, 1897 (Humboldt County Deeds Book 33: 581-82). While in Lovelock, Toi Lee operated Young's Hotel Cafe. He passed away during a trip to China in 1900 (Hart 1979). This trip was only a visit, and it appears as though Toi Lee made Lovelock his home.

Ah Jake (China Jake, Woo Jake) was another man who got his start placer mining in and near American Canyon and branched out into other enterprises. He first appears in the historic record in Spring Valley in 1880 (USCM 1880), 24 years old, married and listing his profession as placer miner.

Like other successful Chinese, Ah Jake had many dealings with Euroamericans in the region; however, his earliest dealings were a bit unusual. In 1881, Ah Jake and Ah William acquired 1,000 feet of placer mining ground in Dry Gulch. Henry Pfluger and W. C. Ruddell turned over the property to them. No money changed hands, and the only conditions for acquiring the property were that they excavate and prospect 10 shafts to bedrock and keep "their noses clean" (Humboldt County Contracts and Records 1881). One suspects that Pfluger and Ruddell owed Jake and William wages and turned over the claim in lieu of cash.

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2 Kin Kee also had dealings with Wong Kee, and took him to court in 1897 to recover $117.38. The case was settled out of court, with Kin Kee paying court costs (Humboldt County Justice Docket 1897)
In 1887 China Jake was assessed $2.70 for a house. The exact location of the house was unrecorded, but it most likely was in the Spring Valley/American Canyon region (HCAR 1887).

By the mid-1920s, Ah Jake was one of four owners of the Hop Jake Company in Lovelock. Based on the names listed in the records, his partners were relatives or clan members. This firm was the largest Chinese-American business in Lovelock and owned much property, including several restaurants and bars. Some of the businesses were leased to Euroamericans, while the company ran others. As of 1979, the company was still listed on the Pershing County Tax Rolls and still owned by a Woo. This gentleman, though born in Lovelock, lived in California. In the early 1930s, Ah Jake moved back to China, eventually selling his shares to his partners (Hart 1979).

Quong Hop Chung also operated a store in American Canyon. He immigrated to the United States in 1870, and was 43 years old in 1900. He told the 1900 census enumerator that he had been married for 14 years, but he had no wife with him in American Canyon (USCM 1900a). Quong's store was the longest running business enterprise in American Canyon, in operation from 1888 to 1903 (HCAR 1876-1916).

Although Quong was a long time resident of American Canyon, his stay there was not without trouble. Bert Campbell, "having a time" (on a drunken rampage?), attacked
Quong's store on August 20, 1899. After breaking out the store windows with stones and breaking up some of Quong's furniture, he attempted to burn the store down ([Lovelock Tribune [LT] 9 September 1899:4; 16 September 1899:1]). Fearing for his property, and possibly his life, Quong, with some help from other Chinese, tied Campbell up (Buena Vista Township Justice Docket 1899). Campbell was arrested on August 23 on charges of assault and battery and some unspecified misdemeanor (public drunkenness?) ([LT 9 September 1899:4; SS 29 August 1899:4]). Campbell demanded a court trial, and when local court officials were unable to raise a jury in Unionville, the case was transferred to Winnemucca for trial. In spite of raising a jury in Winnemucca, the court there decided it did not have jurisdiction and all charges against Campbell were dropped ([SS 29 August 1899:4, 1 September 1899:4]). This was a common danger faced by the overseas Chinese, where they often had to suffer the consequences of violence by EuroAmericans who did not answer for their deeds.

Wong Hueng Chung, who opened for business in 1886, ran the second longest operating store in American Canyon. In 1900, he was counted among the Chinese merchants in American Canyon, although he was no longer on the Humboldt County Assessor's rolls. Perhaps he was operating in partnership with one of the other storeowners. In 1900, he was 45 years
old and had been in the United States for 26 years. He was living with his wife of three years, Luey Hon (USCM 1900a).

A fourth store, opened by Wing Tung Chung, was sold in 1891 to a new firm, Kia (Ki) Hop and Company. This firm was run by Lee Kia and Lee Sing Goy (SS 21 August 1891), who reportedly had an operating capital of $2,000. Lee Sing Goy left American Canyon in 1895 for a trip back to China. There is no record of his return, and he is not listed on any county tax assessments after 1894 (United States Regional Archives 1895; HCAR 1876-1916). The business may have been bought by Guong Sho Lee who operated a store in American Canyon for only two years.

These merchants who operated in American Canyon provided the essential link between the common Chinese miner and the dominant Euroamerican society. They were the ones that made mining for the Chinese possible by leasing claims. In addition to selling goods to their own countrymen, they probably also sold food and other goods to Euroamericans that lived in the area.

Merchants and miners were not the only Chinese businessmen in American Canyon. Ah Lem gave Simon Billups some competition for freighting services into American Canyon. Ah Lem owned a wagon (two in 1893 and 1894), and provided additional freighting services between American Canyon and Lovelock. In addition to hauling goods to American Canyon, he also hauled American Canyon gold to
Lovelock for purchasing supplies or for safe keeping (Murbarger 1958; HCAR 1876-1916). The County Assessor collected taxes from Ah Lem in both American Canyon and Spaulding Canyon (where he owned mining claims), another placer mining area in the East Range roughly 38 km northeast. This indicates that he also provided freighting services between American Canyon and other smaller, satellite Chinese communities.

Yen Chin provided wood for fuel and building purposes. Yen was born in 1848, and immigrated to the United States in 1868. According to the 1900 Census, he was married for 25 years, but lived alone in American Canyon (USCM 1900a). In addition to buying lumber from S. R. Young, he may have also harvested timber from the juniper woodlands growing above 5,600 ft. in the Humboldt Range. Numerous old and weathered stumps in the region testify to timber harvesting.

Clues to the everyday business of American Canyon are also found in the historic and archaeological records. For example, not all foodstuffs were purchased through S. R. Young's Lovelock store. Other sources of pork, chicken and vegetables included Euroamerican truck farmers operating in the Humboldt Range, and Chinese who tended their own gardens and raised their own pigs and chickens (Murbarger 1958). There is archaeological evidence for Chinese gardens in American Canyon, including a hoe blade and leveled areas
with no structural remains. Garden plots have been reported at other Chinese sites (LaLande 1981; Spier 1958).

Chinese often formed various societies. In addition to providing housing, food, and medical care during lean times, and avenues for religious and social activities, some of these societies were also established as political organizations working toward the overthrow of the Manchu rulers of China. Meeting and religious halls for these societies, known as Joss Houses, were constructed in every major Chinatown in the West. A "joss house" was established in American Canyon. The "joss house" may have been a local headquarters for the Zhigongtong (Chee Kong Tong) (Chung 1994). It was reportedly decorated with peacock feathers, gilded paint, pictures of dragons and devils (Basso 1970; Murbarger 1958). A Chinese man who stayed in the area until his death in 1927 (Murbarger 1958) or 1928 (Vanderburg 1983[1936]) was employed to guard the "Joss House."

There was some time available to pursue distractions from the hard and dangerous work of mining. One such distraction was gambling. A newspaper article reports Chinese playing a lottery\(^2\) in American Canyon (SS 18 January 1892:3), and fan tan counters\(^3\) have been found in

\(^2\) The lottery was most likely Pak kop piu, or "white pigeon ticket." The modern game of Keno derived from this lottery (Culin 1969[1891]).

\(^3\) Fan tan is a guessing game where a pile of covered markers is divided by four. Players bet on how many markers are left over after the division (0, 1, 2, or 3). Counters were used for
the archaeological deposits. Others appear to have sought diversion with drugs and alcohol. Fragments of "Tiger Whiskey" (Chinese ceramic alcoholic beverage bottles) and champagne bottles, opium cans and ceramic pipe bowl fragments scattered among the ruins give testimony to their consumption.

Very few Chinese women lived in American Canyon. An early newspaper article mentions that there were six Chinese women in American Canyon in 1892, but did not suggest their exact status (SS 18 January 1892:3). The 1900 census counted four Chinese women. Their occupation was listed as female laborer (three) or placer miner, and their ages ranged from 46 to 52 years old. None of these women was listed as having any living children. Two of these women were merchant wives; Ahe Ho with Wong Kee and Luey Hon with Wong Hueng Chung. A third woman, Gow Choy, was enumerated as living with her placer miner husband, Chow Sing. The fourth woman, One Gun, was listed as the head of a single person household, although she was also listed as being married (USCM 1900a).

It was unusual for Chinese men to bring their wives with them to the United States, and there was a large discrepancy between the number of Chinese men and women. Lyman (1968:323) reports that there were 2,678 Chinese men betting. The counters found in American Canyon are opaque white-glass discs known as "white pearls." They were worth a one-dollar bet (Culin 1969[1891]).
for every 100 Chinese women in the United States in 1890. Chung (1998) lists several reasons for this, including Chinese tradition; a means by which Chinese families ensured the return of their sojourning sons; Chinese and American laws restricting emigration of Chinese women; the expense of travel; and the hostile environments encountered. Many of the Chinese women that did arrive in the United States were prostitutes, students, servants, or the wives of merchants and doctors.

According to the Census Manuscripts (1900a), it appears that only one Chinese man in American Canyon brought his wife with him. This was Wong Kee, who arrived in the United States in 1871 with his wife. Luckily for Wong Kee he arrived with his wife prior to the 1875 Page Law, which made the immigration of Chinese women to the United States problematic, even though merchant wives were still technically allowed to enter the country (Salyer 1995) (The majority of Chinese wives brought into the country were wives of merchants [Lyman 1968]). Unluckily for Wong Kee, Ahe Ho passed away between 1900 and 1910 (USCM 1900a; UCSM 1910b).

Luey Hon immigrated in 1870, four years before her husband, and Gow Choy arrived fifteen years prior to her husband (USCM 1900a). It appears as though these women met their husbands in the United States. There is a possibility that the two women were prostitutes bought out of brothels
to serve as second wives or concubines by their husbands, a practice not unheard of amongst the Chinese on the United State's Western frontier (Chung 1998).

Murbarger (1958) reported the reminiscences of Buena Vista Valley Euroamerican settler, Joe Thorton, who remembers two Chinese women in American Canyon, a merchant wife and one that was "...sort of a sporting woman." Was this One Gun, the only woman not living with a husband in American Canyon? In 1900, her age was listed as 52, which seems old for a "sporting woman." She was listed as a female laborer on the Census manuscript (USCM 1900a).

The American Canyon War

Groups of Chinese emigrating from the same region in China tended to band together and form tongs, or district associations. Within these associations members could speak their own language and dialects and practice customs as they would at home. The associations also provided assistance to members, such as food and housing during lean times, and made provisions for removing the bones of deceased members back to China for final burial. They also regulated the actions of their members, including establishing locations and prices for stores and laundries and setting rules of conduct. Chinese who broke these rules were often punished by the association, independently of United States' laws and customs. Conflict often arose between different
associations competing for resources in the same areas (cf. Elsensohn 1970).

Chinese belonging to the Sanvi (from the vicinity of Guangzhou [Canton]) and Longdo (from the Xiangshan or Zhongshan region near Hong Kong) associations operated peacefully for many years in American Canyon, to the surprise of local newspaper reporters (Chan 1991; Lai et al. 1980; SS 18 January 1892:3). However, in late spring 1893, trouble began. Two groups, one led by Lee Ing (or Hing) and the other by Hong Gee, began to squabble over a claim.

In May, Hong Gee filed charges against Lee Ing and two of his men (Lee Do Toy and Lee Hong Ott) for stealing several ounces of gold and smashing up his house. The three men were arrested on a charge of "riot" and hauled off to Lovelock for "examination" (SS 23 May 1893:3; SS 25 May 1893:3). It is interesting to note that their defense lawyer was M. S. Bonnifield. The defendants were all found guilty as charged, and paid fines and court costs totaling $96 (Union Township Justice Docket 1892-1893: 125-127). The brush with the local legal system failed to resolve the issue among the Chinese, and less than a month later, several Chinese were again in jail, and one man was dead.

On May 31, the two groups fought a gun battle. The Hong Gee faction wounded one man in Lee Ing's party during an attack. When the Lee group returned fire, a Hong man was killed and that party was routed (SS 1 June 1893:3).
Lee Yek, a reputed highbinder (hired thug) in the service of Lee Ing, turned himself into the authorities in Lovelock. He freely admitted that he was responsible for the killing. Initial newspaper reports suggested that the dead man had been shot twice in the back. This conflicted with Lee Yek's story that the shooting was done in self-defense (SS 3 June 1893:3). A manhunt was initiated for Lee Ing. He was found hiding under a house in the Winnemucca Chinatown and arrested (SS 5 June 1893:3).

The Silver State reported on the inquest held on June 9 in Lovelock. Testimony by Thomas Harper (an Euroamerican claim owner in American Canyon) shed new evidence on the incident. According to Harper, Lee Ing was in lawful possession of the claim. Harper's testimony also established that the dead man was a highbinder employed by Hong Gee. The highbinder brought up "four new and the largest sized revolvers" from San Francisco prior to the shootout. These weapons were to be used in the attack against the Lee party. The authorities decided that Lee Yek had acted in self-defense. All charges were dropped, and both Lee Ing and Lee Yek were released (SS 10 June 1893:3).

The court records for the incident are considerably less dramatic than the newspaper account. They state:

M. S. Bonnifield appeared for the defendant, and moved that the defendant be discharged from custody. The District Attorney appearing in the
part of the state, and not being ready to proceed with the examination and knowing of no legal cause why the defendant should not be discharged, said motion is granted and the defendant herein is hereby ordered and is discharged from custody (Union Township Justice Docket 1892-1893: 133).

Nevada has had a tradition of ignoring crimes committed among members of ethnic minorities (Zanjani 1992). It appears as though the law would clamp down on members of a minority as long as there was potential for leveling fines, but would ignore transgressions between members of the minority if the perceived result was going to be an expensive trial. The American Canyon War is an example of the unequal apportionment of Euroamerican law on the western frontier.

Decline of the American Canyon Chinese Village
With passage of the 1882 Chinese Exclusion Act, fewer young Chinese men came to American Canyon to work in the mines, and the aging population began to leave American Canyon to return to China or larger Chinatowns for protection or to retire. All the shallower deposits had been exhausted, and ever-deeper shafts were required to recover gold. Euroamerican miners were once again becoming interested in American Canyon, not only for placer gold, but also hardrock gold, silver and mercury deposits. With
renewed interest in American Canyon, the American District was organized out of the Spring Valley District in June of 1893.

These factors were responsible for the rapid decline in the Chinese population after 1895. The 1900 Census only counted 58 Chinese in the entire district (USCM 1900a). In 1905, after a visit to the area, the Humboldt County Assessor reported less than 10 Chinese living in American Canyon. These men were said, "to be too old to be of any account anywhere else and are left to die." One of the men was Wong Kee, running the sole remaining store. He indicated that he would soon leave American Canyon for Spring Valley (Bragg 1976). A geologist reporting on mercury deposits in Nevada did not mention any Chinese in American Canyon during a visit in 1908 (Ransome 1909). Only four aged Chinese placer miners were counted in American Canyon in the 1910 census (USCM 1910a). These men were 80 year old Lee Hog Ming, 74 year old Lee Ming, 70 year old Quong Che, and 62 year old Ching Yin. Lee Hen, Lee Lim and Lee Ley, brothers ranging in age from 40 to 55, lived in nearby Dry Gulch. Two Chinese men were reported to be "on the ground" in 1913 working with a rocker (Schrader 1915).

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4 It is possible that Ransome didn't think the presence of a few Chinese was important enough to mention, or perhaps the Chinese hid, as they did from the county tax man (Emminger 1966). American Canyon miners often worked the harvest in agricultural areas to establish a "grub stake," and maybe the Chinese were away cutting hay (LT 19 August 1899: 4).
No Chinese were counted in the district during the 1920 census (USCM 1920); however, Vanderburg (1983[1936]) reported that a lone Chinese man died in South American Canyon about 1928. Since the majority of Chinese counted in the district during the 1910 census were Lees, it is possible that this man was a Lee. He stayed in American Canyon as caretaker of the Joss House, and may have indulged in some placer mining as his other duties allowed.

Post Chinese Activity

Abandonment of American Canyon was by no means the end of placer mining in the district. The United States Geological Survey (1908) reported that in 1907 the Nevada Almaden Mining Company was placer mining for gold and cinnabar and, in spite of having no reported production, was planning on building a processing plant in 1908. In 1908 a dozen white miners were reported living in the old Chinese settlement and exploring the gravel with two or three new shafts (Ransome 1909). Locke (1913) predicted renewed mining in the district based on discoveries in an area previously unexplored. The Federal Mines Company started one of the first gold dredging operations in Nevada in Spring Valley in 1910. The operation was plagued by problems, such as drainage of the ponds through pre-existing Chinese tunnels, and was abandoned in 1914. W. H. Harris worked a section of placer ground at the lower end of Spring
Valley from 1921 and 1924 and recovered a "small fortune in gold" using hand methods. In 1935 an attempt to mine hillside placer deposits in upper Spring Valley using a mechanized shovel, trommel and sluice was made (Vanderburg 1983[1936]). Koschmann and Bergendahl (1968) report 255 ounces produced in the district during the period 1932 to 1959. The current claim holder, who acquired the claims around 1961, tells a tale of a white husband and wife team working in the old Chinese shafts in American Canyon (Gordon LaVigne, pers. comm., 1993). Combined Metal Resources, Inc. bulldozed much of the American Canyon placer ground circa 1981. In the last six years, there has been a series of mineral exploration projects by a progression of lessees (United States Department of the Interior, Bureau of Land Management [USDI, BLM] 1981-1998).

Cinnabar is found along with the placer gold in American Canyon. This lead to mercury prospecting in the early 1900s. Two prospects were in the process of development by 1908 (Ransome 1909). The first, known as the Kaolinite Mine, is located upstream from the Chinese diggings. The cinnabar is disseminated in a layer of kaolinite created in a fault. The mercury is too disseminated to mine economically, and the presence of the cinnabar makes the kaolinite unusable. The second prospect, known as the Happy Day Prospect, is just north of the Chinese townsite (Ransome 1909). Other mines and prospects
in the district were located and worked between 1910 and 1943. The highest producer, the Cinnabar City or Cinnabar King mine, was discovered in 1926 and reported abandoned in 1943 (Bailey and Phoenix 1944), though in 1931 it had a Newhall Furnace and an aerial gravity tram connecting the mine with the mill (Vanderburg 1936).

Nearby Rochester underwent a silver mining boom from 1911 to about 1929 (Babal et al. 1993). Silver mining activity made its way into American Canyon, and several hard rock exploration shafts with artifacts dating from this can be found there.

Finite, a mineral used in the production of ceramics, was also mined in the district. This mine, on the ridges south of South American Canyon, was in operation intermittently from 1933 to 1948 (Papke 1975).

Conclusions and Discussion

The Spring Valley District, which once again includes American Canyon, is considered the best, placer-gold mining ground in the State of Nevada (Koschmann and Bergendahl 1968; Vanderburg 1983 [1936]). Estimates for total placer-gold production for the Spring Valley District between 1881 and 1895 vary from $5,000,000 to $20,000,000. The Wells Fargo and Company estimates it hauled $9,000,000 worth of gold on its stage lines during this period. A Chinese man living in the area in 1913 reported that his people removed
$20,000,000 (Schrader 1915). An exact amount will probably never be known since the Chinese were reluctant to discuss such matters with Euroamericans (no surprise there), and much of the gold they mined was sent to China. A reasonable and much quoted estimate puts the figure at $10,000,000 (Koschmann and Bergendahl 1968; Vanderburg 1983[1936]).

Euroamericans in the United States often feared the Chinese. They felt that Chinese willingness to work for lower wages\(^5\) threatened to destroy their standard of living, or that the hard working Chinese placer miners would recover all the gold before they could. Differences in appearance, language and custom made it easy for Euroamericans to hate the Chinese. Bigoted Euroamericans often went to extremes to discourage Chinese miners. They initiated exorbitant foreign miners' taxes, wrote mining district laws outlawing claim possession by Chinese miners, passed other legislation unfavorable to Chinese, and often resorted to mob violence. This persuaded many Chinese placer miners to seek employment in areas less likely to antagonize Euroamericans (Rohe 1982).

This antagonism led not only to the Chinese Exclusion Act in 1882, but also was felt in mining regulation throughout the United States. Prior to the California gold rush, the Federal Government had attempted to control

\(^5\) Whenever wages for Chinese are discussed, they are at most half of what Euroamericans earned.
exploitation of minerals on federally controlled land through leases administered by the War Department. This system was corrupt and difficult and expensive to administer. When the regulations expired in 1840, they were not renewed, leaving the Federal Government with no mining law. Miners in California and Nevada used a system based on Spanish mining law, in which miners claimed minerals as their own. Groups of miners would organize mining districts and establish rules for staking claims and general conduct (USDI, BLM 1992). It was common for Chinese miners to be excluded from claim ownership. This was the case when the first mining district organized in Nevada (Utah Territory) at Gold Canyon in 1859 (BeDunnah 1973[1966]). When the Federal Government finally created mineral and mining laws in 1866 and 1872, much of the flavor of these early district rules was incorporated into these laws. This included the provision that a miner must be, or affirming the intention of becoming, a citizen of the United States (Act of May 10, 1872, 17 Statute 91, 30 U.S.C. § 22 [1976]). Since Chinese were excluded from United States citizenship (Salyer 1995), they technically had no legal right to claim ownership. While this aspect of the Federal mining law was often ignored or unenforced, it was initially upheld in an 1890 Idaho court case. District court judge Willis Sweet ruled that "Chinese have no rights whatever on mining lands in the United States" (James 1993).
After passage of the 1882 Chinese exclusion act and its renewal in 1892, the Chinese population in the United States began to decline. With fewer Chinese working in the United States, the perceived threat felt by Euroamericans that Chinese would take over all the available jobs or force wage scales to a lower level was lessened. Perceived economic threats also lessened as Euroamerican settlers began to secure their own economic positions. Toward the turn of the century, Euroamericans began to show a measure of tolerance for the remaining Chinese in the United States. This is demonstrated in American Canyon by the ability of Wong Kee and Hong Hing to readily enter into a wide variety of business deals with Euroamericans, including leases, loans and mortgages. Eventually, respect for their accomplishments was shown (BeDunnah 1973[1966]). Vanderburg's (1983[1936]) report of placer mining in Nevada reflects this when he states, "Mention should be made of the important role taken by the Chinese in developing the placer deposits in the State in the early days."

Once a claim was considered played out by a Euroamerican miner, the claims would be offered to the Chinese. In most cases, this was done to procure additional income from the claim instead of merely abandoning it, but often was done so that Chinese placer miners working the claims would be around to provide additional customers to Euroamerican businesses. Miners in a district would
reverse, or ignore, district edicts and Federal law against
Chinese owning mining claims in an effort to attract Chinese
to a declining district (James 1993). Many Euroamericans,
taking advantage of loop-holes in the law, leased claims to
Chinese.

Many Chinese miners in Spring Valley were still
purchasing unpatented mining claims from Euroamerican
miners, technically an illegal act that did not afford them
any protection from claim jumpers.® A Silver State (17
January 1877:3) article concerning the placer ground in
Spring Valley reads, "The ground, or at least a part of it,
was purchased by them of the whites, but we believe there is
no law to prevent white men from working in the diggings if
they felt disposed to do so." By the time the Chinese began
to work in American Canyon, they were leasing claims. This
provided an advantage to the Chinese, in that so long as the
leased claims provided income to the Euroamerican claimants,
the claim holders would go to extra lengths to protect
their, and hence Chinese, interests. This is nicely
demonstrated by Thomas Harper's willingness to testify for
Lee Ing during his court appearances, and by M. S.
Bonnifield's legal representation of Chinese on numerous
occasions.

® The Nevada constitution allowed resident foreigners to own
property. Once a claim was patented, and private property, it
could be bought and sold by Chinese.
Another example of tolerance through removal of economic threat, is the willingness of M. S. Bonnifield and L.F. Dunn to lease claims to the Chinese. These two men were actively engaged in the expulsion of Chinese from Nevada, especially in 1869 when the Workingman's Protective Union chased the Chinese from Unionville under threat of arms. Fifteen years later, when they were comfortable pillars of the community, they willingly leased claims to Chinese miners.

American Canyon, with its miles of open shafts and placer tailings and the scattered ruins of a once thriving community, gives testimony to the persistence and hard work of Chinese placer miners and the positive impacts they had on several Nevada communities. A look at the historic record for the area gives testimony to the lessening of tensions after many years of bitter hatred by Euroamericans against the Chinese. Reduction of tension finally allowed Euroamerican and Chinese miners and other businessmen to begin to work together for their mutual benefit. Unfortunately it came too late for the Nevada Chinese to realize the full benefits of United States citizenship, a goal they would not be able to attain for nearly another half century.
CHAPTER 4

THE ARCHAEOLOGY OF AMERICAN CANYON

The archaeological remains in American Canyon cover roughly two miles of the canyon bottom, and represent 118 years of hard rock and placer mining activity by Chinese and Euroamericans.

Clusters of features and associated artifacts assignable to a specific ethnic group, activity, and/or time period were identified and recorded as "localities." Localities were labeled alphabetically as they were identified. There is a total of 14 localities, seven with a clear Chinese occupation, three with Euroamerican only, and four with a mixed or undetermined occupation. In addition to the localities, there are the remains of a water system constructed by the Chinese but re-used by Euroamericans in the early twentieth-century. Between the various localities and features is a diffuse scatter of historic debris and the occasional claim cairn. Also noted was a diffuse scatter of prehistoric stone tools and waste flakes tools representing a prior occupation of the site by Native Americans.
The Physical Setting

American Canyon drains Sage Hen Flat, a small intermontane valley situated at an elevation of roughly 5,800 ft. near the center of the Humboldt Range. The upper reaches of the canyon are narrow, with steep side slopes. The lower portions are somewhat wider with gentler side slopes. American Canyon intersects with South American Canyon at an elevation of 4,640 ft. Below the confluence of the two drainages, a large, well-formed alluvial fan has been created in Buena Vista Valley. Strand lines from Pleistocene Lake Lahontan are on the fan.

The upper portion of American Canyon cuts through Lower Triassic rhyolitic volcanic and tuffaceous sedimentary rocks of the Weaver and Rochester formations. Outcrops of limestone belonging to the Triassic Natchez Pass and Prida formations are visible in lower American Canyon, as is a Pliocene/ Pleistocene basalt flow. A major fault zone forms the contact between the rhyolitic rocks and limestone units (Johnson 1977). This fault zone is responsible for much of the mineralization in the area, and it can be traced by the numerous adits and shafts along its route.

A point of geologic interest is Fossil Hill, located south of the intersection of American and South American Canyons. This locality has numerous marine fossils, first described by W. M. Gabb in 1869 (Jenney 1935).
Soils of the Roca-Reluctan association are forming on the rhyolitic bedrock of upper American Canyon. Atlow-Wiskan soils are forming on the limestones, with a Jerval-Trocken-Golcanoda association present on the alluvial deposits (United States Department of Agriculture, Soil Conservation Service and United States Department of the Interior, Bureau of Land Management 1982).

American Canyon is in the Upper Sonoran vegetation zone. Vegetation observed in the field includes Utah juniper (Juniperus utahensis), tall sage (Artemisia tridentata), shadscale (Atriplex confertifolia), horsebrush (Tetradymia spp.), budsage (Artemisia spinescens), spiny hop sage (Grayia spinosa), rabbitbrush (Chrysothamnus nauseous and C. viscidiflorus), greasewood (Sarcobatus baileyi), Mormon tea (Ephedra nevadensis and E. viridis), lupine (Lupinus spp.), tapertip hawksbeard (Crepis spp.), tumbling mustard (Descurainia spp.), Russian thistle (Salsola kali), halogeton (Halogeton glomeratus), squirrel tail bottlebrush (Sitanion hystrix), Indian rice grass (Oryzopsis hymenoides), cheat grass (Bromus tectorum), and Great Basin wild rye (Elymus cinereus).

Animals observed in the field include blacktailed jackrabbit (Lepus californicus), mule deer (Odocoileus hemionus), coyote (Canis latrans), sage grouse (Centrocercus urophasianus), raven (Corvus corax), collard lizard (Crotaphytus collaris), leopard lizard (Gambelia
wislizenii), horned toad (*Phrynosoma platyrhinos*), rattlesnake (*Crotalus viridis lutosus*), and Great Basin gopher snake (*Pituophis melanoleucus deserticola*).

Archaeological Site 26PE2137

**Locality A**

Locality A covers an estimated 267,102-m² (66 acres) near the mouth of the canyon. An estimated 81 percent of Locality A was destroyed in the late 1970s-early 1980s by modern placer miners using mechanized equipment. A map of the surviving shafts (Figure 7) supports the historic record that shafts were excavated on 20-x-20-ft. (6.1-x-6.1-m) subleases. The map also shows that there are 198 mine shafts surviving in undisturbed areas. Extrapolating the remaining mine shaft pattern into the disturbed areas indicates that approximately 1,032 mine shafts were destroyed. Based on the historic record, mine shaft depth ranges from 20 to 100 ft. (6.1 to 30 m). Excavated into unconsolidated alluvial deposits, the majority of the mine shafts have begun to cave in. They are dangerous to approach, making it difficult to acquire accurate measurements and descriptions. A few of the shafts, however, are in better shape than the others, or are exposed in the sidewalls of modern open pits. Some of these

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7 They have always been dangerous to approach. In 1899 a boy fell into one of the shafts, spraining his ankle. He was hauled out with a windlass (*LT* 2 September 1899:4)
shafts exhibit a series of notches cut into two opposing sidewalls of the shaft. These notches are 20 cm wide and 10 cm high. The measured depth is around 10 cm, but the exposed shaft wall where measurements were taken is actively eroding (a continuous rain of sand grains fell while these data were collected), and they could easily have been deeper. Distance between the notches varies from 35 cm to 40 cm. The notches are vertically arranged, with minor offsets to avoid large rocks in the sidewalls.

Chinese shafts appear to be smaller when compared to Euroamerican shafts, ranging from one-half m$^2$ to one m$^2$. Shafts believed to be Euroamerican range from 1.5 m$^2$ up to greater than 2.5 m$^2$.

Tailings piles associated with the Chinese are also different. They are better sorted and cleaner looking (Figure 8). Euroamerican tailings are not as well sorted. This is from the Chinese practice of working all of the gravel hauled out of their shafts (Williams 1930), whereas Euroamericans tended to work "paystreaks" and did not bother rocking all of the gravel from a shaft.

Few artifacts, mostly hole-in-cap cans, were noted on the surface in the Locality A area. The lack of artifacts may be a reflection of trash disposal methods where debris was simply pitched down abandoned shafts. Current placer miners, which have been restricted to the bulldozed area,
Figure 8. Overview photograph of Chinese placer tailings. View east towards Buena Vista Valley.
Figure 9. Chinese whetstone. Scale 1:1 (Drawing by Sue Edwards).
have recovered many artifacts from bulldozer backdirt piles. Some of these artifacts were turned over to the Bureau of Land Management (BLM), and include opium cans; bamboo, celadon and utilitarian brownware ceramics; can fragments; a small spike; and a slip on lid. One unusual artifact is a rectangular piece of gray, fine-grained sandstone (Figure 9). This rock has a highly polished surface and numerous gouges on two sides. At first it was believed that it was a piece of Native American ground stone, but, upon further reflection, it could be a Chinese whetstone. Hommel (1969[1937]: 257-258) illustrates a similar artifact found at a farmer's home. This farmer resided in Jiangsi province, but was an immigrant from Guangdong.

Locality B

Locality B is located within the boundaries of Locality A. This locality consists of two mine shafts with associated mine tailings, a prospect pit, and scattered debris. The mine tailings indicate that these shafts penetrated into bedrock. Artifacts found include, wooden beams covered with flattened cans and penetrated with large bolts; canvas covered rubber hose; flexible metal hose; a Star tobacco tag; an aluminum tag; and a small ceramic insulator. Analysis of these artifacts indicates that this locality was created 1910-1925. Lack of Chinese artifacts indicate that it was most likely a Euroamerican mine,
possibly the 60 m (200 ft.) deep mine shaft mentioned by Locke (1913) that penetrated into the limestone bedrock.

**Locality C**

Locality C is in the canyon downstream from Locality A. Features consist of a dugout foundation, along with a few tailings piles in the streambed (the shafts themselves are largely backfilled from floods). A hand-repaired shovel blade and opium can fragments were noted in and around the dugout feature. The dugout is built against a steep alluvial bank so that the back wall is the cutbank, while the other three walls are made of mud-chinked, stacked rock, averaging 0.60 m thick. The walls are collapsing, and are now no more than 60 cm high. The front wall has a 46-cm wide doorway. The interior dimensions of the dugout are 2.9 x 2.1-m (6.1 square meters) (Figure 10).

**Locality D**

Locality D consists of an isolated mine shaft (or well) exposing an iron pipe and a claim cairn. Artifacts noted at this location include five hand-soldered can fragments and a five-gallon can with the top cut off.

The shaft is located near a section of the Wong Kee ditch system, and it is probable that the exposed pipe is some of the pipe that replaced the Chinese ditches. It is therefore a twentieth century feature.
Figure 10. Plan map of Locality C Dugout.
**Locality E**

Locality E is another area of intense placer mining. There are an estimated 50 mine shafts, largely backfilled during flood events, with associated, closely spaced tailings piles. There is a building foundation, consisting of three hand-stacked, mud-chinked rock walls, 0.45 m to 1.2 m thick. Road construction may have removed the fourth (south) wall, or it was built from other materials other than rock. An earthen berm is against the west wall (Figure 11). Few artifacts (none Chinese) were noted in this area, and it may represent some of the early (1881-1884) Euroamerican mining efforts.

**Locality F**

Locality F is the uppermost locality associated with the site. It consists of a dugout, tent flat and prospect pit. The front of the dugout has been destroyed by road construction activity. No distinct Chinese artifacts were found. A rocker-screen and several modified five-gallon cans/can fragments (that were made into a bucket, a stovepipe support, and a sieve) are present. This indicates a placer miner(s) lived at this location, but weather the miner was Chinese cannot be determined without additional work.
Figure 11. Plan map of Locality E Dugout.
Locality G

Locality G consists of the remains of a two-room structure and a dugout. Also noted were a talus/barrow pit and a small concentration of Chinese and Euroamerican artifacts (Figure 12). Artifacts found include modified five-gallon cans and can fragments, wood fragments, celadon teacup fragments, and utilitarian brownware ceramic fragments. Traces of the ditch system run in front of the habitation features. These traces are backfilled and resemble trail tread.

The large room of the two-room structure (Feature 1) consists of two collapsing, parallel, stacked rock, mud-chinked walls, 0.30 m wide, 4.9 m long, and currently no higher than 1.2 m. There is a low earthen berm at the front of the structure (3.9 m) where the front wall should be. The second room is attached to the southwest corner of the first. It is a square room, with interior dimensions of 1.8 m by 1.8 m, made with stacked rock walls (averaging 0.30 m wide by 1.2 m high). There is no apparent method of ingress/ egress between the two rooms or between room two and the outside.

The rear wall of the dugout is defined by a cutbank in the ridge slope. The remaining three walls are collapsing, mud-chinked, stacked rock walls, 0.15 to 0.9 m high and averaging 0.3 m wide. The dugout's interior dimensions are roughly 1.8 by 0.9 m.
Figure 12. Plan map of Locality G.
Locality H

Locality H has a shallow dugout or tent platform feature. It is 3.2 by 3.7 m, with a maximum depth of 1.1 m. Also noted was a stacked rock claim cairn. There are few artifacts at this locality, and there is no clear indication of Chinese habitation.

Locality I

A dugout feature, tent platform, and prospect pit are the features at Locality I. The dugout is 3.6 by 3.7 m in area, with a maximum depth of 1.1 m. There is an earthen berm against the south wall. The tent platform area is 3 by 1 m.

Chinese ceramics are found at this location. They are celadon, bamboo, and utilitarian brownware fragments. Brown bottle glass and a sieve made from a can top are other artifacts at this location.

Locality J

Locality J consists of a dugout partially buried by mining tailings. Two parallel hand-stacked, mud-chinked parallel rock walls with an earthen berm define the dugout, which is 3.4 by 3.1-m. Maximum surviving height of the walls is 1.2 m.

A few barrel hoop and tin can fragments were the only artifacts noted. There are numerous mine tailings in the
vicinity, but few shafts have survived flooding, road construction and modern prospecting activity.

**Locality K**

Locality K is the main Chinatown in American Canyon (Figure 13). There are nine dugout features, three rock-walled structures and eight mineshafts along 265 m of the canyon bottom. Traces of the ditch system are behind the cluster of structural remains.

Road construction and placer mining have destroyed Structure 1. All that remains is a low rock wall, roughly 7.9 m long and 1.1 to 1.2 m thick. Charcoal, bone fragments, Chinese ceramics, a white glass *fan tan* counter, and metal fragments were noted eroding out of the road cut.

Dugout 1 is near where the traces of the ditch system are lost. It is 10.6 by 6.4 m in area, and very shallow. The remains of at least 10 five-gallon kerosene cans modified into buckets are associated with this feature. It is interpreted as a location where water was sold to the individual Chinese miners for use with their rockers.

Dugout 2 is adjacent to Dugout 1. It is 18 by 8 m in area, the third largest structure in the Chinatown. An additional 4.7-x-8-m level area is in the front of the dugout. Maximum dugout depth is only 0.15 m. Modified kerosene cans, can fragments, wire, rocker screen fragments, bamboo and utilitarian brownware ceramics, and a white *fan*
tan counter were noted in and around this feature.

Dugout 3, west of Dugout 2, is 6.8 by 8.3 m in area. A collapsed rock wall is around the southern third of this feature. The artifact assemblage is similar to that of Dugout 2.

Structure 2 is west of Dugout 3. This structure is known by locals as the Chinese shrine or "joss house," and is probably the ruins of the Zhigongtong (usually romanized as the Chee Kong Tong) headquarters. It is a 16-x-11-m three-room structure. It is the second largest building in the Chinatown. It was constructed with random rubble, mud-chinked rock walls, 0.50 to 0.61 m thick and currently up to 1.5 m high. The interior walls are also stacked rock, 0.20 to 0.81 m thick. The west wall has completely collapsed. The east room is 3.7 m wide, the center room is 4.8 m wide, and the west room is an estimated 5.8-m wide. There is a cellar or dugout pit at the northwest corner of the structure. Artifacts noted include tin cans and can fragments and a rocker screen. In 1995 a local miner turned over a polychrome footing for a large serving platter that he claims came from this structure. It is illustrated with a lotus flower design and characters from a poem (untranslatable, since most of it is now missing). This ceramic fragment may have been re-used as a bowl.
Figure 13. Plan map of Locality K.

KEY:

- Dugout
- Stonewall/rock alignment
- Shaft
△ Datum
□ Leveled area
- Dirt road
- Ditch trace
- Intermittent stream

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Dugout 4 is a shallow dugout, 6.4 by 5.2-m in area (2.8 m wide in the interior). Artifacts found include a fragment of a modified five-gallon kerosene can, a barrel hoop, window glass, and a frying pan handle.

Collapsing, mud-chinked, stacked rock walls define Structure 3. The west wall is 6.2 m long, the north wall is 6.4 m long, and the east wall is 2.4 m. Walls vary from 0.69 to 1.5 m wide and 0.46 to 0.76 m high. Artifacts noted inside the structure include can and barrel hoop fragments, a piece of white shell, and amethyst and brown glass fragments.

Dugout 5 is 4.7 by 4 m in area. Maximum depth is 0.91 m. Few artifacts were found and consist mainly of can and barrel hoop fragments and green and brown glass fragments.

Dugout 6 is 5.7 by 4.1 m in area, with a maximum depth of 0.76 m. Can and barrel fragments, aqua and green glass fragments, burned bone, opium can fragments, celadon and bamboo ceramic fragments, and a hoe blade were noted at this feature.

Dugout 7 is a large, irregularly shaped dugout. Variations in depth and low earthen berms suggest that it had three rooms. The eastern most room is 13.7 by 11.4 m in area. The middle room is narrow, 3.6 by 11.4 m in area. The westernmost room, a possible add-on, is 4.3 by 6 m in area. This is the largest structure in American Canyon. There is a low rock wall, up to 0.20 m high and 0.61 m wide, along
the entire southern edge of the dugout. Few artifacts are associated with this structure.

Dugout 8 is 6.9 by 11.4 m in area. There is a low rock wall, 0.6 to 1.1 m wide by 0.25 m high along the south end and running for 1.8 m along the western edge. Bamboo ware bowl fragments, barrel hoops, and a fragment of a slip on lid with numerous knife jab holes are the artifacts noted at this location.

Dugout 9 is the westernmost feature associated with this locality. It is 12 m long (8.5 m of actual dugout) by 6.6 m wide. There is a low rock wall, up to 0.20 m high and 0.61 m wide, along the southern edge of the feature. A few can fragments are the only artifacts at this feature.

A few areas that appear to have been leveled were noted between the structures and the road. These areas were difficult to define in the thick vegetation, and were not mapped. These level areas may be garden plots.

**Locality L**

Locality L is the remains of a Chinese habitation area within Locality A. When initially recorded, there were the suspected remains of three dugout structures. A diffuse scatter of Chinese ceramics and other artifacts was also noted (Figure 14).
Figure 14. Plan map of Locality L.
This Locality was tested in August 1994. Test units, 1-x-1-m, were excavated in each of the three supposed dugouts, with an additional 50-x-50-cm test unit in Dugout 2 and a 1-x-1-m test unit on the surface between Dugout 2 and Dugout 3. A detailed map was also created using a transit, and all of the surface artifacts were mapped. The majority of the surface artifacts were described in the field and not collected. Sketches and/or photographs were made of some of the diagnostic artifacts.

Dugout 1 (Feature 1) is roughly 4.0 by 2.1 m in area. It is shallow, with the rear wall excavated less than 0.60 m. Artifacts on the surface of the dugout include a length of twisted wire, modified can fragments, and a piece of green glass. A 1-x-1-m test pit was placed in the front of the feature in an attempt to intercept a wall. No wall was exposed in the unit. The floor of the feature appears to be packed earth that was covered with a thin scatter of green bottle glass fragments and Chinese utilitarian brown ware ceramic fragments. Deposition in the feature is fine gravel, silt and clay slopewash.

Dugout 2 (Feature 2) is 5 by 3.7 m. There are two parallel, stacked rock walls, with an open front and the rear wall buried under tailings. A 1-x-1-m test pit was excavated near the rear in an effort to expose the rear wall. The pit failed to expose the wall, but a suspected floor was reached at about 1.2 m below the unit datum. A
second unit, 50-x-50-cm, was excavated south of Unit 1 to confirm the floor. The floor/foundation of the dugout is packed earth. Artifacts recovered from the dugout include metal fragments, flattened cans, wire, brown and green glass fragments, eggshell fragments, prosser buttons, square nails, and tarpaper.

According to Watson (1978:188), chemist William Griscom developed tarpaper by impregnating paper with asphalt. Jeff Reinsma (1997, pers. comm.) of Johns Manville Corporation in Denver, Colorado, however, indicates that a tar paper product was developed by Henry Johns in 1858. This material was asphalt impregnated asbestos fibers. The tarpaper was sent to Johns Manville Corporation in Denver, Colorado, for analysis. It is woven jute fiber (identical to the material used in burlap bags) saturated with ordinary petroleum derived asphalt. Filler in the asphalt consists of fine-grained quartz, calcite and feldspar. Muscovite mica was added as a surface coating to keep the paper from sticking to itself when rolled up. Tarpaper made from saturated burlap is still available, but not common. It was more common prior to World War II in Asia (Hamilton 1997). This suggests that American Canyon Chinese imported some building material from China, or that Chinese manufacturers in California produced traditionally made tarpaper.

Dugout 3 (Feature 3) was initially described as a roughly 11-x-9.4-m level area, with a stacked rock wall in
the northwest corner. A 1-x-1-m test unit was excavated near the stacked-rock wall in an effort to expose more structural remains. It quickly became apparent that the structure had been bulldozed. The entire northern edge of the dugout is the bulldozer push pile, and that the stacked-rock wall (1.8 m long) is the only surviving structural remnant. Artifacts recovered include buttons (shell and prosser); metal scraps; utilitarian brown ware ceramics; bone and eggshell; glass fragments; milled wood fragments; wire drawn and square nails; and coal clinker.

The bone was analyzed by Kris Bovy (1999), a graduate student at the University of Washington. One-third of the assemblage (53 specimens) is bird bone, mostly chicken. The remaining bone is either medium-sized mammal (45), fish (25) or unidentifiable (36). Twenty-one bones show signs from butchering (saw, knife, or cleaver cuts).

The surface scatter of artifacts was largely contained in the area between the canyon road and Feature 3. Artifacts identified are: cans, modified cans and can fragments (modified cans account for 67 percent of the cans and 16 percent of the entire assemblage); barrel hoops and fragments; opium cans; flat glass; bottle glass (aqua, green, "black," and sun-colored amethyst); bailing wire and heavier gauge wire; Chinese utilitarian brown ware, celadon, and bamboo ceramics; rubber and leather shoe fragments; a stove pipe; and cartridge casings.
One of the cartridge casings recovered is a .44 Webley. The .44 Webley was developed in 1868 for use in the Royal Irish Constabulary Model revolver (Barnes 1985). Another .44 Webley was found in the Lovelock Chinatown (Brown 1979). It is amusing to speculate that this cartridge might have been used in the American Canyon war. Considering the strong British presence in Guangdong, especially in Hong Kong, it is no surprise that the Chinese had familiarity with British firearms.

Locality M

Locality M is the lowest portion of the site, downstream from the majority of the activity. There are two shallow shafts, largely backfilled by flooding, with associated tailings.

There is also a possible, outdoor rock oven, similar in appearance to one illustrated by Sisson (1993). This is a small, semi-circular stacked rock wall, 2.4 by 1.8 m in area and up to 0.7 m high. A 2.5-x-2.8-m rectangular rock alignment, 0.15 to 0.20 m wide, is on the north side of the oven (Figure 15). Fragments of a Four Seasons bowl were the only artifacts noted at this locality.
Figure 15. Plan Map of Outdoor Oven Feature, Locality M.
Locality N

Locality N is an Euroamerican mineshaft near a modern well in the lower reaches of the canyon. There is a deep, caving-in mine shaft with a large tailings pile. The tailings at this location are well washed, but associated artifacts indicate twentieth century Euroamerican activity.

Chinese Water System

The Chinese improved many of the springs in the area and built a ditch and flume system to bring water to the mining site. This water system was mapped in 1909 after it was sold to Euroamerican miner J. W. Wenzel who filed for water rights with the State of Nevada (Nevada State Water Engineer 1909). The ditch was replaced with buried iron pipe, and has largely been destroyed by modern mining and road construction (Figure 16). A few traces of the ditch are visible in Localities A, G and K, and when first recorded resembled a trail. No traces of the flume system remain.

Associated with the water system is an earthen dam. The dam is on the southern hillside in American Canyon. Other dams associated with Chinese placer mining were constructed using hang-tu methods (Steeves 1984). When first recorded in 1993, it appeared that it had been recently repaired using a bulldozer. The dam is 36 m long, eight m wide at the base, and 1.5 meters high on the
reservoir side. The reservoir is about 30 m long. The author has never observed water in the reservoir. This indicates that water was supplied by the ditch/flume system, and that the dam was not built to trap runoff from rain or snow melt.

Native American Remains

Scattered throughout the Chinese mining and placer mining site are widely scattered debitage, chipped stone tools, and grinding stones associated with an earlier Native American occupation and use of the canyon. Humboldt Series projectile points suggest a middle Archaic age for some of the materials. The prehistoric site has been greatly disturbed by the historic mining. There is little indication of contemporaneous use of the canyon by Chinese and Native Americans. The only possible exception to this is a flaked aqua bottle glass fragment found at Locality L.

Conclusion

Though heavily disturbed by modern placer miners, road construction, looting, and flooding, American Canyon has a rich archaeological record. This record includes a diverse artifact assemblage reflecting over 110 years of mining history by Euroamericans and Chinese. In addition to the artifacts, there are hundreds of features related to mining and habitation of the peoples exploiting American Canyon's
mineral resources. Coupled with the historic record, American Canyon is able to provide an excellent picture of Chinese mining and miners in Nevada.
Figure 16. View of iron pipe in road, remnants of the Chinese ditch system.
CHAPTER 5
A COMPARISON OF CHINESE VERNACULAR
ARCHITECTURE IN CHINA AND
THE UNITED STATES TO
AMERICAN CANYON

Chinese Vernacular Rural Architecture

China is a very large country, with a landmass of roughly 9,600,000 square km. In this large area are a variety of environments, including deserts, high mountains, and river plains, all with variable resources. In 1850, China's population was an estimated 430 million (Zhu 1997); in 1990 it was 1.2 billion. While China's government, and much of its culture, is dominated by the Han Chinese, there are many ethnic minorities. In a country this large and diverse, one would expect a wide variety of housing forms. However, the vast majority of the Chinese that left their homes on quests of economic betterment were peasants from Guangdong and Fujian Provinces from the southeast coast of China (Figure 1). Therefore, this study concentrates on the private housing of peasant farmers and small villagers from this region.
The southeast Chinese coast is mountainous, with little flat land available except on river deltas and along the coast. Much of the coastal flat lands are saturated with salt, so there is a strong reliance on river deltas for rice cultivation. The climate is warm and humid, with much rain. Even though the region has little flat land, the warm, wet climate allows for three rice harvests a year.

The region also has the longest record of contact with foreign cultures. Canton has been China's center for foreign trade since the Tang Dynasty (618-907), and many foreign traders, such as Arabs and Persians, settled there (Chan 1991). Contact with Euroamericans was heralded with the arrival of the Portuguese in 1517. After defeating China in the Opium Wars (1840-1842 and 1856-1860), Great Britain and other European powers set up trade colonies in the region. Due to the ability for year-round agriculture, and the initially profitable trade with foreigners, Guangdong and Fujian Provinces are densely populated, and have been for a long time (Chan 1991; Zhu 1997).

Even with a variety of cultures and environmental niches, China does have some architectural continuity. This in part due to the bureaucracy instituted by the Chinese dynasties, which led to some standardization of house forms and village layout since the Zhou dynasty (c. 1100-250 B.C.). Governmental regulations and standards were eventually published in the *Yingzao fashi* (Building...
Standards) during the Song Dynasty, and the *Song cheng zuofa zeli* (Structural Regulations) during the Qing Dynasty, further reinforcing a level of standardization. Common Chinese architectural traditions and construction methods have been reviewed by various authors (Boyd 1962; Chang and Blaser 1987; Fu 1984; Liang 1984; Lip 1995) and are summarized below. An emphasis on rural housing architecture and southern Chinese variations was aided by the works of Hommel (1969[1937]), Knapp (1986, 1989, 1990), Mui (1991, 1994), Needham (1971b) and Spencer (1947).

**Wooden Frameworks**

One of the standards of Chinese building construction is the use of wooden frameworks of columns and beams (*mugou jiegou*). The wooden framework is designed to support the roof and additional stories if so desired. Walls are used only to enclose the structure, and are not weight-bearing (aside from their own mass). This easily allows alterations, such as the addition of more stories and rooms, to be made to the building. Similar framework methods are used in modern skyscraper construction. Wooden framework construction is most dominant in monumental architecture. The most common framework form in China is known as the column-beam-and-strut (*tailiang*). It is most common in northern China, but is found throughout China in important monasteries and official residences. In this
method, major beams are laid across anterior and posterior columns. Laid over the major beams are successive layers of shorter and smaller beams supported by struts. Purlins are added over the successive layers of beams, and rafters are added to the purlins to form the roof frame. The area defined by two adjacent purlins and two adjacent columns is a bay (jian), and serves as the most basic unit in a wooden framed house.

A variation of the wooden framework that is commonly found in southern China is the column-and-tie system (chuandou) (Figure 17). Instead of supporting purlins on beams, the columns rise higher towards the center of the structure to form the slope of the roofline. The purlins are added directly to the columns. Horizontal transverse tie beams (chuan) are inserted into the columns to form the framework.

Discussion of the wooden framework dominates any text on Chinese architecture, and this method is the one found in monumental works, and in the homes of the rich and powerful. Knapp (1986, 1989, 1990) has noted that load-bearing walls (chengzhong) are commonly used in home construction throughout rural China. In these structures, the walls directly support the roof purlins, and no columns are used. The load bearing walls are thicker than curtain walls, and tend to have fewer windows to help maintain wall strength.
Figure 17. Chuandou, or Column-and-tie, Building System (After Steinhardt 1984:12, 1.2).
**Foundations**

The foundations of Chinese homes are generally tamped earth, sometimes at grade level, but often raised to a platform. Wall footings or stone foundations are put down around the perimeter of the tamped earth to reduce absorption of moisture into walls. The stone foundations are generally buried at least a meter and rise above ground level. Occasionally the footings are extended beyond the wall line to mitigate the flow of water from the roof. The buried portion of the foundation is packed tight without mortar. The aboveground portion of the foundation is often mortared. If a frame structure is being constructed, the pillars are set on stone pedestals (zhuchu or zhuzuo) which rest on the foundation. These pedestals are rough-hewn for simpler (cheaper) structures, but can be ornately carved for buildings that are more substantial.

**Walls**

The walls of Chinese houses are built from a variety of materials, including tamped earth (hang-tu), adobe bricks, fired bricks, stone, wood, or vegetation. Load-bearing walls are constructed from tamped earth, bricks and/or stone. Heavier tamped earth and brick walls are also used for curtain walls, while lighter materials such as wood, or bamboo are used exclusively in curtain walls.
Tamped earth wall construction is common throughout China. It is a venerable method, with Chinese tradition naming Fu Yueh as the first tamped earth mason circa 1324 B.C. A wooden box frame, with movable wooden poles or boards framing the long sides, is used. Starting on the foundation, the form is filled with freshly dug earth that is compacted by pounding with wooden or stone rammers. When the dirt is sufficiently compacted, the frame is moved to the top of the lift just completed, and the process is repeated. If the dirt is not sufficiently compactable, binders such as oil, straw, straw paper, coal dust, sand and/or lime are added. A course or two of bricks or stones are usually added to the top of the wall to deter moisture seeping into the roof purlins. Occasionally lifts of rammed earth are separated with brick or stone courses to impede moisture seepage through the walls.

Brick is another common building material used in wall construction. Bricks can be either sun-dried adobe or kiln fired. Bricks tend to be relatively wide and flat compared to bricks in the United States.

Adobe bricks are made by air drying mud that has been compacted into molds. Sometimes the mud for the adobe bricks is cut directly from the floors of rice paddies that have silted in. This not only allows for cheap building material, but also helps maintain the optimum paddy depth for rice cultivation. Adobe bricks are always made in the
fall, when the autumnal sun is too weak to dry them out so fast they crack. Bricks are stacked on edge and covered with straw for drying.

In southern China, hang-tu and adobe brick walls are often covered with plaster made of a mixture of mud, straw and lime. This is done to help reduce rainwash on the soft walls. The plaster is often whitewashed to reflect solar heat and aid in keeping the house cool.

Kiln bricks are made similar to regular adobe bricks, except more care is taken to ensure they are properly compacted in the molds. After drying for a week, the bricks are stacked in kilns and fired. Fuel used for firing bricks can be coal, tree branches or grain stalks. The fired bricks are generally allowed to cool for seven to twelve days. The color of the bricks is generally a function of the soil used in their manufacture; however, gray bricks, popular in certain regions, are produced by pouring water onto the hot bricks through draft holes of the kiln.

Stone, generally not used in construction of homes in China, is utilized more for graves and public works such as city walls and roads. Stonewalls, however, are used for housing in the southern coastal areas where it is abundant and soil is thin. The stone is usually cut into brick shapes, but the poor utilize stone rubble in home construction.
Wooden boards are rarely used in wall construction. When boards are used, it is most often for facades on the larger homes of the wealthy. Timber shortages may be a factor in the unpopularity of this method of wall construction. In southwestern and northwestern China, where there is an abundance of wood, log houses are constructed. These structures resemble log cabins built in the United States, except they often have Chinese style roof lines.

Bamboo is a common wall material used in China. It is most often split and interlaced at ninety-degree angles. Mud, or a plaster of mud and lime, is then added to the bamboo framework. These wattle and daub type walls are curtain walls placed between the pillars of wood framework, house construction.

Matting (made from bamboo, reeds, palm fronds, corn, or kaoliang stalks) is often used for walls on temporary structures and huts built by the poor. Brush walls are also seen on temporary structures or huts in south China. Composite walls, using more than one type of material, are common.

Roofs

Chinese roof styles are highly variable, and can be flat, shedlike, gabled, hipped, hip-and-gabled, pyramidal, and double eaved. The fancier versions, such as hipped and hip-and-gabled, with curved roofs with overhanging eaves,
are especially common on temples and other monumental architecture. Variations in roof form are easily achieved by manipulating the size and spacing of pillars, beams and purlins used in Chinese wooden framework systems.

For rural housing in southern China, the dominant roof form appears to be steeply pitched, overhanging gable roofs. The pitched, overhanging roofs are needed to protect walls from rainwash and to provide shade on hot, sunny days. Porches are often added to the front of the building for added protection from sun and rain.

One of the most common roofing materials used throughout China is tile. Tiles are made of gray, baked clay, and are semi-circular. They are produced by molding thin (3/8 in. or 0.95 cm) slabs of clay around a collapsible circular mold to form a cylinder. The mold has four raised ridges that leave impressed lines on the clay cylinder. These lines allow the cylinder to be easily broken into four pieces prior to firing. In the south, double layers of tiles are used with lime mortar to increase the waterproofing ability of the roof and to provide heat insulation.

Thatch is also a very common roofing material used in China. In southern China, thatch material is rice straw, wild grass or palm leaf. Matting is set directly onto the roof purlins and covered with clay mortar. Another layer of thatching material, often bundled and cut into standardized
lengths, is then set on the mortar in a manner similar to laying shingles. If the homebuilder had sufficient funds, the entire roof is covered with another layer of mortar.

Alternative roofing material includes split bamboo. Alternating concave and convex pieces of split bamboo are placed lengthwise downslope on the purlins. Lime mortar caps the bamboo if needed. Simple matting of bamboo or reeds is used on the huts of the poor. Stone roofs are found in areas where outcrops of suitable stone, such as platy limestone, shale or slate, occur.

Ceilings are generally not used in southern China, unless the house is multi-story. Open rafters are needed to allow more air circulation in the humid climate, and are often utilized to hang drying plants, tools, clothing, etc.

Floors

The most common floors found in rural Chinese houses are the packed dirt of the foundation. Occasionally the packed earth is covered with lime cement. Wood floors are restricted to palaces, temples and the homes of the wealthy.

House Plans

The standard building unit for a Chinese house is the jian or bay--the rectangular space defined by two adjacent purlins and two adjacent columns. The jian concept is also used when load-bearing walls are used. The basic floor plan
of a Chinese house is based on one, three or five jian, although two jian houses are found. The emphasis on odd numbered jian is based on the Chinese belief that odd numbers are more symmetrical and bring good luck. There is no standard jian size. The width ranges from three to five m with proportional depths ranging from five to 10 m.

The most basic Chinese home is a single bay house. The doorway is at one end of the rectangle, and there may be a window on the opposite end of the door. If the family is small, there will be only one interior room, and all functions of the family will be carried out in that room, i.e. eating, sleeping, and, storage. If there are children and there is a need for privacy, a screen or light curtain wall may be utilized to divide the interior space into two rooms.

Most Chinese houses are three or five jian. The doorway is in the center bay, and most of the windows are on the same side of the house. The center room, which has the family's shrine for ancestor worship, also doubles as a bedroom for unmarried sons and a storage area for crops and tools. Rooms on either side of the central bay are bedrooms.

If the family prospers, and requires additional rooms, wings are added to the original house, forming an L- or U-shaped structure, with a courtyard in the enclosed space. A wall is usually added to this space to completely enclose.
Detached kitchens, servants’ quarters, storage rooms, lavatories and gatehouses are often found within the courtyard. Courtyards are sometimes constructed for smaller farm homes that do not contain attached wings. If there is not enough space to add wings to the house, i.e. in an urban setting, additional stories may be added, but courtyard houses are strived for in urban settings as well. In villages, there is a communal courtyard for use by the entire village population.

Chinese houses are also commonly places of business. Shops, small manufacturing locations, and even mines are contained within Chinese houses. Farms are also generally located in the immediate vicinity of the house. This is very convenient for the residents, who do not have to travel far to work, and are usually present to keep an eye on their possessions.

Other types of Chinese housing, such as the practice of digging caves in loess deposits (common in northern China), living in house boats, or the large, fortified structures built by the Hakka, are beyond the scope of this study.

Other House Elements

Northern Chinese houses contain elevated brick beds, known as Kang, that hold hot coals or are attached to hearths to keep sleepers warm during cold northern winters. These features are lacking in southern Chinese homes.
Figure 18. Chinese House Plans Based on One, Three or Five Jian. (From Knapp 1989:34, 2.7)

Figure 19. Layout of farm house courtyards (From Yang 1945:39).
In southern China, cooking is most often done outside, or in a portion of the house separated from the main living areas, to avoid heating up the house. Outdoor, detached brick, or portable ceramic, stoves are used instead. These are used in courtyards of house complexes, or in alleys in more crowded urban settings.

Chinese are reported to be the earliest house builders in the world to paint their homes, this stemming from the use of mercuric oxide as a wood preservative. In the north, building exteriors are very colorfully painted using strong primary colors. In southern China, houses have whitewashed walls and gray roofs (Yan 1994).

Gable murals, painted in color or black and white, are often found on houses in southern China. A number of other minor features, such as latticed windows and walls, half doors, roof decks, awnings, lacquer wood finishes, carved rafter ends and brackets, and ridgepole ornamentation may also be found. These elements are not well discussed in the majority of the literature.

Knapp (1986:52) states that, "Chinese dwellings universally lack basements..." Aside from this statement, little information was encountered on the presence of basements or cellars. The presence of some subterranean storage facilities is expected. These would be used for making Chinese delicacies, such as 1,000-year-old eggs, and other preserved foods (Sue Fawn Chung 1998, pers. comm.)
Feng shui

Chinese mysticism and cosmology through the centuries have given rise to several beliefs concerning the natural surroundings. One is the complementary duality principle of Yin and Yang. Yin governs the earth, and is all that is negative, female, dark, soft, cold, deadly or still. Yang governs the heavens and is all that is positive, male, light, hard, warm, living and moving (Mueller 1987).

A second belief is that there is a life force or cosmic energy, known as qi, which flows through heaven and earth providing nourishment, like blood flowing through a human body (Mueller 1987).

A third belief is that of sha. This is a circumstance where free flow is confined and evil forces can accumulate. It also dictates that evil forces and spirits can only travel in straight lines. Places where a sha condition exists, negate, or take away qi (Mueller 1987).

Feng shui (literally "wind and water") is the Chinese art and science of selecting locations of homes, cities and other human built alterations of the landscape to maximize qi, avoid sha, and balance yin and yang.

There are two schools of feng shui in China. In northern China is the Lo-pan, or Analytical or Compass School (Fan 1992; Mueller 1987). This method requires extensive training, and hiring a specialist is expensive (Knapp 1986; Mueller 1987). In southern China, the Xing, or
Forms or Configurations School, is the dominant methodology (Wei 1992; Mueller 1987). While specialists in the Forms School exist, Mueller (1987) speculates that knowledge about this method would have been familiar to many of the farmers from Guangdong.

Based on feng shui, an ideal building site has five characteristics that should be sought. The site should be protected on three sides by surrounding slopes and hills. If the topography does not provide adequate shielding, groves of bamboo or trees may be utilized. Buildings should be placed on sloping, well-drained land so that unhealthy, easily flooded low land is avoided. The entrance to a village or home should face towards beneficial forces, ideally these are found to the south, but views to where the land is open, there is a stream confluence, or a body of calm water are acceptable. Digging into a hillside should be avoided, since it may cut the "pulse of the dragon."

Villages are oriented on a north-south axis, and along with buildings, should be square or rectangular in outline (Knapp 1986; Mueller 1987).

Since many parts of China are densely populated, most ideal sites are already occupied. When building at a less-than-ideal site, fixes can be achieved with the proper application of talismans and mirrors, by physically altering the landscape by changing river courses, or by erecting artificial mounds (Mueller 1987).
Many western scholars are quick to point out that feng shui principles are practical in their application (Mueller 1987). Ideal locations would provide for protection from cold winter winds, maximize solar exposure for extra light, and avoid placing housing in flood-prone areas.

Poor Peasant Housing

The previous discussion, while attempting to focus on average rural housing, glossed over the housing conditions of the very poor. This is in part due to the majority of the available sources doing the same. Some glimpses of the housing afforded the poor are available, and suggest that the poor lived in meager and irregularly shaped huts. These were constructed using as few, inferior and cheap materials as possible, such as undressed stone, unworked and crooked branches of pine trees, bamboo, tamped earth or adobe bricks, matting, or piled brush (Spencer 1947; Yang 1945).

Village Layout

Jin Qiming and Li Wei (1992) studied rural Chinese settlement patterns. They found that there are numerous village forms in China: nucleated, compact, elongated or linear, ring, and dispersed villages. In the southeast coastal areas of China, they found large dispersed villages on the fertile coastal plains, with populations of over
1,000. In the mountainous areas, villages are also dispersed, but with populations of less than 200.

Dispersed villages are defined as settlements where dwellings are generally not contiguous but are distributed through the landscape. Homes are single- and multi-household complexes. There are no clear boundaries, and villages are defined by custom and administrative concerns. The dispersed village form allows for maximization of local topographic and social conditions, i.e. allowing for division of land into small, irrigated plots controlled by a single family. This is common in the Pearl River Delta region.

Compact and linear villages are also known from the Guangdong region. Xiqi Village from Taishan County, Guangdong Province sent many of its sons overseas. This village is a compact village built on a classic Configurations School feng shui layout, with a rectangular, north/south street plan, a southerly orientation protected on the north, east and west sides by hills, ridges and woods. An excavated pond is in front of the village on the south side (Hammond 1992).

Mui (1994) looked at a small southern Chinese village that was built along a single street, with buildings on both sides, a linear village. All of the structures had porches, which formed a covered walkway on both sides of the road.
Many of the buildings were shops, and the owners displayed their wares under the covered walkway.

Archaeological Expectations

Based on the available information on rural, vernacular architecture, certain assumptions can be made concerning the types of homes Chinese might have built in the western United States during the 19th century.

Chinese peasants in Guangdong and Fujian Provinces demonstrated a willingness to use a variety of construction materials, such as, tamped earth, adobe, wattle and daub, rock, and wood. The Chinese in the United States will show no special preference for construction material. There is a good chance that walls will be load-bearing, but evidence of the wood frame construction technique are anticipated, especially in larger buildings, such as suspected temples and meeting halls. In archaeological contexts, stone pedestals used as pillar supports, and/or post holes, are expected in wood frame construction. A tamped-earth, rock-ringed, foundation should be found in most cases.

Houses were built with the concept of the jian, or bay. Since it was largely a bachelor society inhabiting the American West, rectangular, single bay houses should be the norm. Access to the structure will be through a single doorway at one end of the rectangle. Larger, multiple room structures might be found if large gangs of Chinese were
working together in the same location, or if temples and meeting halls were built. Roofs should be steeply pitched with overhanging eaves, and possibly porches. Some sort of exterior activity area, such as a garden or an outdoor kitchen, is also anticipated.

The principles of the Configurations School of *feng shui* should have been followed. Houses, or groups of houses, were oriented to the south, or towards other favorable areas, such as a stream confluence or a body of calm water. The house, or village, was placed so that at least one side is protected by a hill, ridge, or wooded area.

**Chinese Dwellings in the United States**

Initial examination of sources indicated that the Chinese did not practice traditional architecture in the United States until well into the 20th century. Kirker (1959) states that the Chinese thoroughly accepted American methods of construction. He noted this in a Chinese fishing village in Monterey, California, and in the construction methods he observed for two "joss houses." Yip (1986) states that, "Chinatowns tended to be composed of standard American commercial and tenement buildings altered to suit a male community..." He further says, "During most of the 19th century little effort was made to make these buildings look like buildings in China because the structures, overall
shapes, settings, and social situations were so different in the United States" (Yip 1986). Only after World War II, when Chinese were attempting to draw tourists, and Chinatowns became to be seen as symbols of an ethnic heritage, that a more conscious effort was made to build in a more traditional Chinese style. This supports the findings of Knapp (1986), in that the original sojourners to a foreign land gave little thought to their housing since it was not their intent to stay.

A more detailed look at the available information is needed to test this hypothesis. Two sources of information were examined to find information on Chinese architecture in the United States. The first is local and regional histories. Most of these works focus on the overall Chinese experience in the United States, or on particulars, such as the troubles Chinese had with the United States' legal system. Information on Chinese architecture can still be gleaned from these sources.

Historic archaeological studies are another source of information. Some of these studies are graduate theses and dissertations, but many are reports created to ensure compliance with the National Historic Preservation Act of 1966 (16 U.S.C. § 470). Many of these studies were conducted in cities where Federal money was spent on urban renewal projects; however, projects were from rural settings, such as isolated mining camps.
Below is a review of a small sample of research from Nevada and the neighboring states of Arizona, California, Idaho, and Oregon. The results are presented alphabetically.

**Arizona**

An urban renewal project in Tucson resulted in historical and archaeological studies of that city's Chinatown (Lister and Lister 1989). Chinese began arriving in Tucson in the mid-1870s, and occupied abandoned adobe structures in two areas of town. Chinese may also have built some "shanties," but adobe appears to be the most common construction material (Lister and Lister 1989).

Investigations at two standing structures revealed that the Chinese modified existing Mexican style adobes to fit their own needs. Modifications are: room additions; addition of new shingles and other roofing material; rearrangement of internal features such as doorways, vents, and closets; addition of electrical wiring; and conversion of corner fireplaces into stove flues. Archaeological investigations in areas where there were no longer any standing structures revealed the presence of wells and latrines.

Near the outskirts of Tucson, in what was a more rural setting, Chinese had truck gardens along the Santa Cruz River. Recent archaeological investigations have been
conducted at the site of one of these gardener's houses (Thiel 1997). Architectural remains and other features that were exposed include, the rock base of an adobe courtyard wall, the rock foundation of an adobe house, postholes along the courtyard wall, a burned area, and buried barrels. The postholes were interpreted to be supports for a shack or ramada, and the buried barrels were inferred to be water containers (Theil 1997). These features match the description of a typical rural Chinese farmer's home, with a walled courtyard that contains a detached kitchen and storage room. The buried barrels could easily be the anticipated cellar features for the manufacture of Chinese delicacies.

California

The National Park Service conducted a historical archaeological study of the Harmony Borax Works in Death Valley National Monument (Teague and Shenk 1977). The Harmony Borax Works were in production from circa 1883 to 1888. Chinese laborers were employed to gather borax ores from the surface of the salt marshes. The Chinese lived at the Harmony site, while Euro-Americans resided near Furnace Creek. A few adobe walls remain at the administration site, but no architectural remains were identified at the Chinese Quarters. Figure 28 in the report shows two cobble concentrations and a low pebble mound. The cobble
concentrations and pebble mounds could be foundation remains of Chinese adobes. An outdoor hearth was also identified, which is consistent with traditional, southeast coast Chinese practices.

Impacts to a historic district resulted in an archaeological and historic study of the Weaverville, California Chinatown. This Chinatown was in existence from 1852 through the 1930s. Chinese initially rented wooden clapboard buildings built by Euroamericans. Fire was a big problem, resulting in repeated destruction and rebuilding of the Chinatown. Chinese often rebuilt wooden structures, but also eventually built four tamped-earth structures. A "joss house" was also built, and a sketch of the structure shows that it has a distinct Chinese flavor, with an elaborately decorated roof (Brott 1982).

The tamped-earth structures were torn down to make room for a bank, and were the site of archaeological excavations. The excavations clearly show the repeated fire events that affected the site. No structural remnants of the tamped-earth structures were noted, but a "cache" was found. The cache was a wooden cribbed rectangular pit, 60 cm by 60 cm by 110 centimeters deep. When excavated, it was full of unburned trash, and believed to date to the period 1859-1863.

Julia Costello (1988) investigated a standing tamped-earth structure in Fiddletown, California. Herbal doctor
Yee Fan-Chung built this structure in 1850. It was operated as a store until 1913, when it was deeded to Fong Chow Yow who used it as his residence. Fong passed away in 1965, at which time it became county property. The building has been placed on the National Register of Historic Places and is now a state park. Historical and archaeological investigations were undertaken as part of a restoration project.

The tamped earth building is 10.4 by 6.4-m, with 0.56-to 0.61-m thick walls, with a single jian layout. The foundation for the building was tamped earth with gravel footings. The walls are load bearing and support the roof purlins. The roof, a steeply pitched gable roof, was initially covered with split cedar shakes, but they were later replaced with corrugated sheet metal. There were originally two windows that were later sealed with adobe bricks. There is a porch roof on the front of the building. Additional wooden rooms (kitchen area, bedroom and living area) were attached to the rear of the structure. Outbuildings to the rear of the building include an outside kitchen, a chicken coop (the oldest outbuilding), an outhouse and a well house.

Greenwood (1996) recently concluded studies of a Los Angeles Chinatown. This particular section of the city, in an industrial, flood-prone section, was occupied by the Chinese from 1880 up to 1933 when they were forced to move
for construction of the Union Passenger Terminal. Recent construction on the Los Angeles Metro rail system exposed portions of the site that were previously buried under many feet of fill.

A historical study coupled with an analysis of the exposed features allowed Greenwood (1996) to draw some conclusions on the architecture in this ghetto. There was no evidence that feng shui was practiced. The area was densely populated with a mixture of shops, residences and joss houses. High pitched, front gable roofs on long, narrow buildings were the norm. The structures opened directly on the street without front yards. Open space in the rear of the structures was utilized for gardens and raising pigs and chickens. Early construction with adobe and wooden frames was replaced with fired brick after sections of the Chinatown burned down. Outdoor privies were located. No cellar features were identified archaeologically. There was, however, some discussion of them in the historic background where it was mentioned that they were often "...found full of standing water and rubbish" (probably due to the flood prone nature of the area).

In a more rural setting, there is an archaeological excavation report from two mining sites near Redding in northern California (Sundahl and Ritter 1997). Chinese miners might have occupied the two sites, the Sacramento
Pliocene Mine Site and the Middle Mule Pond Cabin Site, between 1850 and 1870.

At the Sacramento Pliocene Mine Site (CA-SHA-1969/H) a rock alignment foundation, 14-ft. northeast/southwest by 10-ft. northwest/southeast was noted. This foundation was interpreted to be for a small, wood frame structure built for one or several Chinese miners, and occupied for a short period. It was later torn down, with the wood salvaged for another structure (Sundahl and Ritter 1997:61-64).

A rock feature was found at the nearby Middle Mule Pond Cabin Site (CA-SHA-1544/H). It is interpreted to be an outdoor hearth that was used to prepare meals for a number of men who occupied small cabins or tents in the immediate vicinity (Sundahl and Ritter 1997:64-67).

The foundation from CA-SHA-1969/H is consistent with the description of Old World Chinese foundations. The outdoor hearth located at the other site is also consistent with the practices of Guangdong Chinese who often used an outdoor stove/hearth detached from the main house.

Idaho

Many of the archaeological studies of Chinese sites in Idaho have been conducted on sites where the Chinese re-occupied abandoned Euroamerican housing, or acquired Euroamerican housing as part of the package when buying
mining claims from Euroamerican miners (James 1995; Turnipseed et al. 1994; Wegars 1995).

Zhu (1995, 1997) conducted historical studies of Chinese in the Boise Basin of Idaho and reached similar conclusions. He found that the Chinese initially rented or purchased Euroamerican board-and-batten houses or "saltbox" houses. He states that the Chinese found these structures superior to the housing available in China, i.e. roomier and with wooden floors. He concluded that they adopted this house style as their own, building and re-building the same style structures as their neighbors.

An historic photograph from DeLamar, Idaho shows three Chinese structures. Two of them are saltbox wooden buildings, one housing a Chinese laundry. A third structure in this photograph is a Chinese style tamped earth building. (Figure 20). This would indicate at least some preference for traditional housing amongst the Chinese in Idaho. A stovepipe coming out of the roof near the rear of the building indicates a concession to local environmental factors, i.e. cold winters.

Striker and Sprague (1993) excavated the archaeological remains of a reported Chinese store at Warren, north of the Boise Basin. The structure had been burned and looted, and the artifact assemblage found to be confusing, so meaningful extrapolation of the structural elements and use of the building was difficult. They did, however, conclude that
Figure 20. Hang-tu structure (on left) in DeLamar, Idaho (Photo courtesy of the Idaho Historical Society).
the building "was a partially dugout horizontal log structure built of five inch-square hewn timbers," with a gabled roof with a ridgepole and purlin design. The southern, dugout portion of the building had a wooden floor, while the northern portion exhibited no evidence of flooring and had a sloping surface. A stone chimney was located at the north end of the building and a "cache" pit feature was found near the center. The authors were unable to determine if the structure was Chinese built, or if it was a re-occupied Euroamerican building.

Sisson (1993) conducted a study of Chinese occupied structures along the Salmon River in Idaho in an attempt to find diagnostic Chinese architectural traits. He found several attributes that he thought might be uniquely Chinese: rockshelters with rock walls built in front of them, semi-circular fire hearths or ovens located outside the structures, and chimneys located adjacent to the doorway. Sisson (1993) also noted that when a southern exposure of doorways was not present, a view to calm sections of the river was. He felt this indicates feng shui principles were applied in site selection. He also created tables showing the orientation of the structures (which ranged from 30° to 162° or east-northeast to south-southeast) and the interior area in square meters (which ranged in size from 4.2 to 39 m²).
LaLande (1981) completed his Master's thesis on Chinese occupying the Applegate Valley of Oregon during the period 1855-1900. This was a period that the area experienced a gold rush and extensive placer mining. He devoted a section of his thesis to the comparison of Guangdong and Fujian architecture with the archaeological remains found in several Applegate Valley Chinese sites. He found that Chinese miners either moved into vacant cabins abandoned by Euroamericans, set up A-frame canvas tents, or constructed brush huts similar to those built as temporary shelters, or by the very poor, in China. He concluded that the architecture of the Chinese in mining camps was minimal, and characterized by adaptability to a variety of physical environments and the utilization of expedient construction methods and materials. With the ephemeral nature of Chinese structures in Oregon, he hypothesized that it would be more rewarding to search for a Chinese "pattern" of construction in lieu of specific Chinese buildings. This entails searching for tent platforms and building foundations that fall in line with feng shui principles. This includes southern orientations and building sites on well-drained slopes, as compared to Euroamerican building sites that are often placed willy-nilly along flood plains.
One of the first archaeological and historical studies of the overseas Chinese to take place in Nevada was the result of a highway expansion project that impacted a portion of the Lovelock Chinatown. The Lovelock Chinatown was occupied from circa 1870 into the 1940s (Hattori et. al 1977). Two standing buildings and several associated features were examined as a result of this project (Jensen and Rusco 1979). There were three building complexes, although one was removed before it could be thoroughly examined by the archaeologists. All three of these buildings were wood frame structures constructed by Euroamericans as low-income housing. Two of these structures were "core buildings" with numerous rooms and other additions created by the Chinese out of scavenged construction materials such as wooden crates. There is evidence that two of the structures had dirt floors for an extended period. Cellars were found in two of the buildings. Both cellars are wood lined, rectangular pits excavated under house floors. Cellar 1 is 1.5 by 1.1 by 1.1 m. Cellar 2 is 2.8 by 1.7 by 1.1 m. Outhouse pits, wells, and walkways are other associated features identified in this study.

Archaeological studies were conducted prior to large-scale, open-pit mining in the Cortez Mining District in Elko, County. Chinese were employed in the district as hard
rock miners and mill workers from the early 1870s to the turn-of-the-century, and lived in several different locations within the mining district (Hardesty 1988; Hardesty and Hattori 1982, 1983). The researchers noted that there are four types of house structures in the study area: adobe structures, stone structures, dugouts, and wood frame buildings. Four structures were tested in 1981 (Hardesty and Hattori 1982). Of these, three produced Chinese artifacts (an adobe structure and two stone walled buildings). During the 1982 field season, an additional test pit was excavated in one of the structures tested in 1981 (an adobe structure). A stone-lined pit and four additional structures (two dugouts, an adobe and a wood frame building) were also tested. All of the six tested features from 1982 had Chinese artifacts (Hardesty and Hattori 1983). The interpretation for the structures is that the Chinese utilized many of the same design techniques and raw materials as were used in Euroamerican settlements. Hardesty and Hattori (1983) did note that the arrangement of structures is different in the Cortez Chinatowns, and that the dugout was popular with the Chinese. One of the Chinese settlement areas appears to be centered on a large, dugout structure interpreted to be a "josh house."

The Winnemucca Library is located in what used to be that city's Chinatown from the late 1800s to the early 1950s. A 1990 expansion of the library exposed a 6-x-3-ft.,
redwood planking-lined subterranean room, most likely a cellar associated with a Chinese store. A local historian excavated (illegally) during a lull in construction. He recovered many artifacts from the cellar including a large pottery urn, a number of smaller pottery jars, spoons, pig bone scrimshaw, United States coins, a butcher knife, bottles, and a teapot (Brockus 1990).

Virginia City had a very large and colorful Chinese population that has drawn the attention of Euroamericans for years. One recently completed study is Thompson's 1992 Master's thesis. Her research centers on one block in the Chinatown, but has an extensive historic background. Several attributes concerning the Chinatown were noted. Many of the structures were initially rented or purchased from Euroamerican owners. Wood was a major construction material. As is the case in many urban Chinatowns, fire was a major problem, and Chinatown was damaged or destroyed several times. Homes were small, often described as huts or shanties. Cellars were common. Windows provided air circulation in addition to light. Coal oil lamps were used for light. Many tasks took place outside in backyards, which were also the locations of gardens and animal pens. Some fireproof brick buildings were built, and some rather unique fireproof (and possibly bullet proof) buildings were constructed using dirt-filled coal oil cans as bricks.
Frampton (1994) excavated two Chinese dugouts in Placerville, Elko County. He believes that these dugouts were the first, exclusively Chinese dugouts excavated in Nevada. The first dugout is 3.4 by 4.6-m, with a single doorway in front. The walls were partially lined with rounded rocks. A fireplace was located at the rear of the dugout. A small wooden box was partially buried in the floor, and a rock-lined pit was found in the rear corner. A large and varied Chinese artifact assemblage, which includes a lot of bone, was associated with this feature.

The second dugout was located west of the first dugout. It was slightly smaller than the first at three by 3.4-m. A rock alignment extends beyond the front of the dugout, and is a possible patio. Rocks line the front of the dugout and part of one of the sidewalls. A fireplace is located inside the front wall adjacent to the doorway. Postholes were noted along the long axis of the structure. Four roof beams were found perpendicular to the long axis with numerous low sticks attached (Frampton 1994).

Frampton (1994) believes that the second dugout is distinctly Chinese, while the first is somewhat aberrant. Preliminary analysis of the artifacts and faunal remains associated with the two dugouts, coupled with census manuscripts, suggest that the first dugout might have been a Chinese restaurant. The second was occupied by a number of Chinese miners who ate meals next door (Frampton 1994).
Mires and Bullock (1995) conducted archaeological research at a Chinese habitation site near Carson City. It was believed that the Chinese occupant made his living, at least partly, by tending an irrigation ditch system. Few architectural remains were present; however, numerous flattened cans presumably used as siding or roof shingles on a structure were found. The authors suggest that the manufacture of shingles and siding from discarded cans might be indicative of Chinese occupation and construction.

As part of a data recovery project for a mine near Eureka, Nevada, a site located in a drainage (known as Hogpen Canyon) was tested (Mires 1997, 1998). This site contains the remains of six dugouts, all of which contained Chinese artifacts. Results of the testing failed to reveal any significant architectural remains. Again, numerous flattened cans that appear to have been re-used as house siding or roof shingles were found. All of the dugouts faced east over the confluence of two intermittent drainages. Mires (1997) again concluded that the modified cans are diagnostic of the Chinese. He also concluded that the orientation of the dugouts was in line with the principles of feng shui (Mires 1997, 1998). Flattened cans, however, are common as siding and roofing shingles on numerous Euroamerican dugouts and wood frame buildings throughout Nevada, and cannot be considered to be exclusively Chinese (Figure 21).
The Northeastern Nevada Museum in Elko has a collection of five historic photographs from the site of Gold Creek. The Gold Creek, or Island Mountain, Mining District was established in 1873. The majority of the population was Chinese and a Chinatown was established at the confluence of Patterson Gulch and Coleman Canyon. A Chinese store was open at this location until 1918 (Hall 1998). Four of the photographs (File numbers 104-42 through 45 [NF 4970-18 through 21] date to circa 1903 and show numerous low walled structures, with steep gable roofs. Many of the roofs reach the ground. Discernable wall materials are rock and vertical boards with patches of sheet metal. Roofs construction utilizes thatch or sod covered willow branches or wood shingles placed on purlins. Roofs are often weighted down with rocks and boards. Overhanging roofs and awnings or porch roofs are attached to roughly half the structures visible in an overview photo. The overview photograph shows nine structures, all lined up together in close proximity, facing the main road through the drainage, reminiscent of a linear village. Roughly, one-third of the homes have stove pipes protruding from the front portion of the roofs. The orientation of the structures is not possible to determine from the photographs, however, there is a hill immediately behind them. The Chinatown appears to overlook a flat expanse of ground, and is near the
The confluence of two drainages. This could indicate an attempt to adherence to *feng shui* principles.

The fifth photograph is of China Lem, a long time Gold Creek merchant, in front of his store (file number 104-17 [NF 16]). The store has rock sidewalls, a vertical board front wall, a gable roof made of thatch covered with shingles, and an attached porch roof. Lem's store appears to have a wooden floor, which projects out onto the porch area. Under the porch are boxes and barrels of presumed store goods. Lem appears to be old, and enjoying a smoke. Based on shadow projections from the porch roof, the store appears to face to the south.

Overall, the photographs give the impression that the Chinatown was a typical, rural, linear Chinese village. Period photographs from the mountainous regions of Guangdong should look very similar.

**Findings of Comparative Study**

The Chinese in the western United States followed a pattern somewhere between those found by Gaubatz (1996) and Knapp (1986). Like Knapp's (1986) model, initial Chinese architecture was expedient, if practiced at all. Often the Chinese would utilize Euroamerican structures, such as abandoned cabins and dugouts, or adopt the use of canvas tents. Early buildings built by the Chinese were hurried, cheaply built affairs.
As Chinese began to settle in the United States, either because they were not quickly able to make enough money to return home or because they decided they were going to settle down, housing patterns began to change. Homes began to look more like those constructed in the home provinces of Guangdong and Fujian. This is especially true in areas where the Chinese constructed their own housing instead of renting or buying existing structures.

Unlike the pattern found by Knapp (1986), these homes are not indiscernible from those found in China. Suitable adaptations were made for local environmental conditions, such as the use of indoor stoves and fireplaces in areas with harsh winters, and the utilization of unique, but available, building materials, such as dirt-filled oilcans. This is more in line with Gaubatz's (1996) model of adaptation to local conditions modifying a traditional pattern of architecture.

Discerning the Chinese construction methods in the archaeological record is difficult. Construction methods and materials used by the Chinese have proven to be either too similar to those used by the dominant Euroamerican populations, or too transitory for good archaeological preservation.

Previous attempts to identify distinct Chinese architecture in the archaeological record have not met with overwhelming success, and many of the proposed indicators do
Figure 21. Circa 1903 Overview Photograph of the Gold Creek Chinatown, Elko County, Nevada (Photo courtesy of the Northeastern Nevada Museum, Elko, Nevada [File no. 104-44 [NF 4970-20]).
Figure 22. Close-up of two Chinese dwellings in Gold Creek, Humboldt County, Nevada (Photo courtesy of the Northeastern Nevada Museum, Elko, Nevada [File no. 104-42 [NF 4970-18]).
Figure 23. China Lem's Store, Gold Creek Chinatown, Elko Co., Nevada, ca. 1910 (Photo courtesy of the Northeastern Nevada Museum [File no. 104-17(NF 16)]).
not seem to hold up well. For example, the idea that indoor chimneys located just around the corner of the doorway is distinctly Chinese (Sisson 1993) is somewhat troublesome. Many Chinese houses tested in the American West do not have this feature. While it may be true that the chimney just around the corner of the doorway is Chinese, this precise placement of the chimney does not necessarily mean that Chinese built the structure. Frampton's (1994) problematic house in Placerville, Nevada does not have this chimney, and many photographs of Chinese dwellings in the United States show chimneys and stovepipes near the center or the rear of the structure.

The idea that flattened can shingles is indicative of Chinese construction (Mires 1997, 1998; Mires and Bullock 1995) does not hold either, since flattened can shingles, siding, and patches are found on many Euroamerican structures from the same time period. These shingles are more indicative of the adaptability of all populations on the western frontier in terms of utilizing unique construction materials in their housing.

A few architectural traits, however, may be valid Chinese indicators. It is expected that most of these will not be found at sites that were occupied for short periods. Only in sites where Chinese settled for a significant period might you find these Chinese architectural features and patterns. The ones that seem to hold up are: semi-circular
fire hearths or ovens located outside structures; the presence of subterranean cache pits or cellars (often lined with wood brick, or stone); the presence of porch features in roughly half the structures; and a pattern of house placement based on feng shui. It is also expected that joss house construction will be the most distinctly Chinese, and best-built, structure found at most sites. The chimney just around the corner of the doorway might also be found, but not finding it will not rule out Chinese construction.

The American Canyon Structures

Euroamericans were the first to occupy American Canyon, and some continued to live there through its period of occupation. Some of the Chinese population consisted of transient miners. There was, however, a stable Chinese population that spent many years living in American Canyon. Therefore, some distinct Chinese construction is expected.

Archaeological investigations in American Canyon revealed the ruins of 18 dugout structures, a tent platform, and three freestanding rock-walled structures. Three of these structures are multi-roomed, while the remaining have only one discernable room. Two other destroyed structures (only short segments of stacked rock walls remain) were also identified. Twelve ruins are clustered together in what is believed to be the main American Canyon Chinatown (Locality K). Two of the dugouts are inconclusive as to Chinese
occupation, and may have been occupied only by Euroamericans.

The archaeological record indicates that a variety of building materials was used in the structures. Twelve of the dugouts were discernable by cut banks of varying height. Of these 12, six have earthen berms or rock alignments where the front wall should have been. It is speculated that these missing front walls could have been built out of wood or wattle and daub. The remaining dugouts have only the rear wall as a cut bank, four have stacked rock sidewalls with dirt and rock berms, and two have stacked rock walls for the sides and front. Two of the dugouts have cleared areas in front of them, possible indicating a porch. For the dugouts, the stacked rock walls often do not appear to have been high enough for an entire wall, and adobe may have been used. Where one dugout wall is outlined with rock alignments or berms, it is felt that the wall was made of wood or wattle and daub. This is consistent with structures from Gold Creek as indicated in the photographs (See Figures 21 through 23). The freestanding structures all have stacked rock walls that are in various stages of collapse. The structure in Locality E has one wall removed by road construction activity. In Locality K, the two freestanding structures have at least one wall that is totally collapsed, or was built with an alternative material.
This is supported in a quote from Bragg (1976) who states, "It [The Chinatown] is built of adobe, rocks, mud, lumber and dugouts in the side of the hill." Additional supportive information comes from a Nevada State Museum photograph of a structure from American Canyon (Figure 26). (The site of this building was searched for by comparing topography visible in the photo to what was visible on the ground. It appears as though this house was in an area that was bulldozed and no traces of it remain.) The structure was a partial dugout. The side and front walls are composite, with the bottom portion made of stacked rock and the upper with adobe bricks. The roof is a gabled roof made of wood. There was a doorway and a window in the front of the building. It faces in a southerly direction.

Excavations in two of the dugouts in Locality L indicate that their floors were compacted dirt. Use of wood in construction is indicated by the presence of nails. Other construction materials found are flattened cans and tarpaper. Unfortunately, no subterranean cache features, fireplace chimneys, or posts were located.

There is consistency with the placement of the structures in American Canyon. All of them have been built on the north side of the canyon against hill slopes. The orientations of the structures range from 160° to 230° (averaging 187°), a southern orientation. The placement of the buildings against a protective hillside and orientation
Figure 24. Chinese Structure in American Canyon (Photo courtesy of the Nevada State Museum).
to the south is consistent with the Configurations School of feng shui. See Table 1.

Sisson (1993) and Ritchie (1993) both looked at the size of the Chinese structures they investigated, and reported the interior dimensions in square meters. Sisson looked at Chinese placer mining sites along the lower Snake River, and found that house size ranged from 4.2 m$^2$ to 39 m$^2$. Ritchie investigated Chinese placer mining habitation sites in New Zealand, and found them to be more uniform, ranging from five m$^2$ to 7.5 m$^2$. The American Canyon structures show considerable variance, ranging from 1.6 m$^2$ for a dugout in Locality G to 223 m$^2$ for a multi-room dugout in Locality K. See Table 1. Excluding multi-room structures (which are most likely meeting halls and stores), the range is still considerable, from 1.6 to 144 square meters.

Other expected Chinese architectural features found in American Canyon are: indications of porches on two of the dugouts in Locality K; the outdoor hearth feature recorded in Locality M; and rectangular shaped structures, based on the jian.

Overall, the American Canyon structures have a Chinese signature, but it might not be enough to identify the site as being Chinese without the supportive evidence of the historic record and the artifact assemblage.
Table 1. Structure Size and Orientation

<table>
<thead>
<tr>
<th>Structure</th>
<th>Interior Size (Square Meters)</th>
<th>Orientation (To true North in degrees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loc. C, D1</td>
<td>6.1</td>
<td>199</td>
</tr>
<tr>
<td>Loc. E, D1</td>
<td>12.5</td>
<td>170</td>
</tr>
<tr>
<td>Loc. G, D1*</td>
<td>22.3</td>
<td>230</td>
</tr>
<tr>
<td>Loc. G, D2</td>
<td>1.6</td>
<td>230</td>
</tr>
<tr>
<td>Loc. H, D1</td>
<td>11.8</td>
<td>220</td>
</tr>
<tr>
<td>Loc. I, D1</td>
<td>9.7</td>
<td>153</td>
</tr>
<tr>
<td>Loc. I, TF</td>
<td>3.0</td>
<td>160</td>
</tr>
<tr>
<td>Loc. J, D1</td>
<td>10.5</td>
<td>165</td>
</tr>
<tr>
<td>Loc. K, D1</td>
<td>67.8</td>
<td>186</td>
</tr>
<tr>
<td>Loc. K, D2</td>
<td>144.0</td>
<td>188</td>
</tr>
<tr>
<td>Loc. K, D3</td>
<td>56.4</td>
<td>188</td>
</tr>
<tr>
<td>Loc. K, D4</td>
<td>9.2</td>
<td>184</td>
</tr>
<tr>
<td>Loc. K, D5</td>
<td>18.8</td>
<td>182</td>
</tr>
<tr>
<td>Loc. K, D6</td>
<td>23.4</td>
<td>187</td>
</tr>
<tr>
<td>Loc. K, D7*</td>
<td>223.0</td>
<td>180</td>
</tr>
<tr>
<td>Loc. K, D8</td>
<td>78.7</td>
<td>180</td>
</tr>
<tr>
<td>Loc. K, D9</td>
<td>56.1</td>
<td>166</td>
</tr>
<tr>
<td>Loc. K, S2*</td>
<td>157.3</td>
<td>193</td>
</tr>
<tr>
<td>Loc. L, D1</td>
<td>8.4</td>
<td>169</td>
</tr>
<tr>
<td>Loc. L, D2</td>
<td>18.5</td>
<td>169</td>
</tr>
</tbody>
</table>

Loc. = Locality, D = Dugout, TF = Tent platform, S = Free standing structure, * = multi-room
CHAPTER 6

CHINESE PLACER MINING IN AMERICAN CANYON:
A COMPARATIVE EXAMPLE

Placer Mining

The processes of erosion are blind to the materials that humans consider valuable. A gold vein is as susceptible to erosion as any other rock. As particles of gold are eroded from a source, they are redeposited in streams, hillside colluvial deposits, and glacial till with gravel. Gravel deposits containing gold or other minerals (such as cinnabar, diamonds, garnets, jade, platinum, tin, tungsten and turquoise) are known as placer deposits. The 1849 gold discovery at Sutter's Mill in California was a placer deposit. To mine placer deposits, water and gravity are re-used to separate out desirable minerals, which often have a high specific gravity, from undesirable gravel.

The discovery of gold in California attracted Chinese as much as any other group. Chinese argonauts, lured by the promise of easy wealth and pushed by deplorable conditions at home, joined the California gold rush. In the early
1850s, 85% of California Chinese were placer mining (Rohe 1982).

The search for gold often led to the discovery of "mother lodes"--the original gold veins from which the placer deposits derived. To mine gold veins in unweathered rock requires machinery and extra labor to tunnel through hard rock and to separate gold from rock and other minerals. A substantial outlay of capital is required to procure necessary machinery and extra labor prior to commencement of mining. Lacking large sums of money for the initial outlay, most Chinese were prevented from starting hard rock gold mines. Antagonism from Euroamerican miners and mine laborers, who feared that the Chinese would lower their standard of living by working more cheaply, prevented many Chinese from acquiring jobs at hard rock mines. Due to these pressures, many Chinese switched from mining-related jobs to service industries such as cooking or running laundries. Chinese who stayed in the mining industry tended to specialize in placer mining.

A further specialization developed by Chinese to avoid antagonism with Euroamerican miners was the reworking of placer claims believed "worked out" by Euroamerican miners. Late nineteenth century Euroamerican miners generally expected a claim to pay a minimum of four dollars per day. Once the easily obtainable gold was removed by Euroamerican miners, they were willing to sell or lease their claims to
patient and enduring Chinese placer miners who recovered smaller nuggets and gold dust left behind (Liestman 1988).

The tool kit most often used by the Chinese placer miner consisted of the "pan" and "rocker." A gold pan is a large pan in which gold-bearing gravel and water are swished around in an effort to separate lighter sand and gravel from the heavier gold particles. It is most often used in initial prospecting efforts when the miner is looking for pockets of gold. The rocker, also known as a cradle, was first developed by Mexican miners in California. It generally consists of an open wooden box mounted on rocker legs, vaguely resembling an infant's cradle (Figures 26 and 27). Inside the box is a screen for removing large material, a deflecting apron to direct the flow of water and gravel, and a riffled bottom to catch the gold. The device is rocked to keep the gravel moving through the box and to concentrate the gold in the riffles (Vanderburg 1983[1936]). Materials to construct a rocker were inexpensive, and the rocker was easily portable, contributing to its desirability by thrifty and mobile Chinese placer miners (Figures 27 and 28).

A less portable device for placer gold recovery is the sluice box. A sluice box is a flume, through which gold-bearing gravel is moved with a continuous stream of water. Riffles on the bottom of the sluice box concentrate the gold. Diversion dams and ditches were often constructed to
Figure 25. Small Rocker. On Display, Marzen House Museum, Lovelock, Nevada.
Figure 26. Large rocker. On Display, Marzen House Museum, Lovelock, Nevada.
Figure 27. Chinese Placer Miner with Rocker  (Photo courtesy of the Nevada Historical Society).
Figure 28. Chinese Placer Miners in California Using the Same Methods as in American Canyon.
provide the constant source of water needed for a sluice box. Hydraulic mining arose as a technique for sluicing large volumes of auriferous gravel. Chinese miners used sluice boxes and hydraulic mining techniques when sufficient water and capital were available for construction and operation of the sluices, ditches, etc. (LaLande 1985; Rohe 1994).

Chinese Mining with an Emphasis on Guangdong

Some researchers of overseas Chinese history in the United States have stated that the Chinese did not bring any mining technology or knowledge of mining techniques, with them when they joined the California gold rush. Evidence for this lack of mining ability is based on the lack of recognizable Chinese mining equipment from the period. The fact that the majority of the Chinese came from the Pearl River Delta region of Guangdong province, an agricultural and fishing area reportedly without any placer mining history is also supportive of this assumption (LaLande 1985:30; Rohe 1996:14).

These same researchers go on to say that the Chinese quickly borrowed, adapted, and modified Euroamerican technology. LaLande (1981:iii) goes so far as to say "...the technological pattern is the most acculturative and adaptive aspect of sojourner culture." Technological knowledge that the Chinese are credited with bringing to the
United States' goldfields is believed to be related to water management--ditching, damming and pumping--a legacy of rice paddy agriculture and canal building practiced in Guangdong province (LaLande 1985; Ritchie 1986:54; Rohe 1994, 1996; Zhu 1997:105)

The Chinese, however, were often praised by Euroamerican observers for their mining abilities (Vanderburg 1983[1936]; Williams 1930). This was often just an appreciation for the patient and methodical approach to placer mining that the Chinese had, but it was also a measure of the success the Chinese had in placer mining endeavors, especially in recovering the fine gold that most Euroamerican miners could not. How did thousands of Chinese rice farmers and fisherman, supposedly ignorant in the ways of placer mining, gain such immediate success?

Ritchie (1986) and Steeves (1984) note that the Chinese have a long history of metal working, and thus of mining; however, they still credit the success Chinese miners had to two things. The first is their social organization and leadership coupled with knowledge of other engineering principals (mainly water management). The second is an ability to work long hard hours with minimal rewards (which undoubtedly contributed to their success). Steeves (1984:161) also mentions that water engineering was important to mining in Yunnan. He discusses artifacts that he believes are distinct indicators of Chinese mining, such
as small shovelheads, modified shovels and axes, and woks used for panning.

Fredlund et al. (1991) recognized that the Guangdong Chinese had some knowledge of placer mining, though it was for tin (cassiterite) instead of gold. They speculated that much of this knowledge could have been gained during Chinese tin mining endeavors in Malaysia; however, Heidhus' (1992) account of Chinese placer tin mining on the island of Bangka in Malaysia indicates that the Chinese greatly improved mining and smelting techniques when they arrived around 1750. Just what was the level of mining practiced in China, and more specifically in Guangdong, and what level of mining knowledge did the Chinese bring with them to the United States?

China currently has an important mining industry. She was recently listed as the world's fourth largest producer of nonferrous metals such as copper, aluminum, lead, zinc, nickel, tin, antimony, mercury, magnesium, and titanium (Fei 1991). Other metals and commodities such as iron, gold, and coal are also produced. China's gold production was recently increased due to government investment (Beijing Review 1991). China is the sixth largest producer of gold in the world, with placer deposits accounting for 10 percent of China's production (Dorian 1994).

This modern industry is based on a long history of mining and metallurgy dating back to well before 4,000 B.C.
when the Chinese first worked copper. The Chinese developed bronze metallurgy between 2,500 and 2,000 B.C., years before it was developed in Europe or other parts of the world (Penhallurick 1986). The Chinese developed piston bellows to assist with metallurgical endeavors, and were the first to use stamp mills (Craddock 1995).

The Chinese had prospecting experience from antiquity, which included knowledge of associated minerals and rock types (Needham 1971a; Yang 1983) and the use of plants as a possible indicator of high mineral concentrations (Needham 1971a). Chinese prospecting knowledge allowed for the opening of many viable tin mines in Malaysia (Heidhus 1992). Sung's (1966[1637]) account of Chinese technology in the 17th century demonstrates that the Chinese had a thorough knowledge of mining technology at that time, including principles used in placer mining such as sluicing and panning. Sung (1966[1637]) shows Chinese exploiting placer deposits of gold, silver, iron, and jade. He also demonstrates that stream washing was also used as a benefaction process during some lode mining and milling.

This early knowledge of mining was passed down through the ages. Willis (1908:1) states that:

A mining proposition in China is unlike one in any other country; there's nothing new about it. American mines are new and so are methods. In Europe, new methods are applied to old mines. But
in China, mines and methods are those of the ancestral Chinese. Inhabited for several thousand years by a people skilled in the use of metals, China has but little unprospected territory. Practically all her metalliferous deposits are known and have been worked to the level where pumping became necessary; but they have not been worked with effective appliances for deep mining or with an intelligent understanding of ore deposits, and their future productiveness depends upon the application of modern machinery, business methods, and scientific knowledge.

It follows that having mines, one also has miners. Sun (1967) reports on Chinese miners during the Qing period (1644-1911). He notes that miners were generally a low status group, and came from three groups: those from regions without sufficient agricultural resources that were forced into mining to make a living; people without some other "proper" occupation; or local farmers earning extra income during the off-season. Professional miners were closed groups, with their own jargon, gods, charms, and tongs. Professional miners were restless and rootless, and would readily abandon an area to pursue work or rumors of a new strike elsewhere. They participated in many mining rushes throughout China and adjoining regions. Professional miners tended to make Chinese officials nervous, since they
believed miners caused civil unrest when unemployed, through their vagabond ways, or through tong conflicts. Many miners came from the provinces of Yunnan, Sichuan, Jiangxi, and Hunan, where agriculture played a lesser role and mining was less strictly controlled by the Chinese administration, but they worked throughout the Empire.

A cursory examination of Chinese mining in the late 19th/early 20th century is possible, with some information specific to Guangdong province. This is due in large part to mineral and geology reports by European and American geologists who were looking for mineral deposits in China for Western companies to exploit following the Opium Wars (1839-1850). These reports indicate that the Chinese mining industry was in disarray due to the same reasons that the political and economic stability of China was in chaos (Brelich 1905; Read 1912; Tegengren 1920, 1923).

While it is true that a very important part of the Guangdong economy is rice paddy agriculture, it is also true that Guangdong is mountainous. The mountainous regions contain mineral deposits that were mined. The types of mineral deposits specific to Guangdong that were being exploited through the late 19th/early 20th century are: antimony (and associated mercury?) (Scalisi and Cook 1983; Read 1912), bituminous coal (Read 1912), gold (Read 1912:332), iron (Chesneauux et al. 1976; Read 1912; Sun 1967: 59; Tegengren 1923; Wagner 1985), lead (Read 1912; Sun
1967:52), silver (Chesneaux et al. 1976:226; Read 1912), and tin (Penhallurick 1986; Sun 1967:52; Read 1912).

Many of these deposits are mined by hard rock methods, but iron, gold, mercury, and tin (cassiterite) all might have been placer mined. The reference to the Guangdong gold mines is limited, and it is not known if they are hard rock or placer (Read 1912). The presence of mercury mining in Guangdong is inferred from the descriptions of the antimony deposits, and the fact that mercury was important in China for use as vermilion ink and paint (Read 1912; Yan 1994). Tegengren (1920) mentions placer mining of mercury (cinnabar) and the association of cinnabar with antimony, but none of his references mention Guangdong. Cassiterite and ironsand deposits were definitely placer mined in Guangdong (Read 1912; Tegengren 1923).

Wagner (1985) describes placer mining of ironsands in Henan province. In this region, a wooden sluice board is made, and water is diverted (with ditches and dams) to run over it. Ironsands are carried to the sluice for washing. Wagner states that "...ironsand sluicing requires no special tools or skills, is outdoor work, requires less physical strength than mining [hardrock?], and involves no danger." After washing, the sands are smelted using charcoal to produce iron. Although Henan province is distant from Guangdong, extensive iron sands exist along the southeast coast of China in the provinces of Zhejiang, Fujian and...
Guangdong (Wagner 1985:Fig. 14). Tegengren (1923) did not consider ironsands economically important, but he was searching for large deposits for use in heavy industry. He acknowledged that locals in Fujian used low technology methods. Irongsands were important where there is sufficient population to create a demand for iron tools that cannot be cheaply supplied from other sources, and there was sufficient ironsand and fuel for smelting. In these cases, ironsand mining and smelting was done by the local population. Many people, including women and children, were familiar with the processes since they all sluiced ironsand for extra income when not engaged in farming (Wagner 1985).

While placer mining of cassiterite is mentioned from China and Guangdong, no reference describing the methods used was found. Heidhus (1992), however, described tin mining on Bangka Island in Malaysia. The methods she describes are similar to those described for ironsand sluicing, where a sluice board or box was made, water was diverted to run over it, and the tin ore was carried to the board for sluicing. Many of the Chinese who arrived to mine tin were described as being knowledgeable and experienced, and it was speculated that many of them were Hakka from Guangdong.

The Hakka were experienced miners in China. The Hakka migrated into various regions of China, such as Guangdong, where they were not well received by established residents.
To avoid competition, the Hakka moved into mountainous regions where they specialized in slash and burn agriculture, logging, and mining. Hakka women did not practice foot binding, which allowed them to work in the fields. This in turn freed the men to pursue other economic activities, such as mining, without worry (Leong 1997).

Heidhus (1992) also indicates that Chinese pumping technology was applied to mining early on in Malaysia. Another reference to the use of Chinese water technology in mining is Brelich (1905) who states: "During the rainy season, the surface water which accumulates in the lower workings, is forked [sic] by means of bamboo or wooden chain pumps similar to those used for irrigation purposes [emphasis mine]."

The American Canyon Mines

In American Canyon, Chinese merchants leased claims from Euroamericans, and then subleased small 20-x-20-ft. plots to individual Chinese, assigning plots through a lottery. The merchants were also responsible for construction of ditches and a dam that brought water down to American Canyon for use in the placer mines.

This kind of organization is similar to practices that were often carried out in China, where a group of professional miners would act under the leadership of a "manager" who furnished capital, mining expertise and often
had knowledge of local conditions. Occasionally, no wages would be paid, but profits from the mine would be shared between members of the group (Sun 1967). In American Canyon, the managers were the local merchants who put up the money for the claim leases and ditch systems and had the means and knowledge for dealing with local Euroamericans.

Unfortunately, little evidence of the ditch system remains since it was largely replaced with buried iron pipe after abandonment of the area by the Chinese. The dam still remains, but appears to have been recently repaired with modern heavy equipment (Valentine 1993a, 1993b). It is okay to speculate that the dam might have been constructed using *hang-tu* methods, since Steeves (1984) found dams made this way in his study of Chinese placer miners in Oregon.

Several scholars (e.g. McGowen 1996; Ritchie 1986; Steeves 1984) have speculated that well-sorted and well-worked tailings might be a good indicator of Chinese placer mining. The tailings associated with the majority of the placer shafts throughout American Canyon are generally very well sorted. This is reported to be because of the Chinese practice of washing all of the gravel excavated from a shaft. Euroamericans would prospect the gravel as they excavated, and only wash "paystreaks," and their tailings piles often look disorganized and unsorted. Wong Kee alluded to this practice of washing all the gravel (18 bucket loads to a rocker) in his quote from Bragg (1976),
"some time he catch em $10, some time $20, some time $50, some time $90 and some time too bittie to rockerful."
Ritchie (1986) and LaLande (1981:332), however, caution against using the sorting of placer tailing piles to determine ethnicity in mining districts as some Euroamericans eventually became as efficient as the Chinese in their mining practices.

Another indicator of Chinese mining practices that is found in American Canyon is the notches found in the sidewalls of some of the shafts. These notches are 20 x 10-cm. Sets of them are arranged vertically, with regular spacing, on opposing sidewalls of the shafts (Figure 29). This appears to be some sort of shoring method used by the Chinese. A few discussions or illustrations that allude to similar shoring used in Chinese mines were found in the literature. Yang (1983) mentions timber props in an ancient copper mine. Timber props found in vertical and inclined shafts of the copper mine are 5 to 10 cm in diameter. The props used in deeper, "horizontal galleries" are 20 cm in diameter. Another illustration of props comes from Sung (1966[1637]: Fig. 11-3) (Figure 30), which shows wooden poles used for shoring in a coal mine.

Relatively small shaft size is another apparent indicator of Chinese mining. Small shaft sizes appear to be the norm in China. Penhallurick (1986) mentions shafts averaging 80 cm² at a copper mine. Yang (1983) mentions
Figure 29. Notching in Sidewall of American Canyon Chinese Mine Shaft.
Figure 30. Wooden Poles Used for Shoring in Chinese Coal Mine (Based on Sung [1966]: Fig. 11-3).
shafts ranging from 0.95 to 1.3 m². The largest Chinese shafts mentioned are coal shafts described by Hommel (1969[1937]) that are around 1.8 m². It is not known if the Chinese excavated smaller shafts because they tend to be smaller people, or if they did so to reduce the actual amount of material that needed to be moved. Shafts in American Canyon believed to be Chinese range from 0.5 m² to 1 m². Shafts believed to be Euroamerican range from 1.5 m² up to greater than 2.5 m².

In conclusion, there are several points that are important in understanding Chinese mining in the United States. They are: 1) the Chinese have a long history of mining that includes placer mining; 2) miners from China included professional groups that regularly followed mining rushes all over China and other parts of the world; 3) other miners found in China were farmers who mined during the off-season for extra income; 4) water management practices (i.e. pumping and ditching) cannot be considered a strictly agricultural technology since they were also applied to mining in China; 5) all sorts of mining was carried out in Guangdong Province, including placer mining of ironsand and tin, and many of the peasant farmers may have practiced placer mining for these commodities. Therefore, it is likely that a significant portion of the Chinese were familiar with placer mining practices and principles when they arrived in the United States. It may even be possible
that some of the first Chinese to join the gold rush were experienced, professional miners whose employment opportunities in China were restricted due to civil unrest. Chinese mining equipment from the gold rush era might not be recognized as Chinese since it is similar to the equipment used around the world—there are only so many ways to make a sluice box. Adaptation to technology available in the United States was likely due to experienced Chinese miners recognizing a workable, available tool and making good use of it.

Chinese Mercury Mining?

Cinnabar (mercury) is also found in the alluvial deposits in American Canyon (Bailey and Phoenix 1944; Ransome 1909). The presence of cinnabar resulted in Euroamerican hard rock mercury prospecting in the early 1900s (Ransome 1909).

Cinnabar was extensively mined in China, mostly in Yunnan, Guizhou, and Hunan Provinces. A major use of the material was for making vermilion ink and paint. Other uses included amalgamation of gold, manufacture of mirrors, and as medicine (Brelich 1905; Scalisi and Cook 1983; Tegengren 1920).

Mercury mining in the southern Chinese provinces was severely curtailed during most of the 1800s by civil unrest. Although demand for cinnabar and mercury was decreasing at
the time, it still existed. This demand was met by imports (Read 1912; Tegengren 1920). Much of the imported quicksilver came from California (Read 1912: 339). Major cities in the mercury trade were Canton and Hong Kong (Tegengren 1920).

Perhaps some of the cinnabar in American Canyon was recovered during the Chinese placer mining operations, and exported to China. This seems possible, since Chinese in American Canyon were willing to diversify into any profitable venture. Cinnabar was also funneled through Guangdong cities (Canton and Hong Kong) where many of the immigrants originated and had economic ties. The Chinese also seemed sensitive to the metal markets, one example being the Virginia City Chinese melting solder off of cans during a lead shortage (Ritchie 1986).

In an effort to find out if cinnabar was shipped from American Canyon (and how much gold), Mr. Bill Strobridge, a historian in the employ of Wells Fargo, was contacted concerning shipping records from the area from the period 1884-1906. He indicated that many records were lost in the 1906 San Francisco earthquake and fire, or were not turned into the main office from distant agencies. The only shipment record they currently have from the American Canyon region is a note concerning an 1882 wheat shipment from Lovelock. Negative evidence for Chinese not shipping
cinnabar comes from the fact that no mention of it was found in any period newspapers or mining journals.

Conclusion

Chinese placer mining technology, though generally elusive and often not acknowledged, can be recognized archaeologically. In the past, this has largely been the acknowledgment of Chinese water-management practices, such as dam and ditch construction. In American Canyon, a Chinese presence is identified by the arrangement of the placer shafts (created through Chinese social organization) and the presence of Chinese shoring methods. The well-sorted character of the tailings-piles, the small size of the shafts, and the presence of a possible hang-tu dam also allude to the Chinese presence.
CHAPTER 7

CONCLUSIONS

The purpose of this thesis is to explore acculturation, or lack thereof, in Chinese placer miners in American Canyon. Standard historic archaeological methods using the written record in combination with excavation, mapping, and description of archaeological deposits were used. This thesis focuses on architecture and mining technology found at the site, but does not overlook additional lines of evidence.

The written record of American Canyon was used to create a history of the site. This history initially suggests that some of the Chinese merchants in American Canyon underwent some acculturation. This is suggested by the fact that their business dealings with Euroamericans became more complex and relaxed through time. Many of the merchants stayed in the region after the American Canyon settlement was abandoned, continuing to conduct business with their Euroamerican contacts.

Praetzellis and Praetzellis (1998) point out that in Overseas Chinese communities there is a cultural structure
that ties Chinese merchants to each other and to non-Chinese facilitators. This system of business relationships is known as **guanxi**. Putting **guanxi** into practice in the United States entailed the development of business and social relationships with sympathetic Euroamericans. Part of this was attempting to make Euroamericans more comfortable by learning their language and adopting some of their clothing and social mores, an outward appearance of acculturation.

The historic record clearly shows the development of business relationships and friendships with Euroamericans. It also shows that these same Chinese maintained close relationships with China, and that most, if not all, of them eventually returned home. Any semblance of acculturation in the historic record is probably more accurately a reflection of **guanxi**.

One area archaeologists have used to exploring ethnicity and cultural change is with artifacts. While not emphasized in this thesis, the artifact assemblage from American Canyon supports the maintenance of Chinese ethnicity with high counts of distinctly Chinese ceramics and other artifacts (such as opium cans and Chinese gaming pieces). The faunal assemblage from American Canyon is also supportive of Chinese ethnicity in that it is high in chicken and fish. These findings support the findings of earlier archaeologists in that a high percentage of Chinese ceramics coupled with unique faunal assemblages high in
chicken, fish, and/or pork indicates a preference for a traditional diet.

One area of focus for this thesis is in Chinese vernacular architecture. The more specific question raised is; can the remains of dwellings in American Canyon produce a recognizable ethnic Chinese pattern?

Vernacular architecture is believed to be a good indicator of ethnicity. Close similarities between vernacular Chinese homes with the architectural ruins in American Canyon would indicate if this is another area where cultural traditions were or were not maintained. Descriptions of Chinese vernacular architecture in Guangdong Province and at Chinese sites in the western United States were compared with the archaeological remains in American Canyon.

The housing in American Canyon does have possible Chinese characteristics. The most obvious of these is the distribution and orientation of the structures that suggests compliance with feng-shui principles. Another ethnic indicator of the Chinese is the presence of an outdoor hearth feature.

One should note that the orientation and layout of the structures in American Canyon could be a result of environment and geography instead of an attempt to comply with feng-shui. The narrowness of the canyon would dictate a linear arrangement for the housing. The structures could
be oriented to the south to take advantage of all available light and heat. Due to lack of a reliable water source, this would be important if the majority of the mining activity took place in the fall, winter, and spring months when water would be more abundant.

A less reliable, but still tantalizing clue to Chinese construction preferences is the presence of potentially Asian tarpaper. Additional research into the manufacture, distribution, and age of tarpaper products is recommended. This could reveal if the manufacture of this style of tarpaper is truly Asian and preferred by the Chinese, or if the imported tarpaper was commonly used in all construction, including that of Euroamericans.

Unfortunately, archaeological testing in American Canyon was not sufficient to prove or disprove other potential Chinese signatures, such as door and fireplace placement. Additional work, including total excavation of at least one dugout, would be needed to explore these possibilities. More detailed studies of the larger structures would be appropriate and helpful in determining their function.

A second focus of this thesis is on mining technology. Two specific questions were raised. Did the Chinese really have little or no mining knowledge? Are mining features another form of vernacular architecture that can be used to identify an ethnic group?
Mining technology is an area where many believe that Chinese adaptation and acculturation was highest, borrowing much of the technology and equipment from Euroamericans. It was believed that Guangdong Chinese had no knowledge of mining when they arrived (LaLande 1985; Rohe 1996). A technology that the Chinese are credited with having is in the area of water management: construction of dams, ditches, and pumps useful in placer mining (LaLande 1985; Rohe 1996).

In an effort to find out if the residents of Guangdong really had little or no mining knowledge, information on mining practices and technology was gathered from China with an emphasis on Guangdong. This information was then compared to the Chinese mining features in American Canyon.

A distinctive Chinese signature was recognized archaeologically in regards to the placer mining technology in American Canyon. This includes, but goes beyond, the presence of Chinese water-management practices, such as hang-tu dam and ditches. In American Canyon, a Chinese presence is identified by the arrangement of the placer shafts (created through Chinese social organization) and the presence of Chinese shoring methods. The well-sorted character of the tailings piles and the small sizes of the shafts allude to imported Chinese mining practice and knowledge. The shoring features and small shaft size could be considered a form of vernacular architecture useful in identifying other Chinese mining sites. These features should be looked for in other Chinese mining sites in the
United States, and possibly Australia, New Zealand, and Malaysia.

This distinctive mining technology proves that the Chinese had mining knowledge prior to their arrival in the United States. The adaptation of Euroamerican mining tools and techniques is not as strong as previously believed. This supports Chinese ethnicity and minimum acculturation in an area where high acculturation was thought to have occurred.

Overall, the archaeological and historic record in American Canyon shows little acculturation in the Chinese population. More specifically, the architectural remains do not prove to be as useful an indicator of ethnic identity as hoped. This might be, however, a reflection of the limited amount of work done instead of its true applicability. As predicted by LaLande (1981) the pattern of housing is more of an indication than surviving architectural traits. The mining technology aspect has proven to be more useful in identifying Chinese cultural stability than it has in the past. Shaft size, shoring methods, and mine distribution should be added to water management technology when looking for a Chinese signature at other mining sites where an overseas Chinese presence is suspected.
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Sung Ying-Hsing

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1900b Unionville Township, Humboldt County, Nevada.
1910a Foltz Precinct, Humboldt County, Nevada.
1910b Lovelock Township, Humboldt County, Nevada.
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Wei, Fan

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Yan, Victoria

Yang, Martin C.

Yang Wenheng

Yip, Christopher Lee

Yung, Judy

Zanjani, Sally
Zhu, Liping

APPENDIX A

The following table is based on a historic artifact classification developed by Sprague (1981).

All surface artifacts from Locality L were described in the field (Only two of these artifacts were collected—they are marked with an asterisk). Artifacts from the bulldozed ('dozed) area of Locality A, were turned over to the Bureau of Land Management by modern day placer miners as they found them.

Functional Categories for American Canyon Artifacts

<table>
<thead>
<tr>
<th>Chinese Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal Items: Indulgences</strong></td>
</tr>
<tr>
<td><strong>Item</strong></td>
</tr>
<tr>
<td>Opium Can Parts</td>
</tr>
<tr>
<td>Opium Can Strip</td>
</tr>
<tr>
<td>Liquor Bottle</td>
</tr>
<tr>
<td>Opium Can Frag.</td>
</tr>
<tr>
<td>Liquor Bottle</td>
</tr>
</tbody>
</table>

<p>| <strong>Domestic Items: Food Preparation/Storage</strong> |
| <strong>Item</strong> | <strong>Ref. No.</strong> | <strong>Location</strong> |
| UBW | 17-1 | Loc. L, Surface |
| UBW | 21-1 | Loc. L, Surface |
| UBW | 25-1 | Loc. L, Surface |
| UBW | 27-1 | Loc. L, Surface |
| UBW | 29-3,4,5 | Loc. L, Surface |
| UBW | 30-2 | Loc. L, Surface |
| UBW | 32-1 | Loc. L, Surface |
| UBW | 33-1 | Loc. L, Surface |
| UBW | 36-1 | Loc. L, Surface |
| UBW | 40-2 | Loc. L, Surface |
| UBW | 41-2 | Loc. L, Surface |
| UBW | 42-1 | Loc. L, Surface |
| UBW | 43-3 | Loc. L, Surface |</p>
<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Celadon cup frags.</td>
<td>18-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Bamboo bowl frags.</td>
<td>19-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Celadon bowl frag.</td>
<td>19-2</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Celadon cup frags.</td>
<td>18-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Bamboo bowl frag.</td>
<td>29-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Celadon cup base</td>
<td>29-2</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Celadon rim frag.</td>
<td>47-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Celadon cup frag.</td>
<td>184-1,2</td>
<td>Loc. A, 'dozed Area</td>
</tr>
<tr>
<td>Bamboo bowl frag.</td>
<td>189-1,2,3</td>
<td>Loc. A, 'dozed Area</td>
</tr>
<tr>
<td>4 Seasons Bowl frag.</td>
<td>190-1</td>
<td>Loc. A, 'dozed Area</td>
</tr>
<tr>
<td>Blue-on-White Ceramic</td>
<td>198-1</td>
<td>Loc. A, 'dozed Area</td>
</tr>
<tr>
<td>Gray-on-White Ceramic</td>
<td>199-1</td>
<td>Loc. A, 'dozed Area</td>
</tr>
<tr>
<td>Celadon cup frag.</td>
<td>212-1 thru 5</td>
<td>Loc. A, 'dozed Area</td>
</tr>
<tr>
<td>Serving Dish Base Frag.</td>
<td>1218-1</td>
<td>Loc. K, Structure 2</td>
</tr>
</tbody>
</table>
### Unknown Items:

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber Covered?</td>
<td>112-1</td>
<td>Loc. L, F-3, U-1, L-2</td>
</tr>
</tbody>
</table>

### Euroamerican Artifacts

#### Personal Items: Clothing/Footwear Accessories

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Rubber Frag.</td>
<td>22-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Shoe Heel</td>
<td>34-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Shoe Sole</td>
<td>37-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Rubber Boot Frags.</td>
<td>39-1,3,7</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Rubber Boot Heel</td>
<td>41-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Overall Button</td>
<td>75-1</td>
<td>Loc. L, F-1, U-1, L-1</td>
</tr>
<tr>
<td>Prosser Button</td>
<td>90-1</td>
<td>Loc. L, F-2, U-1, L-11</td>
</tr>
<tr>
<td>Prosser Button</td>
<td>106-1</td>
<td>Loc. L, F-2, U-2, L-11</td>
</tr>
<tr>
<td>Overall Button</td>
<td>123-1</td>
<td>Loc. L, F-3, U-1, L-4</td>
</tr>
<tr>
<td>Prosser Button</td>
<td>126-1</td>
<td>Loc. L, F-3, U-1, L-8</td>
</tr>
<tr>
<td>Overall Button</td>
<td>123-1</td>
<td>Loc. L, F-3, U-1, L-8</td>
</tr>
<tr>
<td>Mother-of-Pearl Button</td>
<td>129-1</td>
<td>Loc. L, F-3, U-1, L-9</td>
</tr>
</tbody>
</table>

#### Personal Items: Indulgences

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wine Bottle Frag.</td>
<td>16-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>19-3</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Black glass bottle frag.</td>
<td>20-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Black glass bottle frag.</td>
<td>21-2</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Wine Bottle Frags.</td>
<td>26-3</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Aqua Bottle Frags.</td>
<td>30-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>31-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Amethyst Bottle Frag.</td>
<td>35-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Amethyst Bottle Frag.</td>
<td>38-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Amethyst Bottle Frag.</td>
<td>39-2</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>39-4</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>43-2</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>46-2</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>60-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>76-1</td>
<td>Loc. L, F-1, U-1, L-1</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>78-1</td>
<td>Loc. L, F-1, U-1, L-3</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>79-1 thru 19</td>
<td>Loc. L, F-1, U-1, L-4</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>92-1,2</td>
<td>Loc. L, F-2, U-1, L-11</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>99-1</td>
<td>Loc. L, F-2, U-1, CP</td>
</tr>
<tr>
<td>Tobacco Tag Frag.</td>
<td>105-1</td>
<td>Loc. L, F-2, U-2, L-11</td>
</tr>
<tr>
<td>Wine Bottle Frag.</td>
<td>124-1</td>
<td>Loc. L, F-3, U-1, L-4</td>
</tr>
</tbody>
</table>

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### Personal Items: Medical/Health Grooming

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comb Tooth Frag.</td>
<td>113-1</td>
<td>Loc. L, F-3, U-1, L-2</td>
</tr>
<tr>
<td>Milk Glass Frag.</td>
<td>214-1</td>
<td>Loc. A, 'dozed Area'</td>
</tr>
</tbody>
</table>

### Domestic Items: Food Preparation/Storage

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stovepipe frag.</td>
<td>10-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Barrel hoop</td>
<td>3-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Can Frag.</td>
<td>13-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Can Frag.</td>
<td>14-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Can Frag.</td>
<td>24-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Can Frag.</td>
<td>25-2</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Barrel Hoop</td>
<td>26-4</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Sardine Can</td>
<td>45-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Handmade Stovepipe</td>
<td>50-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Barrel Hoop</td>
<td>110-1</td>
<td>Loc. L, F-2, U-2, L-9</td>
</tr>
<tr>
<td>Yellow Stone Ware Frag.</td>
<td>118-1</td>
<td>Loc. L, F-3, U-1, L-3</td>
</tr>
</tbody>
</table>

### Domestic Items: Food Serving/Consumption

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking glass frag.</td>
<td>33-2</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>White Stoneware frag.</td>
<td>213-1</td>
<td>Loc. A, 'dozed Area'</td>
</tr>
</tbody>
</table>

### Architectural Items: Construction Materials

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheet Metal</td>
<td>1-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Flat Glass</td>
<td>4-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Flat Glass</td>
<td>14-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Flat Glass</td>
<td>15-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Flat Glass</td>
<td>29-6</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Wire</td>
<td>29-7</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>2 Square Nails</td>
<td>40-1</td>
<td>Loc. L, Surface</td>
</tr>
<tr>
<td>Tar Paper</td>
<td>89-1,2</td>
<td>Loc. L, F-2, U-1, L-10</td>
</tr>
<tr>
<td>Square Nail</td>
<td>91-1</td>
<td>Loc. L, F-2, U-1, L-11</td>
</tr>
<tr>
<td>Tar Paper</td>
<td>93-1</td>
<td>Loc. L, F-2, U-1, L-11</td>
</tr>
<tr>
<td>Wire</td>
<td>96-1</td>
<td>Loc. L, F-2, U-1, L-12</td>
</tr>
<tr>
<td>Small Spike</td>
<td>217-1</td>
<td>Loc. A, 'dozed Area'</td>
</tr>
<tr>
<td>Square Nail</td>
<td>103-1</td>
<td>Loc. L, F-2, U-2, L-9</td>
</tr>
<tr>
<td>Nails</td>
<td>107-1,2</td>
<td>Loc. L, F-2, U-2, L-11</td>
</tr>
<tr>
<td>Tar Paper</td>
<td>109-1</td>
<td>Loc. L, F-2, U-2, L-11</td>
</tr>
<tr>
<td>Square Nail</td>
<td>114-1</td>
<td>Loc. L, F-3, U-1, L-2</td>
</tr>
<tr>
<td>Nail Frags.</td>
<td>116-1 thru 6</td>
<td>Loc. L, F-3, U-1, L-3</td>
</tr>
<tr>
<td>Flat Glass</td>
<td>120-1</td>
<td>Loc. L, F-3, U-1, L-3</td>
</tr>
<tr>
<td>Nail Frags.</td>
<td>121-1,2</td>
<td>Loc. L, F-3, U-1, L-4</td>
</tr>
<tr>
<td>Square Nail</td>
<td>128-1</td>
<td>Loc. L, F-3, U-1, L-8</td>
</tr>
</tbody>
</table>
**Transportational Items: Horse, Mule, and Wagon Trappings**

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bailing Wire</td>
<td>12-1</td>
<td>Loc. L, Surface</td>
</tr>
</tbody>
</table>

**Commerce/Industry Items: Hunting**

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>.44 Webley Case</td>
<td>43-1</td>
<td>Loc. L, Surface*</td>
</tr>
<tr>
<td>12 Gauge Case</td>
<td>44-1</td>
<td>Loc. L, Surface</td>
</tr>
</tbody>
</table>

**Commerce/Industry Items: Miscellaneous**

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerosene Can</td>
<td>9-1</td>
<td>Loc. L, Surface</td>
</tr>
</tbody>
</table>

**Items of Unknown Function**

<table>
<thead>
<tr>
<th>Item</th>
<th>Ref. No.</th>
<th>Location</th>
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<tbody>
<tr>
<td>Rusted Metal Frag.</td>
<td>2-1</td>
<td>Loc. L, Surface</td>
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<tr>
<td>Modified Can</td>
<td>3-1</td>
<td>Loc. L, Surface</td>
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<td>Clear Bottle Glass</td>
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<td>11-1,2</td>
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<td>Modified Can</td>
<td>12-2,3</td>
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<td>Perforated Metal Disc</td>
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<td>Flaked Bottle Frag.</td>
<td>30-3</td>
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<td>Rusted Metal Frag.</td>
<td>39-6</td>
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<td>Rusted Metal Frags.</td>
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<td>Modified Can</td>
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<td>Modified Can</td>
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<td>Rusted Metal Frag.</td>
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<td>Small Leather Frag.</td>
<td>59-1</td>
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<tr>
<td>Modified Can</td>
<td>61-1</td>
<td>Loc. L, Surface</td>
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<tr>
<td>Charcoal</td>
<td>77-1</td>
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<td>81-1,2</td>
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<td>Unidentified Material</td>
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<td>Loc. L, F-2, U-1, L-6</td>
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<td>Rusted Metal Frags.</td>
<td>88-1</td>
<td>Loc. L, F-2, U-1, L-7</td>
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<td>Rusted Metal Frags.</td>
<td>95-1</td>
<td>Loc. L, F-2, U-1, L-12</td>
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<td>Rusted Metal Frags.</td>
<td>97-1</td>
<td>Loc. L, F-2, U-1, CP</td>
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<td>Rusted Metal Frags.</td>
<td>98-1</td>
<td>Loc. L, F-2, U-1, CP</td>
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<tr>
<td>Material</td>
<td>Locality</td>
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<td>Glass Frag.</td>
<td>100-1</td>
<td>Loc. L, F-2, U-1, L-13</td>
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<td>Rusted Metal Frags.</td>
<td>101-1</td>
<td>Loc. L, F-2, U-2</td>
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<tr>
<td>Modified Can Frags.</td>
<td>102-1,2,3</td>
<td>Loc. L, F-2, U-2, L-9</td>
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<td>Clear Glass Frags.</td>
<td>215-1,2</td>
<td>Loc. A, 'dozed Area</td>
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<tr>
<td>Slip on lid</td>
<td>216-1</td>
<td>Loc. A, 'dozed Area</td>
</tr>
<tr>
<td>Modified Can Frags.</td>
<td>104-1</td>
<td>Loc. L, F-2, U-2, L-10</td>
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<td>Rusted Metal Frags.</td>
<td>108-1</td>
<td>Loc. L, F-2, U-2, L-11</td>
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<td>Coal Clinker</td>
<td>111-1</td>
<td>Loc. L, F-3, U-1, L-2</td>
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<tr>
<td>Clear Glass Frags.</td>
<td>115-1</td>
<td>Loc. L, F-3, U-1, L-2</td>
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<td>Clear Glass Frags.</td>
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<td>Rusted Metal Frags.</td>
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<td>Loc. L, F-3, U-1, L-2</td>
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<td>Clear Glass Frags.</td>
<td>180-1</td>
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<td>181-1</td>
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<td>Rusted Metal Frags.</td>
<td>182-1</td>
<td>Loc. L, F-3, U-1, L-10</td>
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<tr>
<td>Leather Frag.</td>
<td>183-1</td>
<td>Loc. L, F-3, U-1, L-10</td>
</tr>
</tbody>
</table>

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Figure 7. Plan Map of Locality A.