



DRAFT

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MEMORANDUM

Date: May 30, 2000

To: The Honorable Chair and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

A handwritten signature in dark ink, appearing to read "CHH", is written over the printed name "C.H. Huckelberry".

Re: ***Cultural Landscapes of History in Southern Arizona***

Overview

Recently, as part of the series of research documents that is contributing to the development of the Cultural Resources Element of the Sonoran Desert Conservation Plan, a report was forwarded to the Board that introduced the topic of how archaeologists and historians reconstruct the stories of past cultures from the hints left on the land through the cultural landscape approach. Summarized in this memorandum, the attached report entitled *Cultural Landscapes of History in Southern Arizona* is written by authors from Statistical Research Inc. to describe the different, and sometimes conflicting, conceptions of land use that have been held by residents of Southern Arizona during the past 500 years. Briefly outlining major events in the Native American, Hispanic and Anglo experience, the report provides a chronology of events that tends to support one scholar's view that "western history has been an ongoing competition ...for the right to claim for oneself and sometimes for one's group the status of legitimate beneficiary of Western resources. This intersection of ethnic diversity with property allocation unifies Western history." (Page 3) The report covers the following topics:

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Landscapes of Conquest

A. Discovering the Landscape: Early Spanish Exploration of Southern Arizona

In 1539 the first European passed through southern Arizona and began the written record of events that allows us today to separate the past into the categories of "pre-history" (the domain of the archaeologists) and "history" (the domain of the historians). Some might imagine that the historical period has an advantage over prehistory, in relative literary or technological sophistication. But the first recorded story in southern Arizona "history" was an exaggeration of sorts, told by Friar Marcos de Niza, when he returned from his 1539 entrada and related to the Viceroy of New Spain that legends of the Seven Cities -- where fabulous wealth and high culture abounded -- were partially confirmed. At least there was one place worthy of glowing descriptions, which he called Cibola.

Viceroy Antonio de Mendoza very much wanted to hear this and so commissioned the 1540 entrada led by Francisco Vasquez de Coronado that involved 1300 people (including Niza) and 1500 horses and cattle. But upon retracing Niza's steps -- at least in Coronado's view -- there was nothing as fabulous as Niza described, and so the experience was recorded differently, and entradas, for the most part, were directed elsewhere for the next one hundred and fifty years. As a result, when Father Kino arrived in 1691 to what is now southern Arizona, he had little competition from secular Spanish enterprises, and the Jesuit version of European culture had a chance to gain something of a stronghold before other Spanish influences became a regional presence.

B. New Plants, New Animals, New Diseases

Pages 5 through 8 of the attached study describe the impact on Native Americans of introductions of new plants and animals. Father Kino is reported to have introduced the Pima residents of the Santa Cruz Valley to wheat -- a frost tolerant crop that allowed year round farming and a more stable and sedentary life. Domestic livestock animals were introduced as well, providing a substitute for the food source that formerly required hunting. However, as the authors state on page 7:

- "Whatever the benefits enjoyed by the native peoples of southern Arizona as a result of Spanish plant and animal introductions, those benefits were greatly overshadowed by the effects of another, largely one-sided biological exchange that spread deadly Old World diseases throughout the Americas beginning with the first landing of Columbus in 1492. Prior to that first landing, the native peoples of the Americas had developed for at least 12,000 years in isolation from such European diseases as measles, influenza, and smallpox. Consequently, resistance ... was extremely low ... and the effects of the many epidemics that soon raced through ... were devastating. Native American populations throughout the hemisphere declined by 66 to 95 percent during the Spanish Colonial period, and entire societies simply disintegrated under the pressures of depopulation."

C. Expansion of the Missionary Landscape into Southern Arizona

Pages 8 through 11 summarize the role of missionaries. While Pima County is now considered a part of the southwestern corner of the United States, it was within the northern reach of land visited by Jesuit missionaries who worked their way up from Sinaloa and southern Sonora (Pimeria Baja) to the Pimeria Alta -- the northern territory of Piman-speaking peoples -- with the goal of converting those they met to Catholicism along the way. In addition, the relationship of Native residents to the landscape changed. Later, in 1767, the Jesuit order was expelled from all Spanish colonies and the Franciscan order followed. The authors report that Pimans in the Santa Cruz Valley were so reduced in population that the Franciscans began to seek out the Tohono O'odham to the west of the Valley. By the late eighteenth century, the Tohono people were the largest part of the San Xavier del Bac and Guevavi mission communities.

D. The Hispanic Landscape of Isolation

Pages 11 through 13 of the report describe the landscape that Spaniards crossing the northern frontier of New Spain experienced, including the 1775 exploration by Juan Bautista de Anza to open the overland route to provide service to the Franciscan missions. The isolation of the Pimeria Alta from Mexico City, the challenges of rugged topography and climate, and ongoing hostilities for travelers probably all contributed to the view that Pimeria Alta was a far-flung outpost. Isolation from the economic community to the south during the Mexican era did not prevent residents of southern Arizona from becoming familiar with the growing Anglo-economy to the north. Detailed in the next section, the transition from Native to European land values led to a series of encroachments by Spanish and Anglo-Americans on Native American lands.

E. Dividing Up the Landscape: Land Grants and Homesteads

An overview of the land grant policies of the Spanish Colonial and Mexican eras is found on pages 13 through 16, followed by a comparison of the United States version of this practice codified in the 1862 Homestead Act. The authors make these points:

- "The source of conflict in all three periods [Spanish Colonial, Mexican and U.S.] lay in the fundamentally different conceptions held by Europeans and Native American of the human relationship to the physical landscape. For both Hispanics and Anglo-Americans, that relationship was defined by the principle of private property, the exclusive right of an individual to occupy and use land for personal benefit. ... For the Native Americans of southern Arizona, by contrast, the relationship of people to land had no formal definition, did not involve individual rights, and centered instead on the traditional association of a group of people with a loosely defined territory."
- "Gradually, the Spanish occupation of lands near the missions and in outlying areas was regularized, often with legal sanctions adapted to local circumstances, or official rewards for the continued efforts of Spaniards to colonize the region. For example, when the presidio at Tubac was reestablished in 1787, the new commander hoped to encourage Spanish settlement at the presidio by invoking a provision of the Royal Regulations of 1772, 'whereby those who wished to engage in agriculture could receive title to presidio lands in return for keeping arms and horses available for defense of the country.'"

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- "Such grants were made within the bounds of the four square leagues designated for each presidio. Along the Santa Cruz River, these grants frequently conflicted with earlier assignments of mission lands to Native Americans."
- "The largest of land grants to Hispanic settlers, and the ones that became significant as the bases of major Anglo-American cattle raising operations in the late nineteenth and early twentieth centuries, came at the start of the Mexican period. The grants were made, much like the grants of the Spanish Colonial era, with an eye to encouraging permanent settlement in an area that the central government knew was only tenuously a part of its territory. Almost all of the petitions for large grants were submitted in the 1820s, since by the 1830s most of southern Arizona outside the immediate area of the presidios was too plagued by Apache raids to allow further settlement."
- "The Spanish Colonial policy of granting land to settlers, a policy that continued basically unchanged in the Mexican era, had a practical successor in the land-granting policies of the U.S. government, which instituted a more egalitarian (theoretically, at least) and systematic land-distribution program throughout the American West. ... Following passage of the Homestead Act of 1862, parcels, subdivided into four 160-acre quarter sections, were provided at a nominal cost to anyone who would live on the land and farm it for five years."
- "The concept of a 160-acre self-sufficient farm, originating in the temperate East, failed in much of the arid West. ... The Desert Land Act of 1876 expanded the amount of land an individual could claim to 640 acres (a full section), provided that the land was brought into irrigation within three years."
- "Although the rate of failure of homesteads greatly exceeded the rate of success, successful and abandoned homesteads are found scattered throughout the state, including in Pima County."
- "Two other important land-distribution laws were passed by Congress [in 1862]. Both had a profound effect on Arizona, including the southernmost portion of the state. The first was the Pacific Railroad Grant. ... The second law was the Morrill Act, which provided large grants of federal land to state governments, to be used to support public systems of education. Today, state trust lands (as they are called in Arizona) represent a large portion of the public lands in Pima County. They also constitute one of the largest potential sources of urban sprawl in the county, since the lands must, by the provisions of the Morrill Act and its derivative legislation, be sold to the highest bidder. In the metropolitan portions of Pima County, the highest bidder is typically a private development company."

Living on the Land: Mining, Farming, and Ranching in the Historical Period

Pages 16 through 29 outline the history of mining, ranching and farming in Pima County. A description of the transition from gold and silver mining to copper mining, and the decline in the copper mining industry, is found on pages 17 through 20. Farming, and its various practices by Native American, Spanish and Anglo residents, is described on pages 21 through 23. Ranching and its impact on the landscape in southern Arizona is summarized on pages 24 through 29, including an explanation for the economic and environmental crisis that was caused by overgrazing and drought conditions at the end of the 1800s.

In general, all three enterprises were transformed by the arrival of the railroad in 1880 from small scale operations to large, heavily capitalized businesses that created conflicts with the natural resource base that we still have not reconciled today.

Landscapes of Mobility

The relation of transportation to the local economy and the various residents of Pima County is described. In brief succession, pages 29 through 33 explain how:

- Native American trails gave rise to trails used by Spanish and then Mexican presidio soldiers.
- Wagons with four wheels were introduced by Anglo-Americans, replacing pack horses and mules and creating the need for road maintenance in the 1800s.
- Wagon trains moved through southern Arizona during the California Gold Rush (late 1840s). After the Gadsden Purchase, heavy wagon freighting connected Arizona to the United States, by way of 20 mule teams pulling loads up to 18,000 pounds.
- Starting in 1858 transcontinental stage lines were available, particularly through the Butterfield Overland Mail operation. The railroad replaced cross-country wagon travel in the 1880s.
- Finally, railroads persisted as the dominant mode of transportation until after World War II, when automobiles and airplanes replaced trains as the dominant modes of transportation.

A 1927 cartoon from the *Arizona Daily Star* captures the plight of southern Arizona residents caught in the transition periods. Bemoaning the loss of "silent deserts with their ever changing moods" a rancher on a horse is run off a "high mountain ledge" by the impatient driver of a "lizzie" and the blast of its horn, which is a sound the cartoon translates to words as "hank, hank!" The cartoon concludes that there are no such places of vast solitude anymore since the invention of the car.

The Social Landscape

Pages 33 through 35 describe the shift in the majority population of southern Arizona from Native American to Hispanic to Anglo-American. An increase in Anglo-American population after 1880 led to a sharp decline in the overall percent of marriages between Mexican and Anglo-Americans, falling from approximately 23 percent in the 1870s to less than 10 percent by 1910. Distance between ethnic groups was soon reflected on the landscape as Native Americans, Mexican Americans and Anglo-Americans became concentrated as populations in certain areas of the urban setting.

The Sacred Landscape

Finally, there is a discussion on pages 37 through 49 of the way religious and ethical values of various cultures in southern Arizona are reflected on the landscape.

Recommendations

The report concludes by offering two recommendations to improve future research in the area of cultural resources.

- According to the authors, a useful tool for planners, cultural resource managers and social-historical researchers would result from digitizing homesteading records of the General Land Office and the population census schedules from territorial times up through the 1920s. A GIS layer of homesteading patterns, and census information on household composition, ethnicity, and occupation would allow detailed, broad studies to occur that currently can not be undertaken.
- Oral histories of migrants to southern Arizona after World War II have not been collected, although the post-war residents who came here seeking jobs and housing were the first in the steady population growth trend that has occurred since mid-century.

Conclusion

This brief history of southern Arizona, viewed in terms of the experiences of the Native American, Hispanic, Mexican and Anglo-American residents does support the view that our history is the story of conflicting views of land use and competition for the resource base. What is different now, in the year 2000, is our shared acknowledgement that this resource base is limited and in need of conservation and restoration. By quantifying the resource base through the study process of the Sonoran Desert Conservation Plan, and respecting the underlying land ethic of our diverse residents, our current land use decision making process holds the promise that we can go forward in a different and more thoughtful way.

Regional Synthesis of Cultural and Historical Resources

Pima County Sonoran Desert Conservation Plan

Cultural Landscapes of History in Southern Arizona

Submitted by

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Cultural Landscapes of History in Southern Arizona

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Europeans first set foot in what is now southern Arizona around 1539, thus inaugurating the historical period in the region. With the arrival of a society that would leave a written record of events, prehistory became history in southern Arizona, a transition that has long served as the basis for a division of labor between archaeologists and historians. Traditionally, archaeologists have studied the objects left behind by nonliterate Native Americans, and historians have studied the texts left behind by literate Europeans.

The discussion of the historical period presented here, which begins precisely with the arrival of Europeans to southern Arizona, makes the traditional assumption that what happened after that event is in some sense fundamentally different from what happened before it, at least in terms of the kinds of information left behind, and perhaps also in the way each period must be understood.

In reality, however, a neat watershed has never separated the original Native American world of southern Arizona, and the drastically transformed world that arose after the arrival of Europeans. European plants, animals, and diseases arrived to the region well ahead of European explorers, and Native American societies retained a major presence in the region long after European society came to dominate it. Underlying the changes wrought by both Native American and European cultures is the most constant presence of all, the unique and enduring landscape of southern Arizona.

The patterns left on the landscape by the succession of cultures that have struggled and thrived on it constitute a regional history that transcends any concern about when prehistory ends and history begins. It is the landscape that has determined the possibilities of culture in southern Arizona, and the discussion that follows outlines the distinct set of possibilities pursued by Europeans in southern Arizona since 1539.

Landscapes of Conquest

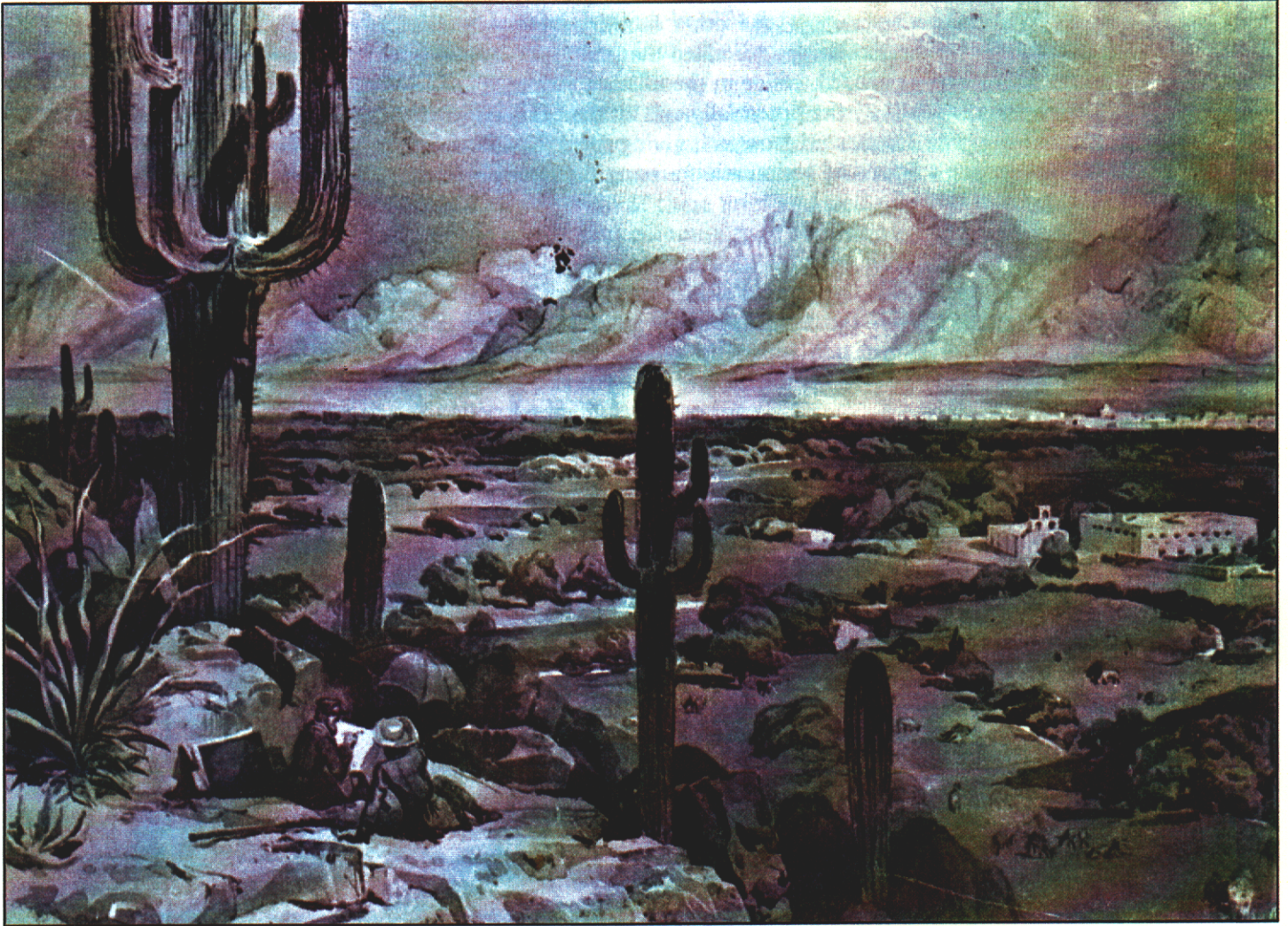
The first hint that the landscape of southern Arizona has played an important role in the history of the region can be found in the name of the region's largest city, Tucson. The modern place-name derives from the Northern Piman word *schookson* or *stjukshon* (actually written a variety of ways), meaning "at the foot of the black hill." This was the name of the Pima village first visited by the Jesuit Eusebio Francisco Kino as early as 1694, located at the foot of the volcanic hill of black basalt now known as Sentinel Peak or "A" Mountain, on the west bank of the Santa Cruz River. To modern Piman speakers the place-name still refers to the hill, but in the eighteenth century the name was adopted by the Spanish settlement that arose across the river, forever linking the identity of the city with one of the most prominent features in the surrounding landscape (Dobyns 1976:3-4; also see Barnes 1988:455).

This does not mean that a less topographical name for the Spanish settlement would have made a difference in its history. The Pima practice of referring to a village by its proximity to a prominent landscape feature (see Barnes [1988] for other examples) undoubtedly says something about Pima notions of what constitutes a place, but this was lost on Spaniards coming to the region. The usual Spanish way to name a place on the northern frontier was to take the indigenous name (its translation was of no concern) and append to it a saint's name, often the name of the saint on whose day in the ecclesiastical calendar the place was discovered. Thus, the Spanish name for a place had little to do with the place itself and much to do with how the place could be made to fit into the most overarching of Spanish systems, Catholicism.

The Pima village of Tucson was first named San Cosme del Tucson by Kino in 1698, was later named San José del Tucson in 1762 by Captain Francisco Elías Gonzales, after he relocated the Sobaipuri of the San Pedro Valley there, and finally came to be called San Agustín del Tucson, when the Franciscan friar Francisco Garcés dedicated a church there by that name around 1772 (Dobyns 1976:4, 20, 33). It is difficult to say how much these saints' names meant to the Pima living in the original Tucson, even after they became Catholics, but the name San Agustín had undoubted significance for the Spaniards who settled across the river after the presidio of San Agustín del Tucson was founded in 1775. San Agustín became the special patron of the Spanish settlement, his image was kept and prayed to in the succession of churches erected there, and his feast day, August 28, became one of the settlement's principal religious celebrations. San Agustín remains the patron saint of Tucson today.

But if the Spanish way of naming places was as meaningful and consequential to Spaniards as the Pima way must have been to the Pima, the contrast between the two also says a great deal about the cultural divide between Spaniards and Native Americans in southern Arizona. To Pima, it seems, a village was in some sense an extension of the landscape, and so its name referred to some part of the land associated with it. To Spaniards, native villages and Spanish settlements were not so much parts of a landscape as parts (or potential parts) of the vast political and spiritual endeavor of the Spanish empire. A place occupied by a village might already have a name, but that name was meaningless until a saint's name was added to it. Doing so made the place a part of the greater Spanish world, and the way the people of that place might be connected to the landscape around them was irrelevant, at least in determining this basic part of the identity of the place.

Spaniards conceived of their mission in the New World as a conquest, in every sense of the word: a military conquest, a spiritual conquest, and a social and economic conquest. This meant, in turn, taking control of each newly discovered region by force of arms, saving the souls of the natives for the Church, and incorporating the people and resources of the region into the social and economic system of greater Spain. The three goals were met with only variable success throughout the Americas; in what is now southern Arizona, the far northern frontier of New Spain, they were met with perhaps the most equivocal success. Nonetheless, the Spanish Colonial enterprise in northern New Spain was, by its own contention, a matter



Watercolor painting of Tucson and the Santa Cruz Valley by John R. Bartlett in 1852. The view is from Sentinel Peak (A Mountain) looking northeast. The buildings in the foreground are Mission San Agustín del Tucson.

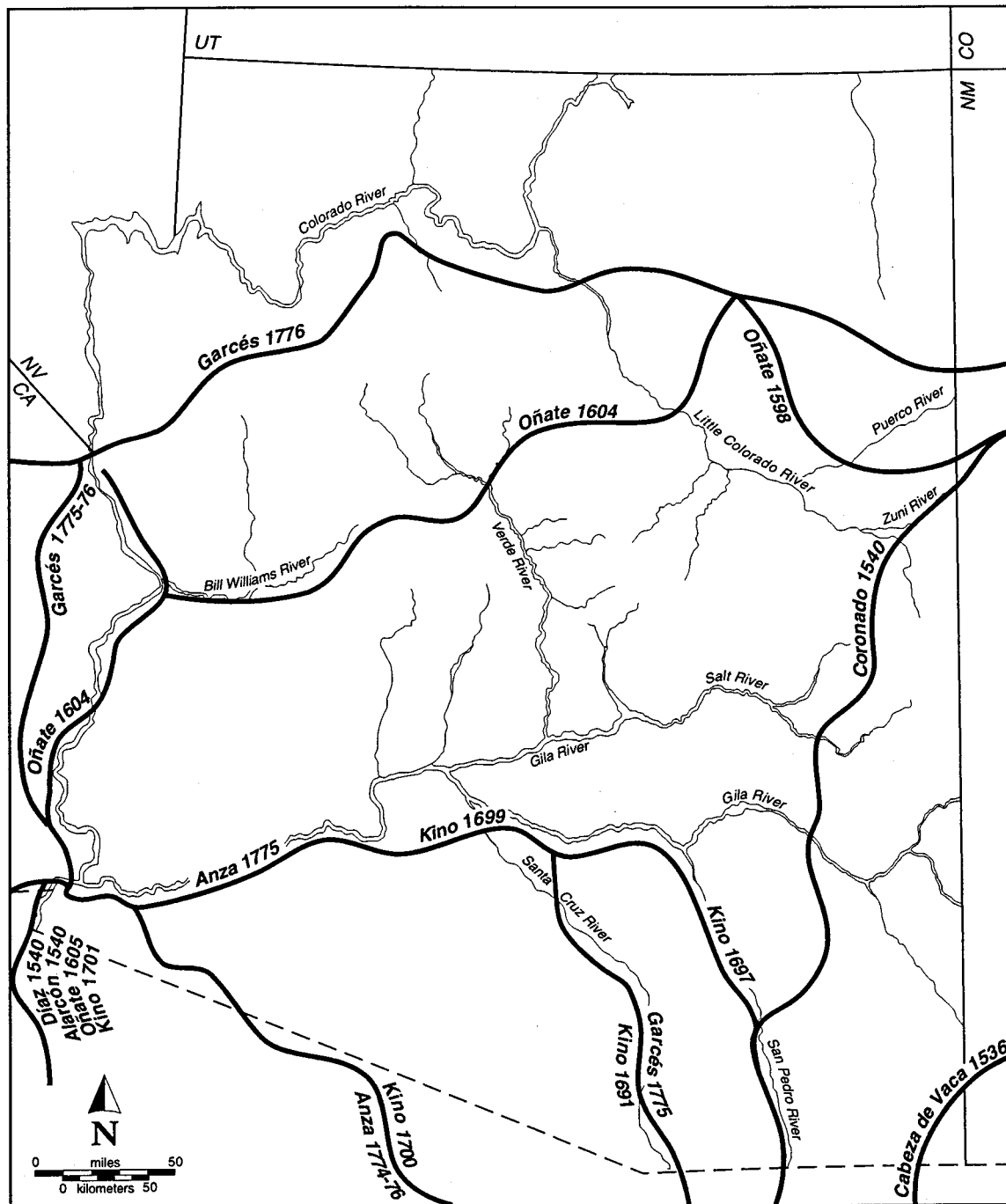
of conquest, of imposing a way of life on any people that it happened upon, and this process did not end even in 1821, when the region became a part of independent Mexico. The three centuries from the earliest Spanish *entrada* to Mexican independence are reasonably viewed as an extended, fitful, and never-complete process of conquest. The subsequent three decades that southern Arizona was a part of independent Mexico were, largely by default, an even more fitful continuation of the same process.

Nor did the conquest of southern Arizona cease with the incorporation of the region into the United States in 1854. Indeed, for the Apache, definitive military conquest came only three decades after the Gadsden Purchase. And the conquest that inevitably followed military subjugation, the more subtle and insidious conquest already experienced by other Native Americans in the form of social, cultural, and economic repression, only accelerated in the U.S. period. Patricia Limerick (1987) has argued that, if there is a unifying theme to the Anglo-American period in the West as a whole, it is not the expanding frontier of Anglo-American settlement and enterprise famously espoused by Frederick Jackson Turner (1994). Instead, it is conquest, or the confrontation of different ways of life and the ensuing struggles to determine which way of life—or which combination of ways of life of the many that have originated in or moved to the West—would prevail. “Western history,” Limerick (1987:27) writes, “has been an ongoing competition for legitimacy—for the right to claim for oneself and sometimes for one’s group the status of legitimate beneficiary of Western resources. This intersection of ethnic diversity with property allocation unifies Western history.”

Most pertinent to a consideration of the Anglo-American period in southern Arizona is the emphasis placed by Limerick on *place* as opposed to the single, monolithic *process* of the Turner frontier thesis. Although Limerick does not use the term, the frontier thesis was the essence of ethnocentrism, assuming from the start that the only things of significance in Western history were the successes and failures of the American way of life in its march westward. By abandoning the frontier thesis, “we gain the freedom to think of the West as a place—as many complicated environments occupied by natives who considered their homelands to be the center, not the edge” (Limerick 1987:26). Southern Arizona is one such “complicated environment,” one such landscape where history can examine how a variety of processes initiated by a variety of people for widely different reasons came to affect life in a particular place.

Discovering the Landscape: Early Spanish Exploration of Southern Arizona

The Hispanic experience in southern Arizona began as it had begun in so many other places in the New World following the arrival of Columbus, with exploratory journeys or *entradas* into the region by small groups of intrepid Spaniards accompanied by Native American guides (Figure 1). The earliest *entradas* into southern Arizona had little or no immediate impact on the region—no settlements were established, no resources were extracted, and interactions with the indigenous peoples were fleeting—but these journeys of exploration were nonetheless of



Routes of early Spanish explorers in southern Arizona.

great consequence to the subsequent history of the region. The information, accurate and otherwise, gathered in each *entrada* was inevitably the impetus for further *entradas*, then for religious missions, and eventually for attempts at settlement. Just as importantly, each successful *entrada* confirmed the feasibility and validity of the Spanish Colonial enterprise, the greater purposes of spreading the Catholic faith, expanding the wealth of the Crown, and bringing Spanish civilization to uncivilized places. An understanding of the Hispanic experience in southern Arizona begins with an appreciation of this remarkable impulse to explore and expand, an impulse pursued at a scale without precedent in human history.

The first directly documented Spanish *entrada* into what would become southern Arizona came in 1539, when a Franciscan friar named Marcos de Niza led a small expedition northward from the town of Culiacán, in what was then northernmost New Spain, to the vicinity of the pueblo of Zuni, in what is now western New Mexico. It is uncertain that Fray Marcos himself made it as far north as Zuni, but he likely did pass through southeastern Arizona, traveling along a stretch of the San Pedro River and reaching the Gila River before returning to Culiacán. His only non-Native American companion for most of the northward journey was a North African called Esteban. Esteban did reach Zuni, where he was met with hostility and quickly dispatched with arrows.

Fray Marcos' expedition was commissioned by the newly appointed viceroy of New Spain, Antonio de Mendoza, in an effort to gather knowledge of the northwestern frontier of the colony. Mendoza was especially interested in confirming reports that somewhere to the north lay the Seven Cities of Antilia, legendary places of high culture and fabulous wealth to rival Tenochtitlan, the Aztec capital in central Mexico conquered by Fernando Cortés in 1521. Interest in the Seven Cities had recently been piqued by the arrival at Culiacán of Alvar Núñez Cabeza de Vaca and his companions, who had spent the preceding eight years wandering the northern deserts after being shipwrecked on the coast of Texas. The doomed Esteban had been among Cabeza de Vaca's party, which may have passed through southern Arizona at some point, although their route is impossible to reconstruct precisely. Esteban was chosen for Fray Marcos' expedition based on his knowledge of the northern deserts and his presumed skills in dealing with the indigenous peoples, skills that failed him in the end.

The most important product of the first *entrada* into Arizona was Fray Marcos' subsequent report to Antonio de Mendoza, which to many people confirmed the existence of the Seven Cities, thenceforth the Seven Cities of Cibola, the name for Zuni heard by Fray Marcos. Based on Fray Marcos' glowing descriptions of Cibola, a much more substantial *entrada* was commissioned by Mendoza in 1540, led by Francisco Vázquez de Coronado and consisting of some 300 Spaniards, 1,000 Native American guides and porters, and 1,500 head of cattle, horses, and mules. Fray Marcos was one of five friars accompanying Coronado, and he served as principal guide as far as Cibola, where the hopes of Coronado and his companions were bitterly disappointed. Much of Coronado's route, which eventually led him as far as the Great Plains, is difficult to reconstruct, but he, too, passed through southeastern Arizona, probably also traveling along a portion of the San Pedro River. Over the next two years, Coronado's



"Anza's Expedition Leaving Tubac, 1775"
Painting by Cal Peters

lieutenants made numerous exploratory side trips, including at least a dozen into Arizona, but none of these trips included further exploration of the southeastern portion of the state.

Despite the success of the Coronado expedition in exploring a vast area and collecting a great deal of potentially useful information, its failure to find anything remotely like the legendary Seven Cities led to a near hiatus in exploration of Arizona for the next century and a half. The occasional Spanish expedition did enter Arizona during this period from northern New Mexico, where a permanent Spanish settlement was founded at Santa Fe by 1610. These expeditions gathered information and made contacts with indigenous peoples in various parts of the state, but none of them extended south of the Gila River, with the exception of the expedition of Juan de Oñate to the mouth of the Colorado River in 1604. Intensive exploration of southern Arizona did not begin until late in the seventeenth century and corresponded with the efforts of the Jesuit father Kino to extend the Jesuit missionary effort northward from established bases in what is now Sonora.

New Plants, New Animals, New Diseases

If the most obvious impact of the Spanish exploration of southern Arizona was not on the peoples and places encountered by explorers but on other Spaniards thus enticed to enter the region, a more subtle process initiated by the earliest *entradas* was ultimately of even greater significance. This was the process of biological and technological exchange that began the moment Europeans first arrived to the New World, a process that likely affected the native peoples of southern Arizona even before Spaniards set foot in the region. Sheridan (1995:23) has characterized the earliest *entradas* into Arizona as "little more than ripples on the surface of a deep dark lake," in comparison with events of less immediate historical interest but of much greater long-term impact, such as "the exchange of seeds, the theft of a horse herd, the introduction of an iron plow." The introduction of the plow to southern Arizona probably had to wait until Jesuits actually carried one there and showed the locals how to use it, but Spanish crops and domestic animals were already a part of Native American lives when Kino first visited the region at the end of the seventeenth century. For example, Kino's military escort, Captain Juan Mateo Manje, reported that watermelons and muskmelons were being grown by the Pima along the Santa Cruz River in 1697. Both crops were Spanish introductions to the New World but had evidently entered the area well in advance of Spanish expeditions (Ezell 1961:32). In more dramatic fashion, the Apache had long since incorporated the horse into their seminomadic, raiding way of life. Ironically, Spaniards first brought horses to the New World to aid in its conquest, but the early acquisition of horses by the Apache, either by theft or happenstance, soon turned this previously pedestrian people into a formidable and enduring threat to Spanish control of the northern frontier (see discussion of the Apache in another section of the cultural resources overview prepared for the Sonoran Desert Conservation Plan [SDCP]: *The People of Southern Arizona, Past and Present*).

The Pima of the Santa Cruz Valley were long-accomplished farmers when Father Kino first entered the region, but they also depended heavily on the resources they could extract from the surrounding desert. They lived lives of variable sedentism, settling in villages along the river to farm for part of the year, but then dispersing to scattered parts of the surrounding region to hunt and gather a wide variety of animals and plants. One important reason the Pima did not rely exclusively on agriculture for their food was a climactic one: the elevation of the Santa Cruz Valley meant that for several months each winter, the likelihood of frost made planting a winter crop an unacceptable gamble. Corn, beans, and squash, the three major native cultivars, all lacked the tolerance to frost necessary to survive a typical winter. Because of this vacant niche in the agricultural cycle, the Pima were especially receptive to the introduction of the principal Spanish cultivar, wheat, which was highly frost tolerant and made living and farming year-round on the Santa Cruz feasible. The increased yields from agriculture created by adding wheat to the cycle also made larger settlements possible, which became a defensive consideration as Apache raiding intensified in conjunction with the influx of Spaniards into the region. Wheat was first introduced to the Santa Cruz Valley by Kino in the 1690s, but it probably did not become a major part of the Pima's diet until the 1730s, when permanent missions were finally established at Guevavi and San Xavier del Bac. Nonetheless, by the middle of the eighteenth century wheat was a major Pima crop along the Santa Cruz, and by the 1770s it had become a major crop even along the Gila River, beyond the sphere of direct missionary influence (Sheridan 1988).

As much as any other factor, it was the Pima's own recognition of the potential role of wheat in their diet that led to its enthusiastic adoption, but the increased sedentism allowed by growing wheat played perfectly into the Jesuits' plans to transform the Pima way of life from one of "pagan intransigence" (Sheridan 1988:156) to one of Christian stability. The flexibility in settlement pattern required by the Pima in their seasonal reliance on hunting and gathering was viewed by the Jesuits as a major obstacle to be overcome by the missions, and the introduction of European crops was a logical first step in making sedentary life both feasible and desirable. At least in this one aspect of the missionizing process, the motivations of Pimas and Jesuits seem to have coincided. In addition to wheat, the Pima benefited from the introduction of a vast array of Spanish cultivars, including legumes such as garbanzos and lentils, vegetables such as cabbage, onions, garlic, and leeks, herbs such as mustard, mint, anise, and pepper, and fruits such as grapes, apples, peaches, quinces, plums, pomegranates, apricots, and figs. As Sheridan (1988:157) puts it, "Thousands of years of Old World experience and experimentation were suddenly placed in Piman hands." Needless to add, by the time the Jesuits arrived to southern Arizona, Europe as a whole was already benefiting from thousands of years of New World agricultural experimentation, as the many cultivars native to the Americas (most notably, corn and potatoes) had quickly become integral parts of many European diets and economies.

In southern Arizona, the Apache were the native people perhaps most transformed by the introduction of a Spanish domestic animal, but Spanish livestock had a significant impact on the Pima as well. In 1699, Captain Manje reported that horses were being kept by the native

Sobaipuri of the San Pedro Valley, and by the early 1700s, herds of horses, cattle, sheep, and goats had been started at a number of Pima settlements by the Jesuits (Sheridan 1988:159–160). Horses were the first introduction to play a significant role among the Pima, serving both as beasts of burden and as weapons in their perpetual struggles with the Apache. Cattle, goats, and sheep spread more slowly and generally under missionary supervision, but their impact on the Pima economy was greater. Sheridan (1988:161) notes that these three domestics were especially important because they “converted grasses and other plants which humans could not eat into meat, cheese, and milk,” and so provided a reliable source of animal protein. If the Pima were obliged to give up much of their earlier hunting-and-gathering use of the desert by the adoption of year-round agriculture, they partially recovered such use, indirectly, by the adoption of grazing animals.

Whatever the benefits enjoyed by the native peoples of southern Arizona as a result of Spanish plant and animal introductions, those benefits were greatly overshadowed by the effects of another, largely one-sided biological exchange that spread deadly Old World diseases throughout the Americas beginning with the first landing of Columbus in 1492. Prior to that first landing, the native peoples of the Americas had developed for at least 12,000 years in isolation from such European diseases as measles, influenza, and smallpox. Consequently, resistance to Old World diseases was extremely low among Native Americans at the time of first contact, and the effects of the many epidemics that soon raced through the Spanish colonies, especially the epidemics of smallpox, were devastating. Native American populations throughout the hemisphere declined by 66 to 95 percent during the Spanish Colonial period, and entire societies simply disintegrated under the pressures of depopulation (Crosby 1972; Sheridan 1995:23–24).

There has been considerable debate about the effects and timing of epidemics among the native peoples of southern Arizona. Certainly the first effects were felt before permanent Spanish settlements arose in the region, and at least a few archaeologists speculate that the demise of the prehistoric Hohokam people is attributable to the arrival of European diseases. The usual end date given for the Hohokam occupation of southern Arizona is A.D. 1450, but the archaeological chronology has enough room for error to make a close correspondence between the end of the Hohokam and the arrival of European diseases a possibility worth considering. Reff (1990:279–280) has attempted to reconstruct the origin and course of epidemics in northwestern New Spain during the early colonial period and concludes that the region experienced the same rapid and devastating depopulations in the sixteenth century that had been experienced in the core areas of the Spanish colony, central Mexico and Peru. He stops short of attributing the Hohokam collapse primarily to the effects of disease, but he does see processes of change that began in late prehistoric times as likely exacerbated by epidemics in the first century or more of the colonial era.

Perhaps more significant is Reff’s conclusion that it was the demoralization of Native American communities through epidemics and severe depopulation that enabled the early missionizing efforts of the Jesuits in northwestern New Spain to succeed. Having suffered repeatedly from

the effects of epidemics, the Native Americans of the region often responded favorably to the Jesuit programs of conversion, resettlement, and agricultural change because they were desperate for a solution to what they themselves perceived as disintegrating social, cultural, and economic systems (Reff 1990:277-278, 1998). But Jesuit (and later, Franciscan) attempts to restructure Native American society in northwestern New Spain ultimately failed because Native American populations never stopped declining. And if an acceptance of social change was at first a response to increased mortality, increased mortality was soon the price of accepting social change. Jackson (1994) has stressed that epidemic disease, while the major factor in Native American population decline, was never the sole factor. The missionary institutions brought to the frontier and imposed on the local people ostensibly for their benefit were themselves devastating to Native American ways of life, often intentionally so. The physical and psychological stresses suffered by Native Americans under the missionary system contributed substantially, if not always measurably, to the decline of Native American populations throughout New Spain, and the Piman-speaking peoples of what is now southern Arizona were not exempt from these effects.

Expansion of the Missionary Landscape into Southern Arizona

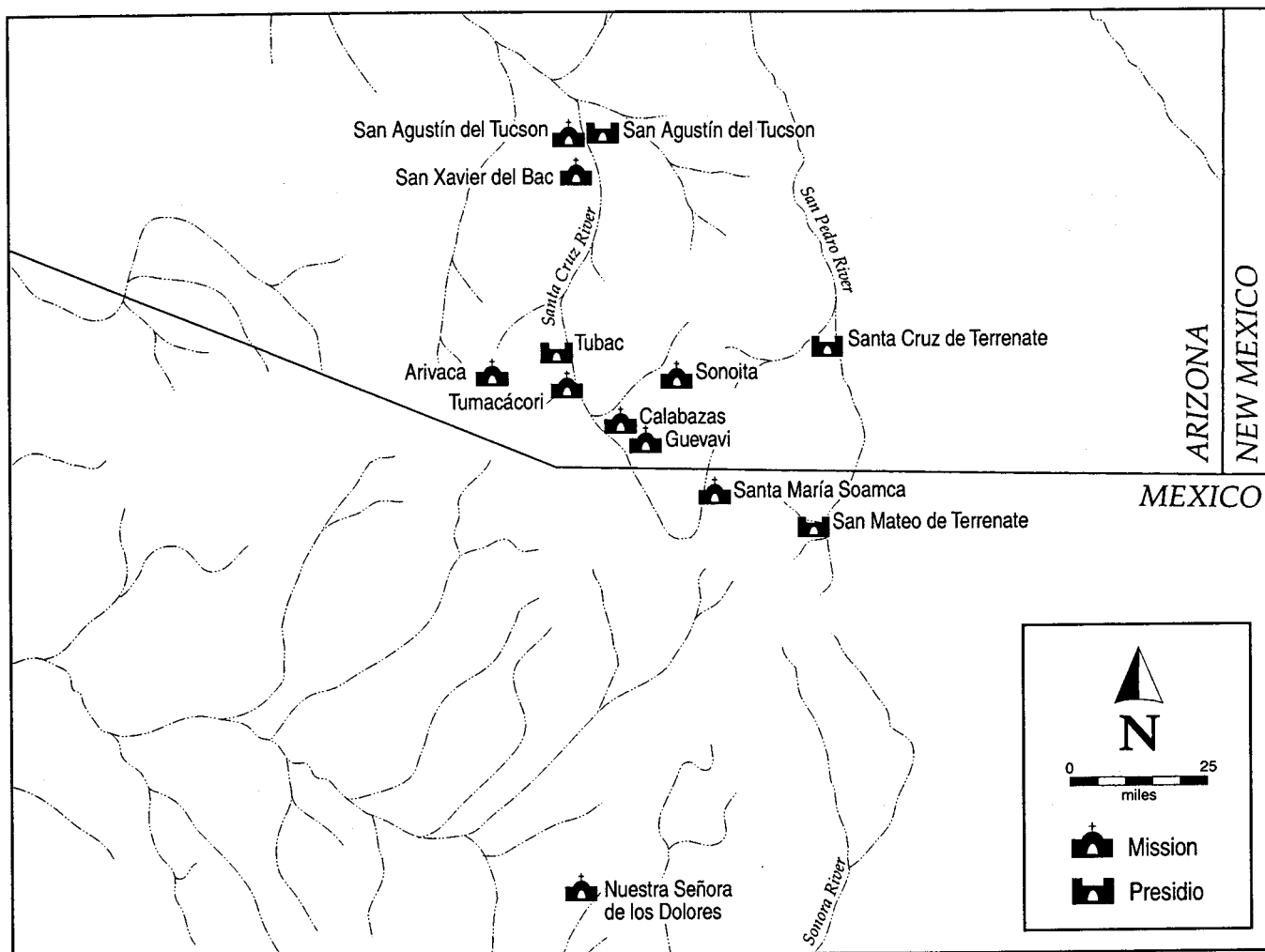
The Spanish missionary effort in northwestern New Spain began in 1591, when two Jesuit fathers were sent from Mexico City to a small Spanish settlement along the Río Sinaloa, in what is now the Mexican state of that name, to begin the conversion of the indigenous people of the region. From this modest start, the Jesuit order soon expanded northward, founding missions in the succession of river valleys that drain the western slopes of the Sierra Madre Occidental. Occasionally, the people they encountered staunchly resisted their efforts to introduce Catholicism and a Hispanic way of life, but more often the presence of the Jesuits was accepted or at least tolerated. By the 1620s, Jesuit missions extended well into the Pimería Baja, the "lower" or southern portion of the territory of the Piman-speaking peoples, in what is now northern Sinaloa and southern Sonora. The Pimería Baja would occupy the Jesuits for the next 65 years, after which the order finally expanded into the northern portion of Piman-speaking territory, the Pimería Alta, an expansion made possible largely by the efforts of Eusebio Francisco Kino (Bannon 1955; Ortega Noriega 1985a).

Born and educated in northern Italy, Kino arrived in Mexico as a Jesuit in 1681. His first assignment was to accompany a military expedition to Baja California, where he served both as cartographer and as minister to the Native Americans subdued by the expedition. The attempt to establish a Spanish settlement in Baja California was ultimately unsuccessful, and Kino was eventually selected to direct the expansion of the mainland Jesuit frontier into the Pimería Alta. He began by establishing a series of missions extending up the principal rivers of the region, most notably the mission of Nuestra Señora de los Dolores at the headwaters of the Río San Miguel, near the modern city of Magdalena, Sonora. Founded in 1687, Nuestra Señora de los Dolores served for the next 24 years as Kino's base of operations, the starting point of his famous expeditions into the northern Pimería Alta that led to the founding of missions along the Santa Cruz River (Ortega Noriega 1985b).

Kino's first entry into what is now Arizona came in 1691, when he reached the Native American settlement at Tumacácori on the Santa Cruz. Over the next 10 years, he made numerous trips up the same river, as far north as the ruins of Casa Grande, and eventually traveled down the Gila River to its confluence with the Colorado. Kino was interested in finding both new territory to missionize, which he found in abundance in the Pima villages along the fertile Santa Cruz, and a land route to Baja California, which would ease the transport of supplies and livestock to fledgling missions there. After a series of arduous trips into the deserts south of the Gila, Kino eventually convinced himself that there was a land route to Baja California, but his claimed discovery was viewed with skepticism until years after his death in 1711. It was the opening of a vast new area to Jesuit missionizing, and Kino's subsequent direction of that missionizing effort, that became his most enduring contributions (Hartmann 1989:36-56; Ortega Noriega 1985b).

In 1731, 20 years after Kino's death, the first permanent Jesuit missions were established at the Pima villages of Guevavi and Bac along the Santa Cruz (Figure 2). Each of the two missions was a *misión cabecera*, a primary mission with a resident Jesuit priest who ministered to Native Americans both at the *cabecera* and at two or three nearby dependent *visitas*, smaller settlements without resident priests. Earlier attempts at establishing missions at both Guevavi and Bac during Kino's lifetime had failed, but now the Jesuits succeeded in instituting basically the same missionary program already in place at the many Jesuit missions to the south. The basic goal of the Jesuit mission was the conversion of Native Americans to Catholicism, but the pursuit of that goal along the Santa Cruz River, like its earlier pursuit elsewhere in northwestern New Spain, involved changing the lives of the local Native Americans in a fundamental way, convincing them not only to abandon their religious beliefs but to alter the nature of their association with the landscape around them.

The keystone in the Jesuit effort to convert Native Americans was the *reducción*, literally "reduction," the gathering of Native Americans into permanent communities "for more efficient and effective administration, both spiritual and temporal" (Polzer 1976:7). In the communities formed by *reducción*, Native Americans were instructed in the faith, encouraged to abandon practices incompatible with Catholicism, monitored as to their genuine acceptance of Catholic doctrine, and put to work in projects for the communal good, most notably constructing and maintaining irrigation systems. The success the Jesuits had in convincing the Native Americans of northwestern New Spain to participate in *reducción* varied widely, from violent rejection to peaceful acquiescence, but the Pima of the Santa Cruz Valley were generally amenable to the process. The precise reasons for their apparent acceptance of this most basic of Jesuit demands were complicated. The constant threat of Apache raids undoubtedly made the Jesuits and the Spanish military escorts who accompanied them appealing as potential allies. The agricultural regime introduced to the region by the Jesuits, with its livestock, wide variety of cultivars, and dependable winter crops, must also have appealed to people living in a demanding and inconsistently productive environment. And there is the real possibility, already noted, that the Pima way of life at the end of the seventeenth century was already so devastated by the impact of European diseases that the Pima would accept any change that would bring stability to their lives.



Selected Spanish Colonial sites in the Pimería Alta.

Whatever factors influenced the original decisions of the Pima, the Jesuit mission settlements at Guevavi and San Xavier del Bac became permanent homes for many of them for much of the remainder of the eighteenth century. They were baptized there, participated in the religious life of the mission (to the degree that the resident Jesuit saw fit), and farmed mission lands using both indigenous and Spanish crops and methods. But beyond the adoption of Spanish agriculture and the rudiments of Catholicism, it is impossible to say how much their new lives actually reflected a conversion to a Hispanic way of life, and this is even more the case for the Pima settled in or near dependent *visitas* such as Tucson and Arivaca. In addition, almost nothing is known about the impact of the missions on the Pima's use of areas away from the main rivers, the areas once frequented in the Pima seasonal round. The enthusiasm with which the Pima adopted wheat farming and livestock raising at the missions suggests that at least the seminomadic aspects of their way of life were quickly abandoned, but Pima culture consisted of more than the routines of subsistence. According to Reff (1990:268–271), native acceptance of Jesuit teachings—religious, social, and economic—throughout northwestern New Spain was at best superficial, and even a century or more after initial contact, Jesuits would complain about the continuing difficulties in transforming native lives. In the northernmost Pimería Alta, where the Jesuit presence was more tenuous than anywhere else in the northern borderlands, the veneer of Catholicism and Hispanicism must have been especially thin.

The Jesuit missionary effort in northwestern New Spain differed in a number of significant ways from earlier missionary efforts by other orders elsewhere in the colony, and these differences had their effects in the northern Pimería Alta. One major difference can be found in the character of the Jesuit order itself. Founded in 1536, the Society of Jesus was the youngest of the major orders to proselytize in New Spain and had attracted an especially devoted and well-educated group of young men to its ranks. Jesuit devotion included a genuine concern for the well-being of the native people placed in their charge, which frequently led them to shield the natives from the abuses of ordinary Spaniards eager to exploit their labor. "The Jesuits," Reff (1990:7) writes, "largely were free of the vices that characterized their countrymen." A basically humane approach to their dealings with the natives (there were exceptions, of course), combined with an emphasis on learning native languages and understanding native customs, was an important factor in the success of the Jesuits in expanding their missions over such a vast area in a relatively short period of time.

Another important difference between the Jesuit enterprise and earlier missionary efforts was the nearly exclusive access to native populations that the Jesuits enjoyed, especially in the northern reaches of the Pimería Alta. In central Mexico, by contrast, the first Spanish institution that many native people were exposed to was the *encomienda*, which placed the Native American population of a given region at the disposal of a private Spaniard (usually a former conquistador). In theory, the Native Americans would simply pay tribute to the Spaniard, but in practice the tribute took the form of forced labor in the Spaniard's mining or agricultural ventures. The encomienda practice was responsible for the early deaths of tens of thousands of Native Americans in central Mexico and elsewhere in the New World and had

largely ceased to be royal policy by the time the Jesuits began their efforts in northwestern New Spain (Weber 1992:124–125). Elsewhere in New Spain, including much of northern Mexico, missionization occurred simultaneously with the expansion of secular Spanish enterprises, most notably mining. Missionary orders such as the Franciscans often had to recruit natives in competition with mining operations, and to negotiate for the rights to native labor. But in the Pimería Alta, the Jesuits were almost always the vanguard of Spanish exploration and settlement. Private Spanish interests would eventually arrive to compete with a Jesuit mission for land and labor, but usually after the mission had chosen lands for itself, established relations with the local Native Americans, and generally made itself the principal Spanish presence in the region (Atondo Rodríguez and Ortega Soto 1985).

Following the expulsion of the Jesuits from all Spanish colonies in 1767, the Franciscan order inherited the Jesuit system of missions in northwestern New Spain and pursued largely the same policies of *reducción* and conversion, except that a severely dwindling Pima population forced the Franciscans to look elsewhere for new converts. They found them primarily among the Tohono O'odham, the Piman speakers of the vast desert region to the west of the Santa Cruz Valley. Coaxed into becoming sedentary river farmers, the Tohono O'odham became the largest component of the native populations at Guevavi and Bac beginning in the late eighteenth century. Life at the Franciscan missions was relatively benign for them, especially compared with the fate of Native Americans living in the Franciscan missions soon established in Alta California. Jackson (1998:78) notes how the Franciscans placed much heavier demands for labor on the natives in the Alta California missions than they ever placed on the natives in southern Arizona, and the California natives suffered accordingly. The difference in the Santa Cruz Valley was due to less ambitious Franciscan architectural projects, a more intermittent Franciscan presence at the missions, and less reliance on mission production by the local Spanish military.

The Hispanic Landscape of Isolation

Sheridan (1992:158) has suggested that Spaniards across the northern frontier of New Spain faced four major challenges: distance, aridity, rugged topography, and hostile Native Americans. The Spanish inhabitants of colonial-period southern Arizona, both missionaries and *vecinos* (ordinary non-Indians), faced their full share of all four challenges, but perhaps the most enduring and pervasive was the first, distance. For the Spaniards of the northern Pimería Alta, the dominant sense of place was undoubtedly one of remoteness, of sheer physical removal from the social, cultural, economic, and political center of New Spain in Mexico City. The colonial capital was itself remote from the epicenter of Spanish life in Spain, which only exacerbated the isolation of the northernmost frontier of the colony. This was the "rim of Christendom," as Bolton (1984) aptly characterizes the region first explored by Kino in the late seventeenth century, the last outpost of Hispanic civilization in North America. In 1775, Juan Bautista de Anza, commander of the Tubac presidio, led a group of Spanish settlers to San Francisco Bay, crossing the formidable western desert and thus opening an overland route to

service the Franciscan missions that were beginning to be established on the Alta California coast, an even more remote extension of the Spanish empire previously reached only by sea. But the road to California was soon closed due to the hostility of the Yuman-speaking peoples of the lower Colorado River valley, and after a few years southern Arizona resumed its status as an isolated cul-de-sac of the colony (Weber 1992:248–258).

Sheridan (1995:22), describing the early-nineteenth-century world of the Akimel O'odham, or Gila River Pima, calls it "a world perched on the periphery of a periphery." The Akimel O'odham probably viewed their world in somewhat different terms, but Sheridan's phrase neatly captures the state of the Spanish world that lay just south of the Gila at the end of the colonial period. It was indeed "the periphery of a periphery," both in the view of the small but hardy group of Spaniards that had managed to make homes for themselves there, and in the practical sense of the social and economic connections that shaped their lives. On the eve of Mexico's independence from Spain, the far northern frontier of the colony was as remote as ever from the center of the colony. As Sonnichsen (1982:29) puts it, "To the Tucson *vecinos* in 1820, the outside world barely existed." As an example of their predicament, the people of the frontier were legally bound to trade only within the Spanish colony, yet their position at the tail end of colonial trade routes made the price of goods brought from central Mexico exorbitant, and the price of goods sent to central Mexico uncompetitive. The frontier Spaniards responded by relying heavily on local trade, and on material goods produced locally, such as Native American pottery (Barnes 1984).

If the Spanish Colonial period was characterized by a southward-looking perspective that made Pimería Alta a far-flung outpost, the Mexican period saw a shift northward in this perspective as the influence of the centralized authority in Mexico City quickly waned following Mexican independence. The lessening of involvement by the central government was partly by design—there were far more urgent demands on its resources—and partly because of a simple inability to exercise its authority at such a distance. An important consequence of the increased independence of the frontier was its *de facto* opening to foreign trade. As the economic system of the United States grew exponentially in the first half of the nineteenth century and expanded westward, the Mexican citizens residing in frontier settlements from Texas to California increasingly found Anglo-American buyers for their beef, hides, and grain. Mexican laws were passed to discourage such interaction, but there was little chance of enforcement. Ironically, as the economy of central Mexico suffered the aftermath of the extended war for independence, the humble settlements on the northern frontier enjoyed a relative prosperity (Weber 1982:147–157). Southern Arizona, the most isolated region in terms of access to transportation routes (remotest California could always rely on the sea), benefited less than the rest of the frontier, but by the end of the Mexican era the inhabitants of the region were well acquainted with the advantages of the U.S. economy.

As the connections to the Anglo-American economy gradually grew, other changes in the structure of frontier society had their impact on both Hispanic and Native American people.

After the Spanish-born Franciscans were expelled from Mexico in 1528, Hispanic encroachment on the agricultural lands assigned to Native Americans at the missions along the Santa Cruz immediately increased. At the Pima village of Tucson on the west bank of the river, the departure of the Franciscan Rafael Díaz prompted Hispanics to begin either buying Native American parcels for nominal sums or simply taking lands as they pleased. During the same year, Antonio Comadurán, commander of the Tucson presidio, arranged for the sale of a large tract of land granted to the peaceful Apache along the west bank of the Santa Cruz, just north of the presidio, to his brother-in-law. The payment offered to the Apache and supposedly accepted by them amounted to about 100 pesos, a pittance. Despite petitioning for lands elsewhere, the Apache who lost their home never found a new one (Officer 1987:114–115). To the south and west of the Santa Cruz, in the valleys of the Altar and Magdalena Rivers, the Tohono O'odham soon responded violently to similar mistreatment at the hands of recently settled Hispanics (Officer 1987:130–133). The increasing pressures of depopulation, the decline of Franciscan influence on the Mexican government, and continuing Hispanic encroachment on mission lands nearly ended the long association of Piman speakers with the missions of the Santa Cruz during the Mexican period.

Dividing Up the Landscape: Hispanic Land Grants and Anglo-American Homesteads

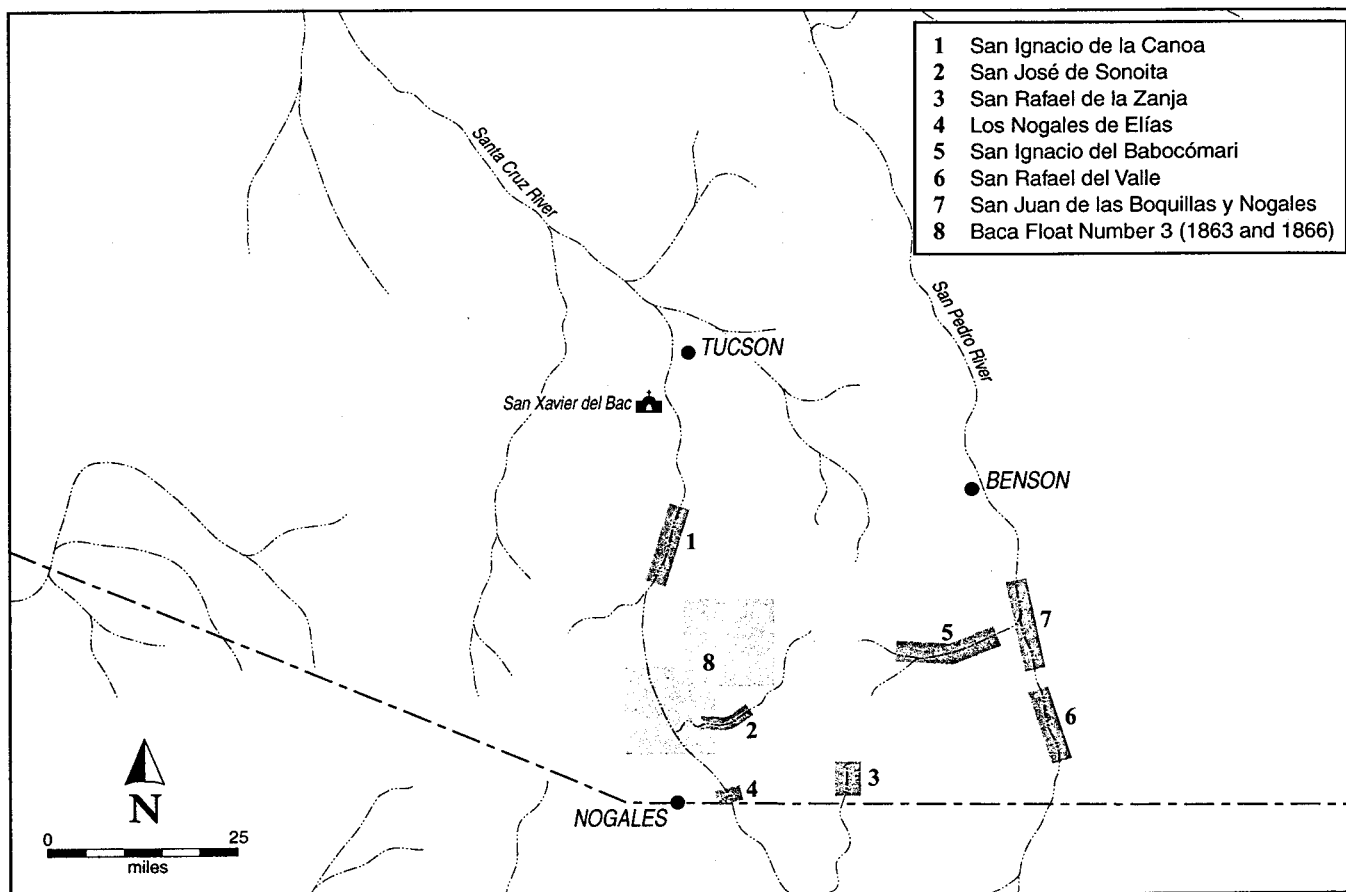
Hispanic encroachment on Native American lands was a constant problem during the Spanish Colonial and Mexican periods in southern Arizona, just as Anglo-American designs on Native American lands were a constant feature of the U.S. period. The source of the conflict in all three periods lay in the fundamentally different conceptions held by Europeans and Native Americans of the human relationship to the physical landscape. For both Hispanics and Anglo-Americans, that relationship was defined by the principle of private property, the exclusive right of an individual to occupy and use land for his personal benefit, and to dispose of that land as he saw fit. This relationship was guaranteed, at least in theory, by the highest sovereign authority, either the crown or the federal government. For the Native Americans of southern Arizona, by contrast, the relationship of people to land had no formal definition, did not involve individual rights, and centered instead on the traditional association of a group of people with a loosely defined territory. The following paragraphs briefly consider how the Hispanic conception of land ownership was made to fit a region where no formal system of ownership had ever existed.

The legal authority under which initial Spanish settlement along the Santa Cruz River took place is poorly understood. Spanish concepts of land tenure were, of course, meaningless to the Pima living in the area, but Spanish law, at least in theory, required that occupation of any part of the Spanish empire (or of any region not yet claimed by the empire) by a Spanish subject first be authorized by the Crown (Radding 1997:175–182). The settlement of Spaniards along the Santa Cruz should have been preceded by some form of legal sanction, but in the first half of the eighteenth century, in this most remote portion of the empire, such was rarely the case.

Even the Jesuit establishment of missions and the assumption of jurisdiction over surrounding areas was authorized only in the vaguest terms. When Spanish "civilians" began arriving in the area, they generally settled on mission lands, usually near the mission proper but occasionally well removed from it, with the informal permission of the mission cleric. Elsewhere in the northern territories, Jesuits and civilians were already at odds over rights to lands and settlement, but in the Santa Cruz Valley, as John Kessel (1970:99) puts it, "Common defense and isolation drew Padre and settlers together."

Gradually, the Spanish occupation of lands near the missions and in outlying areas was regularized, often with legal sanctions adapted to local circumstances, or official rewards for the continued efforts of Spaniards to colonize the region. For example, when the presidio at Tubac was reestablished in 1787, the new commander hoped to encourage Spanish settlement at the presidio by invoking a provision of the Royal Regulations of 1772, "whereby those who wished to engage in agriculture could receive title to presidio lands in return for keeping arms and horses available for defense of the country" (Officer 1987:66). Such grants were made within the bounds of the four square leagues designated for each presidio (Jones 1979:194). Along the Santa Cruz River, these grants frequently conflicted with earlier assignments of mission lands to Native Americans. Under Spanish law, Native American communities were also legal holders of land, although Native American lands were considered to be held in common by a group, and the right to ownership was based on historical association with a given parcel. Although Native Americans could and did resort to the colonial legal system to protect their Spanish-given rights, they were invariably at a disadvantage when tangling with private Spanish interests (Radding 1997:171-207). The remoteness of southern Arizona, which generally limited the Native Americans' recourse to either the mission father or the presidio commander, only exacerbated that disadvantage.

The largest of land grants to Hispanic settlers, and the ones that became significant as the bases of major Anglo-American cattle-raising operations in the late nineteenth and early twentieth centuries, came at the start of the Mexican period (Figure 3). The grants were made, much like the grants of the Spanish Colonial era, with an eye to encouraging permanent settlement in an area that the central government knew was only tenuously a part of its territory. Almost all of the petitions for large grants were submitted in the 1820s, since by the 1830s most of southern Arizona outside of the immediate area of the presidios was too plagued by Apache raids to allow further settlement. The grants petitioned for were often vast. San Ignacio de la Canoa, the earliest grant (approved in 1821), was typical in size, covering four *sitios* (about 17,000 acres) along a prime segment of the Santa Cruz River, from the presidio at Tubac to modern Sahuarita. Other grants were as small as 5,100 acres, the final confirmed size of San José de Sonoita, which extended along Sonoita Creek just west of modern Patagonia. The largest confirmed grant of the era falling wholly within Arizona was San Ignacio del Babocomari, extending over some 35,000 acres along Babocomari Creek, a tributary of the San Pedro River (Officer 1987:106-110; Sheridan 1995:127-129; Wagoner 1975:159-241).



Selected Mexican land grants in southern Arizona.

Another land grant in the Santa Cruz Valley deserves particular mention because of its unique origin and late confirmation date. This was the Luis María Baca Float No. 3, one of five vast parcels granted to the Baca family as compensation for an enormous grant they had won but were forced to abandon in New Mexico. The original grant was made in 1821 by the Spanish crown, but the Baca family did not win a settlement of the grant until 1860, after New Mexico had become a part of the United States. The U.S. government, obliged to honor Spanish and Mexican land grants by the conditions of the treaty signed with Mexico at the end of the Mexican War, compensated the Baca family by allowing them to choose five 100,000-acre "floats" on any non-mineral lands within New Mexico Territory, which at the time included what is now Arizona. Luis María Baca Float No. 3 was first laid out directly over the richest portion of the Santa Cruz River valley in 1863, but was soon moved north and east to center on the Santa Rita Mountains. The validity and location of the grant were the focus of extended litigation until 1908, when the original location was finally confirmed in federal court. Since the 1920s, the lands comprising the original grant have been subdivided and sold numerous times (Wagoner 1975:200-208).

The Spanish Colonial policy of granting land to settlers, a policy that continued basically unchanged in the Mexican era, had a practical successor in the land-granting policies of the U.S. government, which instituted a more egalitarian (theoretically, at least) and systematic land-distribution program throughout the American West. The main objective of the program was to transform public lands, recently acquired by purchase or treaty, into private lands, which would allow the healthy spread of American agriculture and so boost the national economy. An important tool in instituting the program was the rectangular land survey, which divided the West (as it had previously divided the East) into a vast checkerboard of one-mile-by-one-mile sections. Following passage of the Homestead Act of 1862, these parcels, further subdivided into four 160-acre quarter sections, were provided at a nominal cost to anyone who would live on the land and farm it for five years (Stein 1990:3-9; White 1991:137-142).

But the concept of a 160-acre self-sufficient farm, originating in the temperate East, failed in much of the arid West. Alternative acts were eventually passed in an attempt to accommodate the needs of farmers in arid regions. The Desert Land Act of 1876 expanded the amount of land an individual could claim to 640 acres (a full section), provided that the land was brought into irrigation within three years. This act was in some ways as inappropriate for arid lands as the original Homestead Act had been, since bringing 640 acres into irrigation in three years was a feat few individual farmers could manage. Modifications to the act prolonged its life into the 1880s, but the desired effect of making the small individual farmer the dominant economic force in the West was never realized (White 1991:150-151).

Despite all of the difficulties inherent in federal homesteading policies, homestead patents were the origin of much of the private land in Arizona. Statewide, almost 5,000,000 acres passed from federal to private hands through homesteading, and over 3,000,000 of those acres are still privately held. Although the rate of failure of homesteads greatly exceeded the rate of success, successful and abandoned homesteads are found scattered throughout the state, including in Pima County (Stein 1990:8-9).

Two other important land-distribution laws were passed by Congress the same year as the Homestead Act (White 1991:142–143). Both had a profound effect on Arizona, including the southernmost portion of the state. The first was the Pacific Railroad Grant, the first in a series of large grants of land to railroad companies to allow for construction of a transcontinental railroad. It was on land granted by the federal government that the Southern Pacific Railroad eventually reached Tucson in 1880. The second law was the Morrill Act, which provided large grants of federal land to state governments, to be used to support public systems of education. Today, state trust lands (as they are called in Arizona) represent a large portion of the public lands in Pima County. They also constitute one of the largest potential sources of urban sprawl in the county, since the lands must, by the provisions of the Morrill Act and its derivative legislation, be sold to the highest bidder. In the metropolitan portions of Pima County, the highest bidder is typically a private development company.

Living on the Land: Mining, Farming, and Ranching in the Historical Period

Of the three major economic pursuits that characterized southern Arizona through much of the historical period—mining, farming, and ranching—only ranching was introduced by Europeans. The Native Americans of the region, using their own repertoire of crops and techniques, had farmed competently for many centuries before Europeans arrived, and the extraction of precious metals from the earth, although never pursued on a large scale, had a similarly long history in the Americas. Native American farming in the Pimería Alta was transformed by the introduction of Spanish crops in the seventeenth and eighteenth centuries (see above). Native Americans were also among the free-lance prospectors at placer deposits in early Spanish mining camps on the northern frontier, although many more Native Americans ended up laboring in Spanish vein-mining operations, often against their will, particularly in the major mining settlements of what is now Sonora and Chihuahua (Radding 1997:32–40). As for ranching, the people of the Pimería Alta began raising cattle, sheep, and goats shortly after Jesuits introduced the practice in the late seventeenth century, and small-scale ranching remains a part of rural Native American life in the region today.

Spanish mining, farming, and ranching in the Pimería Alta also benefited from the encounter with Native Americans, but far more from the land and labor that the encounter yielded than from any exchange of knowledge and technology. Spanish settlers spread through the Pimería Alta on the heels of the Jesuits with little interest in the subsistence strategies of Native Americans—the New World crops Spaniards used were first adopted many years earlier—and every interest in establishing traditionally Spanish mining operations, farms, and herds. On the northernmost frontier of New Spain, where isolation and Apache raids limited Hispanic settlement largely to the Santa Cruz River valley, the scope of all three pursuits never approached that of other parts of the Pimería Alta, much less that of the wealthiest places in New Spain. Nonetheless, it was the attempt to recreate a traditionally Spanish economy on the far northern frontier that caused the first major transformation of the southern Arizona landscape.

The second major transformation came in the late nineteenth century, following the arrival to the region of the "industrializing world economy" (Sheridan 1992:168). Anglo-Americans began settling in southern Arizona immediately after the Gadsden Purchase of 1854, bringing with them their own interest in mines, farms, and ranches, but both the technology they used and the scale of their operations were at first similar to those of their Hispanic counterparts. It was not until 1880, the year the railroad reached southern Arizona, that mining, farming, and ranching became large, heavily capitalized businesses, closely linked to the greater financial world of the United States. Almost overnight, the three mainstays of the southern Arizona economy saw sweeping changes in scale and complexity, and the landscape that supported them was altered forever.

The following paragraphs outline the history of mining, farming, and ranching in southern Arizona, with an emphasis on how each pursuit changed during the shift from Hispanic to Anglo-American times. The discussion ends with a consideration of the effects of all three pursuits on the character of the southern Arizona landscape.

Mining

The first Spanish settlements in southern Arizona may have been the Jesuit missions at Guevavi and San Xavier del Bac, but the search for gold and silver was as much responsible for bringing Spaniards to the region as a desire to spread Catholicism. The very name Arizona derives from a place called Arizonac, just southwest of modern Nogales, where silver was discovered in 1736. This was just five years after the Santa Cruz Valley missions were permanently established, and the strike led to the first wave of Spanish prospectors to the region, many of whom stayed after the strike at Arizonac petered out (Officer 1987:4). Sheridan (1992:160), noting the central role of mining camps in opening new areas to settlement in northern New Spain, has called the Spanish mining frontier "the cutting edge of empire," where ordinary Spaniards first mingled regularly with Native Americans, and where Native Americans were first exposed to the novelties of Spanish economy and society. In southern Arizona, mining never played anywhere near the role in the economy that it did in the major mining centers of Sonora and Chihuahua, but the hope that it might kept a steady flow of Spaniards coming to the region throughout the colonial period.

Officer (1991), sifting through a variety of confusing and ambiguous documentary data regarding Spanish mines in southern Arizona, concludes that the actual extent of mining in the region during the Spanish Colonial and Mexican periods was very limited. Locations where mining likely did take place are limited to silver deposits in the Santa Rita Mountains, the Arivaca area, and the south end of the Huachuca Mountains, and gold deposits in the Sierrita Mountains, the Arivaca area, and on Mount Benedict west of Guevavi. The precise spots where most of this mining took place are unknown.

Despite a great number of optimistic legends to the contrary, there is no good evidence that Spanish and Mexican mining ever took place in the Tucson Mountains, the Patagonia Mountains, the Ajo region, or a variety of other places that would later claim the interest of Anglo-American miners. Factors that limited every Spanish enterprise in southern Arizona—remoteness from Mexico City and the constant threat of Apache raids—were especially limiting to mining. Remoteness from Mexico City made procurement of tools and supplies (such as mercury for processing silver) prohibitively expensive, and the limited range of presidio protection made miners working isolated deposits easy targets for the Apache. "Even in the most favorable locations," Officer (1991:8) writes, "Arizona mining could not have amounted to much in Hispanic times."

Two features of Hispanic mining in southern Arizona survived the Gadsden Purchase to become incorporated into the Anglo-American approach to mining. First was an acceptance of the mythical abundance of Arizona's mineral resources, an abundance first postulated by Spaniards at Arizonac, accepted hopefully by Hispanic miners for the next 120 years, and seized on enthusiastically by Anglo-Americans from the 1850s onward. Polzer (1968) has suggested that much of the mythology of Arizona's buried wealth is in fact Anglo-American in origin, either the optimistic yearnings of small-time prospectors or the propaganda of commercial mining interests looking for financial backing, but as Officer (1991) notes, there were plenty of Hispanic antecedents for the Anglo-Americans to build on.

The second feature of Hispanic mining borrowed by Anglo-Americans was its technology. Hispanic miners exploited the two basic varieties of deposit, placer and vein (or lode). Placer deposits (literally, "pleasure" deposits), the most common source of gold, consisted of gold-bearing gravels exposed on the ground surface, often in or adjacent to a streambed. The typical method for isolating the gold from a placer deposit was by panning, using the *batea*, a large, conical-bottomed vessel of hardwood or sheet metal. The method might be supplemented by dry washing, or winnowing the ore from accompanying heavier gravels by throwing it in the air over a blanket; and by amalgamation, or the use of mercury to draw small particles of gold together in the *batea*. These simple methods were adopted early on by Anglo-Americans entering the Spanish frontier (Coggin 1987; Fansett 1952; Sheridan 1995:147–148; Wilson 1952).

Silver was more commonly mined from veins than from placer deposits. Silver was also much more abundant than gold in northern New Spain, and the Spaniards entering southern Arizona brought with them a variety of methods for extracting and processing silver ore. Nonetheless, the technology was still relatively simple, and the more involved processes used in the major mining centers of Mexico were generally not used on the northern frontier. Mining along a vein usually began with shallow, open-pit diggings, then progressed to vertical shafts 2–4 m deep, sometimes augmented with small horizontal drifts. Deeper shafts would prompt the use of wooden beams as reinforcements and measures to control flooding, but given the limited nature of mining in southern Arizona it is doubtful that even these simple steps were commonly taken. An important tool for processing raw silver ore, also adopted by early Anglo-

American miners, was the *arrastre*, a large, circular, stone-floored depression, with a central post and a horizontal beam suspending two large boulders. The boulders were drug in a circle around the post by mules, pulverizing the coarse ore dumped on the stone floor (Keane and Rogge 1992:26; Sheridan 1995:147–148; West 1993:50–53). Officer (1987:16–17) notes that knowledge of these and other methods, first developed in the Spanish Colonial period, was brought by Mexican immigrants to Tubac after 1856, as mines abandoned many years earlier to the Apache threat were reopened. “From this point on,” he writes, “Hispanic miners would play an indispensable role in the development of Arizona’s mineral industry.”

Although a great deal of placer and vein mining (including the beginnings of mechanized hard-rock mining) took place elsewhere in Arizona during the 1860s and 1870s, the first major strike in southern Arizona did not come until after the Apache threat in the region had been significantly curtailed by the U.S. Army. In 1878, silver was discovered in the hills near Tombstone in Cochise County, and by 1880, the discovery had created a town of 10,000 people or more where two years earlier there had been none. Mining at Tombstone during its short boom—the mines were largely abandoned by the end of the 1880s—underwent all of the changes seen in mining throughout the West during the same period. The major claims were bought up by powerful business interests, the extraction and processing of ore became increasingly large scale and mechanized, and hired workers replaced individual prospectors in performing the manual labor of mining (Schillingberg 1999; Sheridan 1995:152–160). The railroad, crossing southern Arizona two years after the Tombstone discovery, was a major factor in the early development of industrial mining in the region, linking the mines to the markets and technological innovations of the East. By the 1880s, large mining interests in Arizona were buying and building their own railroads to service their mining operations (Irvin 1987; Sheridan 1995:167–168).

Anglo-Americans began entering southern Arizona in search of mining opportunities immediately after the Gadsden Purchase. Although the number of miners in the region grew slowly, by the 1860s the competition for claims, combined with a lack of clarity about how U.S. mining laws should apply in the newly acquired region, led to the establishment of mining districts, modeled on the districts formed by groups of independent miners in California and Nevada. A mining district corresponded to a recognized mining area, such as a valley or group of hills. Its official boundaries and a set of regulations to govern mining within the district were established by agreement among the miners active there. The regulations addressed things such as how claims must be filed, what the limits of individual claims were, and how disputes would be settled. Every district had its own set of regulations, but regulations were generally very similar from district to district. Even after federal laws governing mining were passed in the later 1860s, mining districts continued to be an important regulatory mechanism at the local level, and districts continue to serve a regulatory function today (Lacy 1987:7–9).

The first mining district established in Pima County was the Cerro Colorado district near Arivaca, the regulations of which were published in 1864 (Lacy 1987:9). Other mining districts soon followed, and by the 1970s, there were over 30 recognized mining districts in

the county (Keith 1974). The names and delimitations of districts have changed often since the 1860s, but the areas occupied by the original districts remain the same: most are situated in the island-like clusters of mountains scattered around the county, the typical locations of major mineral outcrops (Wilson 1995). Many of these districts have seen repeated episodes of mining since the nineteenth century, particularly copper mining, beginning as early as 1865 in the Silver Bell District west of Tucson (Tuck 1963:31).

In some districts, communities sprang up near ongoing mining operations, such as in the Rosemont District, another copper-producing area in the Santa Rita Mountains southeast of Tucson, where the town of Rosemont had two different incarnations, 1894–1910 and 1915–1921 (Ayres 1984a). In the Greaterville District, on the eastern slopes of the Santa Ritas, the discovery of gold placers in 1874 prompted the community of Greaterville, which arose in the late 1870s but was already dwindling by the early 1880s. Kentucky Camp, a complex of buildings erected in the early twentieth century as headquarters for a hydraulic mining operation at the Greaterville deposit, has since become a National Historic District (McDonald et al. 1995; Orrell 1998).

Copper became the focus of the mining industry in southern Arizona not long after the collapse of the silver market in the late 1880s, a collapse largely responsible for the demise of Tombstone. The most important copper-mining operation in the region, by far, was centered at Bisbee in Cochise County. By the end of the century, the Copper Queen mine at Bisbee had a large, modern smelter, many miles of underground rail, and a huge labor force. It was also one of the richest copper mines in the world (Graeme 1987; Sheridan 1995:165). Improved metal prices in the late 1890s also led to an increase in production in the Helvetia, Rosemont, Silver Bell, Twin Buttes, and Mineral Hill Districts of Pima County, districts that subsequently enjoyed a heyday during World War I, when the demand for copper rose sharply in response to weapons manufacturing. The Ajo District also began large-scale production at the start of the war. Production in all of these districts declined after the end of the war, nearly disappeared during the Depression, then rose again during World War II (Wilson 1949:5–6).

The most recent stage in the development of mining in southern Arizona has been the nearly complete conversion from underground mining to large, open-pit extraction, a change implemented throughout the industry after World War II. The conversion has involved a great increase in mechanization, which has in turn allowed both increased exploitation of lower-grade ores and much less reliance on human labor. Yet despite the increased production created by open-pit extraction, the general trend for copper throughout the United States since World War II has been one of decline, due in large part to the expansion of copper-mining operations overseas (Hyde 1998:189–190). Nonetheless, the copper industry continues to be a major force in the southern Arizona economy, and the enormous open excavations and mountains of tailings and slag left on the landscape by copper mining since World War II are inescapable reminders of the industry's importance.

Farming

The Spanish settlers of southern Arizona practiced agriculture largely for the sake of subsistence, much like the Native Americans who preceded them in the region. Somewhat ironically, the largest producers of both native and introduced crops in southern Arizona throughout the Spanish Colonial and Mexican periods were not the Spaniards, who had made so many additions to the Pima way of farming, but the Pima themselves (Officer 1987:15). On the mission lands along the Santa Cruz River, Pima farming never produced the kinds of surplus that would make the trading of produce a major enterprise, but by the end of the Mexican period, the Pima living along the Gila River had become prolific wheat farmers with abundant surpluses. When the California Gold Rush of the late 1840s started funneling people across Arizona along the Gila Trail, the Akimel O'odham became "the first agricultural entrepreneurs in Arizona" (Sheridan 1995:97), trading surplus wheat to supply-seeking travelers, and by 1870 they were producing and selling a surplus of more than three million pounds of wheat per year. Unfortunately, the Gila River Pima soon lost the key to their agricultural success when Anglo-American farmers upstream began diverting the water of the Gila for their own irrigation projects (Sheridan 1995:97-98).

Two major factors limited the scale of Hispanic agricultural endeavors in southern Arizona. First was the constant problem of distance: the Santa Cruz Valley was too far from central Mexico either to make the export of agricultural produce profitable or to encourage enough settlement to create a local market. As Officer (1987:15) puts it, "The isolation of the Pimería Alta and its limited population provided little inspiration for major agricultural development." The second limiting factor was the obvious environmental one: in a region of generally high aridity, the land suited to agriculture was restricted to narrow swaths of the major river valleys, and for virtually the entire Hispanic era, the only valley afforded enough protection from the Apache by the presidios was the Santa Cruz. For Hispanic farming, as for Pima farming, irrigation was the key to maximizing productivity in an arid, circumscribed environment.

Irrigation had been used by Native Americans in southern Arizona for many centuries before Spaniards arrived in the region, but the Spaniards were also heirs to an ancient tradition of irrigation, brought with them from Europe and ultimately having Roman and Arabic antecedents (Meyer 1996). On the northern frontier of New Spain, where labor was scarce and engineers nonexistent, only the simplest techniques of the tradition came into common use, which made the physical side of Hispanic irrigation not substantially different from its Native American counterpart. The basic element was the acequia (canal), a hand-excavated earthen ditch, leading from a simple diversion dam in a stream to an agricultural plot. Acequias typically ranged in depth from two to nine feet, and in width from one foot to seven feet. Depending on topographical circumstances, they might be straight or winding, single or multiple (Meyer 1996:41-42; Sheridan 1995:189).

The social side of Spanish irrigation was as important to the success of the system as the physical side. The amount of water available for farming along the Santa Cruz River was limited and unpredictable, and even the small Spanish population living there had to be conservative in its use of the resource. The traditional Spanish institutions that helped ensure equitable distribution of irrigation water during times of scarcity were the *común de agua* (water users' association) and the *juez de agua* (water judge) or *zanjero* (canal overseer). The *juez de agua*, elected by the *común de agua*, was assisted by a *mayordomo* (ditch boss), who helped him implement a strict rotation of water usage when a shortage occurred. Indian settlements under Spanish control were also supposed to have *jueces de agua*, or functionaries serving a similar role (Meyer 1996:64–66; Sheridan 1986:14–15, 1995:189). There is direct evidence for these institutions in the Mexican-American settlement along the Santa Cruz River as late as the 1880s (Sheridan 1986:64–65), and their pervasiveness throughout the northern frontier in the Spanish Colonial period makes it likely that they existed in southern Arizona from the start of Spanish settlement.

Despite the burdens of isolation and aridity, Hispanic farming was largely a success along the Santa Cruz. Clustered at the Tubac and Tucson presidios, Hispanic farmers planted corn, wheat, barley, garbanzos, lentils, and a variety of vegetables, as well as fruit trees and grape vines. The most important crop was wheat, not entirely because of a Spanish preference for wheat over corn, but because wheat, frost tolerant and maturing in winter, could take advantage of the most dependable irrigation season. The occasional surplus raised by Hispanic settlers would be sold to the commander of the presidio. Soldiers at the presidio themselves sometimes cultivated gardens, and in the latter part of the Mexican period they were expected to plant crops to feed their horses and other livestock. At different times during both the Spanish and Mexican periods, settlers from Tucson visited the San Pedro Valley to plant and harvest crops, protected from Apache attack by escorts of presidio soldiers (Jones 1979:194; Officer 1987:15; Sheridan 1986:15).

The hallmarks of Hispanic agriculture along the Santa Cruz were, as Sheridan (1986:15) puts it, "scarcity and cooperation," and the successful balancing of the two by Hispanic farmers continued well into the U.S. period. Officer (1987:290) notes that by 1862, just eight years after the Gadsden Purchase, Anglo-American immigrants to Tucson had already acquired considerable property in and around the town, but they found it difficult to purchase agricultural lands along the river. A map of Tucson's fields prepared in 1876 shows that even 14 years later most irrigated land was still owned by Mexican-Americans. This situation changed soon enough, as both Anglo-Americans and some newly arrived Mexican Americans continued to acquire land for agricultural purposes both by purchase and by claims made under the Homestead Act. The newcomers were often more interested in acquiring land for speculative purposes than for agriculture, and in either case altogether uninterested in conforming to the traditional Hispanic practice of irrigation conservation. Disputes soon arose in Tucson between new landholders who wanted to divert the flow in the Santa Cruz to some private purpose, such as to power a flour mill, and traditionalists who were thereby denied access to flow they had long depended on (Sheridan 1986:63–65).

The increasing population of Tucson also brought a rise in the demand for crops such as alfalfa (for livestock forage) and vegetables. Alfalfa required twice the water of traditional crops, and the Chinese vegetable truck farms that sprang up on the west bank of the Santa Cruz were much more intensive operations than the traditional Mexican-American family vegetable garden. The Chinese wanted irrigation water everyday where before water had been routed only once a week, and when they did not get the water they needed, they managed to steal it (Sheridan 1986:65-66). But these pressures were only the beginning of the abuses the river was subjected to in the late nineteenth century by people hoping to intensify agriculture along its banks. Woodcutting and overgrazing near the river also added their effects, and in 1889, a project designed to access water flowing beneath the surface of the river backfired when flood waters, racing through a canal cut deep into the riverbed, ended up carving an arroyo 18 miles long and placing the water level even further out of reach of irrigation. The net result of all of these changes was a steady decrease in the numbers of Mexican-American farmers along the Santa Cruz (Sheridan 1986:67-68).

In the rest of the Tucson Basin, irrigated farming was practiced in the nineteenth and early twentieth centuries along the major tributaries of the Santa Cruz such as the Rillito River. The Mormon settlement of Binghampton was founded at the end of the nineteenth century along the Rillito, about six miles northeast of Tucson. The community farms were soon serviced by a canal originating in Tanque Verde Wash (Sterner 1996). Also on the Rillito, the Mexican-American community of El Fuerte, established at abandoned Fort Lowell, farmed with irrigation on the Rillito floodplain. Both Binghampton and El Fuerte felt the effects of a lowering water table and entrenching river before being absorbed by greater Tucson in the 1940s (Ciolek-Torrello and Homburg 1990).

The biggest change in Anglo-American agriculture in Arizona as a whole came with the cotton boom that followed U.S. entry into World War I in 1917, and agriculture along the Santa Cruz attempted to follow suit. The war demand for cotton was spurred by the need for high-tensile, long-staple cotton for tires and aircraft fabric, and long-staple cotton required the lengthy growing season that southern Arizona could provide. The biggest cotton-growing operations were based in the Salt River Valley near Phoenix, where cotton soon replaced the existing mix of dairy, citrus, and grain operations (Sheridan 1995:211-213).

But the Santa Cruz Valley also began producing cotton during the war, most notably along a stretch of the river near Cortaro, downstream from Tucson and near the northern end of the Tucson Mountains. A land speculator named Edwin R. Post had earlier purchased large tracts of land in the area and developed an extensive irrigation system of wells and canals, with the idea of selling parcels to independent farmers who would then purchase his water and raise cotton. The scheme worked until cotton prices plummeted at the end of the war and most of the farmers went bankrupt. The operation changed hands several times over the following years, and a variety of efforts to establish farming in the area finally met with success in the 1940s, when the demand for cotton once again rose in response to World War II. The area continues to be important for agricultural production today, although the community of

Marana, which originally arose as a result of Post's project, is now a rapidly growing suburb, and much of the land once devoted to agriculture is either developed or threatened by future development (Stein 1993; Whittlesey et al. 1994:320).

Ranching

Farming was only one half of the traditional Spanish economy brought to southern Arizona by the earliest settlers. The other half, which came to have a much larger impact on the regional landscape later in the historical period, was stock raising. Sheridan (1986:14) has characterized the traditional Hispanic way of life in southern Arizona as "agropastoralist," relying on a mixed economy of farming and stock raising, much like the rest of northern New Spain during the colonial period, and deriving ultimately from a way of life common throughout rural Europe. Hispanic agropastoralism in southern Arizona continued largely unchanged during the Mexican period, and well into the U.S. period, when it was also adopted by the earliest Anglo-American settlers in the region.

The first livestock brought to the northern frontier of New Spain were the small herds of cattle and horses distributed by Father Kino in the 1690s to Pima villages scattered around the region (Sheridan 1988:160). This was the beginning of Pima stock raising, which was soon successful in its own right in supplementing the Pima diet, but Hispanic ranching did not become a significant presence in southern Arizona until after the Jesuit missions at Guevavi and Bac were staffed with resident priests in 1731. The Spaniards drawn north by the discovery at Arizonac in 1736 were soon settling along the upper reaches of the Santa Cruz River, grazing cattle on the lush grasslands of the valley, just as Spaniards had so often done farther south in New Spain during the previous two centuries. By 1752, when the presidio at Tubac was established in response to the Pima uprising of 1751, Spaniards were grazing cattle along much of the Santa Cruz above Tucson and had expanded westward into the Arivaca region. By the end of the Spanish Colonial period, the numbers of cattle in the region reflected a successful but spatially circumscribed enterprise. In 1804, 3,500 head of cattle were reported for the Tucson vicinity, with another 1,000 around Tubac; and in 1818, the mission at Tumacácori reportedly had 5,000 cattle and San Xavier around 8,800 (Dobyns 1976:51; Officer 1987:15, 31; Sheridan 1995:127-129).

Except for the limited activity in the Arivaca region, stock raising in southern Arizona during the Spanish Colonial period was generally confined to the Santa Cruz Valley, for the perennial reason that the risk of Apache raid was too high at any distance from the presidios at Tucson and Tubac. Following Mexican independence, the effectiveness of the Santa Cruz presidios declined as the connections to central Mexico became even more tenuous, but despite the decline, Hispanic ranchers were determined to take advantage of the large grasslands that lay well outside of presidio control, such as along the San Pedro River. The result of their determination was the era of large land grants discussed above, when individual Hispanic settlers petitioned for and received vast tracts of land from the Mexican government. The grants were soon supporting large herds of cattle, but by the 1830s the Apache had killed or chased away the ranch owners and run off the cattle (Wagoner 1952:24-36). These cattle

were apparently the origin of the large herds of wild cattle reported by the earliest Anglo-American visitors to southern Arizona, although the numbers of cattle in the region, both before and after the ranches were abandoned, have often been exaggerated. Sheridan (1995:129) suggests that the total population of cattle in southern Arizona during the Mexican era never exceeded 20,000–30,000 animals because, in addition to the predations of Apache, ranching in the region before the 1840s was limited by the lack of a dependable market for beef.

The problems with Apache continued for another 40 years, and by the time Anglo-Americans started passing through southern Arizona on their way to California in the late 1840s, Hispanic ranching in the region was a shadow of its earlier self. During the years following the Gold Rush, large herds of cattle were driven by Anglo-American ranchers across southern Arizona from Texas to sell as beef in the mining communities of California (a pattern that actually continued until about 1870), but it was not until the Gadsden Purchase in 1854 that Anglo-Americans made some initial attempts to raise cattle in the region. Their successes were limited by the same factors that plagued Hispanic ranching: Apache raids and distance from markets. One of the first Anglo-Americans to run cattle in the Tucson area was Bill Kirkland, who brought 200 head of cattle to the Canoa Ranch along the Santa Cruz River in 1857. By 1860, the cattle had been stolen, and Kirkland had moved on to a different location (Wagoner 1952:33). Also along the Santa Cruz, a German immigrant named Fritz Contzen started Rancho Punta de Agua in 1855 with about 500 head of cattle. He, too, suffered repeated Apache raids and had given up on ranching by the 1860s (McGuire 1979). An example of a Hispanic rancher during the same period is Francisco Romero, who established a ranch near the Cañada del Oro in what is now Catalina State Park, on the western slopes of the Santa Catalina Mountains north of Tucson, in 1844. After two and a half decades of intermittent Apache violence, the hardy Romero and his family were finally driven from the ranch for good in 1870 (Mabry 1991:62–69).

The Civil War, which made southern Arizona an area of Union-Confederate contention for a brief time, put a stop to Anglo-American ranching at the start of the 1860s. The Apache extended the hiatus for another decade and a half. In 1870, the year U.S. Army Gen. George Crook arrived to southern Arizona to begin his long campaign to subdue the Apache, the territorial census reported only 1,800 cattle in all of Pima County, which at that time encompassed almost all of the state south of the Gila River (Wagoner 1952:36). The situation changed rapidly as the Apache frontier was pushed eastward from the Tucson Basin during the 1870s. By 1873, both Mexican- and Anglo-American ranchers had successful small operations along the Santa Cruz River, and soon similar operations were springing up in the Arivaca region to the west of the Santa Cruz, along Sonoita Creek to the east of the river, and along Cañada del Oro to the north of Tucson. There were also a number of successful Mexican-American ranches along Tanque Verde Wash to the east of Tucson (Mabry 1991; Wagoner 1952:39–41). The spread of ranches along the principal streams of the region was soon accompanied by the gobbling up of all available sources of water, including both streams and springs, by ranchers claiming parcels under the Homestead Act and the Desert Land Act.

By patenting a claim on a parcel with a water source, ranchers could have de facto control over surrounding parcels without water, and some ranchers built major land holdings by having other people (such as employees) file claims that the rancher would then buy up cheaply as they were patented (Mayro 1999:40).

Other Anglo-American ranching operations that would grow to dynastic proportions in subsequent years were begun in this period. In the late 1860s, the first large-scale ranching operation in southern Arizona was begun by Henry Hooker, who had started in the business by running cattle across the region from Texas to California. Hooker, recognizing both the grazing potential of the area and the potential market represented by the emerging system of U.S. forts in the region, founded the 25-square-mile Sierra Bonita Ranch in 1872 in the northern Sulphur Spring Valley, 10 miles from Camp Grant. He was soon the main supplier of beef to the federal government throughout the region. In 1876, Walter Vail and two English partners started the Empire Ranch in the vicinity of Cienega Creek, to the east of the Santa Rita Mountains. The ranch eventually spread to cover over a thousand square miles, and was grazed by more than 50,000 head of cattle. Vail and his partners also began the Total Wreck mine in the nearby Empire Mountains, supplementing their ranching business in the 1880s with profits from silver mining (Mayro 1999:41-42; Sheridan 1995:130; Wagoner 1952:41-43).

The arrival of the railroad in southern Arizona in 1880 was a major boost to the cattle industry, which from then on was dominated by large business interests. An important example of the shift was the 1883 purchase of the San Rafael land grant along the headwaters of the Santa Cruz River by a consortium of eastern investors organized by Colin Cameron, not a cattleman by training or inclination, but a businessman. With a combination of shrewd legal maneuvering and ruthlessness, Cameron developed the San Rafael into a major enterprise. For years he vigorously contested the original 17,000-acre allotment of the grant for years, claiming that it should have been 152,000 acres, and although he never won a larger allotment, he was able to graze a large herd on many times the official acreage for the remainder of the century. He was also one of the few large ranchers in the region to recognize and act against the problems of overgrazing that soon plagued the industry. In 1903, well after the boom of the 1880s was over and most of southern Arizona was grazed to destruction, he was still able to sell the San Rafael for \$1,500,000 (Hadley and Sheridan 1995:97-107; Sheridan 1995:125-126).

But most ranchers in the 1880s kept grazing as many cattle as they could, both on their own acreage and on the abundant acreage still in the public domain. By the start of the 1890s, it was apparent to many ranchers that overgrazing had quickly become a serious problem. To compound the problem, the early 1890s saw several years of severe drought. The grass soon disappeared, pulled from the ground by its roots by starving cattle. "It was a disaster of biblical proportions," Sheridan (1995:141) writes, "one in which nature and greed conspired to magnify their individual effects." From 50 to 75 percent of all the cattle in southern Arizona died, most surviving animals were shipped out of the region to avoid complete losses, and numerous ranching operations of every size folded (Sheridan 1995:140-141; Wagoner 1952:53-54).

A key to the disaster of the 1890s was the nature of ownership and control over the range lands of southern Arizona. Cattle-raising operations were almost always based on private land holdings, but use of the large surrounding tracts of public lands for grazing was unavoidable, both from the standpoint of the acreage required to support a herd of profitable size, and because the federal government could never practically prevent cattlemen from using the land. Since the 1890s, cattlemen and the federal agencies responsible for public lands have struggled, sometimes in cooperation, sometimes in conflict, to adapt the raising of cattle to the limitations of the southern Arizona environment, attempting to resolve the dilemma posed by an industry that both required access to large areas of public land and posed a threat to the health of that land when multiple individuals used it for the same purpose.

Mayro (1999:47–55) reviews the history of federal policy regarding the access to federal lands allowed to private ranchers, which ultimately led to the development of grazing districts, leases, and fees, administered by federal agencies such as the Forest Service and the Bureau of Land Management. Although ranching in southern Arizona in the twentieth century saw periods of relative success and decline, it has survived into the twenty-first century as a viable industry in large part because of the conservation of public lands made possible by the combination of federal management and the responsible practices of many private ranchers.

Ecological Consequences of Living on the Land

As Sheridan (2000:106–108) has recently emphasized, human impact on the Sonoran Desert did not begin with the arrival of Europeans in the region. The desert was home to Native American peoples for at least 12,000 years before Spanish explorers ventured into it, and the impact of Native Americans on the landscape ranged from speeding the extinction of Pleistocene megafauna to redirecting the water of desert rivers into extensive irrigation systems. Native Americans continued to have significant and often deleterious effects on the landscape in the historical period, resulting both from their traditional subsistence adaptations and from the adoption of European crops, animals, and land-use patterns (Dobyns 1981). But whatever the Native American impact on the environment of southern Arizona, it rarely reached the scale of the changes inflicted in the historical period by non-Native Americans.

Mining, farming, and ranching, the core economic pursuits of the historical period prior to World War II, together had a lasting impact on the landscape of southern Arizona, an impact that began as relatively slight in the Spanish Colonial and Mexican periods and quickly progressed to drastic in the U.S. period. Spanish Colonial mining in southern Arizona, because it was so circumscribed by the Apache threat, never had a major presence in the local economy, and so never left much of a mark on the landscape. In other circumstances, it might easily have done so. Not far to the south, in the major silver-mining districts of the northern Spanish frontier, “voracious demands for charcoal, timber, firewood, tallow, salt, and mercury” led to environmental transformation: “hillsides were denuded, streams diverted, water tables polluted, and vegetation communities irrevocably changed” (Sheridan 2000:111).

Hispanic farming in southern Arizona, restricted largely to the Santa Cruz floodplain, also had a minor impact on the natural environment, both because of the small scale of Spanish Colonial and Mexican farms and because Hispanic farmers practiced "a system rooted in the community and adapted to scarcity," rather than one rooted in private gain and geared to a commercial market (Sheridan 1995:189). Hispanic ranching was similarly small-scale and of limited environmental impact, although it had the most extensive impact of the three pursuits. If the Apache had allowed mining to flourish, Hispanic ranching in southern Arizona would almost certainly have expanded in the same way that it already had farther south in the colony, where its growth was closely linked to the development of mining settlements (West 1993:58–59). This would have given the environmental degradation instigated by ranching in the U.S. period more of a running start.

For the first two decades or so after the Gadsden Purchase, mining, farming, and ranching by both Mexican Americans and Anglo-Americans continued to have a fairly minor impact on the landscape. This changed suddenly in 1880 when the arrival of the railroad made the region a part of the industrial economy of the greater United States. The effects of commercialized farming after 1880, although localized, were often severe. On the Santa Cruz River, as noted above, the intensification of irrigation along its banks, combined with ill-advised efforts to maximize its surface flow, led to the deep entrenchment and drying up of the river by the end of the century. Entrenchment of rivers and the related process of arroyo formation greatly changed the face of floodplains in the Tucson Basin and surrounding areas beginning in the late nineteenth century, spurred by the spread of irrigation for agriculture. Not only did irrigation place unprecedented demands on river flow, but the canals dug for irrigation presented new erosion points for the start of arroyos, which could eventually carry away large portions of river terraces. Other erosional points created by Anglo-American settlement—trails, roads, building sites, and a multitude of drainage projects—exacerbated the problem, as did the increased discharge of water onto valley floors due to the loss of vegetation on surrounding slopes (Cooke and Reeves 1976:98–99; on the effects of early wagon roads, see especially Dobyns [1981:117–134]).

Other than the holes it blasted in the ground (and the associated localized erosion), the principal impact of mining on the landscape after 1880 was on vegetation. At Tombstone, the demand for firewood for use in powering steam-driven ore-processing machinery led to the complete denuding of the Tombstone Hills, followed by the leveling of the mesquite stands along the San Pedro River (Bahre 1991:146–154). Sheridan (1995:156) calls the impact on the vegetation of the region "immense," and it was typical of the many other mining districts that became active after the arrival of the railroad. The demand for firewood at the mines peaked in the 1890s, when other fuels such as coke began to be used in mining, but the cutting of firewood continued in many mining districts until the 1940s. Interestingly, Bahre (1991:154) notes that the distribution of woodlands in southern Arizona was ultimately not seriously affected by such cutting, although its impacts on fire history, erosion, woodland structure and composition, and wildlife ecology have yet to be fully appreciated.

The grazing of cattle had a profound effect on the ecology of southern Arizona after 1880, a fact recognized by contemporary observers in the aftermath of the 1890s drought and since a major focus in historical and scientific analyses of environmental change in the region (Bahre 1991; Cooke and Reeves 1976; Hastings and Turner 1965). Bahre (1991:123) lists the effects of livestock grazing on the vegetation of the region as "soil erosion, destruction of those plants most palatable to livestock, changes in regional fire ecology, the spread of both native and alien plants, and changes in the age structure of evergreen woodlands and riparian forests." The spread of native plants is one of the ironies of grazing. Left to overgraze, cattle seem to strip the ground of every shred of green, yet the burden they impose on grasses actually opens the ground to invasion by native species that would otherwise never take hold, such as mesquite, acacia, creosote bush, juniper, oak, burroweed, senecio, and snakeweed. Cattle generally do not eat these species, so land overgrown with them becomes useless for grazing, and this process continues to be a major concern to range managers today (Bahre 1991:119-120).

Overgrazing and several years of drought were the immediate causes of the environmental degradation that brought ruin to the cattle industry in the 1890s, but it now appears likely that longer-term climatic factors were also at play. The severe droughts of the early 1890s were only the most obvious episodes in a 20-year dry period extending from 1885 to 1905. Compounding the effects of drought and overgrazing were an unusually high number of El Niño years falling between years of drought. Heavy rains brought on by the El Niño effect eroded the topsoil from slopes denuded by grazing, then rushed into drainages denuded of riparian vegetation, deeply entrenching existing channels and cutting new arroyos along the way (Hadley and Sheridan 1995:105-106). Southern Arizona's first major environmental crisis was as much a product of ignorance as greed, a combination of the liabilities that would plague Anglo-American economic enterprise in the region for many years to come.

Landscapes of Mobility

Although the precise routes of the Spanish explorers that traversed southern Arizona in the sixteenth and seventeenth centuries are unknown, it is likely that they followed existing Native American trails. The accounts left by Spanish explorers rarely bother to discuss the Native Americans who accompanied them, but it is unlikely that any *entrada* ever started out without at least one Native American guide, and major expeditions like those of Marcos de Niza and Coronado included many Native Americans. Those accompanying an expedition might not be directly familiar with the territory they were entering, but it is safe to assume that they sought advice from their local counterparts as to where trails were and where they led. Spanish explorers may have been daring, but it is doubtful they would have chosen blazing a new trail over using an existing one. And Native American trails were followed by travelers long after the early *entradas* had come and gone. As Stein (1994:3) puts it, "In Arizona, historic routes almost always have prehistoric roots."

During the Spanish Colonial and Mexican periods, the missions and presidios established in southern Arizona were undoubtedly connected by a series of trails extending into the rest of northern Mexico, but in historical sources of the era, the existence of established trails is usually only implied by references to regular stops on the route from one location to another. One example is the apparently repeated use of a camp along Cienega Creek, first by Spanish, and then by Mexican presidio soldiers, in the late eighteenth and early nineteenth centuries, along the route from Tucson to the San Pedro Valley (Dobyns 1981:18). Elsewhere in northern New Spain, the route maintained between Spanish settlements where the crown had direct mining or other interests was called the *camino real*, or royal road (e.g., Polzer and Sheridan 1997:450), but the far northern frontier lacked any route with that formal designation. For a short time, there was a Spanish route to Alta California, first opened in 1775 by Juan Bautista de Anza to connect California with the Pimería Alta. It was abandoned six years later after the Quechan people of the lower Colorado River massacred the Spanish settlers sent there to secure the road (Sheridan 1995:33).

Despite its relative proximity to the long-established Spanish colony in northern New Mexico, no permanent route between Arizona and New Mexico was established until Anglo-Americans did so late in the Mexican period, shortly after the U.S. government declared war on Mexico. In 1846, Colonel Stephen Watts Kearney, after assembling the new Army of the West at Fort Leavenworth, Kansas, headed to Santa Fe with a company of 1,700 men. He met with little resistance from the Mexican force resident in Santa Fe and soon started southward again, intent on blazing a wagon trail to the Pacific coast. Kearney and his company turned westward at the head of the Gila River, then followed close along the river through rugged and desolate country all the way to its confluence with the Colorado. From there, Kearney continued west, finally reaching San Diego (Wagoner 1975:260–268).

Kearney's decision not to travel south of the Gila was made to avoid what he thought to be a significant Mexican force at the Tucson presidio, but the route he chose proved too rugged for wagon travel. The first practical wagon route across southern Arizona was not blazed until several months later, when the Mormon Battalion, a company of volunteer Latter-day Saints assembled in Missouri and led by Captain Philip St. George Cooke, traveled from Santa Fe to San Diego, crossing Arizona well south of the Gila. The Mormon Battalion passed through Tucson in December, 1846, without confronting the Mexican garrison, which had withdrawn to San Xavier del Bac. The following January, the battalion reached San Diego. Although itself a demanding journey, Cooke's route made crossing by wagon to California feasible, and it was soon a major route for wagon trains from all points east (Wagoner 1975:268–272).

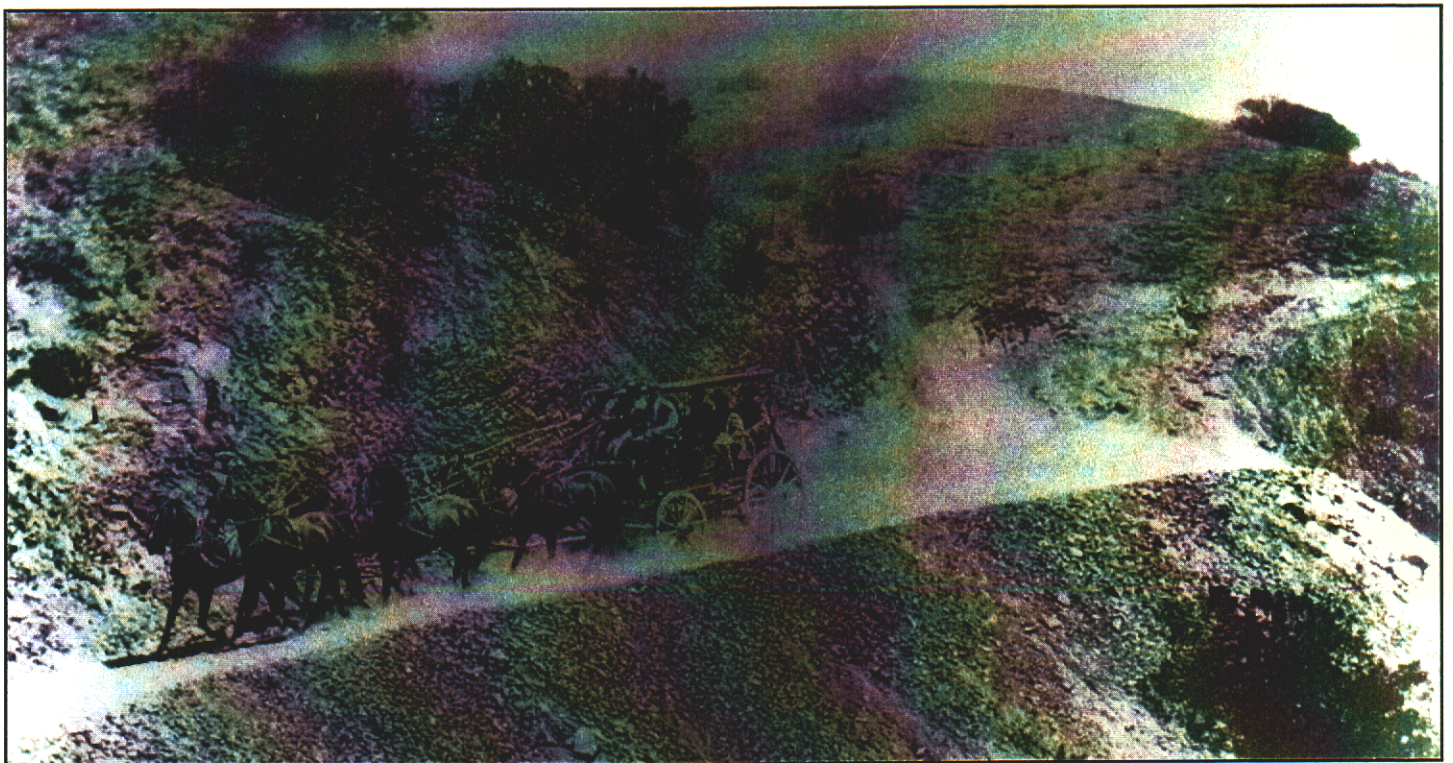
The use of wagons—specifically, four-wheeled wagons with steel-rimmed wheels—to haul cargo in southern Arizona was largely an Anglo-American innovation. In the Spanish Colonial and Mexican periods, pack animals (horses and mules) carried the bulk of the cargo moving from settlement to settlement, which was comparatively inefficient but did not require much in the way of road maintenance (Dobyns 1981:117; Walker 1973).

For 35 years following Cooke's opening of the road to California, wagons dominated the transportation of goods in southern Arizona. The first wave of wagons came during the California Gold Rush of the late 1840s, while southern Arizona was still a part of Mexico. Departing in caravans from Texas, Arkansas, Missouri, and other points in the East, most would follow Cooke's route across southern Arizona to the San Pedro River near modern Bisbee. There many would head due west to the Santa Cruz River rather than heading down the San Pedro as Cooke had done. The caravans would then turn north down the Santa Cruz and pick up Cooke's trail once again in Tucson (Wagoner 1975:299-300).

After the Gadsden Purchase, heavy wagon freighting became the principal economic connection between southern Arizona and the rest of the United States. Almost everything required by the growing settlements of the region had to be brought in from elsewhere, and wagons were the most efficient means of hauling freight. Freighters typically consisted of two or three wagons hitched in tandem to a team of 12-20 mules, and carrying up to 18,000 pounds of cargo; some tandems were even bigger. The wagons themselves were often huge, with rear wheels as high as eight feet (Sherman and Ronstadt 1975; Walker 1973). Freighting was the biggest business in southern Arizona prior to the railroad, and the men who ran freight lines were often the only people with significant capital in the region. As was the case for the cattlemen of the 1860s and 1870s, one of the biggest customers for the freighting business was the U.S. Army (Sheridan 1995:104-105).

At the same time that freight wagons were beginning to bring cargo into southern Arizona, the first well-organized transcontinental stage line entered the region. The Butterfield Overland Mail began operation in 1858 in response to the demand for a dependable communication link between California and the East (a poorly conceived stage operation had failed the previous year). Lightweight stages drawn by horses or mules carried both mail and passengers along a 2,700-mile route from St. Louis and Memphis to San Francisco. The route of the Butterfield through southern Arizona basically followed Cooke's 1848 route, with stations at regular intervals, including the San Pedro River, Cienega Springs, Tucson, Point of Mountain (at the northern end of the Tucson Mountains), and Picacho. The Tucson station was located downtown near the intersection of Alameda and Main, just outside the former gate of the presidio. Other stations were added later along the line, and some stations changed locations. Because the stations were always located near sources of water and were often the only trace of occupation in an area, many served as the start of settlements, either small communities or clusters of ranches. The Point of Mountain station is a good example of the latter (Conkling and Conkling 1947; Stein 1993:96, 1994:14-17; Wagoner 1975:351-359).

By 1861, the Butterfield line in southern Arizona was an evident success, but that same year the company shifted the line northward to pass through Salt Lake City, fearing that a disruption of service in Arizona might result from tensions surrounding the start of the Civil War. After the war, other stage lines entered southern Arizona, and following the arrival of the railroad in 1880, local stage lines actually proliferated for a time, serving a wide variety of routes that connected towns to the rail lines (Stein 1994:22).



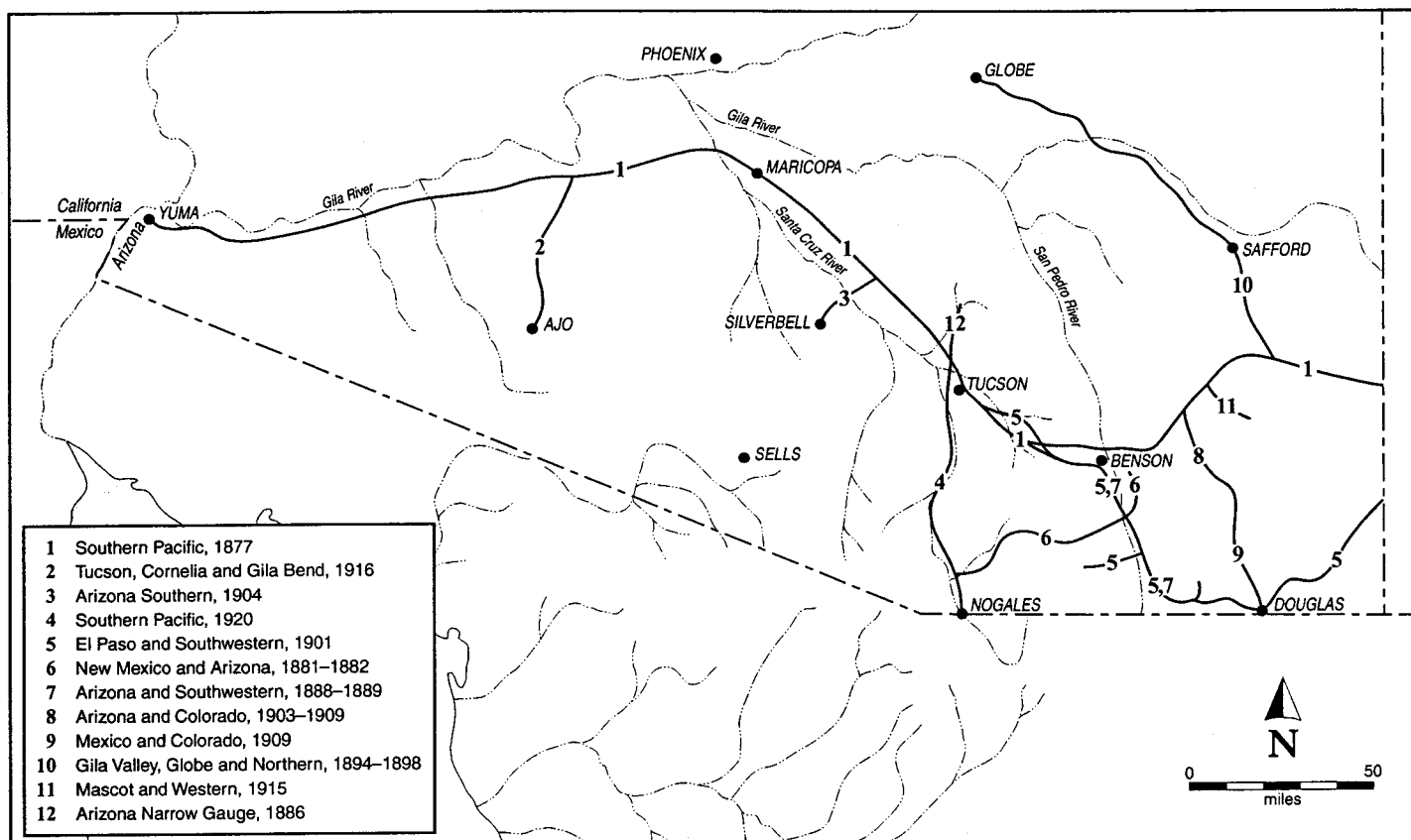
*Stage coach lines began regular service through Tucson and southern Arizona in 1858
with the establishment of Train in Cienega Creek ca. 1880s the Butterfield Overland Mail Company.*

The arrival of the railroad was less kind to the long-distance freighters in southern Arizona, many of whom were put out of business overnight by the drastically cheaper hauling rates offered by the railroad. But local wagon lines often benefited, connecting mining camps and ranches to the rail lines (Sheridan 1995:104; Walker 1973:202).

Plans to build a railroad across southern Arizona began as early as the 1840s, as part of the general interest taken by the U.S. government and private business in creating a transcontinental railroad. In the years just prior to the Gadsden Purchase, spurred notably by recent mineral strikes in California and Nevada, the U.S. government commissioned a series of surveys of the West in search of the most suitable route for a transcontinental line. Surveys along the southernmost of the proposed lines established the feasibility of a railroad across southern Arizona, and the Gadsden Purchase soon made the necessary land available, but the Civil War quickly dampened federal enthusiasm for a transcontinental line that would best service the Southern states. As a result, the first transcontinental line, completed in 1869, passed through Utah instead of Arizona (Cowdery 1948; Sheridan 1995:112-114).

The first railroad to enter Arizona came not from the east, where Anglo-American novelties usually came from, but from the west. The Southern Pacific Railroad, moving east from San Diego on track laid primarily by Chinese laborers, crossed the Colorado River into Arizona at Yuma in 1877, and the following year started up the Gila River valley. Reaching the lower Santa Cruz Valley in early 1879, the railroad turned south toward Tucson, stopping at Casa Grande in May 1879. After a delay of several months, track was being laid once again up the Santa Cruz Valley, and on March 20, 1880, the city of Tucson welcomed the railroad with a large celebration. A commemorative silver spike, made from ore from the Tough Nut mine at Tombstone, was presented by the city to the president of the Southern Pacific, Charles Crocker (Janus Associates 1989; Myrick 1975:19-55).

The Southern Pacific soon continued eastward across southern Arizona, entering New Mexico in late 1880, and eventually completing the transcontinental line by connecting to the Texas & Pacific Railroad east of El Paso in 1881. During the next 40 years, the Southern Pacific became the backbone of a series of branch railroads extending throughout southern Arizona, servicing towns, mining districts, and the Mexican border (Figure 4). A major link was made with Mexico with the completion of the Tucson-Nogales line of the Southern Pacific in 1910, although the start of the Mexican Revolution the same year limited the importance of this line for the next decade. As noted earlier, the major mining interests were especially dependent on the railroads to bring equipment and supplies to the region, and to haul processed minerals out of the region. Some companies bought or built their own lines to avoid the control over their industry exercised by the Southern Pacific (Irvin 1987). The Phelps Dodge Corporation owned the El Paso & Southwestern Railroad, which, beginning in 1901, connected the Phelps Dodge mines at Bisbee and their smelter at Douglas with northern New Mexico. Phelps Dodge eventually considered extending the line through Tucson and on to the Pacific coast. The line to Tucson was completed in 1912, allowing service between Tucson and El Paso, but the effort to extend the line farther west was soon abandoned (Myrick 1975:237).



Railroads in southern Arizona.

For much of its route, the El Paso & Southwestern closely paralleled the route of its competitor, the Southern Pacific, and was even obliged to build bridges across it at two points. Just east of Tucson, the El Paso & Southwestern ran about a mile and a half south of the Southern Pacific and entered downtown Tucson from the south. A gracious passenger station was completed in 1913 on Congress Street, and a freight station was completed later. In 1924, the Southern Pacific bought out the El Paso & Southwestern, thus eliminating its largest competitor in the region (Myrick 1975:237; Sonnichsen 1982:163-164).

As noted at various points in the discussions of mining, farming, and ranching, the arrival of the railroad to southern Arizona transformed the region, pushing it headlong into what Sheridan (2000:112) has called the "Era of Extraction." The regional economy quickly changed from a locally focused, low-capital, preindustrial system to an outwardly focused, heavily capitalized, fully industrial one. The change was swift and dramatic, and in many ways devastating to the regional landscape. The railroad economy dominated southern Arizona until World War II, when trains began to decline in importance and the next great transformative modes of transportation, the automobile and the airplane, exerted their influence.

The Social Landscape

When Anglo-Americans first started settling in southern Arizona in the middle of the nineteenth century, the region was a distant frontier of Mexico, where a unique mixture of Hispanic and Native American culture had developed over the preceding century and a half, under the sometimes tenuous control of a Hispanic political system. The Gadsden Purchase of 1854 instantly brought overarching political change to the region, placing it under U.S. control, but the social landscape of southern Arizona was much slower to change. Sedentary Native Americans like the Tohono O'odham retained a significant presence in the region, their status shifting from second-class (though welcome) participants in Hispanic society to afterthoughts of Anglo-American society. The Hispanic people, Mexicans for 33 years, were suddenly Mexican Americans, but continued to form the majority of the population of the region until the early 1900s, actively participating in the social and economic life of the region alongside their less numerous but generally more powerful Anglo-American counterparts (Sheridan 1986).

Gradually, the social landscape of southern Arizona became dominated by Anglo-Americans, but the process of change was a complex one that included the participation of people from a wide variety of backgrounds. Non-Hispanic people from outside the Anglo-American mainstream began entering the region at the same time as the people conventionally considered Anglo-American. African Americans came as drovers, cowboys, and settlers as early as the 1850s, Mormons came to farm and found towns as early as the 1870s, Chinese men came as railroad workers in the 1880s, and a host of people of other ethnic affiliations came in the wave begun by the arrival of the railroads, each contributing to a social and cultural diversity that is easily overlooked in an era dominated by Anglo-American enterprise

(see especially *The People of Southern Arizona, Past and Present*, an earlier section of the cultural resources overview prepared for the SDCP).

The ethnic diversity of mining camps in the period just after the arrival of the railroad is a case in point. Eppinga (1993:49) notes that the 1882 voter rolls for Cochise County, home of the copper mines at Bisbee, listed people born in a remarkably wide range of countries, including Algiers, Argentina, Australia, Azores, Belgium, Brazil, Chile, Finland, French Guinea, Greece, Peru, Poland, Portugal, Russia, Slavonia, and Spain (as well as at sea). She goes on to document the important roles played by Jewish, Scottish, Hispanic, English, Serbo-Croatian, Cornish, African-American, and Chinese peoples in the history of mining in Arizona as a whole, most as laborers but a few in the more prestigious aspects of the industry such as engineering and ownership.

The fate of ethnic and minority groups in the dominant Anglo-American society that emerged at the start of the twentieth century has varied widely, from assimilation to a kind of imposed estrangement. Many of the people from the wide mix of national origins in late-nineteenth-century southern Arizona made the region their home when they stopped working in the industries that first brought them here. Some were absorbed quietly into the mainstream, others either proudly maintained their distinctiveness or were forced by bigotry to remain apart. The Chinese railroad workers that settled in Tucson in the late nineteenth century never left their small downtown enclave, excluded from the Tucson mainstream by a combination of their own cultural conservatism and the anti-Chinese sentiments of both Anglo- and Mexican Americans (Keane et al. 1992). African Americans formed a part of the Tucson population since the 1850s, but were similarly confined by the unwritten laws of racism to a few enclaves in the city until the second half of the twentieth century. Jews in Tucson had a different fate. Although they suffered the usual injustices imposed by anti-Semitism, Jews were among the early success stories of the region. Philip Drachman, a German-speaking Jew who fled Europe in the late 1840s, came to Arizona to haul freight and run a store in a northern mining district before settling in Tucson in 1854. He soon had a successful business in Tucson, and his many descendants have included entrepreneurs, territorial legislators, local politicians, and philanthropists (Drachman 1999; Sheridan 1995:106; Sonnichsen 1982:96).

It is the Mexican-American community in Tucson, of course, that has had the most prominent role of any non-Anglo-American group in the history of the city, a role documented in detail by Sheridan (1986). Mexican-American culture had a profound influence on Anglo-American culture from the very start. The social landscape of post-Gadsden Tucson was for decades predominantly Mexican in origin and character, and the earliest Anglo-Americans in the region were obliged to structure their social and economic lives accordingly. One important factor in establishing links between Mexican Americans and Anglo-Americans in the early U.S. period was the scarcity of Anglo-American women. Many Anglo-American men took Mexican wives, and the most prominent of Anglo-American men married women from prominent local Mexican families.

These links between Mexican and Anglo families are a major reason for what were generally good relations between Mexicans and Anglos prior to the arrival of the railroad to southern Arizona. As the Anglo-American population steadily increased after 1880, the number of Anglo-Mexican marriages steadily decreased, from about 23 percent in the 1870s to less than 10 percent in the 1910s. Sheridan (1986:146) considers the implications of the trend:

These statistics constitute one of the most telling indices of the growing social distance between the Mexican and Anglo communities in town. Prior to the advent of the railroad, frontier conditions to a certain extent obscured differences of race and class. Mexicans and Anglos fought the Apaches together, engaged in long-lasting business partnerships, and occasionally married into each other's families. By the turn of the century, however, Tucson was evolving into a typically segregated urban center of the southwestern United States.

Tucson soon became just such a segregated urban center, and it still remains one in many respects. The Mexican community continues to center on the southern and western sides of town, the Anglo-American community continues to sprawl north and east away from it. But Tucson is also a town where Mexican Americans and Anglo-Americans still intermarry, still share social, cultural, and economic interests, and still come together as Tucsonans in the face of challenges to the community as a whole.

The Military Landscape

The political system of the Spanish empire was manifest on the southern Arizona landscape as the northernmost extension of a system of missions and presidios. These were instruments of religious and military imperialism, respectively, and closely interdependent in the attempt to bring Native Americans and Native American territory into the Spanish realm. In the Mexican period, the system remained intact, at least officially, although the missions lacked resident priests for most of the period, and the presidios were hard-pressed to keep soldiers fed and armed in the continuous struggles with the Apache. After the Gadsden Purchase of 1854, southern Arizona entered the political system of the United States, first as an extension of New Mexico Territory, then as a part of the newly established Arizona Territory (1863), and finally as a state (1912).

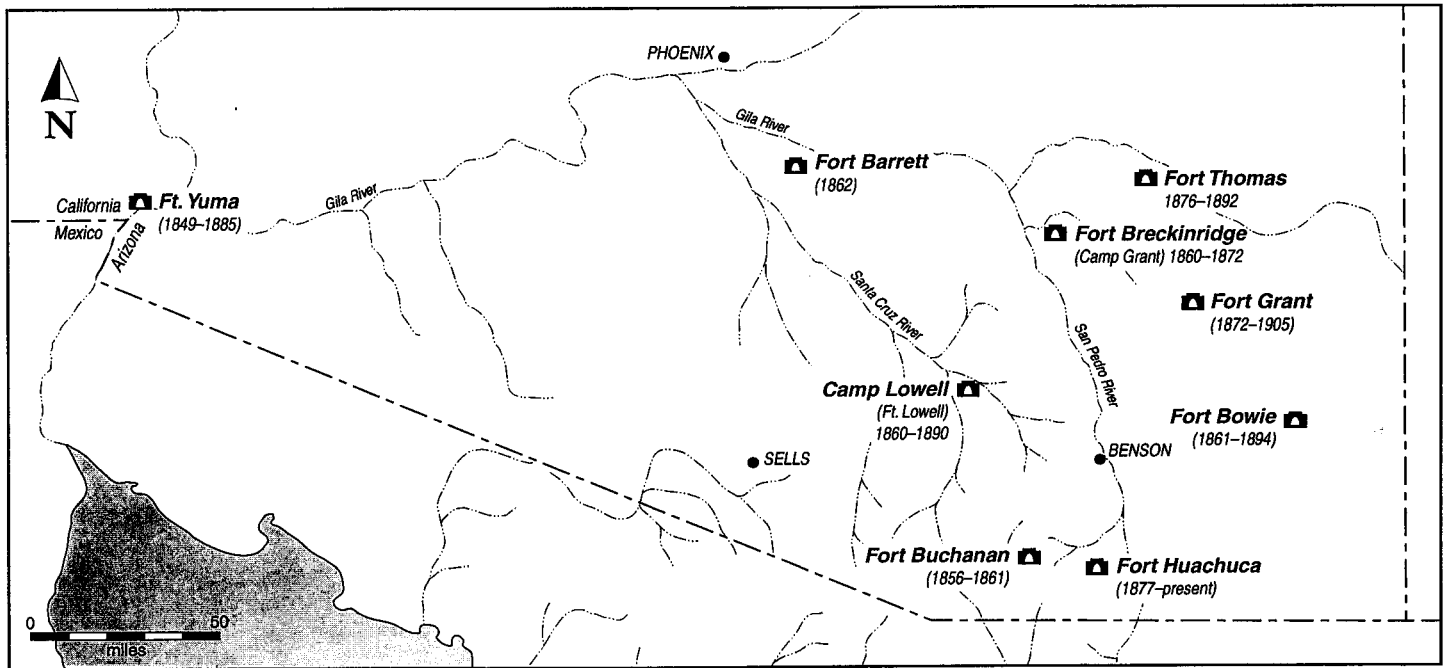
The first permanent presence of the U.S. government in southern Arizona came in 1856, when U.S. troops finally replaced Mexican troops at the Tucson presidio. The same year, Fort Buchanan was established south of the Santa Rita Mountains, the first in a series of forts in the region intended to offer protection against Apache raids. In 1860, the soldiers camped in Tucson became Camp Lowell, and Fort Breckinridge was established at the confluence of the San Pedro River and Aravaipa Creek (Whittlesey et al. 1994:298-299).

In 1861, the start of the Civil War put a temporary end to the expansion of the U.S. military presence in southern Arizona. That year, Confederate forces scored a series of easy victories in New Mexico, which led to the declaration of all of New Mexico south of the 34th parallel as the Confederate Territory of Arizona. In response to what appeared to be an imminent invasion of southern Arizona, the U.S. Army ordered that Forts Breckinridge and Buchanan be destroyed and the troops withdrawn rather than risk losing either to the Confederates. The U.S. troops marched eastward to New Mexico to defend forts there. Soon after, a small group of Anglo-American Tucsonans passed an ordinance of secession from the Union, and in February 1862, Confederate troops occupied Tucson. For a short time, southern Arizona became a part of the Confederacy (Wagoner 1975:443-452).

A counter-invasion by the California Column, a company of Union volunteers based in California, soon put an end to the Confederate occupation. The Column caught up with a small Confederate force at Picacho Pass, about 45 miles north of Tucson, and engaged them in a short but fierce battle since known as the Battle of Picacho Pass. This is generally considered the westernmost battle fought in the Civil War. Both sides retreated, the rebels to Tucson and the column to Fort Breckinridge, which was reestablished as a Union post. In May 1862, the column marched into Tucson, which had been abandoned by the Confederates. Southern Arizona was once again a part of the United States, and Union troops moved to secure the rest of the region as the Confederates abandoned the Southwest for Texas (Wagoner 1975:453-458).

Following the Civil War, the U.S. military in southern Arizona focused almost exclusively on the Apache problem, and the series of forts established in the region were placed to best pursue Apache pacification (Figure 5). In 1873, Camp Lowell in Tucson was moved six miles east of town to the Rillito River, becoming Fort Lowell in the process (Peterson 1963). Fort Breckinridge on the San Pedro first became Camp Grant, and served as the scene of the infamous Camp Grant Massacre of 1871; it was later christened Fort Grant. Fort Huachuca was established in 1877 farther up the San Pedro River, near the eastern foot of the Huachuca Mountains. Fort Bowie, originally established in 1862 near the Chiricahua Mountains in the southeastern corner of the territory, played a major role in the later years of the Apache wars (Wagoner 1970:151; Whittlesey et al. 1994:303).

The campaign against the Apaches did not end until 1886, when the Chiricahua leader Geronimo surrendered to a U.S. Army captain in the Peloncillo Mountains of southeastern Arizona. With the Apache now pacified throughout the territory, the army soon decided to eliminate many of the posts it had established in Arizona to deal with the problem. The posts closest to Tucson were among those chosen for elimination: Fort Lowell was abandoned in 1891, and Fort Grant in 1895. The next closest post, Fort Huachuca, was kept open because of its proximity to Mexico, which was viewed as a potential military concern. Fort Huachuca soon assumed a central role in the U.S. military presence in the region. In 1916, a punitive expedition against the Mexican revolutionary Francisco (Pancho) Villa, consisting of a cavalry force from Fort Huachuca, pursued Villa into Mexico, in retribution for his earlier harassment



U.S. military posts in southern Arizona.

of U.S. forces. The punitive expedition, the last campaign of the U.S. cavalry, soon failed in its purpose and returned to Arizona (Whittlesey et al. 1994:303–304).

Following World War I, Fort Huachuca became the only active Army post in Arizona, after the closing of Fort Apache in the White Mountains. The fort saw a great deal of activity in World War II, especially as a training post and preparatory station for infantry, but was deactivated in 1947. After several years of serving as a buffalo preserve for the Arizona Fish and Game Department, the post was reactivated during the Korean War, when it served as a training facility for aviation engineers. It was then deactivated once again in 1953. In 1954, the Army decided to return Fort Huachuca to permanent use and transferred its electronics testing operations there from interference-ridden New Jersey, naming the new facility the U.S. Army Electronic Proving Ground. The next major role for the fort came when the U.S. Army Intelligence Center and School was transferred there from Maryland. The school continues to conduct training in counter-intelligence and interrogation today (Van West et al. 1997:319; Whittlesey et al. 1994:305).

Since World War II, the other dominant military installation in Pima County has been Davis-Monthan Air Force Base, first opened as a municipal airport in the 1930s and established as Davis-Monthan Field by the U.S. Army in 1941. The designation as an Air Force Base came in 1948, when the Air Force became a separate branch of the U.S. armed forces. During World War II, Davis-Monthan served as a training installation for medium and heavy bombardment. It has since served a variety of roles in the U.S. Air Force, including as a major aircraft storage facility (Whittlesey et al. 1994:305).

The Sacred Landscape

As seen throughout this review, cultural landscapes involve more than the built environment and the myriad associated activities that are applied to the land and its resources. Cultural landscapes also involve mobility, connectivity, social interactions at many levels, and beliefs (Whittlesey 1998). The complexity of these systems is intensified by those particular sets of beliefs associated with the sacred and maintained through rituals that connect such beliefs with the land.

The sacred landscape is a level of cultural landscapes that reflects fundamental relationships between people and the land, involving kinship, identity, religious beliefs, and issues of environmental ethics. As such, it carries with it more sensitive policy implications than other cultural landscapes. National Register Bulletin 38 (Parker and King 1992), for example, although providing guidance for Traditional Cultural Properties (TCPs), also discusses issues that confirm the existence of cultural landscapes. Primary differences between cultural landscapes and TCPs are the larger scale and greater complexity of human-land connections that characterize a landscape and make boundaries more difficult to determine than TCPs.

Yet, according to Bulletin 38, there are three basic characteristics shared by TCPs and cultural landscapes: (1) human-land connections are born out in beliefs, customs, and practices of a living community that have been passed down through the generations, usually orally or through practice; (2) such connections are spatially and materially anchored to locations associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world; and (3) it is to these locations where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice (Parker and King 1992).

Therefore it is possible to conceive a TCP as one component of the cultural landscape. Unfortunately, the specific guidelines for identifying and evaluating landscapes, as defined in National Register Bulletin 30 (McClelland et al. 1990), are applicable to rural historic use areas but have yet to be explicitly articulated with Bulletin 38 and its tenets. The cultural and ethnic groups to which Bulletin 38 applies are not limited to Native Americans. Key components of the sacred landscapes of Native Americans, however, are emphasized because several laws—the National Historic Preservation Act of 1966 (NHPA; P.L. 89-665, 16 U.S.C. 470–470w, with amendments 91-243 and others), the American Indian Religious Freedom Act of 1978 (AIRFA; P.L. 95-341; 42 U.S.C. 1996), the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA; P.L. 101-601, U.S.C. 3001–3013)—and Executive Order 13007 “Indian Sacred Sites” (dated 24 May 1996) specifically protect them.

In this section, sacredness is discussed as a concept and a descriptor of objects, sites, and resources that make the fiber of a landscape. Discussion of the relationships among sacred entities reveals levels of complexity of human-land interaction networks underlying sacred landscapes. Specific sacred entities such as missions, churches, shrines, and pilgrimages are examined relative to their role within the sacred landscape.

Characterizations of sacred landscapes of Native Americans and other groups follow. These reveal some basic shared attributes as well as some stark differences, illustrating some of the underpinnings of cultural misconceptions and confusions about what is sacred. The majority of this discussion focuses on Native American sacred landscapes because of the legal standing of these groups and the emphasis placed on them in Bulletin 38. A particular interesting implication of these differences—that of the sacred landscape as the source of a cultural group’s environmental ethic—concludes this section.

The Concept of the Sacred

What does “sacred” mean and how does it apply to landscapes? Although the term has different meanings for different cultural groups, the concept has universal currency (Callicott 1994). Sacredness reflects perceptions of something central, an axis, or the origin of the world.

When people define space, they are attempting to create order out of disorder. That space, consequently, acquires some of the significance of the primordial act of creation or its sacred character (Casey 1998; Eliade 1959). Sacred character also is acquired through an association with some form of divine manifestation or with an event of overwhelming significance. Sacred places may reflect the perception that the land embodies the powers that rule the world (Tuan 1974).

One of the difficulties of defining the sacred universally is that, as it is perceived by different cultures, one concept may or may not equate to other concepts and may not be definable in another culture's terms. Carmichael et al. (1994) state that it is the nature of sacred places, rather than the definition, that is different and, consequently, unrecognizable to those not of the associated cultural group. He identified three descriptors that appear to be common to sacred places of different cultural groups: separateness, respect, and rules of behavior. The English interpretation of sacredness, for example, implies restrictions and prohibitions on human behavior—certain rules must be observed in relation to the sacred.

Sacred implies a particular cultural significance, carrying with it rules and regulations for people's behavior in relation to the sacred. It implies a set of beliefs, often in relation to the spirits of ancestors, as well as remote or powerful gods or spirits (Carmichael et al. 1994). Interpretations from indigenous cultures in the United States and Australia, for example, express sacredness as an integral part of being. A sacred place, consequently, is part of the cultural group's being (Rose 1996), and the ritual actions derived from this belief serve to maintain the group's identity and cohesiveness. This epistemological difference is quite complex and illustrates the difficulty of trying to define the concept through another cultural group's terms.

For many Native American groups, sacred equates to the notions of respect, traditions, and lifeways, as phrased by Lassiter (1999:161): "We respect it. We have to take care of it, to pass it on to our children. It's our way of life, and it goes with us all the time, every day." When outsiders try to define Native American sacredness, they exaggerate the term and the idea of spiritualism, consequently, undermining the experiential complexity of Native American sacredness (Champagne 1999).

According to the Native American conception, "sacred" is often free of any system of dogma. Being part of a way of life, a sacred feeling derived from a place or activity can reflect a strengthening, renewal, or maintenance of a cultural group's social relations (Champagne 1999). Stories and songs are vehicles that are often used to bring such feeling to a place, a ceremony, or an activity (Champagne 1999; Kelley and Francis 1994).

When expressed through symbols, language, and concepts that organize peoples' relationships with the social world, feelings, beliefs, and rules of behavior come to be applied in physical ways that form the sacred landscape (Greider and Garkovich 1994; Marquardt and Crumley 1987; Whittlesey 1998). Places where events that occurred in the mythical past or where

charismatic leaders with divine attributes were born or died, take on some of the event's or person's sacred character. Although sacredness may center on a shrine, tomb, or site, the sacred aura associated with it may be dispersed over a larger area, elevating the significance of everything within the area, including plants and animals (Carmichael et al. 1994; Tuan 1974).

Sacred places take on many forms including gardens, groves, forests and woods, pools and waterholes, rivers, springs, rocks and rock formations, mountains, caves, engravings and paintings on rock surfaces and inside caves, pictographs, and petroglyphs (Basso 1996; Carmichael et al. 1994; Tuan 1974). Native American sacred sites almost always occur near water or where water used to be found (Layton 1995) because water is life-giving and life-preserving.

Behavioral rules associated with these sacred places include offerings for appeasement, supplication and thanksgiving, and restrictions on activities (Carmichael et al. 1994). Large sacred areas or preserves such as some canyons and mountains in Arizona may define zones where daily activities such as herding and farming cannot be conducted; these zones may be considered "holy." In addition, outside these zones there resides a different kind of power that endows commonplace areas with a different kind of sacredness. From Native American perspectives, places are alive, and the ones with special power are most alive. People visit these places so that they can connect with that power. They use ceremonies to establish proper social relations with the Holy People and spirits who inhabit places and anchor their origin stories and lifeways in such places (Kelley and Francis 1994). Thus, the landscape may be conceived as containing places where people dwell, produce, and procure food and other resources, develop social relations, and worship their gods (Zedeño 1997). All of these, in turn, are connected through the belief that all places and resources are sacred to the people because they contain life-giving power. Ritual actions conducted at each of these places range from individual daily prayer to group or intergroup ceremony and are intended to maintain the flow and balance of life-giving power.

Although certain places and resources may be recognized as sacred by multiple cultural groups, their connections with the surrounding geographic area may not be acknowledged cross-culturally because they are not always tangible (Carmichael et al. 1994). Here we come to the nonphysical aspect of the concept of sacredness. Marquardt and Crumley (1987) have defined landscape as the spatial and material manifestation of human-nature relationships. They refer to the physical aspects as landscape signatures or "the material imprints left on the earth's surface by particular constellations of human groups" (Marquardt and Crumley 1987:7). There are other, intangible spatial imprints, however. These include cognition and beliefs of cultural groups. Oral histories and traditional knowledge reflect a tangible aspect of the spatial imprints when their connections to the land result in material imprints (e.g., petroglyphs, intaglios, and cairns). Because cognition is culturally specific, spatial imprints and the resulting material imprints may not be recognized by other cultural groups as sacred.

An oak savanna in northern California, for example, that was created by Native American burning to produce specific plants and plant communities for various cultural needs, including ritual and ceremonial, represents a sacred material imprint derived through the application of spatial imprints.

From the Native American perspective, land that has no wells, no names associated with the ancestors, and no perpetual links between land, people and the natural and supernatural worlds is empty of religious affiliation and meaning (Rose 1996). But the presence of these features suggest a complex networking and spatial expansion that permeates the landscape. These also suggest the possibility of determining all the physical components of a sacred landscape and, consequently, being able to address them in contemporary planning process. The complexity that is manifest in the connections among tangible and intangible imprints, however, makes such efforts difficult at best.

Relationships among Sacred Objects, Sites, and Landscapes

Human-nature relationships produce increasingly complex landscapes. When we attempt to understand those relationships and the incumbent concerns of the associated cultural groups, we often confront aspects we do not understand. In our desire to address everyone's concerns, we apply our classificatory tools—most commonly scale, boundary, landmark, site, feature, and object—in whatever fashion our own cultural cognition and analytical training dictate. To tackle those aspects and relationships that we do not readily comprehend, we need to understand how the physical aspects are connected.

As different cultural groups struggle to share geographic areas, cultural landscapes come to be shared. Beliefs, consequently, overlap on the ground, giving rise to the concept of multiple layers of landscapes. These layers can be as small as a landmark or as extensive as the Colorado River. The challenge begins when Native Americans attempt to convey their concepts of landscapes, and the critical cultural connections that bind the physical, biological, cultural, and spiritual together, beyond the landmark. Our comprehension depends on our ability to accept and perceive the connections between landscapes and the meanings of places.

The concept of layered landscapes, as developed by Stoffle et al. (1997) with the Southern Paiute people of the Grand Canyon area, explains that landscapes are spatial and temporal in nature, and are shared with other Native American groups, creating multiple layers of or nested cultural meanings. These authors identify five levels of landscapes, in order of decreasing size and complexity: holy landscapes (the sacred landscape this section addresses), storyscapes, regional landscapes, ecoscapes, and landmarks. These layers are connected to one another by ritual action that provides meaning and that binds all spaces and activities together in one single sacred network. If we begin with the sacred landscape, what Stoffle et al. (1997) call holy landscapes, and work our way to the more familiar level of landmark, we can begin to develop a sense of the connections and meanings that tend to elude us.

The sacred landscape is broad and usually encompasses a Native American group's creation place to which other places within this landscape layer are connected. The spiritual and origin characteristics of this layer add a temporal component to the spatial one. Groups that have moved across the land through migration incorporated places to their original creation place as they went along, thus progressively expanding their sacred landscape. The Hopi Tutskwa is an example in point (Whiteley 1989; Zedeño 1997).

Storyscapes are temporal and spatial landscapes within the sacred landscape. Although contiguous spatially, such landscapes follow trails and, consequently, delineate the sacred landscape. The temporal aspect of this landscape is characterized by "mythic time" (Stoffle et al. 1997:7), which simply implies sometime in the past. The structure and meaning of storyscapes is revealed through associated stories or songs, such as those told by the O'odham people about I'toi and recorded in their creation story (Bahr et al. 1994).

Regional landscapes, such as the Grand Canyon, are another component of the sacred landscape and also have both spatial and temporal layers. This level of cultural landscape reflects our term "ecosystem." It is at this scale that Native American people can reside and use the resources through adaptive strategies for long periods of time (Stoffle et al. 1997).

The next level of cultural landscape is the ecoscape. It is a component within the regional landscape and has clear geographic and cultural definitions. The cultural significance of ecoscapes comes from the specific economic and social roles these have in the history and culture of Native American groups. These are the largest landscapes Native Americans and Euroamericans frequently recognize, creating multiple cultural layers.

The fifth landscape level is the landmark or what Zedeño et al. (1997:125) call a "historical transformation of place" that has significant, readily recognizable meaning. For Native American people, the landmark represents one layer of meaning within a larger cultural landscape. This level of landscape typically gains recognition for protection as a TCP, because the meaning of a landmark, often an interesting feature, can be readily conveyed to different cultural groups (Stoffle et al. 1997).

Although the meaning of a landmark may be easily perceived, it also presents another area of cultural differences and understandings. How does meaning come about? Is it assigned to existential space, or rather, a "blank environment," an "empty and innocent spatial spread?" (Casey 1996:14). Or is meaning imbedded in a place, waiting for humans to sense it, as Basso (1996) suggests? Many Euroamericans assume the origin of a place's meaning to derive from people, that the place is only space until someone gives it a meaning (Greider and Garkovich 1994; McHarg 1992; Schama 1995). Many Native Americans perceive a variety of meanings in an area of proximate places, many of which may derive from the nature of the place itself: for example, a "curing rock" has a life force, will, and power of its own and independently of humans. The role of meaning and its multifarious spatial and material imprints on the land must therefore be understood as a cultural imperative.

It is reasonable to assume that the meaning of landscapes may be assigned or imbedded, however, the meaning of landscape is not simply a sum of place meanings. This discussion has focused on relationships and connections. How are places connected and what does meaning have to do with it? Connections, whether tangible or intangible, are spatial—humans assign meanings not just to places but also to the spaces that separate each of their sacred places. For example, an area where all activity is forbidden and one must cross without pause may be conceived as a meaningful space between places. Where spaces between places have meaning, we can identify a connection through a relationship. Because spaces are abundant among places, a network of meanings is established and a cultural landscape is formed. This is the process by which small, discrete, understandable landmarks become part of the sacred landscape and illustrates how sacredness is dispersed throughout a landscape.

An example from Australia clarifies the process of layered meaning, relationships, and connections of sacred landscapes. The landmarks of sandstone and quartzite escarpments in Australia are Aboriginal ancestors who turned into stone at their final resting places. When contemporary Aborigines quarry these areas for tools, they are carrying the bones of the ancestors. The tools that are made from the quarried stone, therefore, are very powerful (Tatton 1991). The escarpments also are used for burial to return the dead to the ancestors, reflecting dual meanings of these areas or what Zedeño (1997) calls procurement space and ritual space.

Missions, Churches, Shrines, and Pilgrimages

Sacred landscapes contain ritual space that includes modifications associated with ceremonies, shrines, and ancestral sites. Geoglyphs and intaglios in the western Arizona desert, for example, represent Patayan mythology and cosmology, and define territorial boundaries (Ezzo and Altschul 1993; Hayden 1982). Landmarks, representing locational markers where activities occurred, are units where discrete human-nature interaction was focused. Such places may be sacred, symbolic, ceremonial, or secular and have historical and behavioral referents. As described above, the sacred landscape comprises places, resources, and the network of interactions between people, places, and resources (Zedeño et al. 1997).

Landmarks may be classified as unmodified, modified through human interactions but not construction, and modified through human constructs. Examples of unmodified landmarks are the sacred mountains that are central to Navajo, Tewa, and Hopi cosmology (McPherson 1992; Ortiz 1969; Waters 1963). Examples of landmarks modified by human interactions but not of human construction is Ayers Rock in Australia, and pictographs and petroglyphs of the southwestern United States (Basso 1996). Landmarks of human construction, the topic of this section, include missions, churches, shrines, and pilgrimage routes. These sacred sites and objects are identified easily as separate entities, but their place and role in the sacred landscapes of the Southwest requires a conjoined discussion.

The first connection among the missions and churches of the Southwest is their establishment by Jesuit priests. The second connection is the agricultural component that sustained the missionaries and indigenous people who provided the necessary labor. Throughout the historical period in the Southwest, connections among mission populations and remote indigenous groups were established, maintained, severed, and reconstructed. It is along these connections among missions and churches, represented physically by trails and the valleys these trails followed, that a layer of the sacred landscape is formed, just as monuments may be linked or grouped in ways that define routes or direct passage (Thomas 1993; Tilley 1993).

The significance of missions, churches, and shrines is readily apparent, though not necessarily understood, by many cultural groups. It is the connections, the pilgrimage routes to these and other sacred places, whose importance is less obvious (Kelley and Francis 1994). An example from Ireland illustrates why these routes are not only important but also sacred. Irish monuments are often linked or grouped in such ways as to define routes or to direct passage. These arrangements are purposeful actions to dictate how the landscape is to be viewed, to influence the correct behavior for viewing, and to dictate how the landscape is ordered (Thomas 1993; Tilley 1993). This type of construct reflects complex social interactions based upon a shared and extensive belief system that definitively establishes relationships between people and the land.

One of the best known pilgrimage trails associated with Pima County actually has a starting point in Santa Cruz County. People of all the major ethnic groups in Pima County gather in Nogales to trek to Magdalena de Kino, Mexico, for the fiesta day of San Francisco Xavier. They go to repay vows to the saint, sometimes leaving a small gift before joining the music and festivities in the plaza (Griffith 1996).

Trails, roads, and cognitively derived connections provide the networking of this layer of the sacred landscape. The missions, churches, shrines, and even roadside crosses, are the points of significant events, people, and interactions that remain important to people in Pima County today. Without these connections, the points become isolated and their significance is reduced. The sacredness of connection lies in the enrichment of meaning that illuminates the sacredness of the places.

Sacred Landscapes of Native Americans and Other Groups in Pima County

This discussion focuses on contrasts between indigenous and nonindigenous sacred landscapes. Many native peoples' religions are cosmotheistic, that is, plants, animals, rocks, etc. are conscious and willful and must be treated with respect as the source areas for them may be powerful or sacred (Carmichael et al. 1994). Such perceptions result in a lack of differentiation between sacred and secular, between material and spiritual, and reflect everything as part of a whole rather than individual.



*Chapel in Sil Nakaya, 1970.
Photo by James S. Griffith.*



*The field or mission cross at Sil Nakaya, 1970.
Field crosses usually stand a few hundred feet
from the door of the chapel, and serve as focal
points for saint's day processions.
Photo by James S. Griffith.*

For example, features of the Australian aborigines' landscapes are the embodiment of spiritual forces and the means they use to establish links among their ancestral groups, their social groups, and the land (Morphy 1993). This is a flexible concept that strongly parallels the Diné conception of landscape (Kelley and Francis 1994).

At the heart of the Native American sacred landscape is the understanding that nature is alive, willful, and talks. Nature is interactive and responsive to human behavior; sometimes it is healing, while at other times it can be punishing. The essential balance as defined at creation can be achieved only by a reciprocal flow of communication and culturally appropriate behavior between people and nature (Stoffle 2000). This process is illustrated in Stoffle's (2000) discussion of riverine cultural landscapes, which contain many sacred elements, both natural and human, and represent another layer of the sacred landscape. The natural elements that may define an area, and subareas within it, as culturally important include rivers, volcanic flows, hot springs, caves, medicinal plants and animals, paint source, and landmarks such as a mountain peak or large rock. In this setting, the landmark is "a place that conveys a story of power to all people and provides a universal and dramatic setting for human activity." Human elements that may define an area include origin stories, identification of component places with special purposes, connections between places derived from sequential ceremonies, rock peckings and paintings, and historic events (Stoffle 2000).

There are interesting relationships between the natural and human elements including the attachment of meanings by humans to the natural elements. Places of great cultural significance, for example, often have an origin story that explains a people's purpose and why they are on earth. These stories may involve the beginning of creation, when the place and the people were formed together, or these may involve a later time, what some call "mythic time," when things were different from what they are today (Stoffle 2000). Other places within the riverine ecoscape may have special purposes such as where power moves into and out of the earth, or where sequential ceremonies take place, thus connecting places in a foundational way and enhancing their sacred character (Stoffle 2000).

The perspectives of several Native American groups illustrate this abstraction as reality. The O'odham view their mountains as being connected by powerful forces that bind the components of the earth together (Richard W. Stoffle, personal communication 1999). If these ties are broken, the O'odham believe that the earth will disintegrate and no longer exist. Although we may interpret this as an exaggeration or superstition, if the connections holding the earth together are broken, the O'odham's sacred landscape is broken and so are the people. They are within the landscape, of the earth, not on it. This perception tells us that the disruption of connections will cause the people of that sacred landscape to cease to exist, they will lose their identity as a people. A primary reason behind the sacredness of the mountains to the O'odham is rain. Mountains bring down the rain from which traditional O'odham irrigated the crops that sustained them. The mountains bring rain, rain brings life, life is sacred, the mountain is sacred.

Although the O'odham accepted some Catholic teachings, they accepted only what could be combined with their native beliefs. Their traditional practices were not as formalized as those of some other Native American groups, so it was important that any new religion also be informal. The result was a religion with many Catholic attributes but without the direction of the church and its priests. The O'odham people's religious activities were bound primarily in healing practices and rituals of purification for hunting, menstruation, war, and salt pilgrimages. The most significant religious ritual was the rain-bringing ceremony or *vi:gida*, which involved making and drinking *tiswin*, a wine made from the saguaro fruit (Erickson 1994).

The emphasis on the importance of rain is not unique to the O'odham. The rules of behavior in the sacred areas of the Navajo change with elevation. The sacred areas of the higher elevations, which receive more water in the forms of rain and snow, have much stricter rules of behavior and fewer acceptable activities than those areas at lower elevations. Appropriate activities include praying, gathering plants, and conducting ceremonies. Gathering food and fuel wood in some places is also appropriate. Mining, grazing livestock, and building roads is prohibited in the upper elevation sacred places (Kelley and Francis 1994). Although the importance of rain is not made explicit, its implicit significance is apparent by the distinct influence of elevation on sacred areas (Vannette and Feary 1981).

Another shared aspect of the sacred landscape is the use of geographic features for teaching moral codes. For the Apache, losing their land means the loss of those geographic features upon which they affix the moral teachings of their history. When land is lost, it results in social instability, alienation, and uncertainty. The culturelessness of the urban Indian and myriad moral and social ills are symptomatic of the loss of the land rather than a loss of culture (Basso 1996). The Diné maintain a similar moral relationship to the land (McPherson 1992). The contemporary Tohono O'Odham also view their sacred places as sources for cultural renewal and revitalization, which will teach the youth and the future generations how to live in the Sonoran Desert and, more importantly, how to live correctly.

An example from the Northwest is the *Sto:lo* people. Their sacred ground is "a site or physical locality with which members of a native group have strong spiritual ties or feelings based on traditional beliefs and/or ceremonial usages" and includes transformer sites or sites attributed to or associated with the deeds or actions of *Xa:/s*, the Great Spirit. Transformer places are locations where *Xa:/s* transformed people into various features as part of his duty to set things right in a world without order. Most transformer sites are associated with bedrock outcrops, prominences, large and small boulders, caves, river pools, and mountains. Other sites may be spirit residences, ceremonial areas, traditional landmarks related to specific aspects of culture or significant cultural historical events, questing or power sites, legendary and mythological places, burials, traditional resource areas, astronomical sites, and medicinal pools and springs (Mohs 1994:192). When we consider how many potential sites are in the *Sto:lo* sacred landscape, it becomes clearer how significant the natural environment can be to Native American groups.

Non-native sacred landscapes in the United States derive from ancient beliefs developed in Europe. Initially, perceptions paralleled native philosophies. Cretan palaces were built to adapt to the forces of the earth with the ideal site being an enclosed valley where the palace was built, with a conical hill to the north or south of the palace, and a higher, double-peaked mountain located some distance beyond the hill. The result was a landscape of protective forms (Tuan 1974). Later, however, the Dorians built strongholds on top of mountains, creating a monumental quality and sense of domain. These structures were not limited to locale as the Cretan places were, although, sanctuaries to goddesses continued to be located in natural hollows (Tuan 1974). This philosophical shift from power in nature to power in man continued as the Christian tradition spread. The church did not adapt to the spirit of the land, rather it imposed its spirit on the environment. Although some Christian sacred places can be found near springs or in grottos, they do not acquire their sacredness from these places, but instead from a miraculous appearance of a martyred saint or the Virgin Mary (Benz 1953).

The idea of a sacred landscape that involves more than religion as we perceive it and that does not differentiate between sacred and secular can be better understood when we consider the sacred aspect of places we have created, other than churches or cathedrals, that can be directly experienced. Places like Independence Hall in Pennsylvania, the shrines of General Lee in Lexington and of General Grant in New York, and the monuments of Washington, D.C., stir intense feelings in most Americans that provide a window to understanding the sacred landscapes of Native Americans (Tuan 1977).

Although generalizations of Native American beliefs tend to be highly erroneous, some commonalities of the sacred can be found. Their deeply felt religious systems, in which land and religion are interwoven, guide their daily lives. They consider the land to be sacred and, though not so much today, they followed cycles of ceremony and prayer that created a feeling of personal kinship with the land and an intrinsic relationship among land, religion, and tribal identity (Feher-Elston 1988).

We are all taught beliefs and that what we are taught is correct. So too are the beliefs taught among Native American groups. There is "no ultimate, specific truth or way of understanding, but rather room for thought and meditation" (McPherson 1992:8). Native ways of thinking cannot be compared with the Euroamerican world's analytically-based belief system. Consideration of the two systems, however, can provide different perspectives of the same thing in a way that we might develop a broader understanding and appreciation of how people view their world (McPherson 1992). This is not a concept easily accepted by some but its iteration here is important if we are to understand the divergent perceptions of the cultural groups of Pima County and their responses to our management decisions.

As Greider and Garkovich (1994:7) have stated, "Landscapes embody the nucleus of cultural stability within the whirlwind of change. Landscapes hold the most fundamental meanings, the core of continuity, survival, and reconstruction."

From the Native American perspective, "These places are very important for us, those that know about them. They are something that is proof of our past. But it seems that something that is proof of our past is not as sacred as things that are sacred to Europeans" (consultant E. P. 1985 in Mohs [1994:184]), and "These places are an affirmation of our spirituality before the white man came. . . I don't mind them (white people) going there to see them because it's proof that *Xa:/s* was here. And that's one thing that the white man doesn't believe is that we were spiritual. . . . They figured. . . our paint and regalia, what we wore for spiritual occasions, praying to our Great Spirit . . . was all Devil's work because it looked strange to them. They didn't understand that we had our ways" (consultant T. G. 1985 in Mohs [1994:184]).

Environmental Ethics Implicit in Sacred Landscapes

The idea of an environmental ethic, as posed by Leopold (1949), suggests a more reverent attitude toward the land than we often express. If people must be directed to treat the land as sacred, is it possible that anyone could develop such an ethic without being told to do so? The preceding descriptions of sacred landscapes suggest an affirmative response. The traditional ways in which indigenous people of North America, and Australia, interacted with their environments were built on beliefs of respect for and equality with the land—the same characteristics that Leopold advanced.

Native people tend to think of land as theirs only when they come in spirit from the land as did their ancestors (Rose 1996). It is through lawful processes and the rules of behavior that the continuity of life is assured. These rules extend to times when a person is in a place that is not "his" or "hers," that he or she is not related to spiritually. According to these rules and the guiding system of reciprocity and respect, one must always ask, because knowledge is local; if one is not local, then he or she must ask. If one does not ask, he or she potentially risks causing damage or harm to the land and its people, emotionally, spiritually, and possibly physically (Rose 1996). The *Sto:/o* explain it as "These places are special. But if we don't look after them, our people will continue to get harmed" (consultant T. G. 1985 in Mohs [1994:184]).

When land is perceived as the source or provider for a cultural group, it becomes particularly important and sacred. When a river that provides fish becomes central to a cultural group, they often organize their activities and beliefs around it. The Sonoran Desert has had a similar impact on the O'odham, played a similar role in their culture, and consequently become sacred.

When people perceive the land as the source of life, including their own, the place where one is born may become spiritually and materially significant. Rituals based on such beliefs may further establish a spiritual relationship between a person and the land of his or her birth (Rose 1996). Poor treatment of the land not only means disrespect of the sacred, but can result in illness or death to the offender, to his or her family, and possibly the community (Morphy 1995).

From the Apache perspective, "The land makes people live right. The land looks after us.... Our children are losing the land. It doesn't go to work on them anymore. They don't know the stories about what happened at these places. That's why some get into trouble.... Stories go to work on you like arrows. Stories make you live right.... One time I went to L.A., training for mechanic... It was bad. I forget about this country here around Cibecue.... I forget how to live right, forget how to be strong" (Basso 1996:38-39). From the Navajo perspective, the landscape is an "integrated system of locations for the various activities that make up the customary Navajo way of life" (Kelley and Francis 1994:96). Loss of land, consequently, equates to spiritual deprivation (Carmichael et al. 1994).

When feelings for the land run this deep, what we call an environmental ethic becomes quite apparent. But what we call conservation, native people call life. As an Australian native told Rose (1996:38), "I would give up my life for this mountain." The *Sto:ló* make the permeation of the ethic in their lifeway more apparent, "These places are special. They were put here for a reason. *Xa:ls* meant for these places to last for all time. They were not meant to be destroyed. But white men don't understand this" (consultant E. P. 1985 in Mohs [1994:184]).

These expressions reveal that landscapes are relevant on a deeper, more significant level as a sense of place. This is the essence of traditional relationships with an environment, of how people identify themselves, and what underlies the impact that loss of land can have on a cultural group, that is, the loss of something much more profound than the physical ground (Whittlesey 1998). Nor is the present so much produced by the past as it reproduces itself in the form of the past and increases the intensity of attachment to the places where people live (Dixon 1976; Morphy 1993; Stanner 1965; Williams 1982).

In addition to the quotations above, the theoretical underpinnings of cultural landscapes, such as the writings of Basso (1996), Feld and Basso (1996), Greider and Garkovich (1994), Strang (1997), Tilley (1993), and Tuan (1974, 1977), are leading us toward a deeper understanding of the essential nature of cultural landscapes to people. By understanding the concept of cultural landscapes, we can better understand why Native Americans, as well as others with long-standing traditional ties to the land, express such grief when management decisions affect certain areas (Stoffle 2000). Once they are conceived, cultural landscapes operate as places of power that people use again and again. New meanings may be attached over time possibly as the result of a historic event. One meaning does not necessarily replace another, however, it simply adds a new layer to the landscape.

Problems and Directions for Future Research

A wide variety of potential topics for future historical and historical-archaeological research will emerge from even a casual review of southern Arizona history. The discussion here is limited to a few topics that seem especially important, and that would directly serve the cultural-resource planning purposes of Pima County.

Compilation of Historical Data

A useful tool for planners, cultural resource managers, and social-historical researchers in Pima County would be an electronic compilation of two key sets of historical data: the homesteading records of the General Land Office (GLO), and the population census schedules from territorial times to 1920. Currently, research on the homesteading and early occupational history of a parcel of land in Pima County involves a new search each time for the associated homesteading records and population census schedules at, respectively, the Bureau of Land Management (BLM) office in Phoenix and the Arizona Historical Society in Tucson (the BLM field office in Tucson has some GLO records, but not homestead patents). Accessing this information through a single electronic database would not only make research on individual properties vastly more practical, it would also make detailed, large-scale studies of the nineteenth- and early-twentieth-century history of Pima County feasible.

Creating the database would be time-consuming but not complicated, and the final product could be one or more GIS layers, preferably accessible via the internet. Both the homesteading records and the census schedules have a limited number of data categories, and both have precise locational information. Creating GIS layers based on the homesteading records would allow a detailed look at homesteading patterns through time, and layers based on the census schedule information such as household composition, ethnicity, and occupation would allow similar study of trends in these variables. The 1930 census will be made public in a few years and could also be incorporated. Homestead patents and census records are not the end-all of local historical research, but they are often the best starting point for research on particular properties. An electronic compilation of all of the data for the county would be a boon to countywide historical research.

Collection of Oral Histories

The generation of people who made up the first wave of post-World War II migrants to southern Arizona (most notably, veterans in search of jobs and cheap housing) is rapidly thinning. A real contribution to Pima County history would be an intensive effort to collect oral-historical testimony from the many men and women who made southern Arizona their home during the great postwar boom. The possibilities are unlimited (for the time being), and there is an abundance of recent similar oral-historical work on this generation from elsewhere in the country that would provide the basis for interesting comparative studies.

Historical and Archaeological Work on Mining

James Ayres (1984b) has commented on the totally untapped historical and archaeological potential of mining sites in the Tucson Basin, noting that the Tucson Mountains alone hold some 300 mining-related sites, with a comparable number likely in other ranges outside the Tucson Basin. He makes the interesting point that "It was rare in the western United States to have an already established town so close to major mining activities in the 1880s" (Ayres 1984b:230), which makes for excellent documentation of many sites in the Tucson area.

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