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11 BEFORE THE

12 ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

13 IN THE MATTER OF THE NAVIGABILITY
OF THE SALT RIVER FROM THE
14 CONFLUENCE OF WHITE AND BLACK
RIVERS TO THE GILA RIVER
15 CONFLUENCE, MARICOPA COUNTY,
ARIZONA.

NO. 03-005 AND 04-008-NAV
(Consolidated)(Salt)

**CITIES' NOTICE OF FILING
EXPERT REPORT AND
CURRICULUM VITAE OF JACK
AUGUST, JR., Ph.D.**

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19 The Cities of Phoenix, Tempe and Mesa (Cities) hereby submit the expert report of
20 Jack August, Jr. to the Arizona Navigable Stream Adjudication Commission (ANSAC).

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RESPECTFULLY SUBMITTED this 7th day of August, 2015.

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August, 2015:

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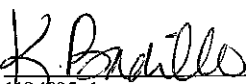
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History of the Lower Salt River Prior to February 14, 1912

Introduction

The unique environment of the Salt River, where multiple civilizations and cultures have lived over centuries, enabled them to develop and subsist. The Hohokam, successive Native American peoples, Spain, Mexico, and the United States all exerted sovereignty over the Lower Salt River area, from where its waters met and blended with the Verde River to its confluence with the Gila River thirty-eight miles to the southwest. In none of the civilizations or cultures that settled along the Lower Salt River in the area commonly known as the Salt River Valley, was the river used for transportation, nor was it considered susceptible for use as a route for trade or commerce.

The importance of water and attempts to control it has shaped the political ecology and economy of human societies in Arizona for thousands of years. Until the late nineteenth century Indian and Hispanic farmers engaged Arizona's rivers but never learned to control them. The Hohokam may have constructed the largest canal systems in pre-Colombian North America, but they, like the farmers of the Salt River Valley in the 1870s, 1880s, and 1890s were ultimately overwhelmed by both droughts and floods.

Until the nineteenth century, Arizona was a frontier. The region under discussion was a contested area, a region where no one group—tribe, nation state or empire—held uncontested hegemony. During the last four centuries Athapaskans, Hispanics, Anglo Americans—converged on what is now Arizona. Upon their arrival, they and the people already living in Arizona—Hopis, Paiutes, River Yumans, Upland Pais, and O'odahm—battled, slept, and traded with one another, exchanging ideas, rituals, foodstuffs, seeds, ceramics, and genes. But none of the groups established dominion over the entire area

until the U.S. military subdued Arizona's Indian population between the 1860s and 1880s. When Geronimo surrendered to General Nelson Miles in 1886, this version of the Arizona frontier ceased to exist.

In the 1880s, the extractive phase of Arizona's history began in earnest as the Southern Pacific and the Atlantic and Pacific (later known as the Santa Fe) transcontinental railroads broke Arizona's isolation and bound it to the rest of the nation. For the first time, capitalists in California, Illinois, the eastern United States, and Western Europe were able to convert Arizona's resources into commodities that could be transshipped for processing. Modes of transportation therefore, played a significant role in the region, and how the successive civilizations in Arizona approached transportation, was a central theme in the area's growth and development.

The vagaries of nature and the Lower Salt River, however, slapped down American dreams in the desert one by one. Between 1890 and 1905 in the Salt River Valley, floods and droughts alternated, making transportation impossible and ruining individuals and canal companies. Endeavors attempting to use the river for commercial transportation failed. Between twenty-four and thirty-three percent of acreage in cultivation was abandoned. Banks failed and merchants lost their businesses. Some valley residents, like Carl Hayden, acquired the strong belief in the power of big water projects as he watched his parents struggle to survive the hard times. Big business and corporations possessed the capital and expertise to run the railroads, manage the mines, and oversee the stock ranges, but the new scions of industry could not afford the enormous long-term investment to build waterworks.

The method of transportation that these successive civilizations and cultures traversed the region in question, and whether or not the river, in its natural and unregulated state, served as a transportation route or served as a river of commerce, is the focus of this report. Based on my research into primary, secondary, government, newspaper accounts, and archival sources discussed and identified in this report, I conclude that the Lower Salt River was not navigated and was not considered to be susceptible for navigation prior to statehood on February 14, 1912.

Pre-Columbian Conditions on the Salt River Watershed

Archeological evidence from approximately two thousand years ago suggests that a proto-agricultural civilization arose in the Salt River Valley, known as the Hohokam. Although their civilization was based on a mastery of canal irrigation, the Hohokam and their predecessors traveled long distances by foot, not by navigation of rivers. Arizona first inhabitants maintained active and robust contact with peoples scattered across the Southwest and northern Mexico. “It could be argued,” one historian has written, “that travel was a defining and central experience of Native American life.”¹ The Hohokam visited and traded with other groups in present-day Mexico, California, Baja California, New Mexico, and Colorado. The journeys were made for many different reasons; they traded for shells, stones, minerals, bells, and figurines, and for organic goods like herbs, animal hides, and feathers. They made spiritual journeys to sacred locations where they gathered plants and minerals, captured animals, and conducted ceremonies. And they carried out raids on neighboring peoples, sometimes returning with captives. Although there is abundant evidence that the Hohokam needed

¹ Pat H. Stein, *Historic Trails in Arizona from Coronado to 1940* (Phoenix: Arizona State Historic Preservation Office, 1994), 2-3.

transportation for travel and trade, there is no evidence that they navigated the Lower Salt or Gila rivers.

Archeologists continue to debate the nature and extent of the more than three-hundred miles of canals along the Salt River in the Phoenix area and the additional canals in southern Arizona. It was the most extensive prehistoric irrigation system in North America, and the Hohokam, according to recent scholarship, irrigated approximately 100,000 acres of land in the Salt River Valley alone. One scholar has noted that while the Hohokam are recognized as the premier desert irrigation specialists of the prehistoric era, they actually used many methods to control and use water. Besides an extensive canal system, they developed terracing, check dams, rock piles and linear and grid borders.²

Additionally, like other prehistoric cultures in Arizona, Hohokam water resource development fell into two categories: irrigation methods (canals and ditches) and indirect methods reflected in soil moisture conservation. These methods provided powerful technological precedents for the region's other Native American communities and European successors.³ In effect, the Hohokam devised the most extensive system of water control on the pre-Columbian North American continent, including Mesoamerica. Moreover, although the Hohokam were experts in water management in the Salt River Valley, there is no evidence that they used the Lower Salt or Gila rivers for navigation.

Recent accounts have estimated that at its peak, Hohokam culture in the Salt River Valley comprised one of the most densely populated areas in what is now the

² Michael Logan, "Head Cuts and Check Dams: Changing Patterns of Environmental Manipulation by the Hohokam and Spanish in the Santa Cruz Valley, 200-1820," *Environmental History* 4 (July 1999), 405-430.

³ Jack L. August, Jr., and Grady Gammage, Jr., "Shaped by Water: An Arizona Historical Perspective," in Bonnie G. Colby and Katharine L. Jacobs, *Arizona Water Policy: Management Innovations in an Urbanizing, Arid Region* (Resources for the Future Press: Washington, D.C., 2007) 11, Douglas Kupel, *Fuel for Growth: Water and Arizona's Urban Environment* (Tucson: University of Arizona Press, 2003) 2-5.

American Southwest. Some estimates range from 80,000-150,000.⁴ Likewise, and as noted above, during the height of their civilization (1100-1200 AD), the Hohokam irrigated nearly 150,000 acres via an irrigation system of canals extending well over three hundred miles. Without doubt, irrigated acreage fluctuated over time. Nor could all portions of the canal network be in use at any given time. An examination of the irrigation network at La Ciudad, along the Salt River, for example, revealed that sections had to be rebuilt or abandoned after floods. Through tree ring analysis from the Salt and Verde drainages, dendrochronologists have been able to pinpoint some of the floods by reconstructing the annual flow of the Salt River from 740 to 1370. They found that numerous large floods had surged down the Salt between 798 and 805, apparently forcing Hohokam populations to leave the Salt River Valley and settle along the Agua Fria, Verde, and New Rivers and even as far north as the Tonto Basin. Then, in 899, the largest floods in the entire 630-year span under review flowed forth from the mountains, devastating canal systems and making irrigated agriculture impossible for several years. Like the farmers along the Lower Salt in the nineteenth century, the Hohokam learned that the Salt River could ravage as well as sustain them. Indeed, the pendulum of flood and drought threatened the stability of Hohokam culture and society.

Various judgments and conclusions about Hohokam population, their irrigation system, and of irrigated land range widely. Using the most conservative estimates of Hohokam population living in the Salt and Gila River valleys and the areas of land they irrigated, the Hohokam far exceed the historical significance of the Pima culture residing in the area when the first reliably recorded contact with Spanish explorers and priests

⁴ Before the Arizona Navigable Stream Adjudication Commission, "In the Matter of the Navigability of the Salt River From Granite Reef Dam to the Gila River Confluence, No.: 03-005-NAV," September 21, 2005. 24-25.

occurred. As discussed earlier, after 1450 Hohokam culture and population declined and only ruins existed when the earliest Spanish explorers passed through the area.

Explanations for their demise are numerous: a twenty-five year drought; intrusion of Apachean groups; erratic and unpredictable flow of the river followed by extended periods of drought; European-borne disease; alkaline soil; perhaps a combination of all of the above. Although the Hohokam were gone before the time of early European exploration, colonization, and settlement, many of the early farmers of the nineteenth century utilized existing Hohokam canals for irrigation purposes. Significantly, with the vicissitudes of flood and drought, no evidence exists that the Hohokam utilized the Salt River for commerce or travel. Boating is not mentioned in any of the archeological, anthropological, or pre-Columbian historical research. The Hohokam used the river to divert water for use in irrigation.

European and Anglo-American Development the Salt River Valley 1527-1820

As the area's earliest European occupants, Spanish priests, soldiers, and civilian explorers of the seventeenth and eighteenth centuries took note of the inhospitable arid landscape and inadequate water supplies of the Salt and Gila River systems and did not consider it susceptible for navigation. "With few major exceptions," according to the distinguished historian of Mexico, Michael Meyer, "the water sources (the Rio Grande, the Colorado, the Fuerte, the Yaqui, and the Gila being among the most notable) which the Spanish dignified with the word 'Rio' were scarcely rivers at all." Not even the largest, the Rio Grande, proved valuable for needed transportation or commerce either before or after conquest. Although scientific evidence suggests that they carried a larger flow than they do now, most rivers were not perennial; they ran only part of the year,

trying their best to carry the excess from an exceptional winter snow cover in the surrounding mountains. The more common pattern was for the water that reached them to sink quickly into the sandy bed within a short distance to disappear from human sight. On occasion, however, they ran partly above surface, then underground, protected from the evaporative powers of the environment, to be forced to the surface again by the geological structure of a given area.⁵ Such was the case with the Lower Salt River.

To place the concept of aridity in regional and historical context, with the exception of eastern Texas, the Mexican north, which the Spanish first encountered in the sixteenth century, was generally arid, semi-arid, and on occasion, extremely arid. The availability of water for navigability or consumption spelled the difference between desolation and abundance with countless variations between the two. This vast desert region had been occupied continuously for several thousand years, but, in the mid-

⁵ Michael C. Meyer, *Water in the Hispanic Southwest: A Social and Legal History, 1550-1850* (Tucson: University of Arizona Press, 1985) 23. See, also, Roger Dunbar, *The Sonora Desert: Its Geography, Economy and People* (Tucson: University of Arizona Press, 1970). For its importance to the natural and human history of the Southwest, the Salt and Gila River have inspired surprisingly few books. Two of the best known are Edwin Corle, *The Gila: River of the Southwest* (New York: Holt Rinehart, and Winston, 1951) and Ross Calvin, *River of the Sun* (Albuquerque: University of New Mexico Press, 1951). Corle's book is useful but dated, reflecting an ideology of conquering the wilderness. Other noteworthy accounts are M.S. Salmon, *Gila Descending* (Silver City, New Mexico, 1985); Edmunds Andrews et. al. *Colorado River Ecology and Dam Management* (Washington, D.C.: National Academy Press, 1991); Arizona Rivers Coalition, *Arizona Rivers: Lifeblood of the Desert* (Phoenix: Arizona Rivers Coalition, 1991); Richard Berkman and W. Kip Viscusi, *Damming the West* (New York: Grossman, 1973); Charles Bowden, *Killing the Hidden Waters* (Austin: University of Texas Press, 1977); Philip R. Fradkin, *A River No More: The Colorado River and the West* (New York: Alfred A. Knopf, 1981); Paul Horgan, *The Great River: The Rio Grande in North American History* (New York: Rinehart and Company, 1954); H.B.N. Hyne, *The Ecology of Running Waters* (Toronto: University of Toronto Press, 1977); Ed Marston, *Water Made Simple* (Covelo, CA: Island Press, 1987); Frank H. Olmstead, *Gila River Flood Control* (Washington, D.C.: Sen. Doc. No. 426, 65 Cong. 3 Sess., Government Printing Office, 1919); Rich Johnson, *The Central Arizona Project, 1918-1968* (Tucson: University of Arizona Press, 1977); Tim Palmer, *Endangered Rivers and the Conservation Movement* (Berkeley and Los Angeles: University of California Press, 1986); Jack L. August, Jr., *Vision in the Desert: Carl Hayden and Hydropolitics in the American Southwest* (Ft. Worth: TCU Press, 1999); Jack L. August, Jr., *Dividing Western Waters: Mark Wilmer and Arizona v California* (Ft. Worth: TCU Press, 2007); John Wesley Powell, *Lands of the Arid Region of the United States* (Washington, D.C.: Government Printing Office, 1879); Marc Reisner, *Cadillac Desert: The American West and its Disappearing Water* (New York: Viking Press, 1986); Salt River Project, *Taming the Salt* (Phoenix: Salt River Project, 1979); John Walton, *Western Times and Water Wars* (Los Angeles and Berkeley, University of California Press, 1992); Frank Welsh, *How to Create a Water Crisis* (Boulder: Johnson Books, 1985); Donald Worster, *Rivers of Empire* (New York: Pantheon, 1985).

sixteenth century, the population density was low, perhaps less than two people per square mile. Significantly, aridity increased as one moved west from Texas and Coahuila to New Mexico and Chihuahua, and then to Arizona and Sonora and southern California and Baja California. With the exception of the higher elevations and coastal zones of the north, evaporation was high and humidity low. The topography and natural vegetation doubtlessly reminded the first Spaniards of southern Spain. They were not surprised that the sun could crack the soil and blister the land. They fully comprehended moisture deficiency and knew the critical challenges of aridity encouraged the development of a special kind of human society. They, like their successors, the nineteenth century Anglo American pioneers, were not surprised to learn that the labor of controlling water and putting it to beneficial use could occupy much of the working day in the continuous struggle to forge an existence. There is no mention in the historic record that navigation was even considered.

This vast region was much more varied and capricious than its counterparts in Andalucia and Castile. It had a wider range of altitudes, soils, animal life, drought resistant vegetation, and even more unpredictable cycles of annual rainfall. The mountains were more rugged and towering, and the canyons virtually impenetrable. Erosion and sedimentation bequeathed a physiography at once harsh and captivating—frightening yet alluring. The rainy season extended from July to September but few areas of the desert received more than twelve or thirteen inches of precipitation per year. In drier parts, like central Arizona, years of less than seven inches of rainfall were not uncommon. The mountains of this inhospitable land captured most of the moisture carried by prevailing Pacific or Gulf of Mexico winds and left the valley parched for

most of the year. The winter snow cover in the mountains was almost always insufficient to provide lower elevations with a reliable source of water, except during the early spring thaw.⁶

Two generations after the disappearance of the Hohokam, Alvar Nunez Cabeza de Vaca, one of four survivors of the shipwrecked Panfilo de Narvaez expedition of 1527, was the first European to traverse what is now Arizona. He and three companions somehow managed to make it back to Mexico City on foot. During eight years of traveling through what later became the American Southwest, Cabeza de Vaca became a slave trader and shaman to various groups. Upon his arrival in Mexico City he told authorities there of the great cities of the Southwest, which prompted the organization of an expedition into the area crossed by the four castaways. Later in 1537, he wrote an account that was first published in 1542, called *La Relacion (The Account)*.⁷ Notably, the account did not promote or even suggest the possibility of navigating rivers for exploration of the Southwest.

Then, in 1539, as a direct response to Cabeza de Vaca's briefings to the Viceroy, Marcos de Niza led an advance party for the Coronado Expedition.⁸ Though he and the Coronado Expedition (1540-1542) did not cross into the Lower Salt River area, they did

⁶ See Thomas D. Hall, *Social Change in the Southwest, 1350-1880* (Lawrence: University Press of Kansas, 1989); Donald W. Meinig, *Southwest: Three Peoples in Geographical Change, 1600-1970* (New York: Oxford University Press, 1971). Specialists in Southwest history, who are numerous, have yet to concur on cultural consequences of chronology, and the overall prehistory of North America. The field undergoes substantial revision every decade. The longtime dean of Southwestern archeology, Emil Haury, was one of the first scholars to produce large-scale studies of the region. See Emil Haury, *Hohokam: Desert Farmers and Craftsmen* (Tucson: University of Arizona Press, 1976); Emil Haury, *Prehistory of the American Southwest* (Tucson: University of Arizona Press, 1986); Emil Haury, *The Archeology and Stratigraphy of Ventana Cave, Arizona* (Tucson: University of Arizona Press, 1966). Also, one should consult Suzanne K. Fish, et. al. eds., *The Marana Community in the Hohokam World* (Tucson: Anthropological Papers of the University of Arizona No. 56, 1993).

⁷ The best source on Cabeza de Vaca and his *Relacion* is Rolena Adorno and Patrick Pautz, trans., *The Narrative of Cabeza de Vaca* (Lincoln: University of Nebraska Press, 2003).

⁸ See, of course, Herbert Eugene Bolton, *Coronado: Knight of Pueblo and Plains* (New York: McGraw Hill, 1949).

traverse the Salt River above modern-day Granite Reef dam, into the White Mountains, and into northern New Mexico. Coronado's "little army" as Herbert Eugene Bolton called it, was widely scattered throughout the interior in the autumn of 1540. They were engaged in an effort to uncover the secrets of the north and two of the expedition's diarists noted the crossing of what was the Salt River. Bolton wrote in his classic *Coronado: Knight of Pueblo and Plains* (1949), the force under Tristan de Luna Arrellano crossed the Salt River and its tributaries that ran deep in gorges and entered the Great Forest (White Mountains). On this stretch of trail, according to one of the scribes in Arrellano's force, some of the Indian allies from interior Mexico found themselves unable to keep up with the army. When they emerged from the Great Forest, they entered a desert country, crossed the Little Colorado, a stream whose waters were muddy and red, and ascended the Zuni River.⁹

Nearly fifty years later, the first Jesuits were at work among some of the Lower Piman peoples, but as the celebrated anthropologist Edward Spicer observed: "There was no continuity of their work from the Lower to the Upper Pimas," in and around the Gila and Salt rivers.¹⁰ As the area of New Mexico to the east was settled by Spanish colonists, missionaries, and military officials in the late 1500s and early 1600s, there was no Spanish exploration into the area of the Lower Salt River during that time. Certainly the existence of a navigable river in the Salt River Valley might have resulted in further exploration and colonization.

In the 1680s, an "energetic Italian who was as much explorer as missionary," Francisco Eusebio Kino, began establishing missions among O'odahm living in the river

⁹ Herbert Eugene Bolton, *Coronado: Knight of Pueblo and Plains* (Albuquerque: University of New Mexico Press, 1949) 196.

¹⁰ Edward Spicer, *Cycles of Conquest*: (Tucson: University of Arizona Press, 1962) 86-87.

valleys of northern Sonora. He arrived at the mission of Cucurpe, along the San Miguel River, in 1687 and soon established a mission at the village of Cosari, fifteen miles upriver. From this base, Kino initiated an active program of exploration, evangelization, and mission building among the Piman and Yuman groups of the Pimeria Alta to the north.¹¹ Under Kino's leadership, Jesuits established missions and introduced cattle raising in the valleys of the Altar, Magdalena, Santa Cruz, and San Pedro rivers during the late 1600s and early 1700s.¹²

Indeed, from the time of Father Eusebio Francisco Kino's extension of the "Rim of Christendom" into the lower Santa Cruz and Gila Valleys in the 1690s, the Salt and Gila, especially the latter, played prominent roles as land transportation routes in furthering Spanish aims. Diarists often noted the remnants of the Hohokam civilization that marked much of the lower reaches of the Gila from its confluence with the Salt.¹³ Sergeant Juan Bautista de Anza (the elder), on a reconnaissance of central Arizona in November 1697, took note of ruins on the north side of the "irregular" river which was not described as navigable.¹⁴

¹¹ Herbert Eugene Bolton, trans. *Kino's Historical Memoir of Pimeria Alta: A Contemporary Account of the Beginnings of California, Sonora, and Arizona...1683-1711* (Berkeley: University of California Press, 1948) 49-55.

¹² *Ibid.* 53-57.

¹³ The literature is extensive concerning Spanish exploration in the region. Without question Herbert Eugene Bolton's work during the first half of the twentieth century set the standard. See, for example, Herbert Eugene Bolton, *Anza's California Expeditions* 5 vols. (Berkeley: University of California Press, 1930); Herbert Eugene Bolton, "The Early Expeditions of Father Garces on the Pacific Slope," *The Pacific Ocean History*, ed. Morris Stevens (MacMillan: New York, 1917); Herbert Eugene Bolton, *Guide to the Materials for the History of the United States in the Principal Archives in Mexico* (Washington, D.C.: Carnegie Institution, 1913); Herbert Eugene Bolton, "The Mission as a Frontier Institution in the Spanish American Colonies," *American Historical Review* 23 (1917), 42-61; Herbert Eugene Bolton, *Rim of Christendom: A Biography of Eusebio Francisco Kino, Pacific Coast Pioneer* (New York: MacMillan, 1936). See also, Edward Spicer, *Cycles of Conquest: The Impact of Spain, Mexico, and the United States on the Indians of the Southwest 1533-1960* (Tucson: University of Arizona Press, 1962); Francisco Garces, O.F.M., *Diario de exploraciones en Arizona y California en los Anos de 1775 y 1776*, ed. John Galvin (Mexico, D.F.: Universidad Nacional Autonoma de Mexico, 1976).

¹⁴ See Emil Haury, Harold S. Gladwin, E.B. Sayles, and Winifred Gladwin, *Excavations of Snaketown, Material Culture* (Globe, Arizona: Medallion Papers No. 25, 1937); John L. Kessel, *Friars, Soldiers and*

Although de Anza generally followed the course of the Salt and Gila on land, he made no effort to travel on the river or report the possibility of the use of the river for navigation.

The so-called “Padre on Horseback,” made a number of journeys to the Gila between 1694 and 1701. Juan Mateo Manje, a Spanish military officer, usually accompanied Kino on these expeditions. In their respective accounts, Manje and Kino noted when Gila River Pimas, Opas [Maricopas], and Cocomarcopas pledged fealty to Spain and received staffs of justice in return. How the Indians interpreted such episodes remains a mystery. There was a notable absence in the report of a river susceptible to navigation of any kind. The existence of such a river surely would have been prominently featured in Manje and Kino’s accounts to the Spanish government or the Church. In the end the Spanish did not establish a permanent missionary or military presence as far north as the Gila Valley, because it was well-beyond their effective administration.¹⁵ The lack of a navigable river certainly contributed to this conclusion.

Father Kino drafted the first map of the river which was shown flowing south to the Gila River. In 1702, after traveling through much of the province the Spanish called Pimeria Alta (Upper land of the Pima), including a visit to the confluence of the Salt and Verde in 1699, he produced the region's first remotely accurate map. By this time cartography played a significant role in Spanish exploration of the North American continent and Kino gained an international reputation for his skill. It is also worth noting that he was the first to demonstrate that California was not an island, one of those fanciful

Reformers: Hispanic Arizona and the Sonora Mission Frontier, 1767-1856 (Tucson: University of Arizona Press, 1976).

¹⁵ Juan Mateo Manje, *Luz de Tierra Incognita: Unknown Arizona and Sonora, 1693-1701*, trans. Harry J. Karns, (Tucson: Arizona Silhouettes, 1954) 90.

cartographic notions that appeared in virtually every previous Spanish map of the Southwest. On his 1702 map, Kino depicts a river entering the Gila from the north but does not include a description that it was navigable, a fact which certainly would have been included.

Though no permanent missions or churches were established by Kino or his Jesuit brethren during this period, Kino left an imprint on the Salt River Valley. He traveled north to the area in 1696 and several historians have speculated that he gave the Salt River its name, Rio Salado. As they traversed the banks of the Salt and Gila rivers, Kino, according to his military escort Manje, issued names for the rivers. He wrote:

Here there are fertile lands, but the Indians plant only the lowlands of the river. The river carries sufficient water to justify digging ditches for irrigation in an event a mission should be established.With the idea of establishing a mission in view Father Kino started out on a series of continuous trips of discovery. He named this river [Gila] the Rio Grande de los Apostles. Another, due to the redness of the earth, he named the Colorado of the Martyrs. The Salt River (Rio Salado) he named and the Verde, and the two rivers of the Sobaipuris, which join with this, he named the Evangelists.¹⁶

At one point Kino climbed a pass to the top of the Estrella mountains and from there his guides pointed out what Kino named the Rio Verde and the Rio Salado, which united and flowed west and joined the Gila.”¹⁷ Manje added, “This Salado River runs from east to west and to the south of. . .the Verde River. . .and they merge, as I have said. To the very end and to the most easterly point of this Pimeria there are also two rivers called, more properly, *arroyos*. They do not have any particular names.”¹⁸ Kino’s brief encounter with the Salt River Valley region in general, and with the Lower Salt in

¹⁶ Manje, *Tierra Incognita*, 121.

¹⁷ For a comprehensive biography of Kino see Herbert Eugene Bolton, *Rim of Christendom: A Biography of Eusebio Francisco Kino, Pacific Coast Pioneer* (New York: Russell and Russell, 1960) 422.

¹⁸ *Ibid.* 124.

particular, offer no indication that he used the river for transportation or commerce, nor do his diaries or accounts suggest that he viewed the Salt River as susceptible for transportation or commerce.¹⁹ On the contrary, if the Salt River were navigable, Kino would have hailed it as the essential element to encourage the establishment of missions and military installations to better administer the Pimeria Alta.

Both Spanish military and religious figures promoted further development of the Pimeria Alta, but, lacking a navigation route and influenced by the presence of hostile Apache, those recommendations never came to fruition. A descriptive report, dated July 31, 1732, to the bishop of Durango from the newly appointed missionaries of San Xavier del Bac, Guevavi, and Santa Maria Suamca; royal cédulas of 1728 and 1733 regarding the missions of Pimeria Alta; and a report of Captain Juan Bautista de Anza (the elder), January 7, 1737, on the discovery of silver at Arizonac, near Guevavi, have been published from a longhand pamphlet.²⁰ Father Juan Balthasar made an official visitation to the Sonora missions in 1744, and prepared a report for the Father Provincial in Mexico, that was critical of the lack of support for Sinaloa, in the southern portion of the Pimeria. A report of the bishop of Durango to the King of Spain, dated June 19, 1745, supported a recommendation to establish new missions north on the Gila, Colorado, and Azul rivers and urged the construction of a presidio for their defense.²¹ If the Gila and Salt would have been suitable for navigation, such a fact would have been included in the reports and would have been considered a significant benefit to further exploration and

¹⁹ Herbert Eugene Bolton and John Francis Bannon, *The Padre on Horseback: A Sketch of Eusebio Francisco Kino, S.J., Apostle to the Pimas* (Chicago: Loyola University Press, 1982).

²⁰ George P. Hammond, trans., and ed., "Pimeria Alta after Kino's Time," *New Mexico Historical Review* 4 (July 1929), 225-238. ; Peter S. Dunne, S.J., trans., and ed., *Juan Antonio Balthasar, Padre Visitador to the Sonora Frontier, 1744-45: Two Original Reports* (Tucson 1957).

²¹ Ronald L. Ives, trans., and ed., "The Report of the Bishop of Durango on the Conditions in Northwestern Mexico in 1745," *Hispanic American Historical Review* 19 (August 1939) 314-317.

missionary activity, providing incentive, and perhaps a military route, to overcome any dangers posed by the Apaches. The Salt River Valley may have looked more like parts of Southern Arizona or even California with missions built alongside a navigable Salt River, establishing a better route between Santa Fe and California via the Gila to Yuma. Indeed, the Salt River was part of the Jesuit missionary discussion during this period. For example, after an earlier trip to Casa Grande in 1736, Father Ignacio Keller, the missionary at Suamca, reached the Salt River in 1737, but when traveling north of the Gila to visit the Hopis six years later, his party was attacked by Apaches.²² Although the Salt River was within the Apaches' sphere of influence, lacking a compelling reason to advance exploration and colonization through one or more navigable rivers, it was regarded by Keller and his contemporaries as a region that was too dangerous to explore. In effect, the Spaniards knew it was there but considered it an obstacle in pushing their missionary efforts northward.

Keller was succeeded as an explorer by Bavarian Jesuit, Father Jacobo Sedelmayr, who had made several journeys north between 1737 and 1743 from his base in Tubutama. Accounts of his later expeditions of 1746, 1748, and 1750 have been published from manuscripts located in the Arizona Historical Society Archives. His 1746 report, for example, provides a review of exploration of the Pimeria Alta from the time of Kino, with historical, geographical, and ethnological information and accounts, in which he touched the Gila, Salt, and Colorado rivers as well as the Bill Williams Big Fork.²³

²² John A. Donahoe, S.J., *After Kino: Jesuit Missions in Northwestern New Spain, 1711-1767*, (Rome and St. Louis: Jesuit Historical Institute, 1969) 80; John Kessel, *Mission of Sorrows: Jesuit Guevavi and the Pimas, 1691-1767* (Tucson: University of Arizona Press, 1970) 98.

²³ See Peter M. Dunne, S.J., trans., and ed., *Jacobo Sedelmayr, Missionary Frontiersman, Explorer in Arizona and Sonora: Four Original Manuscript Narratives* (Tucson 1955). The 1746 "relacion" was published in Spanish in *Documentos para la historia de Mexico*, 3d ser. 1:pt. 2, this relations was used to

Sedelmayer was known as the “father of the Papago,” and became in the 1740s, according to Spanish Borderlands historian John Francis Bannon, the great Arizona traveler and explorer.²⁴ As noted above, shortly after his arrival into what is today southern Arizona in 1736, he had traversed the land of the Papago (Tohono O’odahm) and persuaded a number of this tribe to settle near the mission at Tubutama. In 1743 he traveled north to the Gila. The next year Sedelmayer went even further north which brought to the Spaniards the first comprehensive knowledge of the trans-Gila area into the world of Spanish cartography. His route on this 1744 expedition took him to the Casa Grande ruins, thence directly north to the Salt River, then down the Salt, which he called Rio de la Asuncion, to its confluence with the Gila. Sedelmayer walked or rode his horse on the banks of the Lower Salt and did not use its waters as a form of transportation. When he reached the confluence of the Salt and Gila, he continued down the Gila and was the first person on record to explore the “Bend” of the river. His route next led him across the desert, through the lands of the Cocomaricopa, to the Colorado.²⁵

Thus, through the 1730s and 1740s, the Jesuits attempted to push their sphere of ecclesiastical influence north, beyond the Gila River. Based on the explorations of the Jesuit explorers, Keller, Sedelmayer, and their military escort, Captain Anza, the Salt River was not considered for or used as a stream for transportation or commerce in the conditions observed during that time period. In reality, after Father Sedelmayer’s

prepare an earlier English translation, Ronald L. Ives, trans., and ed., Sedelmayer’s relation of 1746,” U.S. Bureau of Ethnology, *Bulletin* 123 (Washington, D.C.: Government Printing Office, 1939).

²⁴ John Francis Bannon, *The Spanish Borderlands Frontier, 1513-1841* (Albuquerque: University of New Mexico Press, 1974) 150.

²⁵ Peter Masten Dunne, *Jacobo Sedelmayer, Missionary, Frontiersman, Explorer* (Tucson: Arizona Silhouettes, 1955). This slim volume contains four Sedelmayer narratives, translated, annotated, and with historical introduction. See also, Jacobo Sedelmayer, *Before Rebellion: Letters and Reports of Jacobo Sedelmayer, S.J.*, trans. Daniel S. Matson, intro. Bernard L. Fontana (Tucson: Arizona Historical Society, 1996) 130.

meandering along the Salt and Gila in 1744, the Jesuits excused themselves from the enterprise of the Hopis and pressing to the north, turning their attention instead toward the Gila and Colorado rivers.²⁶ While the Jesuits pressed toward the Colorado as the only navigable river in the region, the rivers of Central Arizona, including the Gila and the Salt, were only worthwhile as a clear path for overland travel with a source of water significant enough for watering horses and men, not navigation.

During the second half of the 1700s the Spanish made additional attempts to establish their presence in Arizona. Beginning in 1774 Juan Bautista de Anza (the younger son of the elder Anza who crossed the region in 1697), led a series of expeditions through the Gila Valley, south of the Salt River Valley, for the purpose of founding a land route between Sonora and California. Then, in 1775-76, Anza led a colonizing expedition from Tucson to San Francisco. Father Pedro Font, who irritated Anza greatly, nevertheless kept the best diary of this historic colonizing expedition that traversed central Arizona via the Santa Cruz to the Gila, then down to its confluence with the Colorado River. The Gila portion of the journey brought forth noteworthy observations of its flow. According to Font, there were Indian agricultural systems diverting water, dry stretches, and occasional deep reaches that coursed slowly down the streambed. In effect, the Gila, in the fall of 1775, was intermittent and erratic, and in many reaches, dry.²⁷ Font did not mention any interest or attempts to use the Gila or the existence of any other river for navigation. Therefore, during this year, the Salt and

²⁶ Peter S. Dunne, S.J., "Captain Anza and the Case of Father Campos," *Mid America* 23 (1941) 55-60.

²⁷ Kessel, *Friars, Soldiers, and Reformers*, 90-115; Sidney B. Brinckerhoff and Odie B. Faulk, *Lancers for the King: A Study of the Military System of Northern New Spain, with a translation of the Royal Regulations of 1772* (Tempe: Arizona Historical Foundation, 1965). The expedition, comprised of roughly 200 people, traveled from Horcasitas, Sonora to San Francisco.

Verde, which merged thirty-eight miles northeast of the Salt's confluence with the Gila, must have had similarly erratic flows during this time.

Shortly thereafter, in 1776, the mission of Tubac was moved forty miles north to Tucson as part of the Bourbon Reforms. In 1780 the Spanish located a new mission and colony in the lower Colorado near present day Yuma in an attempt to secure the overland route pioneered by the Anza expeditions.²⁸ Once again, the Lower Salt River, whose waters flowed into the Gila, was beyond any relevant consideration for transportation or commerce during the Anza expeditions that focused on developing transportation routes in northern New Spain.

Indeed, the Spanish hold on Arizona was tenuous at best. Spanish presence—ranchers, miners, priests, soldiers--existed only in the valley of the Santa Cruz River. In 1767, moreover, the Jesuits were expelled from New Spain and were replaced by the Franciscans. Though the efforts to evangelize Indians continued, overall the subsequent era of Franciscan hegemony (1767-1842) in the mission effort was a period of decline.²⁹ As the mission frontier receded, there were no accounts of transporting goods or material along the Lower Salt River. In fact, the Spanish faced armed resistance from recalcitrant tribes in Arizona. The few Spanish ranchers and mining settlements which had existed north of this line had been abandoned.” He added, “It was evident that the Apaches had perfected a way of life which called for no increase in their own territories and no desire to defeat the Spaniards in what the latter called battles. The Apaches aimed merely at

²⁸ See Donald T. Garate, *Juan Bautista de Anza: Basque Explorer in the New World* (Reno: University of Nevada Press, 2005); Spicer, *Cycles of Conquest*, 130

²⁹ There is consensus on this issue among Borderlands historians. See David Weber, *The Spanish Frontier in North America* (New Haven: Yale University Press, 1994); John L. Kessel, *Friars, Soldiers, and Reformers: Hispanic Arizona and the Sonoran Mission Frontier* (Tucson: University of Arizona Press, 1976); John L. Kessel, *Spain in the Southwest: A Narrative History of Colonial New Mexico, Arizona, Texas, and California* (Norman: University of Oklahoma Press, 2003); John L. Kessel, *Pueblos, Spaniards, and the Kingdom of New Mexico* (Norman: University of Oklahoma Press, 2010).

supplying their shifting camps in the mountains of southeastern Arizona and southwestern New Mexico by raids whenever they wished on the settlements of Spaniards, Opatas, and Pimas....They maintained themselves by quick raids in which they drove off stock and plundered communities.”³⁰ In effect, the Apaches kept Spanish missionary and colonization efforts out of the area of the Lower Salt River until the advent of the Mexican Revolution (1810-1821), a period in which attention was focused on the interior of Mexico rather than its northern frontier that included central Arizona.

Based on the Spanish experiences in other parts of the Southwest, especially along the California coast, a navigable river in the Salt River Valley would have completely changed the course of Spanish exploration. The purpose of exploration was to find suitable places to establish missions and natural resources for exporting. While mineral deposits were known to the Spanish, without a transportation route, there was no way to exploit those resources. Without reliable methods of transportation, especially a direct route to or from Yuma on the Gila and Salt Rivers, missions could not be supplied. While the Apaches represented a deterrent to exploration in Central Arizona, the existence of a navigable river would have resulted in the same type of military presence and presidio construction that occurred in Tucson and Tubac, pushing back the Apache in favor of colonization and commerce. In reality, those opportunities simply did not exist.

Advent of the Mountain Men

The next European accounts about the Salt River occur shortly after the Mexican Revolution which ended in 1821. Mexican Arizona was remote and the new government struggled to bring the area under its sphere of influence. The revolution destroyed the colonial silver mining industry and bankrupted the national treasury. Along the northern

³⁰ Spicer, *Cycles of Conquest*, 239.

frontier, funds that had supported missions and presidios instituted under the aegis of New Spain, dried up and disappeared. Without the protection of the presidios, the Apaches began raiding at unprecedented levels, running off horse herds and killing anyone unlucky enough to be caught outside the protection of presidial walls. Then, in early November 1826, Ignacio Pacheco, the *alcalde de policia* (mayor) of Tucson, reported that “the Gila Pimas, represented by a village governor and two of his men, arrived at this presidio with news of sixteen foreigners bearing arms along the banks of their river. The Gila governor demanded papers of identification. . . . Their leader replied that they came only to visit Indians along the Gila in order to obtain mules and horses from them and to find out where there might be other rivers abounding with beaver.”

The first Anglo frontiersmen were scarcely an invading army. On the contrary they were a ragtag collection of misfits, adventurers, and businessmen romanticized by later generations as “mountain men.” From their headquarters in Taos, New Mexico the mountain men entered Arizona for one purpose; to rip the “hairy banknotes,” as they called beavers, from every water course between the Upper Gila to the Colorado River delta. No single individual was their leader but Old Bill Williams could serve as their prototype. One contemporary writer described him as “gaunt, and red headed, with a hard, weather-beaten face marked deeply of the small pox. He was all muscle and sinew, and the most indefatigable hunter and trapper in the world.” At a time when William Henry Ashley, John Jacob Astor, and the Hudson’s Bay Company dominated the great trapping areas in the Pacific Northwest and Canada, the independent trappers like Old Bill, Kit Carson, Pauline Weaver, Ewing Young, Sylvester Pattie, James Ohio Pattie, and Michael Robidoux, flourished in the Southwest, at least until European and eastern

American fashion tastes changed as gentlemen donned hats made of silk instead of beaver felt. These frontiersmen were at once capitalists and refugees from corporate capitalism; they prized their self-reliance, yet they were as dependent on the market as any other commodity producers in the world.³¹ Despite their business acumen as trappers, they did not use the Salt River for commerce or travel for themselves. Instead, they sought out horses to conduct their business in the river while on foot. The records do not reflect that they used or considered using the Salt River for navigation.

The first mountain men to set foot in Arizona were Sylvester Pattie and his son, James. They spent the winter of 1825-1826 trapping along the San Francisco, Gila, and San Pedro rivers. In late December 1825, or early January 1826, they crossed what is today the Arizona-New Mexico border and traveled along the Gila River to its confluence with the Salt. They then returned to New Mexico, arriving at their point of departure early in April 1826.³² During the winter of 1826-1827 Pattie returned to Arizona with a group of French trappers led by Miguel (Michael) Robidoux, one of six brothers who had grown up trapping and trading along the Missouri River. After visiting a village of Spanish-speaking O'odahm who cultivated wheat, corn, and cotton along the south bank of the Gila, Robidoux and his companions moved on to a "Papawa" settlement about one mile up the Salt River. The Indians turned their war clubs on the trappers, killing everyone except Pattie, Robidoux and an unnamed Frenchman. According to Pattie, the

³¹ Thomas Sheridan, *Arizona: A History* (Tucson: University of Arizona Press, 2012) 52. See also, Le Roy Hafen (ed.), *Fur Trappers and Traders of the Far Southwest* (Salt Lake City: University of Utah Press, 1997).

³² James E. Officer, *Hispanic Arizona, 1536-1856* (Tucson: University of Arizona Press, 1987). James O. Pattie, *The Personal Narrative of James Ohio Pattie*, The 1831 Edition, Unabridged, with Introduction by William H. Goetzmann (Philadelphia and New York: J.B. Lippencott Co., 1962) 46-65, (dates are revised from those shown by Pattie), see David Weber, *Taos Trappers: The Fur Trade in the Far Southwest, 1540-1856* (Norman: University of Oklahoma Press, 1980) 93 (fn 37).

carelessness of Michael Robidoux triggered the attack.³³ Fleeing the carnage, the three men stumbled upon another group of trappers led by Ewing Young. The trappers sought revenge; returning to the Pee Posh settlement where, according to Pattie, they killed 110 Indians. It should be noted that no other encounter between mountain men and Native Americans matched the brutality of the Robidoux massacre or its retaliation.³⁴

But they kept coming. In 1828, Ewing Young, referred to by Mexican authorities as “Joaquin Jon” or “Joaquin Joven,” led a party to the Salt River to trap beaver. Young, a Tennessee carpenter who crisscrossed Arizona more than anyone else, was reviled as a smuggler and criminal by the New Mexican authorities, epitomized the almost single minded ruthlessness of the trappers. He fought with Apaches and Mohaves and quarreled constantly with Mexican authorities. He pioneered a grueling overland trail up and down the Verde River and west to California across the Mohave Desert. The lure of the beaver laden rivers, according to historian Thomas Sheridan, “was too strong to be dampened by the danger of Indian attack or the tenuous legality of Mexican claims.”³⁵

This expedition, which revealed that the Salt had not yet been fully exploited for beaver pelts, traveled overland and did not use the river as a mode for transportation or commerce. In October 1831, Young led another trapping expedition to the Salt River. He followed his previous route via the Zuni Pueblo, continuing to the Salt, thence followed that stream, setting traps as they progressed. Although there are diary accounts chronicling their days trapping on the Salt, there is no mention of the use of the river for

³³ Although Pattie identifies the assailants as Papagos, anthropologists have suggested that they were Apaches or Yavapais. See Clifton Kroeber (ed.), “The Route of James O. Pattie on the Colorado in 1826, A Reappraisal by A. L. Kroeber,” *Arizona and the West*, 6, 2 (Summer, 1964) 124-135.; David J. Weber, *The Taos Trappers: The Fur Trade in the Far Southwest, 1540-1846* (Norman: University of Oklahoma Press, 1968) 123-124.

³⁴ Sheridan, *Arizona: A History*, 53.

³⁵ *Ibid.*

navigation. The group also trapped for twelve days on the Verde River. Significantly, in this, as in and previous trapping expeditions to the Salt, the party did not use the stream for transportation, but instead extracted beaver pelts from it.³⁶

The fur trade in the Southwest in general, and as practiced on the Salt River, declined precipitously after 1833. In their wake the mountain men left streams depleted of beaver. Moreover, their overall impact was not profound. Because they exported their pelts through northern New Mexico or California, they had little reason to visit Tucson or Tubac, the only two settlements in the area. As a result, the trappers avoided confrontations with Mexicans along the Santa Cruz and even though they decimated beaver populations along the Salt, Gila, and Verde rivers, those beaver populations recovered by the mid-1840s when the next swell of Anglo Americans surged across the area. The mountain men did not stay in Arizona long enough to transform its economy or ecology. Nor did they use the Salt River as a highway of transportation, trade, or commerce. Whether they exported their pelts through New Mexico or California, they moved through Arizona on foot or horseback. This was not simply a matter of preference. Their horses were frequently stolen by the Apache and other local tribes, so travel by boat – using the same rivers they trapped for pelts – would have been preferable. In the mid to late 1830s, the beaver trade waned, in part because of the Panic of 1837 and in part because of the vicissitudes of high fashion. In an inexplicable turn

³⁶ J. Francis Dye, *Recollections of a Pioneer, 1830-1835* (Los Angeles, 1951) 23-24. See also the testimony of David E. Jackson in papers regarding the embargo of the furs of Ewing Young, July 12-July 15, 1823, Mexican Archives of New Mexico (MANM), Santa Fe, NM.

noted earlier, silk hats replaced beaver hats as objects of patrician desire in eastern urban areas and Europe³⁷

Moreover, the mountain men, by often refusing demands to show their passports at the presidio of Tucson, the trappers made a mockery of the Mexican pretensions to control Arizona beyond the Santa Cruz Valley. This example would be followed, in a more undeviating and aggressive fashion, by merchants and frontiersmen moving into New Mexico, California, and Texas. In short, the mountain men may not have subjugated Arizona, but through their disrespect for Mexican territorial claim and their single-minded focus on exploiting the rivers of the region, they established a pattern for those who followed.³⁸ Though trapping continued well into the 1840s this vanguard of American expansionism did not use boats for travel along the Lower Salt or other streams, like the Gila and Verde, and instead traveled by horses, mules, wagon, or foot along the sides of the rivers.

Mining and the Military: the Lower Salt River Region in the Mid-1800s

Historians of American expansionism are unanimous in their interpretation of the primary objective in the War with Mexico (1846-1848): the acquisition of California. With the Treaty of Guadalupe Hidalgo (1848) and the subsequent Gadsden Purchase (1854) affirming American title to the land bisected by the Gila River, much changed in the region's legal, political, and social foundations as they pertained to land use and water resource development, though some traditions—like the legal doctrine of prior appropriation—carried over to the American period. Evolving concepts and public policies concerning central Arizona's natural resources emanated from Washington, D.C.

³⁷ Hampton Sides, *Blood and Thunder: The Epic Story of Kit Carson and the Conquest of the American West* (Doubleday: New York, 2006).

³⁸ Sheridan, *Arizona: A History*, 54, 33.

rather than from Madrid or Mexico City and the outlines of these policies shaped the contours of life in the Salt River Valley.

In Oscar Winther's pathbreaking study, *The Transportation Frontier: Trans-Mississippi West, 1865-1890* researchers turn to "Arizona" in the index and find "railroads in, 102; steamboats in 82; and wagon freighting in, 27." Winther does not refer to any existing steamboats or other water transportation in the Lower Salt or any other interior water courses, playing a role in the history of transportation in Arizona during the period.³⁹ As Winther suggests, the development of transportation routes within Arizona Territory became important both for the military commander and the civilian miner. In fact the development of any type of transportation grid within the territory proved extremely challenging. It seems likely that inhabitants would have considered transportation along Arizona's streams if the streams were susceptible to navigation.

One of several factors that engendered the War with Mexico and the settlement and development of the trans-Mississippi West, especially the Pacific Coast, was the area's enormous cache of minerals. According to Rodman Paul, in his classic account, *Mining Frontiers of the Far West, 1848-1880*, New Mexico and Arizona were comparatively slow to begin vigorous development of their natural resources. Unlike California and Nevada, for example, both were held back by a highly adverse combination of poor transportation due to the fact that they were largely bereft of navigable streams and overland trails, a geographic environment made harsh by aridity, topography, mineral resources in which complex and refractory ores were too prevalent for quick exploitation on an isolated frontier, and, for a time, hostile Indians. Without a

³⁹ Oscar Winther, *The Transportation Frontier: Trans-Mississippi West, 1865-1890* (New York: Holt, Rinehart, and Winston, 1964) 122.

navigable river for commerce or travel, the Americans did not see the point of overcoming the other obstacles when reliable transportation was unattainable. A navigable river in the Salt River Valley would have changed the landscape and development of the area.

Notably, western Arizona was not cut off from transportation. Today it is not customary to think of the Colorado River as an artery of commerce, but prior to railroads it was an important entrance into what was otherwise the landlocked Southwest. In the 1860s sailing vessels made the long voyage of several weeks from San Francisco down the coast of American California and Lower California and up the Gulf of California to the mouth of the Colorado. Subsequently, enough business was generated to justify putting steamers on this coastal run. At the mouth of the Colorado, cargo and passengers were transferred to shallow draft steamers that paddled up the Colorado at least as far as the mining village of La Paz, more than one hundred miles above Yuma, and during favorable seasons they went as far north as Callville, in southern Nevada, now covered by the waters of modern-day Lake Mead.⁴⁰ Unfortunately, navigation was not possible to move commerce into or from the Salt River Valley or other portions of Central Arizona.

Eastward from the Colorado River, travel depended entirely upon pack animals and freight wagon, and the further inland one traveled through the inhospitable region the more hazardous passage became. New Mexico, for example, was beyond the reach of the river's influence; the Salt was not considered a possible route to travel northeast to Santa Fe. In Spanish and Mexican days (1598-1848) its trade had to come from overland routes,

⁴⁰ Rodman Paul, *Mining Frontiers of the Far West, 1846-1880*, rev. ed. (Albuquerque: University of New Mexico Press, 2001) 155; Godfrey Sykes, *The Colorado Delta* (American Geographical Society, "Special Publication" no. 19, Washington and New York, 1937) 8-34. See also Richard Lingenfelter, *Steamboats on the Colorado, 1852-1916* (Tucson: University of Arizona Press, 1978).

such as the long road that struck northward from Chihuahua, Mexico or the Santa Fe Trail that came southwestward from the Missouri frontier. Such difficult overland routes would not have been necessary if the Salt or Gila Rivers were navigable, opening the way for commerce and settlement within the Salt River Valley. Significantly, after New Mexico became part of the United States as part of the Mexican War (1846-1848), the territory still had no alternative to lengthy and exclusively overland approaches, which made for exceedingly expensive transportation whenever a promoter sought to bring in the heavy, bulky equipment and supplies required for any but very simple mining.

In fact, in the War with Mexico (1846-1848) Arizona was never a prize in the conflict. On the contrary, most Anglo pioneers and politicians in the East considered it a wasteland, a desert, an Indian-infested obstacle between Santa Fe and San Diego, utterly lacking in a reliable transportation route, especially one as ideal as river navigation. As U.S. military expeditions passed through the area on their way west, they did so as hastily as possible and few, if any, stayed. General Stephen Watts Kearny, commander of the Army of the West, led the first group of military through Arizona. Following the “Bloodless Conquest” of Santa Fe, New Mexico, Kearny and his men left the capital city on September 25, 1846. Kit Carson, who happened to be heading east toward Santa Fe on his way back from California, was “impressed” into service sixty miles south in Socorro. Carson was no stranger to Western exploration, from river trips with John Fremont to trapping expeditions along Arizona’s rivers. When he first met Kearny’s group, he tersely noted: “Kearny ordered me to join him as guide. I done so.”⁴¹ General Kearny was seriously concerned about the unmapped desert ahead of him, uncertain which route to take and whether his animals could survive the journey. Carson, more than

⁴¹ Sides, *Blood and Thunder*, 133.

once, had crossed the same withered terrain over which Kearny's dragoons would be soon passing. Carson knew the land, water courses, and the disposition of the Indians along the route. He could tell Kearny which stretches were suitable for wagons and rolling artillery pieces. Most importantly, he knew the best places to ford the creeks and rivers.⁴² Kearny needed the former mountain man, Carson, whose forays into Arizona a decade earlier imbued him with critical knowledge of the terrain, water courses, and hostile Indians. Although he was familiar with exploration using rubber boats during his time with Fremont in Utah, Carson never navigated a river or even considered it viable as a guide through Arizona.

Significantly, Carson swung south, guiding Kearny and his 100 dragoons on what one member called "The Devil's Turnpike," avoiding the Salt River because he knew it was not susceptible to serving as a transportation route. He had trapped the river many times prior to the Mexican War and he knew its canyons, braided reaches, and uneven flow. The Salt River clearly could not serve as a possible waterway to move this contingent of military men to their ultimate destination, California. Thus they headed south and west—avoiding the Upper Salt—and struck the Gila River and then followed its course on foot, horseback and mule through challenging canyons and land that was barren and arid. In October and November 1846, they passed from the realm of the Apaches into the territory of unknown tribes with names like Wolf Eaters, Dirty Fellows, Club Indians, Pine Forest Dwellers, Tremblers, Albinos, and Fools, informal names gleaned from Spanish interpreters and quickly scribbled down in official American journals.

⁴² Sides, *Blood and Thunder*, 131.

Carson informed Kearny that the few previous parties that had ventured into the Gila had emerged from its stark canyons in an advanced state of starvation. The going would be so rough that there was no reason in bringing wagons along; the overland trail which followed the Gila River was not passable and navigating the river as a method of transportation was not possible. Kearny complied; sending wagons back to Santa Fe and replacing them with more mules. Sergeant William Emory, of the Topographical Engineer Corps, accompanied Kearny and was supposed to investigate the region for transportation routes. He ruled out the water courses he encountered, including the Gila, declaring it was impossible to put a decent thoroughfare through the ragged rock wasteland let alone consider using the region's water ways for transportation.

Carson led Kearny and his men down the Gila for two months on a long and torturous journey that ended at the Colorado River. The expedition marched overland on the side of the river, through the villages of the Akimel O'odahm (Pima), bypassing Tubac and Tucson, thus avoiding a confrontation with Mexican troops. One of the most famous accounts came from Emory, who related that in November 1846, his unit, encamped nine miles from a Pima village. "Yet, in three hours," he wrote, "our camp was filled with Pimas, loaded with corn, beans, honey, and zandias (watermelons)." A brisk trade commenced and Emory expressed high regard for the Pimas and declared his admiration for their agricultural abilities, especially, "the beauty, order, and disposition of the arrangements for irrigating and draining the land." Emory's *Notes of a Military Reconnaissance*, published by Congress in 1847, was instrumental in creating a favorable

opinion of the Pimas and in providing a new insight into the land soon to become part of the United States.⁴³

The trek provided the American military vanguard a taste of the Arizona desert and its stunning aridity and lack of navigation. Notably this expedition as well as subsequent ones during the two-year course of the war, traveled south of the Salt River Valley. “Every bush is full of thorns...and every rock you turn over has a tarantula or centipede under it,” Dr. John S. Griffen complained in his diary. “The fact is, take the country altogether, and I defy any man who has not seen it—or one as utterly worthless—even to imagine anything so barren.”⁴⁴ That route and Griffen’s comments would have been very different if the Salt River were navigable.

The next military expedition through Arizona swung even more southerly, rolling through Tucson on its way to California. This was the celebrated Mormon Battalion, which marched 2,000 miles from Council Bluffs, Iowa to Southern California. As has been well-documented, just two years after founder and leader Joseph Smith was killed by a mob in Carthage, Illinois, new Mormon leader Brigham Young sent more than five hundred Latter Day Saint soldiers on a mission to serve in the U.S. Army in an effort to diffuse anti-Mormon sentiment and raise funds for Mormon colonization of Utah. The central purpose of their journey was to construct a transportation route across the region. Lacking a navigable route, the Mormon Battalion was charged with carving out a wagon trail across the southern Great Plains and into the Southwest. When the battalion reached

⁴³ William H. Emory, *Notes of a Military Reconnaissance, from Fort Leavenworth, in Missouri, to San Diego, California, Including Part of the Arkansas, Del Norte, and Gila Rivers*, 30 Cong., 1 sess., (1847), S. Ex. Doc. 7 (Washington, D.C.: Wendell and Van Benthuysen, 1848) 82-83.

⁴⁴ California Historical Society, *A Doctor Comes to California: The Diary of John S. Griffen, M.D., 1846-1847* (Los Angeles, California, 1944). Griffen’s account reveals the hardships endured in General Kearny’s small force as it crossed the unknown deserts of Arizona and recounts battles of San Pascual, San Gabriel, La Mesa and Los Angeles. It also describes his methods of treatment for wounds and diseases afflicting the soldiers in charge.

Santa Fe in October 1846, Lieutenant Philip St. George Cooke took command and led it to San Diego. In November 1846 Cooke's battalion moved through the Gila Valley south of the Salt River Valley. Several members of this force left recollections of their stay in Pima country. Robert Bliss judged that the Pima settlements extended about twenty-five miles down the Gila and that the tribe had a sound economy. Nathaniel Jones corroborated Bliss's description: "Their village extended some twenty-six miles down this river and was very thickly settled." John Bigler wrote on December 21, 1846, that the battalion camped in a Pima village. Like the others Bigler estimated that the settlements extend down the Gila for about twenty-five miles and that the Indians numbered around 5,000. They brought corn, beans, meal, and pumpkins to the Mormon camp to barter for clothes, buttons, needles, and thread. The Pimas refused money for their agricultural goods because they said it was no use to them.⁴⁵ Although they were looking for viable transportation routes, Bliss did not record the Salt or Gila rivers as suitable for navigation.

Upon leaving Tucson on the last leg of the trip, Cooke wrote a letter to the governor of Sonora, which, once again, indicated that transportation across Arizona was one of the key reasons for his service in the American military. Cooke assured the governor that he had not come "as an enemy of the people whom you represent; they have received only kindness at my hand," adding, "The unity of Sonora with the States of the north, now her neighbors, is necessary...to subdue these Apaches. Meanwhile, I make a wagon road from the streams of the Atlantic to the Pacific Ocean, through the valuable plains, and mountains rich with minerals, of Sonora. This, I trust, will prove useful to the

⁴⁵ "The Journal of Robert Bliss, with the Mormon Battalion," *Utah Historical Quarterly*, 4 (July 1931) 81; The Journal of Nathaniel V. Jones, with the Mormon Battalion," *Utah Historical Quarterly* 4 (January 1931) 9-10; "Extracts from the Journal of Henry W. Bigler," *Utah Historical Quarterly* 5 (April 1932) 52.

citizens of either republic, who, if not more closely, may unite in the pursuits of a highly beneficial commerce.” Cooke’s men did little actual road building. Mainly they marked their route and removed major obstructions like brush and rocks; otherwise they made no improvements. As one historian wrote, “When the going was smooth, it appears that they marched along, moving from water hole to water hole, convinced that the marks left by their turning wheels had established a road.”⁴⁶ No attempt was made to navigate a river in Arizona, including the Salt.

By 1849 a section of Cooke’s road through southeastern Arizona was part of the Gila Trail, which was the popular name for a series of roads that connected El Paso with southern California. Because the Gila Trail was not a formally developed road but rather a popular name for a travel route, there has always been a degree of uncertainty about its specific location in Arizona. Some maps show the Gila Trail passing through Apache Pass instead of Guadalupe Pass. That caveat notwithstanding, for three decades, from the late 1840s to the late 1870s, the Gila Trail was the primary travel route across southern Arizona. It was followed not only by miners and adventurers but also by settlers and ranchers traveling from the east. The Salt River was bypassed as a watercourse that could not serve as a transportation route for the increasing numbers of travelers and settlers venturing through or settling in the region.⁴⁷

In 1857, Congress ordered the construction of two federal wagon roads through New Mexico, which at the time included Arizona. One was to cross the northern portion

⁴⁶ W. Turrentine Jackson, *Wagon Roads West: A Study of Federal Roads Surveys and Construction in the Trans-Mississippi West, 1846-1869* (Berkeley: University of California Press, 1952) 21-22.

⁴⁷ Fry and Anderson, *Arizona Transportation History*, 11.

and the other across the southern.⁴⁸ Construction began in 1857 on the northern road, which came to be known as Beale's Wagon Road, after construction superintendent Edward Fitzgerald Beale. Many years later, when U.S. Route 66 was built, it followed Beale's route. When it was finished, the road was advertised as suitable for six-mule teams pulling wagon loads as heavy as 3,500 pounds. Returning to New Mexico on his second trip along the road, Beale needed just 100 hours to travel from the Colorado River to Albuquerque.

The southern road, the El Paso–Fort Yuma Wagon Road, was begun in 1858. It followed the route laid out by Parke in his 1854-1855 survey. After entering southeastern Arizona near Apache Pass, the road headed directly west to the San Pedro River, which it followed north to the Gila River. These roads were important to Arizona. The El Paso–Fort Yuma road in particular helped connect the Territory's far-flung settlements with each other, and it provided a much-needed trade route to California, New Mexico, and Texas. Once again, the Salt River was outside the area of consideration to serve as a route through Arizona in the 1850s and into the Civil War years. A navigable Salt River, converging with a navigable Gila River to Yuma would have provided a much simpler route between New Mexico and California which was so desperately needed at the time.

Just prior to the outbreak of the Civil War, activity by English speaking Americans seems to have started with the finding of placer gold in May of 1860 at Pinos Altos in present-day New Mexico. The prospectors came from California, presumably on one of those incredibly long and dangerous trips in which Old Californians, still seeking the big strike, were so prone. Within a short time the remote outpost had attracted people

⁴⁸ Jackson, *Wagon Roads West*, 163 ff, 241 ff; Gerald Thompson, *Edward F. Beale & The American West* (Albuquerque: University of New Mexico Press, 1983).

from California, Texas, Missouri, and the Mexican provinces of Sonora and Chihuahua. It should be noted that veterans of the gold rush days in California, headed east from California but bypassed the Salt River enroute to Pinos Altos.⁴⁹

The historical record of this period indicates that there was a significant need for transportation in Central Arizona. In spite of this need, there is no record the military or explorers of the era used, or considering using, the Salt River for navigation.

Development of Transportation and Arizona's Economy Prior to Statehood

In general, Arizona entered the 1870s without having conquered its biggest obstacles to progress—hostile Indians and transportation. The Salt River, not to mention the Gila, Verde, and other interior water courses, were not susceptible to transportation or even considered as rivers of commerce, and thus provided no incentive to overcome the hostile Indians. In a practical sense, the latter need, transportation, was not met until the years 1878-1883, when the Santa Fe and Southern Pacific built parallel railroad lines across Arizona and New Mexico and at the same time they built a line down the Rio Grande Valley to El Paso. With the expansion of U.S. territory to California and the Southwest, and the gold rush to California, there was an urgent need to improve communication and transportation links between the West and the rest of the nation. In 1853 Congress appropriated \$150,000 for surveys of potential railroad routes to the Pacific Ocean that would be conducted by Army topographical engineers. The Army was “to ascertain the most practicable and economical route for a railroad from the Mississippi River to the Pacific Ocean.” As a result four small bands of army engineers

⁴⁹ The early history of New Mexico mining is outlined in Fayette A. Jones, *New Mexico Mines and Minerals. World's Fair Edition, 1904. Being the Epitome of the Early Mining and Natural Resources of New Mexican Mines, in the Various Districts...* (Santa Fe, 1904); and Waldemar Lindgren, Louis C. Graton, and Charles H. Gordon, *The Ore Deposits of New Mexico* (U.S. Geological Survey, “Professional Paper No. 68,” Washington, 1910) 17-20; Paul, *Mining Frontiers of the Far West*, 151-153.

and civilian scientists set off across the continent to survey passages along the forty-seventh, thirty-eighth, thirty-fifth, and thirty second parallels.

At first, Arizona was little more than a footnote in a broad and lengthy narrative. Without reasonable transportation routes, especially navigable rivers, it was an obstacle to overcome rather than a destination to be reached. The first survey, led by Lieutenant Amiel Weeks Whipple, crossed present-day Oklahoma, the Texas Panhandle, and New Mexico, picking up mountain man Antoine Leroux in Zuni. Over the next two years, the Army carried out six surveys; two of them, the Whipple and the Parke surveys, crossed Arizona. Although their purpose was to identify transcontinental railroad routes, the surveys in fact first led to the construction of wagon roads. These surveys did not consider the Salt, Gila, or other rivers in Arizona as relevant to the need to improve communication or transportation as potential routes between the West and the populated areas in the East.⁵⁰ Finally connected to the East and West by a viable transportation route, the region began to advance economically.

In December 1861, during the Civil War, President Abraham Lincoln learned of Confederate victories in New Mexico and a Rebel invasion of Arizona. General George Wright proposed to invade the territories with a force of California troops that would cross the Colorado River at Yuma and proceed to New Mexico along the Gila River on the Butterfield Overland Mail route. The Union brain trust and the generals in the field never considered making their eastward push through the Salt River Valley and the Salt River. Instead the California Volunteers proceeded along the 32nd parallel.⁵¹

⁵⁰ William H. Goetzmann and Glyndwr Williams, *The Atlas of North American Exploration* (New York: Prentice Hall, 1992), 162-63, 166-67; Walker and Bufkin, *Historical Atlas*, Map 23.

⁵¹ George Wright to Lorenzo Thomas, December 9, 1861, in Andrew E. Masich, *The Civil War in Arizona: The Story of the California Volunteers, 1861-1865* (Norman: University of Oklahoma Press, 2006) 12.

The war also gave rise to the creation of Arizona Territory, which was established in 1863.⁵² Federal officials were concerned that the Confederacy might try to break the Union blockade of the South by occupying New Mexico Territory thereby establishing a trade route across the Southwest. By creating a new territory that encompassed just Arizona, Congress could bring greater federal authority to the region—a move favored by Arizona residents. As suggested above, the vast majority of residents in the new territory agreed that Arizona's most pressing need was for wagon roads. A navigable Salt River would have served the few residents without the pressing need for wagon roads. The landscape of Arizona would certainly be different if residents were able to use boats as opposed to or in addition to wagon roads. However, navigable rivers were not available for viable boat traffic.

In terms of access to Arizona via rivers and streams, freight and passengers had been able to reach the western boundary of Arizona by boat since 1852, when steamboat service was established on the lower Colorado River. But travel inland from the river still required a difficult and time-consuming journey by horse or stagecoach, one made worse by the poor condition of the few existing roads. However, when the Territorial Legislature met for the first time in 1864, at the new Territorial capital in Prescott, it passed only one measure related to roads or transportation. Legislators approved a resolution declaring the already-built Woolsey Trail, which connected Prescott with the Pima Villages, to be Arizona's first public road. In addition, the Territorial Legislature petitioned Congress for funds to improve navigation on the Colorado River, and in the petition the Legislature declared that the Colorado River was the only navigable stream in

⁵² The best and most comprehensive account of Arizona Territory during the Civil War is Andrew E. Masich, *The Civil War in Arizona: The Story of the California Volunteers, 1861-1865* (Norman: University of Oklahoma Press, 2006).

the territory. No contemporary observer thought that the Salt River was navigable in 1864. Considering the Territorial Legislature's request for funding for *navigation*, and the fact that settlers were beginning to recognize the value of the agriculture in the Salt River Valley, mention of a navigable Salt River would have been included, as well as a possible request for funding to improve navigation to this inland destination. However, in that first meeting of the Territorial Legislature of Arizona, no mention of the Salt River as a highway of commerce or transportation appears in the record.⁵³

On June 1, 1865, then-Secretary of the Territory, Richard C. McCormick, wrote a letter to the *New York Tribune*, which was printed in that paper, then reproduced in pamphlet form under the title, "Arizona: Its Resources and Prospects." Concerning the area of the Salt River, McCormick noted, "Until 1863, saving for a short distance above the Gila, it was even to the daring trapper and adventuresome gold-seeker a *tierra incognita*, although one of the richest mineral, agricultural, grazing, and timber divisions of the Territory; and abundantly supplied with game...[The area] is nearly as large as the state of New York. The Verde and Salinas [Salt] Rivers, tributaries of the Gila which run through its center, abound in evidences of a former civilization. Here are the most extensive and impressive ruins to be found in the Territory. Relics of cities, of aqueducts, acequias and canals, of mining and arming operations and of other employments indicate an industrious and enterprising people." McCormick cited John Russell Bartlett of the United States Boundary Commission, who conducted a reconnaissance of the Salt River upstream from the confluence of the Gila as far upstream as present-day Mesa in 1852. Bartlett wrote of the extent of the agricultural population formerly supported in the area,

⁵³ *Acts, Resolutions and Memorials, Adopted by the First Legislative Assembly of the Territory of Arizona* (Prescott: Arizona Miner, 1865), 20.

as well as arguing that the Salt River Valley could be as an ideal position as any for an agricultural settlement between the Rio Grande and the Colorado. McCormick appears to have focused on the Salt River Valley when he added, “The...district north of and immediately contiguous to the Gila River, is *par excellence*, the finest agricultural district in our territories lying in the same latitude, between Eastern Texas and the Pacific, for the great extent and richness of the soil, the...water, the cottonwood timber for building purposes, the fine quarries of stone in the adjacent hills, and for the facility with which it may be approached from every quarter.” McCormick championed multiple commercial uses of the Lower Salt, including agriculture, and based on his soliloquy to the East Coast, a navigable Salt would have resulted in Phoenix being a hub of commercial river traffic. McCormick didn’t see the potential of the Salt River Valley as a hub of commercial navigation, but rather, as a place for irrigated agriculture.⁵⁴

Transportation of any type posed enormous challenges to Arizona’s early territorial officials. Arizona was a sprawling territory of 114,000 square miles, much of it rugged desert and mountain terrain that posed serious technological and logistical obstacles to road builders. Any kind of road construction was made more difficult and expensive by the distances that separated the Territory’s towns, ranches, and mines. Supplies and water had to be hauled to construction sites, and camps often had to be set up for the workers. Moreover, the financial resources available to the Territory were limited; it was sparsely populated and there was little taxable economic activity. Worse, incomes were low, and territorial residents made it clear that holding down taxes should be one of the legislature’s first priorities. And most legislators believed that road building

⁵⁴ Thomas Edwin Farish, *History of Arizona*, Vol 4, (San Francisco: Filmer Brothers Electrotype Company, 1916) 15-16

was the responsibility of the counties, not the Territory. Under these circumstances, it was hardly surprising that progress in improving Arizona's roads came slowly. Water resource development, whether diverting waters from the Territory's streams or improving them for other purposes, was dismissed to the private sector. With the Territorial government leaving public road construction to the counties, progress in improving Arizona's roads was slow. The notion of dealing in a similar way with territorial rivers and streams was not addressed.

Most of the roads built in Territorial Arizona were local. In essence they were designed to connect towns with nearby ranches, farms, and mines. Few territorial roads connected efficiently with other roads, nor were they located to reduce traveling times or distances. Thus many of the Territory's roads were not useful to long distance travelers. The exceptions were the roads located and built by the Army, which until the late 1870s was the only authority in Arizona building roads specifically designed for long-distance travel. Even though many of these Army roads were trails rather than appropriately constructed roads—they were usually called “routes”—they were nevertheless important to Arizona. One widely circulated guidebook, written by the well-known journalist Richard N. Hinton and published in 1878, the *Hand-Book to Arizona*, identified forty-one military routes to and across Arizona.⁵⁵ None were rivers.

These military roads connected the numerous forts and camps that the Army had established to support its campaigns against the Territory's recalcitrant Indian tribes. They ranged in length from the 39- mile route between Fort Verde and Fort Whipple, which was located at Prescott, to the 316- mile route between Fort Apache, in the White

⁵⁵ Richard J. Hinton, *Hand-Book to Arizona: Its Resources, History, Towns, Mines, Ruins and Scenery* (1878; Tucson: Arizona Silhouettes, 1954), xxii (appendix).

Mountains, and Maricopa Wells, a station on the newly built Southern Pacific Railroad. Hinton's book also included route descriptions and information about the available water, wood, and grass supplies and provided some instructions on route-finding.

One of the better-known military routes was the General Crook Trail, which was established in the early 1870s between Fort Apache and Fort Whipple. Named after General George Crook, who at the time was the Army commander for Arizona Territory, the road followed the Mogollon Rim from Fort Apache to Fort Verde, where it then descended into the Verde Valley, crossed the Verde River, and followed the Cherry Creek road to Prescott. The route was laid out by Crook in 1871, and construction work started in 1872. Most of the work was confined to removing large obstacles such as trees and rocks from the roadbed. By 1873 the trail was declared ready for pack trains, and by 1874 it was considered usable by wagons.⁵⁶

Travel on the General Crook Trail was never easy. One Army wife who took the road soon after its opening, Martha Summerhayes, vividly recalled the experience many years later: "For miles and miles the so-called road was nothing but a clearing, and we were pitched and jerked from side to side of the ambulance as we struck large rocks or tree stumps; in some steep places, logs were chained to the rear of the ambulance, to keep it from pitching forward onto the backs of the mules."⁵⁷ The completion of Arizona's transcontinental railroads rendered Crook's Trail unnecessary for long-distance wagon freighting, but the road continued to be used by Army troops on patrol and by settlers and

⁵⁶ The three best books on General George Crook remain, George Crook and Martin Schmitt, *General George Crook: His Autobiography* (Norman: University of Oklahoma Press, 1986); Charles M. Robinson III, *General Crook and the Western Frontier* (Norman: University of Oklahoma Press, 2001); John G. Bourke, *On the Border with Crook: The American Indian Wars, and Life on the American Frontier* (Lincoln: Bison Books, 1971).

⁵⁷ Martha Summerhayes, *Vanished Arizona* (Lincoln: University of Nebraska Press, 1979) 69-70.

ranchers in the Mogollon Rim country. Many parts of it can still be traveled today using U.S. Forest Service trails and roads.⁵⁸

During the 1860s and 1870s, Arizona was too isolated and dangerous to enable any major industries to develop, so the scale of the territory's economy remained small. Transportation was difficult on roads and non-existent by river navigation. Livestock remained the prey of the Apaches while agriculture began to flourish around Yuma, Tucson, Florence, Wickenburg, and Prescott. The military and mines were part of this incremental growth but the markets were local, not even regional. Technological innovation had not transformed copper mining to allow the extraction of low-grade ore. Thus, unless one struck it rich in the goldfields, the only way to make a sound living—even a fortune—on the Arizona frontier was long-distance freighting. Virtually everything, including basic foodstuffs, had to be imported from outside the territory. Wheat and corn, for example, came from Sonora and Chihuahua while manufactured goods arrived from the eastern states. Not surprisingly, Army posts were the Territory's biggest markets and they received their clothing and equipment from San Francisco. But even those supplies could be carried by ship around the Baja peninsula to the Colorado River and upriver by steamboat. Significantly, goods and clothing destined for Arizona's inland Army posts had to be hauled by wagon or mules across hundreds of miles of desert and mountains. Indeed, the inland rivers, including the Salt, were not considered in the equation of transportation or commerce during this juncture of the military, civilian, mining, and agricultural expansion of the territorial economy.⁵⁹

⁵⁸ Public Lands Information Center, "General Crook National Recreation Trail, Arizona," <http://www.publiclands.org/explore/site.php?id=967>.

⁵⁹ Sheridan, *Arizona: A History*, 112.

From 1850-1875, then, Arizona's most important vehicle of transportation was a wooden leviathan known as the Murphy wagon. It was not a boat, skiff, canoe, or kayak. Named after its inventor, Joseph Murphy, the Murphy wagon was designed to ride the vast "waves" of the Great Plains. It had a sixteen foot long bed and was four feet wide. Its sides were six feet high. The rear wheels measured seven feet in diameter. The wagon could haul up to 12,500 pounds, and teamsters usually hitched two or three rigs together and cracked their whips across the backs of as many as thirty-six mules. Like enormous slow-moving snakes, the wagon trains tied together the web of forts and mines in Arizona Territory. Freighting was a difficult way to make a living but the likes of Michael Goldwater of Ehrenberg and Charles Trumbull Hayden of Tempe, for example, made long-distance freighting the foundation of their endeavors in Arizona Territory. No similar attempts were made to establish river traffic on the Salt River or any other Arizona river.

It was only after the arrival of the Southern Pacific and the Santa Fe railroads in the late 1800s that Arizona's modern economy could begin. Some of the changes were immediately felt, while others would not occur until the early years of the 20th century. The railroad greatly reduced the cost and time required to ship goods to and from Arizona. More importantly, it made it fiscally feasible for producers to ship bulky agricultural and mining products. This allowed such critical Arizona industries as citrus and cotton farming, copper mining, and cattle ranching to grow and prosper. The advent of rail service in Arizona also increased the demand for improved roads, as businesses and towns across the Territory pushed for better connections to the two railroads' depots.

Before the railroads could be used to ship goods to and from Arizona, new roads had to be built to transport those goods.⁶⁰

Given Arizona's size, the lack of navigable rivers and the poor condition of its existing roads, progress in building the new Territorial system was slow. Most travelers in Arizona noticed few real improvements. Isolated sections of roadway were graded, drained, and surfaced with crushed gravel, but they were still interspersed with long sections of roadway that had been built with nothing more than dirt and other local materials. For more significant road improvements, Arizonans would have to wait for assistance from the federal government, which did not come until after Arizona attained statehood. From 1863 to 1912, territorial and county administrators wrestled with transportation in Arizona. The absence of the Lower Salt River in transportation records suggests that officials viewed the Salt River as a non-navigable stream nor even susceptible to navigation. It was, as the Salt River Valley grew and developed, an obstacle to cross when flowing. When dry, pedestrians crossed it by foot. But just four years after the creation of Arizona Territory, its primary historical use was revisited as settlers began diverting its waters for irrigation.

American Institutionalization of the Salt River: Irrigation and Storage

As Arizona Territory developed its transportation grid based upon army roads, wagon roads, county roads, territorial roads, and railroads, its interior streams served a different purpose in the development of the economy--irrigation. The Salt River took on an historic, and at the same time, new and vital significance in fostering the growth of a new civilization in what had been an area passed over since the disappearance of the Hohokam.

⁶⁰ Pry and Anderson, *Arizona Transportation History*, 20.

Central Arizona in the mid-to-late nineteenth century was an arid land, but one that had yielded successful development by prehistoric Hohokam, contemporary Indian groups, Spaniards, and Mexicans. For much of the period between 1850 and 1880 American water development followed the pattern of earlier cultures. While growth was slow and uneven, the seeds for future growth were planted. Furthermore, pioneering efforts in the early years of American political control in Arizona proved that the area had tremendous potential for economic development.

By 1872 farmers were cultivating over 8,000 acres of barley, wheat, beans, corn, sweet potatoes, grapes, and fruit trees. In a shockingly brief period the Salt River Valley developed into the most important agricultural region in Arizona. Area farmers supplied not only the military but also the mines, which would proliferate throughout the territory in the next two decades. The beneficent river, conversely, could change radically and threaten the incipient irrigation community dependent upon its sustenance. In September 1868 heavy rains sent a huge flood roaring down the Salt. Six years later, in January 1874, the Salt flooded the valley for three days, destroying the Swilling head gates and wiping out William Parker's granary, which was filled with ten tons of wheat. Farmers dashed away from their crumbling adobe homes to seek refuge in the local school house and court house. For weeks religious services were held in a saloon. After these two signal events, the farmers knew they faced serious environmental challenges in harnessing the river's resources.

The progress made was publicized in an exhibit at the World's Industrial and Cotton Centennial Exposition in New Orleans in 1884.⁶¹ The significance of the mining industry and the subjugation of the Apache threat were emphasized by a display of 50,000 specimens of minerals including a piece of copper ore from Bisbee that weighed 7,300 pounds, containing thirty-three percent copper. One *New York Tribune* correspondent reported that Arizona's copper yield had increased by twenty-five million pounds between 1880 and 1884. The same journalist noted that Arizona's climate made year-round work in the mines and fields possible. He called attention, also, to a canal being constructed in the Salt River Valley –the Arizona Canal--that would irrigate 100,000 acres. Improved land selling at the time for \$15 to \$25 per acre could be worth as much as productive lands in southern California that brought \$100 an acre.⁶²

The grandiloquent description of Arizona's exhibit at the exposition emphasized its potential. It read: "Realistic exhibit of the wonderful resources and remarkable

⁶¹ See *Journals of the Thirteenth Legislative Assembly*, 145-147; *Weekly Arizona Miner*, February 13, 1885; *Times Picayune* (New Orleans), September 18, 2011. The World's Industrial and Cotton Centennial Exposition was conceived to promote New Orleans and mark the 100th anniversary of the nation's cotton industry. The city's first world's fair opened in what is now Audubon Park on December 16, 1884. It wasn't until September 1884 that bids were put out for vendors for the event, which opened two weeks late. Some exhibits weren't completed until long after the exposition had opened. The Cotton Centennial Exposition's largest building was also the largest building in the country in 1884. It covered thirty-three acres and was constructed in about six months. The Horticultural Hall, the largest greenhouse in the world, was among many notable buildings constructed for the World's Industrial and Cotton Centennial Exposition. It was the only one to remain in use on the site after the fair, but it was destroyed in a 1915 hurricane. By the time it concluded in May 1885, the expo had attracted more than one million visitors, including an estimated 36,000 the week of Mardi Gras. Still, it closed deeply in debt, and today none of the buildings remain at the park. The fair ended deep in the red in May 1885; Edward Burke, the former director general of the expo, was later indicted for forgery and fraud allegedly committed while he was the state treasurer. He fled the country.

⁶² *New York Daily Tribune*, December 29, 1884; *Arizona at the World's Industrial and Cotton Centennial Exposition, New Orleans, 1884-1885* (Chicago: Poole Brothers Printers, 1885), a souvenir of the Atlantic and Pacific Railroad, 67, Special Collections, University of Arizona, Tucson, Arizona.

⁶² *New York Daily Tribune*, December 29, 1884; *Arizona at the World's Industrial and Cotton Centennial Exposition, New Orleans, 1884-1885* (Chicago: Poole Brothers Printers, 1885), a souvenir of the Atlantic and Pacific Railroad, 67, Special Collections, University of Arizona, Tucson, Arizona.

products of the coming empire in the Southwest. [There is] a mineral collection unrivaled for richness, extent and variety, unequaled for beauty and unique display. Cereal and semi-tropical fruits, sugar cane and cotton, timber and stone for building purposes—in fact, every natural product of the continent—is found in Arizona, which may well be termed a paradise for the miner and husbandman; a limitless field of study and research for the historian and scientist; a feast of happy surprises for the pleasure-seeking tourist. Pause and study this wonderful lesson from the land of “Sunshine and Silver;” from the land of which Baron Von Humboldt said: ‘Here is the wealth of the world to be found.’”

Each county featured their considerable assets at the exposition and Maricopa County’s “commissioner” was Judge A.D. Lemon. Maricopa County, according to the program guide, “has been looked at as an *agricultural* and not a mining region....The rich valley of the Salt produces in abundance of everything in the way of provisions, which can be had at reasonable prices, and the roads leading to the railroads were the best in the country. In this collection can be seen some of the finest fruits, cereals, and vegetables of all kinds to be seen anywhere. The yield per acre of wheat and barley in this county is from twenty-five to thirty-five bushels, and, after this is harvested, corn can be planted on the same ground and a fine crop raised the same season. Apples, peaches, pears, plums, figs, quinces, apricots, and nearly every other variety of fruit, yield largely. Lemons, oranges, and olives can be raised with profit and finer grapes cannot be produced anywhere. Sugar cane and cotton have also been grown successfully. The 3,000 pounds of cotton on exhibition from Maricopa county and marked No. 11, will compare favorably with that raised in any of the Southern States, as will also the sugar cane. The

valleys of the Salt River and the Gila are remarkable for the extent and variety of their agricultural products, and thousands of acres of fertile lands await the immigrant.”⁶³

Not only did reporters at the exposition focus attention on the rapid economic development taking place in a territory that was comparatively unknown to most people living east of the Mississippi River, but also they wrote stories on Arizona’s needs. The lack of enough railroads, outlined earlier in this narrative, was a temporary problem that could be partly overcome, they suggested, by the construction of two north-south railroads in the territory. In essence, many incorrect impressions about Arizona were corrected at the New Orleans exposition. It lasted for two years and was still open when the Thirteenth Legislature convened in Prescott in January 1885. Significantly, at the New Orleans expo, the Salt River was not touted as a stream that could serve as a transportation route for commerce. Instead, Arizona’s boosters at this exposition focused on the Salt River’s uses for irrigating the 100,000 acres that could be brought into cultivation through completion of the Arizona Canal.⁶⁴

The importance to the State’s economy of the connection between Central Arizona and the outside world, a role never played by the Gila-Salt River System, was once again demonstrated by the construction of the Maricopa and Phoenix Railroad. In 1887, the grading of the eighty-four-mile right-of-way began. The crew completed the roadbed grading in late June 1887 in time for the first passenger train carrying fifty people over the completed line from Tempe to Maricopa.⁶⁵

⁶³ *Arizona at the World's Industrial and Cotton Centennial Exposition*, 16.

⁶⁴ Jay J. Wagoner, *Arizona Territory, 1863-1912: A Political History* (Tucson: University of Arizona Press, 1970) 205.

⁶⁵ *Phoenix Gazette*, May 19, 1887.

The implications of the completed railroad spur were significant and further transformed the valley's agricultural economy and triggered the crop diversification that marked the 1890s and the first decade of the twentieth century. As Maricopa County's population grew from 235 souls in 1870 to 11,000 by 1890, the Maricopa and Phoenix spur line opened the valley to unprecedented opportunities. Farmers knew prices of wheat and barley fell in the late 1870s after a brief boom in the earlier part of the decade. Wisely, they diversified their crops in the 1880s, discovering that some fruit trees flourished in the valley's mild climate; they planted peach, fig, apricot, and a variety of citrus trees next to the traditional alfalfa, clover, and grains. On the north side of the river, along the 50,000 acres of land irrigated by the recently-constructed Arizona, Maricopa, Grand, and Salt River Valley canals, farmers planted alfalfa, citrus orchards, and grains. As local boosters publicized the completion of the railroad spur in 1887, which finally allowed the Salt River Valley to market and ship its agricultural products via the mainline Southern Pacific railroad, more settlers came to build homes and farm the rich, alluvial soil of central Arizona.⁶⁶ The Salt River produced water for agriculture and the new spur line provided a transportation route for the export of agricultural products.

The completion of the Arizona Canal in 1885 and the spur line from Tempe to Maricopa in 1887 fueled a population influx and agricultural revolution by the mid-1890s. Development of the Salt River's water flows was essential for sustainability and continued growth. If there was concern or debate about the impacts on navigability by diverting the Salt River for irrigation, there is no historical record of it. The Salt River, as it descended from the mountains to the Salt River Valley, was never viewed by these 19th

⁶⁶ Smith, *The Magnificent Experiment*, 5.

century American pioneers as a river of travel and commerce, it was, however, the essential factor in irrigated agriculture.

The Salt River and the Federal Government: 1890-1912

The environmental and economic challenges of the 1890s, “one of the darkest decades in this history of the United States,” had a significant impact on Salt River Valley residents.⁶⁷ In 1891 Congress appropriated \$50,000 to the Geological Survey to gauge stream flows in order to determine the water supply in the U.S. and to prepare reports on the best uses for water in the nation’s arid and semi-arid regions. The second of these reports was on irrigation near Phoenix, Arizona. Meanwhile, the federal government made incremental inroads into discussions surrounding the Salt River. In *the Thirteenth Annual Report of the US Geological Survey*, hydrologist Frederick H. Newell, who studied the river in 1891-1892 found the Salt River “An extremely difficult stream from which to divert a canal, owing to the irregularity of its discharge. As a consequence of this erratic discharge, the riverbed itself is very wide, and a long and expensive diversion weir is required in order to procure stability and permanence.”⁶⁸ Notably, Newell did not mention the Salt River as a possible conduit for transportation or commerce. The chief purpose of this and other similar investigations were twofold: to gather scientific and technical data for planning reclamation projects and to publicize potential reservoir sites to Congress.

⁶⁷ Donald Pisani, *Water and the American Government: The Reclamation Bureau, National Water Policy and the West, 1902-1935* (Berkeley: University of California Press, 2002) xiii.

⁶⁹ Fowler and Kibbey knew that selection of the Salt River as a project depended upon government acceptance of its organization and the executive committee carefully considered the content of the Articles of Incorporation. In essence, the articles sought to reconcile reclamation law with territorial vested rights. See *Arizona Republic*, December 25, 1882.

Shortly after President Roosevelt signed national irrigation legislation into law, stakeholders formed an organization which could deal with the government implementing the National Reclamation Act to benefit the Salt River Valley. Among the most difficult issues in the construction of Roosevelt Dam was construction of a road from the Valley to the Tonto Basin.⁶⁹ The construction of the road further reinforced the notion that the Salt was not suitable for transportation. Federal workers needed an overland transportation route to access the dam site. The Salt River itself was not viewed as a possible transportation route for the transfer of supplies to the dam site.

Newspaper accounts from the period underscored the notion that roads and railroads were the highways of commerce, not the Salt River. And as plans for construction of Roosevelt Dam (called Tonto Dam at the time before its completion) began to take shape the press published numerous accounts of how freight and people would be carried to the construction site near Globe. In August 1903, for example, the *Phoenix Enterprise* announced that a group of entrepreneurs considered construction of a trolley to the dam location in order to avoid the lengthy and arduous trip via Globe to Roosevelt. In the ensuing public debate, editors gave no indication that the Salt would be used for transportation.⁷⁰ Another group championed construction of a wagon road from Phoenix to the Roosevelt Dam site. *The Arizona Gazette*, on August 25, 1903, argued that the proposed road might be too costly, but even if it were built the freight could not be handled by the Salt River. Instead, men and material would be conveyed via Globe: "The proposed wagon road...is not seriously talked of for the reason that it is

⁶⁹ Fowler and Kibbey knew that selection of the Salt River as a project depended upon government acceptance of its organization and the executive committee carefully considered the content of the Articles of Incorporation. In essence, the articles sought to reconcile reclamation law with territorial vested rights. See *Arizona Republic*, December 25, 1882.

⁷⁰ *Phoenix Enterprise*, August 14, 1903.

impracticable....Globe will handle all the freight.”⁷¹ The cost and distance of the proposed wagon road notwithstanding, the Salt River itself was not mentioned as a transportation alternative.

Instead, government workers blasted a road to Globe then began the famed Apache Trail, then called the Yavapai Trail since it was the Yavapai who lived along the Salt River that enabled two rail lines from Mesa to access the eventual construction site. Punctuating the fact that the Salt River was not considered a transportation route for hauling goods, equipment, or people to the reservoir site, the *Arizona Republican* suggested: “The road of course is designed at present only for the hauling of telephone poles and wire and the supplies for the men engaged in construction work,” the article began,...”it is like it will be made into a permanent highway and graded for freight handling.” Shortly thereafter, the *Arizona Gazette* reported that Arthur Powell Davis, then-Director of the Reclamation Service, had begun discussions with federal and local authorities on the need for a good road from the Salt River Valley to the reservoir site. Davis never considered using the Salt River as a route to carry men and material to the site. On January 27, 1908, the *Arizona Gazette* described a stagecoach trip over the “Apache Trail” to the dam construction site: “There are many men and teams engaged in hauling stuff to Roosevelt by wagons. Four to six horses are generally used and the outfits travel in pairs, the owners and drivers together.”⁷² The road gave engineers nightmares and threatened workers’ lives.⁷³ It wound along the Salt River, clung to steep

⁷¹ *Arizona Gazette*, August 25, 1903; Littlefield, “Assessment of the Salt River’s Navigability,” 166.

⁷² *Arizona Gazette*, September 2, 1903; *Arizona Republican*, March 8, 1904; *Arizona Gazette*, January 27, 1908.

⁷³ *Arizona Daily Silver Belt*, March 16, 1961. In fact, later a new road north had to be built as the water behind the dam would back up and cover roads then in use. It was on this road that Al Sieber, noted Indian scout, was killed while in charge of a crew of Indians digging out beneath to loosen a gigantic red sandstone boulder above the road. When Sieber saw it was ready to fall into the excavation below, he

cliffs and ascended and descended mountains like Fish Creek Hill in 10 percent grades. Road builders had to use lifelines to hack twenty-to seventy-foot deep cuts.⁷⁴ There was no suggestion of transportation of goods via the Salt River in this account.

Two water decrees from this era also found that the Salt River was non-navigable. Judge Joseph Kibbey and Judge Edward Kent handed down decisions that affected water rights well into the new century. Earlier, in 1892, Kibbey, then-the chief justice of the territorial Supreme Court, tried to resolve a number of water rights and canal company disputes that punctuated the increasingly chaotic community of water users. Kibbey's landmark decision, in *Wormser v Salt River Valley Land Company* (1892) reaffirmed the doctrine of prior appropriation. Eighteen years later, as the dam neared completion, Kent essentially reiterated Kibbey's decision in *Hurley v Abbott* (1910).⁷⁵ The decision determined the prior rights of all acreage in the Salt River Valley and even adjudicated when each parcel had been first cultivated. The Kent decree, in its determined complexity, took into consideration elements of the federal Newlands Reclamation Act and enabled Arizona to undergo a seamless transition into statehood in 1912, especially as it concerned water law administration. The decree stands as one of the great early monuments to Arizona's maturing legal system.

hustled his men out before starting to move out himself. The boulder crushed him, and though his crew hurried to remove the boulder, he was dead when they reached him.

⁷⁴ Reclamation Service planners decided it would be cheaper to manufacture the cement on the site than to pay freighting costs. To build housing for the camp workers, a sawmill was built on the Sierra Ancha. A cement mill was also built. A water supply had to be built and a sewage system established. Also a temporary steam power plant was installed. Corrals, store houses, and warehouses were built. Bricks, too, were made on the site. There as a scarcity of fuel in the area so a power canal was decided upon as part of the project to develop power for the construction of the dam, including the operation of the cement mill and pumping plant water from sources in what was called "the Little Salt River Valley." The water for the power canal was taken about nineteen miles upstream from the work site. Contract work on the canal was begun in 1904 and the system was in operation in 1906. See *Arizona Daily Silver Belt*, March 16, 1961.

⁷⁶ August, *Vision in the Desert*, Chapters 2 and 3.

Future congressman and senator Carl Hayden, who grew up on the southern banks of the Salt River at Hayden's Ferry (renamed Tempe in 1878), recalled the significance of these decisions, both of which held that the Salt River was a non-navigable stream. As noted above, the 1890s and the first decade of the 1900s was a period of large floods along the Salt River, interspersed by long periods of drought. Carl Hayden, who grew up on the south side of the Lower Salt during this period often described it as an erratic and unpredictable stream and that the flood of 1891 erased decades of human effort along the banks of the river, including his family's properties.

Hayden had known District Judge Kent for some time and agreed with his findings on issues pertaining to water rights and non-navigability. Kent issued a ruling in the case *W.W. Dobson et. al., v. James Johnson*, which Hayden observed, "The Salt is an innavigable (sic) stream flowing in a general Northeast to Southwest direction through Maricopa County, Arizona...." Similarly, Hayden knew intimately the details and agreed with the ruling in the *Hurley v. Abbott* case, which resulted in a decree that indicated, "Entering the Valley from the northeast is the Salt River, a non-navigable stream." As Arizona's first federal representative in Congress, Hayden never wavered in his conviction that the Salt River was non-navigable.⁷⁶

Not surprisingly, as another outgrowth of the construction of Roosevelt Dam, the promise of regulated flood control and irrigation fueled a population boom and scramble for irrigable land below the dam. Therefore, federal land patents to private parties demonstrated contemporary views that the Salt River was non-navigable. With the U.S. Land Office implementing an orderly system for federal disposition of the public domain in the Territory of Arizona prior to 1912 federal and state officials were challenged by the

⁷⁶ August, *Vision in the Desert*, Chapters 2 and 3.

Byzantine process of settlers applying for land patents. Nineteenth century homestead laws, like the Homestead Act (1862) and the Desert Land Act (1877) required settlers to file applications that described their patents by township, range, and section, within each six-hundred-forty-acre section.⁷⁷ If the Salt River flowed through the parcel and was navigable, federal officials would not have granted title of the bed of the stream since the State of Arizona would own it due to the state's sovereignty. Thus a patent to a quarter section would have been recorded with fewer acres, taking into account the streambed. If the river had been considered navigable, an irregularly-shaped parcel next to the river would have been identified as a "government lot." Significantly, none of the federal patents that overlay the Salt River—regardless of the filing dates—contain any provision for reserving the bed of the stream to the State of Arizona.⁷⁸

Around the time of statehood, Rawleigh C. Stanford, who later served as State Supreme Court Justice and Governor, filed an application for eighty acres in township 1 north, range 3 east. The homestead was located in the southwest quarter of section fifteen. According to file documents and historical mapping sources, much of the land encompassed by the patent lay in the Salt River bed. One of Stanford's witnesses, Frank Harris, stated, "About sixty acres of the claim can be put under cultivation: the rest of the claim is river bed and is totally unfit for cultivation." Another witness, William Blucks, corroborated Harris's assessment: "All of the entry can be put under cultivation but

⁷⁷ Perhaps the most important of these laws was the Homestead Act, "An Act of Secure Homesteads to Actual Settlers on the Public Domain," *37 Cong., 2 Sess., Ch. 75* (1862). Once an application was filed the settler was required to live on the land and make improvements. When the appropriate time elapsed the settler returned to the land office with witnesses to file affidavits stating that the settler had complied with the statutes. These affidavits and accompanying paperwork created patent files that contained critical information about the patent and filer. Typically the affidavits described the parcel, number of acres, crops farmed, improvements made, and related information. If the land office approved the affidavits, the settler would pay a small additional fee and he would be given a patent (legal title) to the parcel.

⁷⁸ Littlefield, "Assessment of the Salt River's Navigability," 70-72.

twenty acres; which is the river bed and unfit for cultivation.” Stanford never received notice of the State of Arizona withdrawing acreage due to navigability, which demonstrated the commonly-held view that the Salt River was non-navigable. Stanford’s was one of over two-hundred-twenty-five separate patents to private individuals that touched or overlay the Lower Salt River. If the state truly believed that it owned the streambed, it certainly would not have disposed of the lands under question and allowed patents to be perfected.

During this period in which modern Arizona began and the Salt River was captured behind Roosevelt Dam, there is no record of any consideration of the impacts the dam might have on the river’s navigability or use as a potential route for commerce. When construction of the dam was undertaken, there is no record of any consideration of transporting the workers or the building materials up any part of the Salt River. In fact, the record reflects that, in the opinion of the residents of Arizona just before statehood, the Salt River was not navigable, and there is no indication that the residents believed the river to be susceptible to navigation.

Conclusion

The Salt River in general and the Lower Salt in particular, has provided irrigated livelihood for thousands of years. Its uses and institutionalization have, for the most part, resulted in fostering agricultural and even urban civilizations to grow and prosper. In spite of numerous civilizations making use of the River over hundreds of years, there is no historical record of any of these civilizations using the Lower Salt River for navigation or of considering it susceptible to navigation.

The Hohokam used the river to divert water for irrigation. Spanish explorers, missionaries, and military personnel noted the river but never considered it as a transportation route. Its waters were used for irrigation, exploitation for the fur trade in 1820s and 1830s, agriculture, and human consumption. Though trapping continued into the 1840s the fur traders did not use boats for travel in the Lower Salt and instead traveled by horses, mules, wagon, or foot along the stream's banks. When former mountain man and guide Kit Carson was impressed into military service by General Kearney in Socorro, New Mexico during the War with Mexico because of his knowledge of the central Arizona rivers and mountains, he guided the military detachment far south of the Salt River because it was not a suitable transportation route. Transportation along the Lower Salt River, pre-historically and historically, was over land and reflected the respective civilization's technologies, from foot to horse to railroads to early versions of the automobile. The Salt River, in its natural and unregulated state, was never seriously contemplated as, or used as, a river of commerce or for transportation. In none of the civilizations or cultures that settled in the Salt River Valley was the river used for transportation, nor was it considered susceptible for use as a route for transportation or commerce.

Vitae

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Education

Ph.D. University of New Mexico, History, with Distinction (1985)
M.A. University of Arizona, History
B.A. Yale University, American Studies

Current Activities and Brief Biography

Dr. Jack L. August, Jr. serves as Scholar-in-Residence for the Southwest Center for History and Public Policy, a non-profit and non-partisan 501 c 3 corporation dedicated to the collection, preservation, and dissemination of the history and culture of Arizona and the Greater Southwest. Since the formation of the Center in 2008 Dr. August has secured research grants in excess of \$800,000.00 from the Flinn Foundation, International Genomics Consortium, and Snell & Wilmer LLP, among others. He is also a faculty member in the Center for Civic Leadership at the Flinn Foundation and frequent faculty member for Continuing Legal Education (CLE).

At the current time, also, he is Visiting Scholar in Legal History at Snell & Wilmer. In addition, he is a feature writer and history columnist, for *Phoenix Magazine* (www.citieswestpublishing.com). Previously, a historian in Northern Arizona University's Statewide Programs, he taught courses in Western Water Policy and the New American West for the Master's in Liberal Studies Program and undergraduate history courses about the American Environment, American West, Far Southwest, and Arizona via interactive instructional television and satellite cable. He is a former

Fulbright Scholar (Canada), National Endowment for the Humanities Research Fellow (University of Oregon), Pulitzer Prize nominee in the history category in 2000, and in 2007 he was awarded the Southwest Book Award for Literary Excellence and Cultural Enrichment of the Southwest given annually by the Border Regional Library Association headquartered at the University of Texas El Paso.

In 2014 Arizona Secretary of State Ken Bennett appointed Dr. August to the Advisory Board of the Arizona Department of State Library, Archives, and Public Records. This board advises the Secretary of State in the supervision of the State Library, Archives, Capitol Museum, the online Arizona Memory Project, and county libraries throughout Arizona. The advisory board consists of the President of the Senate, the Speaker of the House, one member who is appointed by the Speaker of the House of Representatives and who is a member of a different political party than the Speaker and seven members who are appointed by the Secretary of State. He will serve a three-year term and become a member of a Task Force to help form the State Library Foundation.

He has recently been engaged as an expert witness for the City of Tombstone on litigation concerning their water supply system, the Salt River Project regarding water rights dating from the 1920s, and the City of Phoenix, the City of Mesa, and the City of Tempe in the Arizona Navigable Stream Adjudication hearings on the Lower Salt River and in the case of the City of Phoenix, the Lower Verde River. He maintains another expert witness role with Resolution Copper Company (a division of Rio Tinto Ltd.) on issues concerning natural resource history and mineral rights. Also, he was engaged as historian and expert witness in the Natural Resources Section of the Arizona Attorney General's Office where his work focused on Indian versus non-Indian water issues and state trust lands. Additionally, he has served as expert witness for GRUPO MEXICO (ASARCO), Arizona State University, the City of Tempe, the City of Tucson, the Buckeye Water Conservation and Drainage District, Farmer's Investment Corporation (FICO) of Sahuarita, Arizona and private law firms representing clients with land and water rights claims. He also served as water resources consultant to the City of Page and historical consultant to the Hopi Tribe, where he secured a Department of Interior grant for \$50,000 for an oral history project on Hopi elders. In 2012, Dr. August was served as Humanities Advisor for the proposed PBS documentary, "Sandra Day O'Connor."

Dr. August has appeared on numerous television and radio programs, including "Horizon," "Horizonte," "Arizona Illustrated," "Books and Co.," the KAET/PBS Documentary "Arizona Memories from the 1960s," the HBO Documentary, "Barry Goldwater: Mr. Conservative," KTAR's "Think Tank" (92.3 FM) and National Public Radio features, including "All Things Considered" with Robert Siegel. He is a frequent contributor to newspapers, magazines and historical journals including the *Arizona Republic*, *Arizona Highways*, *Phoenix Magazine*, *Journal of Arizona History*, *Pacific Historical Review*, *Western Historical Quarterly*, and many others, and writes a popular monthly column, "Around Arizona History" which carries the tagline, "You Need Your Food, You Need Your Water, and You Need Your History" for the *Arizona Food Industry Magazine*. Often sought as a speaker at conferences and conventions, in 2012 he served as keynote speaker at the University of Arizona's annual Water Research

Resources Center Conference, “Urbanization, Uncertainty, and Water: Planning for Arizona’s Second Hundred Years,” as well as the jointly sponsored Membrane Technology Conference and Exposition hosted by the American Water Works Association and American Membrane Technology Association. Recently, he was the keynote speaker at the Thurgood Marshall Inn of Court, chaired by Special Master George Schade, Jr., concerning the ongoing Gila River System Adjudication, where he discussed the historical context for these crucial legal processes.

His book, *Vision in the Desert: Carl Hayden and Hydropolitics in the American Southwest* (Ft. Worth: Texas Christian University Press, 1999) was considered by distinguished historian Howard Roberts Lamar, President Emeritus and Sterling Professor of History Emeritus at Yale University, a groundbreaking analysis that filled a major gap in the history of the Southwest. Another book, *Senator Dennis DeConcini: From the Center of the Aisle* (Tucson: University of Arizona Press, 2006) was coauthored with former three-term U.S. Senator from Arizona, Dennis DeConcini, and was recently awarded the Southwest Book Award for Literary Excellence and Cultural Enrichment by the Border Regional Library Association. His volume, *Dividing Western Waters: Mark Wilmer and Arizona v California* (Ft. Worth: Texas Christian University Press, 2007), was released to universally outstanding reviews. His recent book, *Adversity is My Angel: The Life and Career of Raul H. Castro* (Ft. Worth: Texas Christian University Press, 2009) appeared in May 2009. Stellar Productions in Hollywood has optioned this book for film adaptation. His recent, award-winning book, *Play by Play: Phoenix and the Building of the Herberger Theater* (Ft. Worth: Texas Christian University Press, 2010) emphasizes the important role that arts and culture play in the urban history of the New American West. *The Norton Trilogy: A History of Water and Agribusiness in the American Southwest* (Ft. Worth: Texas Christian University Press, 2013), which features a foreword by former Arizona Senator Jon Kyl, has just been released to positive reviews, is a finalist in the New Mexico-Arizona Book Awards in the Biography category, and has been nominated for several other awards, including the Southwest Book Award for Literary Excellence and Cultural Enrichment. He has completed a new manuscript, *Law in the New West: The Story of Snell & Wilmer*, which has been through peer review and accepted by Texas Christian University Press and the Texas A&M University Press Consortium.

Professional Experience

2014-present, features writer and history columnist for *Phoenix Magazine* (www.citieswestpublishing.com).

2014-present, Expert Witness for the City of Phoenix, City of Tempe, and City of Mesa pertaining to the Arizona Navigable Stream Adjudication Commission (ANSAC) hearings on the Lower Salt River.

2014-present, Expert Witness for the City of Phoenix pertaining to the Arizona Navigable Stream Adjudication (ANSAC) hearings on the Lower Verde.

2012-present, Expert Witness for City of Tombstone on ongoing litigation with the U.S. Forest Service, Department of Agriculture concerning that city's water delivery system.

2011-present, Expert Witness for Salt River Project (SRP) on current litigation concerning dam applications, water, and power on SRP lands 1920-present.

2008-present, Litigation Consultant and Expert Witness for Resolution Copper Company, a Division of Rio Tinto and BHP, concerning pending federal land exchange that includes one of the largest copper mines in the world located in Gila and Pinal Counties in eastern Arizona.

2008-present, Expert Witness for Farmer's Investment Corporation (FICO) and the Green Valley Pecan Company in southern Arizona concerning water rights to the San Ignacio de la Canoa Land Grant of 1820.

2007-present, Visiting Scholar in Legal History at Snell & Wilmer L.L.C. to research and write a comprehensive history on the topic, "Law in the New West: The Story of Snell & Wilmer."

2007-present, Historian and Expert Witness for the Buckeye Water Conservation and Drainage District pertaining to private ownership of the Buckeye Irrigation Canal and appurtenant lands.

2005-2007, Historian and Expert Witness for GRUPO MEXICO via the law firm of Squire, Sanders, and Dempsey in the matter of *ASARCO v Olmos* in Gila County Superior Court and Pinal County Superior Court.

2004-2007, Historian for the law firm of Snell and Wilmer (Phoenix, Arizona) to write a book on Arizona attorney Mark Wilmer and *Arizona v California* (1963), with the resulting publication of *Dividing Western Waters: Mark Wilmer and Arizona v California* (Ft. Worth: Texas Christian University Press, 2007).

2003-2007, Executive Director, Arizona Historical Foundation, Arizona State University. Secured \$529,000 appropriation from the Arizona State Legislature for processing the Personal and Political Papers of Senator Barry Goldwater.

2003-present, Expert Witness, Moyes Storey Law Firm, and Meyer, Bivens, and Hendricks Law Firm for Buckeye Irrigation District, Paloma Farms before the Arizona Navigable Stream Commission (ANSAC), for the Middle Gila River.

2003-present, Expert Witness, Moyes Storey Law Firm, Arizona State University and City of Tempe, before the Arizona Navigable Stream Adjudication Commission (ANSAC), for the Lower Salt River.

2003-present, Expert Witness, Moyes Storey Law Firm, Arizona Navigable Stream Adjudication Commission (ANSAC) for the Santa Cruz River and Gila River Confluence to the Headwaters.

2002-present, Expert Witness, City of Tucson, *Qwest v City of Tucson* in United States Ninth Circuit Court of Appeals.

2002-2003, Arizona Humanities Council Lecture Series Speaker on *Moving Waters* National Endowment for the Humanities Grant and *Parched Arizona* Lecture Series.

2000-2003, Water Resources Consultant, City of Page, Arizona.

2000-2005, Historical Consultant, Hopi Tribe, Cultural Preservation Office.

1999-2002, Expert Witness and Historian, Natural Resources Section, Office of the Attorney General, State of Arizona.

1993-2004, Historian, Northern Arizona University-Yavapai, teaching courses statewide through interactive instructional television and other distance learning technologies.

1994-1996, Historian, Graduate Advisor, and Grants Coordinator, Prescott College.

1994-1995, Historian and Writer for *Arizona Highways* Book Division; soft-cover book, *We Call it Preskit: A Guide to Prescott and the Central Arizona High Country*.

1994, National Endowment for the Humanities Faculty Research Fellow, Oregon Humanities Center, University of Oregon, Eugene, Oregon, Summer Fellowship.

1993-1994, U.S. Fulbright Scholar and Fulbright Professor of History and Environmental Studies to Canada. Teaching and research areas: Comparative Frontier History, the American West and the Canadian West, Environmental History.

1992-1993, on leave with Presidential Research Fund Grant, Assistant Professor of History and Associate Director of Public History Institute, University of Houston.

1992-1993, Editor and Chief Analyst, *Arizona Career Ladder Program: A Critical Analysis* (15 vols.) Arizona Department of Education, Phoenix, Arizona.

1987-1988, IPA Fellowship Program Officer and Academic Administrator, Division of Research Programs, National Endowment for the Humanities (NEH), Washington, D.C.

1986-1987, Assistant Director, Southwest Center, Adjunct Assistant Professor of History, Department of History, University of Arizona.

1985-1986, Visiting Assistant Professor of History, University of Arizona, Tucson, Arizona.

1985-1986, Visiting Assistant Professor of History, University of New Mexico, Albuquerque, New Mexico. (Summer Sessions).

1983-1986, Department Head and Field Historian, Hayden Library, Arizona State University, Tempe, Arizona.

1983-1984, Chief Editor, Carl Hayden Family Letters Project, Hayden Library, Arizona State University, Tempe, Arizona.

1981-1984, Project Director and Author, *From Horseback to Helicopter: A History of Forest Management on the San Carlos Apache Indian Reservation*, U.S. Department of Interior, Bureau of Indian Affairs (BIA) Contract History.

1981, Historian, U.S. Department of Interior, National Park Service (NPS), Santa Fe, New Mexico. Analyzed the architectural and social history of the Lyndon Baines Johnson National Historic Site for NPS and completed numerous National Register Forms.

Teaching

2012-present, Faculty Member, Center for Civic Leadership, Flinn Foundation, Phoenix, Arizona.

2005, Graduate Course: Water Policy and Management, School of Planning, College of Architecture and Environmental Design, Arizona State University, Tempe, Arizona.

1993-2004, Northern Arizona University, Department of History, Office of Statewide Programs. Undergraduate Courses: The Making of the American West, 1500-1850, The American West Transformed, 1850-present, History of the Far Southwest, Recent America, 1919-present. Graduate Courses: Public History, History of Western Water Policy, New American West.

1994-present, Prescott College, Graduate Professor of History in Humanities Program. Courses: The American West: Historical Perspectives on Environmentalism, History of the American West, Public History, Historic Preservation.

1993-1994, University of Northern British Columbia, Fulbright Professor of History and Environmental Studies, Faculty of Graduate Studies. Courses: Environmental History of the Western Hemisphere, Environmental History of the American West, Comparative Frontiers: The American West and the Canadian West.

1988-1993, University of Houston, Assistant Professor. Undergraduate Courses: U.S. History to 1877, U.S. History 1877-present, History of the Trans-Mississippi West to 1900, The American West in the Twentieth Century, American Indian History. Graduate Courses: Public History, History of the American West.

1985-1987, Visiting and Adjunct Assistant Professor, University of Arizona. Courses: History of the Hispanic Borderlands, 1503-1848, History of Arizona, History of the Southwest, American West in the Twentieth Century.

1985-1986, Visiting Assistant Professor, University of New Mexico. Course: American West in the Twentieth Century.

Publications: Books

Law in the New West: The Story of Snell & Wilmer (Ft. Worth: Texas Christian University Press, accepted and in editing phase prior to publication).

The Norton Trilogy: A History of Water and Agribusiness in the American Southwest (Ft. Worth: Texas Christian University Press, 2013). Finalist for New Mexico-Arizona Book Award in Biography and submitted for several other literary awards.

Play by Play: Phoenix and the Building of the Herberger Theater (Ft. Worth: Texas Christian University Press, 2010).

Adversity Is My Angel: The Life and Career of Raul H. Castro (Ft. Worth: Texas Christian University Press, 2009). This book has been optioned by Stellar Productions in Hollywood to be adapted for a feature film.

Dividing Western Waters: Mark Wilmer and Arizona v California (Ft. Worth: Texas Christian University Press, 2007).

Senator Dennis DeConcini: From the Center of the Aisle, with former Arizona Senator Dennis DeConcini, (Tucson: University of Arizona Press, 2006). This book won the Border Regional Library Association (BRLA) Southwest Book Award for Literary Excellence and Enrichment of the Cultural Heritage of the Southwest.

Vision in the Desert: Carl Hayden and Hydropolitics in the American Southwest (Ft. Worth: Texas Christian University Press, 1999), with a foreword by former U.S. Secretary of the Interior, and Arizona Governor Bruce Babbitt. This book was nominated for Pulitzer Prize in history category (2000).

We Call it Preskit: A Guide to Prescott and the High Country of Central Arizona (Phoenix: Arizona Highways Books, 1996).

Editor, *Arizona's Career Ladder Program: A Critical Analysis*, 15 vols. (Phoenix, Arizona Department of Education, 1993).

From Horseback to Helicopter: A History of Forest Management on the San Carlos Apache Reservation, (Mesa, Arizona: American Indian Resource Organization, 1985).

Publications

Scholarly Chapters/Scholarly Articles in Peer-reviewed Journals/Features/Columns

“Carl Hayden and the Case of the Beardless Boy Bandits,” *Phoenix Magazine*, December 2014.

“Enemy Mine,” *Phoenix Magazine* (Feature), November 2014.

“Thinking in Time: Two Examples of Civic Leadership,” *Civic Leadership for Arizona’s Future* (Phoenix, Arizona, Arizona Town Hall, 2012).

“Hydropolitics in the Far Southwest: Carl Hayden, Arizona, and the Fight for the Central Arizona Project,” in U.S. Bureau of Reclamation, *Essays in American Reclamation History* (Washington, D.C.: Government Printing Office, 2008).

“The Most Important Man in Arizona History,” *Phoenix Magazine* (Phoenix: Cities West Publishing, October 2007).

“Shaped by Water: An Arizona Historical Perspective,” chapter co-authored with Grady Gammage, Jr. in *Arizona Water Policy: Management Innovations in an Urbanizing, Arid Region* (Washington, D.C.: Resources for the Future Press, 2006).

“Graham County Summers,” with Dennis DeConcini, *Journal of Arizona History* (Summer 2006).

“The Other Side of the Mirror: My Political Education,” with Dennis DeConcini, *Journal of Arizona History*, (Summer 2004).

“The Colorado River and the Grand Canyon,” *Moving Waters* (Flagstaff: Grand Canyon Institute, 2003).

“Carl Hayden and the Legislative Quest for the Central Arizona Project, 1952-1968,” *Bureau of Reclamation Centennial* (Washington, D.C., 2003).

“Arizona’s Legislative Watermaster: Carl Hayden and the Central Arizona Project,” *Arizona Insight*, (Phoenix: Arizona Humanities Council, 2002).

“Old Arizona and the New Conservative Agenda: The Hayden versus Mecham Senate Campaign of 1962,” *Journal of Arizona History* (Winter 2001).

“Diamond Valley Lake and the East Side Reservoir: A Short History,” Metropolitan Water District of Southern California (April 8, 2000).

“Water, Politics and the Arizona Dream: Carl Hayden and the Modern Origins of the Central Arizona Project, 1922-1963,” *Journal of Arizona History* (Winter 1999).

"Desert Bloom or Desert Doom? Carl Hayden and the Modern Origins of the Central Arizona Project, 1922-1952," *Cactus and Pine*, Vol. 8 (Summer 1996).

"A Vision in the Desert: Charles Trumbull Hayden, Salt River Pioneer, *Journal of Arizona History* (Summer 1995).

"Carl Hayden," *Encyclopedia of the American West* (New York: MacMillan Publishing Company, 1995).

"Carl Hayden and Arizona," *Encyclopedia of the United States Congress*, edited by Roger Bacon, Morton Keller, and Roger Davison (New York: Simon and Schuster, 1995).

"The Navajos and the Great Society: The Strange Case of Ted Mitchell and DNA," *Canon: The Journal of the Rocky Mountains American Studies Association* (Winter 1994).

"Carl Hayden's 'Indian Card': Environmental Politics and the San Carlos Reclamation Project," *Journal of Arizona History* (Winter 1993).

"Carl Hayden, Arizona, and the Politics of Water Development in the Southwest," *Pacific Historical Review* (May 1989).

"A Sterling Young Democrat: Carl Hayden's Road to Congress, 1900-1912," *Journal of Arizona History* (Autumn 1987).

"Law Enforcement on the Arizona-Sonora Border," *Arizona Town Hall* (Tucson: University of Arizona Press, 1987).

"The Future of Western History: The Third Wave," *Journal of Arizona History* (Spring 1986).

"The Formation of the Bar: Americanization and Cultural Accommodation in New Mexico," *Journal of the New Mexico Bar Association* (November 1985).

"Phoenix: Desert Metropolis," in *Arizona: Its Land and Resources* (Tucson: University of Arizona Press, 1986).

"Carl Hayden: Born a Politician," *Journal of Arizona History* (Summer 1985).

"Balance of Power Diplomacy in New Mexico: Governor Fernando de la Concha and the Indian Policy of Conciliation," *New Mexico Historical Review* (Spring 1981).

"The Anti-Japanese Movement in Arizona's Salt River Valley," *Arizona and the West* (Summer 1979).

Publications: Selected Book Reviews

The Frontier of Leisure: Southern California and the Shaping of Modern America, by Lawrence Culver for *Journal of Arizona History* Autumn 2012).

Innocent Until Interrogated: The Story of the Buddhist Temple Massacre and the Tucson Four, by Gary Stuart, for *Journal of Arizona History* (Autumn 2011).

Stealing the Gila: The Pima Agricultural Economy and Water Deprivation, 1848-1920 by David De Jong for *Journal of Arizona History* (Spring 2011).

The Political Culture of the New West, ed. By Jeff Roche for *Journal of Arizona History* (Spring 2010).

Wayne Aspinall and the Shaping of the American West, by Stephen Schulte for *Western Historical Quarterly* (Fall 2004).

Acequia Culture: Water, Land, and Community in the Southwest by Jose A. Rivera for *New Mexico Historical Review* (Winter 1999).

Barry Goldwater: Native Arizonan by Peter Iverson for *Journal of Arizona History* (Winter 1999).

Reclaiming the Arid West: The Career of Francis G. Newlands by William Rowley for *Journal of Arizona History* (Winter 1997).

Politics in the Postwar American West, edited by Richard Lowitt for *Journal of Arizona History* (Winter 1996).

The Last Water Hole in the West: The Colorado-Big Thompson Project by Dan Tyler for *Canon: the Journal of the Rocky Mountains American Studies Association* (Winter 1996).

Carl Hayden: Builder of the American West, by Ross Rice for *Pacific Historical Review* (February 1996).

Turning on Water with a Shovel: The Life of Elwood Mead by James Kluger for *Pacific Historical Review* (January 1996).

The Legacy and the Challenge: A Century of Forest History at Cowichan Lake by Richard Rajala for *Forest and Conservation History* (October 1995).

Flooding the Courtrooms: Law and Water in the Far West by M. Catherine Miller for *Canon: The Journal of the Rocky Mountains American Studies Association* (Winter 1995).

To Reclaim a Divided West: Water, Law, and Public Policy by Donald Pisani for *Journal of Arizona History* (Summer 1995).

Cadillac Desert: The American West and its Disappearing Water by Marc Reisner for *Prince George Citizen*, Prince George, B.C., Canada, (December 17, 1994).

Phoenix: The History of a Southwestern Metropolis by Bradford Luckingham for *Southwestern Historical Quarterly* (Summer 1991).

New Courses for the Colorado River: Major Issues for the Next Century by Gary Weatherford and F. Lee Brown for *Journal of the Southwest* (Fall 1988).

Rayburn: A Biography by D.B. Hardeman and Donald Bacon for *Western Historical Quarterly* (Summer 1985).

The Politics and Economics of Racial Accommodation: The Japanese of Los Angeles, 1900-1942 by Thomas Modell for *Arizona and the West* (Spring 1979).

Selected Awards: Fellowships

2009, Golden Bear Champion Award recognizing individuals and organizations for their support and contributions to Phoenix College students, employees, programs, services, and the community college community.

2007, Southwest Book Award for Literary Excellence and Cultural Enrichment in the Southwest from the Border Research Library Association for *Senator Dennis DeConcini: From the Center of the Aisle* (Tucson: University of Arizona Press, 2006).

2002, Margaret T. Morris Foundation and Kiekhefer Foundation Grant for Study of Arizona Cattle Industry.

2002, Hopi Oral History Grant, U.S. Department of the Interior, wrote and secured \$50,000 grant for Hopi Tribe.

2001, University of Arizona College of Law, Dennis DeConcini Education Grant for research into the public career of former Arizona Senator Dennis DeConcini.

2000, Nominee for the Pulitzer Prize in the History Category.

1998, Far West Foundation Grant for study into the business and public career of former governor Evan Mecham.

1996, nominee to the Center for Advanced Study in the Behavioral Sciences at Stanford University, funded by the MacArthur, Guggenheim, and Ford Foundations.

1994, National Endowment for the Humanities Summer Research Fellowship to Oregon Humanities Center.

1993, U.S. Fulbright Scholar Award to Canada in Comparative Frontiers and Environmental History, University of Northern British Columbia, Prince George, B.C.

1992, Presidential Research Scholarship Fund Grant (PRSF), University of Houston.

1992, Limited Grant-in-Aid (LGIA) Award, University of Houston.

1989, Research Initiation Grant (RIG), University of Houston.

1987, Intergovernmental Personnel Act (IPA) Grant to serve at National Endowment for the Humanities.

1986, New Mexico Legal History Grant, New Mexico Bar Association.

1984, New Mexico Humanities Council Grant, "Urban Growth and Economic Development in Northern New Mexico."

1983, Lyndon Baines Johnson Presidential Library, Moody Grant for research into the public career of U.S. Senator Carl Hayden of Arizona.

1982, University of New Mexico, Dorothy Woodward Memorial Fellowship in Hispanic Borderlands/U.S. Southwestern History, University of New Mexico Foundation.

Selected Scholarly Papers Presented

2015, "The Education of J. Fife Symington, III," Arizona Historical Convention, Tucson, Arizona.

2011, "John R. Norton and Corporate Water," Arizona Historical Convention, Yuma, Arizona.

2006, "Burros, Bullets, and God: The Republican Primary for the U.S. Senate in Arizona," Arizona Historical Convention, Tucson, Arizona.

2005, "The Arizona Navigable Stream Adjudication Commission," McFarland Plenary Lecture, Arizona Historical Convention, Flagstaff, Arizona.

2005, "The Central Arizona Project: Fuel for Business Growth in Arizona," Lecture for the Annual Barry M. Goldwater Lecture Series, Arizona Historical Foundation, Kerr Cultural Center, Scottsdale, Arizona.

2005, "Arizona Treasures: Locating Arizona History," Keynote Speaker, Annual Meeting of the Arizona Historical Society Board of Directors, Tempe, Arizona.

2004, "Ernest McFarland, *Arizona v California*, and the Central Arizona Project, Arizona Historical Convention, Safford, Arizona.

2002-2003, Arizona Humanities Council Lectures: "Parched Arizona: The Colorado River and the Future of the Southwest," papers presented in Tucson, Casa Grande, Tempe, Peoria, Prescott.

2001-2002, National Endowment for the Humanities Lectures: "Carl Hayden and the Central Arizona Project," papers presented in Tucson, Tempe, Grand Canyon.

2002, "Carl Hayden and the Legislative Quest for the Central Arizona Project, 1963-1968," Centennial Celebration Conference for the U.S. Bureau of Reclamation, Las Vegas, Nevada.

2000, "The American Southwest: Hydraulic Society at the Crossroads of History," Nineteenth Annual Maricopa Community College Honors Forum Lecture Series, Phoenix, Arizona.

2000, "The Hayden versus Mechem U.S. Senate Election of 1962: Old Arizona and the New Conservative Agenda," Arizona Historical Convention, Yuma, Arizona.

1995, "Alcan: Mission to the North," British Columbia Studies Conference, Okanagan, B.C., Canada.

1994, "Carl Hayden and the Origins of the Central Arizona Project," Arizona Historical Convention, Casa Grande, Arizona.

1991, "A Comment: The Third Great Age of Discovery," Johnson Space Center, NASA, Houston, Texas.

1986, "The Formation of the Bar: Americanization and Cultural Accommodation in New Mexico," Annual Meeting of the New Mexico Bar Association, Ruidoso, New Mexico.

1985, "Carl Hayden, Regionalism, and the Politics of Water in the Southwest, 1920-1928," Western History Association Conference, Sacramento, California.

1983, "Recent Interpretations of the Twentieth Century American West," Western History Association Conference, Salt Lake City, Utah.

1983, "The Progressive Impulse and the Navajo Soil Conservation Program," Arizona Historical Convention, Prescott, Arizona.

Other Professional Activity: Selected

2014, Advisory Board, Secretary of State, Arizona, Department of Library, Archives, and Public Records.

2012, Keynote Speaker, Annual Conference of American Engineering Association, Glendale, Arizona.

2012, Keynote Speaker at annual Water Resources Research Center Conference at the University of Arizona.

2011, Board of Directors, Grand Canyon Institute.

2011, Arizona Centennial Courts Commission.

2010, Luncheon Speaker at Water Resources Research Center, University of Arizona.

2010, Board of Directors, Raul Castro Institute, University of Arizona/Phoenix College.

2010, Keynote Speaker, Western Water Well Drillers Association Annual Conference, Prescott, Arizona.

2009, Keynote Speaker, Arizona Food Marketing Alliance Annual Education Scholarship Awards, Phoenix, Arizona.

2009, Keynote Speaker, Arizona Law Library Association Annual Conference, Phoenix, Arizona.

2009, Keynote Speaker, 82nd Annual Arizona Water & Pollution Control Association Conference and Exhibition, Glendale, Arizona.

2007, Keynote Speaker, Annual Meeting of the Environmental and Natural Resource Law Section, Arizona State Bar Association, Phoenix, Arizona.

2003, Keynote Speaker, Annual Meeting of the Environmental and Natural Resource Law Section, Arizona State Bar Association, Phoenix, Arizona.

2003-present, Arizona Historical Convention Board of Directors.

2003, Plenary Speaker at the Annual Arizona Hydrological Society Convention, Mesa, Arizona.

2002, Keynote Speaker and Presenter, Biltmore International Water Conference, sponsored by the Arizona Philosophical Society and Salt River Project, Phoenix, Arizona.

2000, Keynote Speaker, Maricopa County Community College Honors Program, "Water and the West in the New Millennium," Phoenix Arizona.

2000, Historical Consultant for Metropolitan Water District of Southern California for Dedication of East Side Reservoir at Diamond Valley Lake, Riverside, California.

1999, Chair of Distinguished Arizonans Panel consisting of U.S. Secretary Bruce Babbitt, Grady Gammage, Arizona Water History Celebration, Tempe, Arizona.

1999, Featured Speaker at Valley Citizens League Luncheon, "Hydropolitics in the American Southwest," Phoenix, Arizona.

1999, Featured Speaker at Library of Congress Affiliate, Arizona Center for the Book, Lake Havasu and Prescott, Arizona.

1999, Keynote Speaker for Annual Legal Counsel Meeting for the Metropolitan Water District of Southern California, Los Angeles, California.

1999, Keynote Speaker for Phi Theta Kappa Awards hosted by Northern Arizona University, Bullhead City Campus, Bullhead City, Arizona.

1993-present, contributing author to *Arizona Highways*.

1990-present, editorial referee/reader for several scholarly presses, including University of Arizona Press, University Press of Kansas and *Journal of Arizona History*, *Western Historical Quarterly*, *New Mexico Historical Review*, *Pacific Historical Review*, among others.

1989, Evaluator of Senator Ernest McFarland editing project, Florence, Arizona.

1983-present, Commentator and Speaker at various scholarly and historical conferences.

Professional References

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Other references available upon request.