

Chapter 3

THE PATAGONIA AREA MINING DISTRICTS, Santa Cruz County, Arizona, 1539-1930

© 1998 Robert Lenon

The Patagonia Mining Districts, for purposes of this article are defined as the area lying within 20 miles of the Town of Patagonia and within what is now Santa Cruz County, Arizona. Local custom and usage has divided this region into eight mining districts: The Santa Rita Mountains and its foothills are included within the Greaterville, Tyndall, Aztec and Wrightson Mining Districts, and then, beginning with the Nogales District encompassing the area around Mt. Benedict northeast of Nogales, Arizona, and proceeding east, one then finds the Patagonia, Harshaw and Red Rock Mining Districts. All but the Nogales District have been formally organized (mostly during the 1870s) following the procedures permitted under the federal mining laws.

The Town of Patagonia lies barely inside the northerly limits of the Harshaw District, some seven miles from the mining district from which the town took its name. The mine actually called the "Patagonia" has also borne the name "Mowry Silver Mine" since the late 1850s and was probably called the "Plomosa" (for plomo, "lead" in Spanish) in missionary times. The mine was known as the "Patagonia" as early as 1854 and gave the name to the Patagonia Mountains about the same time. A post office was established at the mine during 1866-67 using "Patagonia" about the time the mining district acquired its name.

Earliest Times: Prior to 1640

Because the Patagonia district is flanked on the west and east by natural north-south "water-level routes," the valleys of the San Miguel, Sonora and Santa Cruz Rivers were the home to many generations of different aboriginal tribes. These peoples would have been the first prospectors and miners of the region to meet the needs for tools and weapons (flint), pottery (clay), dyeing and body paint (ocher), and personal adornment (turquoise, malachite, chrysocolla and jasper). The old-timers reported that portions of the iron-red outcroppings of the Trench Mine, lying about a mile to the northwest of what is now Harshaw, must have been

worked by Indians because of the number of worn-out or broken stone hammers found at the site. Similar evidence exists in the Salero-Alto vicinity in the Tyndall District. The author has also observed an irregular shallow pit in the extreme southeast corner of Pima County, excavating a narrow veinlet of azurite-chrysocolla that appeared to have been explored by primitive means. This inference was strengthened, although not necessarily confirmed, by the presence of a lone flint arrowhead found in a dump alongside the pit.

The earliest European traveler was probably the Franciscan monk, Marcos de Niza, who traversed the San Pedro Valley twice in 1539 and then guided the party of Francisco Vasquez de Coronado northward along the San Pedro, which they called the "Nexpa," in search of the fabled Seven Cities of Cibola in the spring of 1540. During this entrada the first mineral values were noted when small amounts of placer gold were found at a place the members of the expedition were told was called "Suya," probably near the junction of Babocomari Creek with the San Pedro River northeast of present Fairbank, Arizona, and named Santa Cruz de Gaybanipitea.

The Jesuit Period: 1691 to 1767

The so-called Jesuit Period began in 1691 when two missionaries of the Society of Jesus, Juan María de Salvatierra and Eusebio Francisco Kino, while visiting the small mission community of Saric, 35 miles southwest of present-day Nogales, Arizona, were invited by a delegation of Indians from the Tumacacori settlement to establish a mission or visita in their neighborhood. The fathers accepted the invitation and were so pleased with what they saw they decided to formally establish the Tumacacori visita. On their return, Salvatierra and Kino traveled to Dolores Mission (some 60 miles south and east of modern Nogales) by way of San Antonio Pass and a nearby village they called "Santa Maria de Suamca" near the source of a stream which thus became known as the Rio Santa Maria. By custom, streams in northern Sonora bear

the names of the principal settlements nearest their source, and therefore, when this settlement's name was changed to "Santa Cruz," the name of the river flowing northward through Tucson was "automatically" also changed to "Santa Cruz."

Father Kino's interests, unfortunately for mining historians, did not include mineral development and therefore his diaries are limited to brief mentions of rumors of a quicksilver (mercury) deposit said to lie some "five days west" of the Casa Grande ruins and a silver deposit that had been found "several days travel" west of San Xavier del Bac. Other Jesuits following Kino seemed more interested in minerals. Fr. Joseph Och, at the village of San José de Imuris wrote of mines and smelting in the 1750s and of a deposit of native copper "a day and a half journey toward the northwest from my Mission of San Ignacio [de Caborica]." This would probably place the site near Cobre (Copper) Ridge, adjacent to present-day Ruby, Arizona. Fr. Ignaz Pfefferkorn, of San Francisco de Atí, wrote of 11 active gold and silver mines during his service there. This would have included only two mines within the Patagonia District, at Buena Vista and San Antonio, both located only a few miles to the north of the present international border and 10 and 14 miles, respectively, to the east of Nogales. Fr. Juan Nentvig, at Guasavas in 1762, found time to write of dozens of mines and ranches in Northern Sonora, the majority of which were abandoned at the time because of incursions of the Seri and Apache Indians. In fact, the main attention at the time was to the south of the district, in and around Arizona, where a purported native silver deposit called the *planchas de plata* was discovered in 1736 and resulted in a minor rush of the miners into the area.¹

The prospecting activities during the time were doubtless given a boost during this time by the establishment of military presidios a day or two's ride apart roughly following the present Arizona-Sonora border. This protection, modest as it was, did not offer much help for those to the north of the present international border in Santa Cruz County, Arizona. These garrisons included Fronteras (1701), Terrenate (1741), Tubac (1752), and Altar (1752).

The Franciscan Period: 1768 to 1820

The expulsion of the Jesuit Order by the King of Spain in 1767 created a spiritual vacuum in the Patagonia Districts for more than a year until their Franciscan replacements began to arrive to take over.

The troops at Tubac, like those in all of the presidios, were woefully underpaid and were also poorly armed and mounted. They were therefore unable to respond to the guerrilla warfare being waged by the Apache. Only the communities of Tucson (the troops at Tubac had been transferred there in 1777), Tumacacori and Guevavi were relatively safe although livestock was frequently stampeded away and fields burned in raids. The small farming and mining community of Aribac (Arivaca) seemed to have been far enough off the raiding trails of the time and the value of the silver ores at its Longorena mine high enough to justify the risk to life and limb to engage in mining efforts during periods of apparent calm.

Very little has been reported on activities in the district during this time although a somewhat suspect account was published in the (Yuma) Arizona Sentinel on April 13, 1878, purporting to be a translation of a petition written by Francisco Castro and Antonio Romero to Don Manuel Baragua (the reporter misread this as "Barragan") dated November 21, 1777, requesting the restoration of fortifications at Tubac. This letter reported the presence of many mines at Aribac that yielded sopotable (tolerable) grades of silver and that a fine gold placer in the Bavoquivari Valley existed. Silver mines in the Santa Ritas were also noted, but that they couldn't be worked because of the Apaches at Agua Caliente (which site still bears this name today).

The land in the vicinity of Agua Caliente was known to be well mineralized and several independent sources dating from the 1770s report a silver deposit that picked up the name of "Salero" sometime in the 1830s, when the area was under Mexican colonial occupation.

In 1781, Teodoro de Croix (1730-1791), the commander of the presidio at Fronteras, reported on the conditions in the area and suggested the creation of a new presidio at "la Estancia de Buenavista." This was to be a mile or two south of the present international border, about seven miles east of Nogales "on a large mesa, along the base of which flows the Rio de Santa Maria." He noted that "four [leagues] to the northwest is the Sierra de la Chihuahuilla, second in riches and known minerals," and also mentions the "pass of la Plomosa." "Chihuahuilla" would likely be Mount Benedict and Plomosa, as noted previously, would be the Mowry Mine.

The real colonialization of the Patagonia Districts began in the later stages of the Spanish colonial era

with the issuance of land grants by the Spanish crown. The first grants of the district included the Nogales de Elias Grant, initiated in 1741, which extended into the United States for three miles;² the San Jose de Sonoita Grant, initiated in 1754, some nine miles long and a mile wide along the Sonoita Creek, and the Otero Grants at Tubac initiated in 1789. From the 1790s to 1821, these grants provided the basis for large haciendas and commerce expanded with trains of ox-carts or pack animals. Prospectors also began to peck at many of the known deposits of valuable metals and it is apparent to the author that during this and prior periods virtually all the "diggings" in the Patagonia Districts that were re-discovered during the American mining period had been identified by Spanish and Mexican exploration.

The Mexican Period: 1821 to 1853

With the change of government after the Spanish dominion was removed, the new Mexican Republic continued the efforts to colonize the district. The first grant was San Rafael de la Zanja Grant in 1821, at four leagues square (a corrected second description of four square leagues provided some early fodder for lawyers), and became the center of Col. William Greene's later extensive ranching and mining enterprises on both sides of the border. This was followed by the San Ignacio de Babocomari Grant, taken up by the still-prominent Elias family in 1827, reaching from the San Pedro River to the present town of Sonoita and is today still virtually under a single ownership; the Arivaca Grant, taken up by the Ortiz family in 1835,³ that formed the basis of the land development efforts of Charles D. Poston, the "father of Arizona," in the first years after the Gadsden Purchase; the Maria Santissima del Carmen ("Buena Vista") Grant, originally claimed by the Tuveras family in 1826, that extends into Arizona for about four miles on both sides of the Santa Cruz River; and the grant to Luis María Baca that became known as the Baca Float No. 3 and figured prominently in the subsequent mineral development of the area.

Originally, these grants had little real value because of their remoteness from civilization and the weakness of the Spanish presidio system. The owners and their families, servants and slaves were forced to build up what strongholds they could around their living quarters, and defend themselves as best they might. Most lived by giving the neighboring groups of Indians a portion of the harvest, provid-

ing less-desirable cuts of meat when butchering and "overlooking" the killing of occasional livestock. The Spanish presidio system had finally taken hold in the late 1790s and groups of Indians who were not at peace with the settlers were targeted for military action; once peace was sued for, these groups were relocated to settlements near the established presidios and given obsolete firearms for subsistence hunting. These settlements were called *establecimientos de paz* and were effective until after Mexico won its independence from Spain in 1821. The new government was sorely short of capital and when funds to maintain these programs ran out, the battle between the Indians and the "colonists" began anew.

The "Gadsden Period": 1854 to 1861

The mining activity in the Patagonia Districts during the first few years following the purchase of "Arizona" through the Gadsden Purchase were limited to exploration of the deposits of the Salero-Alto area from the headquarters of Charles Debrille Poston's Sonora Exploring and Mining Company in Tubac and to the south of Patagonia near the San Antonio and what would become Duquesne.

Poston, a native of Hardin County (near Elizabethtown), Kentucky, then 29 years old, first visited the area in 1854 with Herman Ehrenberg, attracted by the story of the *planchas de plata*, which, more than 100 years after its "discovery" had become legend. Poston saw other opportunities however, and returned in 1856 with Ehrenberg, a German surveyor and veteran of the Texas War of Independence who had made the first map of the area, and money from his so-called "Cincinnati Syndicate," headed up by brothers William and Thomas Wrightson of Cincinnati, Ohio, to establish the Sonora Exploring and Mining Company with headquarters in Tubac to mine the deposits in both the Salero-Alto and Cerro Colorado areas. Poston's principal associates in Tubac, as indicated by the names on the location notices of their mining claims, included Ehrenberg, Frederick Brunckow, Charles Schuchart, Theodore Moohrmann, George W. Fuller, Samuel P. Heinzelman, Edgar Conkling and William Wrightson. This group "relocated" the Salero mine, but soon discovered that the only high-grade ore was in narrow veins, the wider veins held only low grades and by and large the mineralization was impossible to mine or treat at the existing facilities. As a result, the majority of operations were shifted to the Cerro Colorado Mine in the moun-

tains west of Tubac with its headquarters in Arivaca. The principal claim was the "Heintzelman," named after its manager, Maj. Samuel P. Heintzelman, a career military officer who had established Fort Yuma and had commanded the United States forces along the border for four years.

Company president Frederick Brunckow reported in the 1859 report to the shareholders of the Sonora Exploring and Mining Company that although the Salero had been cleared down to the water level at 72 feet, the work in the Santa Ritas would be suspended "in order to concentrate all the works and working force...at the Heintzelman vein." In a March, 1859 report, Heintzelman reported that the Santa Rita property, under the supervision of William Wrightson, was "pushing forward the work with great energy...and we hope will soon be paying expenses." He enumerated many of the difficulties encountered in the operations, so far away from any reliable source of labor or supplies, and noted that "it takes four months to get an invoice from San Francisco" adding that "the freight on the [Colorado] river is \$65 per ton...and 14 cents per pound land carriage [from there to the Cerro Colorado]!"

Early in 1861, Raphael Pumpelly, a 26-year-old mining engineer, and a graduate of the famous school of mines at Freiberg, Germany, arrived from the East to assist Horace Grosvenor, the manager of the Santa Rita "unit," and his skeleton crew to attempt to put the Salero unit on a paying basis. Finding little to work with, Pumpelly reported that he had to revert to using "the simple methods of the ancients" and began by sampling and sorting the ores. He followed by building two furnaces, one for smelting and the other for cupelling (that is, producing pure silver from the lead-silver alloy resulting from the smelting), and laid in a supply of mesquite for charcoal and began "production." Pumpelly's ore was scanty, but of good grade, and he therefore made up 350-pound "charges" for his furnace, mixing his high-grade fahlores (banded copper-silver ores), with those bearing lead in the form of galena, and ironstone and litharge as flux. These charges were then smelted separately, but in Pumpelly's words "we had...not enough ore to meet expenses, for the veins were thin, and our work was mere prospecting."⁴

The final chapter of the Santa Rita "division" of the Sonora Exploring and Mining Company began with a wagonload of ore imported from the Heintzelman "division" as payment of an intra-company debt. As

the two teamsters approached the Salero with the promised wagonload, they were waylaid and massacred by Apaches, virtually within sight of camp as Grosvenor, who had walked out to see why they were delayed, and also lost his life in the attack. With the entire countryside under siege, the Salero crew, under the direction of Pumpelly, picked up the ore and smelted it, working day and night to do so, behind armed guards, and delivered the silver ingots to the company headquarters in Tubac. The general unrest continued and within a few weeks, the entire crew at the Heintzelman Mine (including Poston's brother John) was murdered by Mexican bandits who had come up, in the words of Pumpelly, "for the purpose of inciting the peons...and to rob [the two mines]."⁵ Sensing the seriousness of the situation, Poston, Pumpelly and others, escaped to California through the Sonoran desert.

The other activities during this era were at ex-Lt. Sylvester Mowry's Patagonia Mine. The mine, as noted earlier, had been established some years earlier, and was sold by its Mexican owners to a group of U.S. Army officers from Fort Buchanan who in turn sold it to Mowry in August, 1860. Mowry, from a prominent Rhode Island family, was a West Point graduate (Class of 1852), and had served at several posts in the West before resigning his commission in June, 1858. During Mowry's tenure, lead-silver ore was mined from the lode claim now known as the "Enterprise" and the smelting done along the north bank of Commission Creek, about a mile to the south, where fragments of Mowry's slag can still be found. Mowry's activities were short-lived, however, as on June 8, 1862, he was arrested under orders from Gen. James H. Carleton, the commander of the U.S. Army forces in Arizona, on a charge of treasonable complicity with Southern sympathizers (his lead was likely finding its way into Southern bullets) and his mining property was confiscated. Mowry was held at Fort Yuma for several months before being released without having charges preferred against him. Upon his release, Mowry went to England in the hope of raising money to resume operations.

The Civil War Period: 1862 to 1865

Mowry's arrest marked the beginning of the Civil War period in the Patagonia Districts. The United States military forces that had been providing security for the mines and ranches were withdrawn. The result was that the Apache controlled all areas out-

side of a few fortified villages, and mining activities slowed considerably. This is not to say, however, that no mining was going on, as the northern Sonoran *gambusino* miners who had been the last to leave the mines could have, and doubtless did, make it a point to conduct their own mining at the sites temporarily abandoned by their owners. There are no written records of these activities, but it is likely that these efforts were not those of individual miners, as it would have been imperative for any of these miners to stay together for security. The properties that would have been prime for this type of raiding were the Arivaca-Longareña area, the Sopori and Heintzelman mines at Cerro Colorado, the San Antonio, a half mile to the West of the present town of Duquesne and only a couple miles from the international border and the Mowry, where it is known that the pillars left in the mine to hold the large stopes open were robbed and the wall-rock collapsed during this time.

The Post-Civil War Years: 1865 to 1880

Mining activities in all of Southern Arizona got off to a slow start after the Civil War and when the army returned to the area. The troops had never fully abandoned Southern Arizona as there had been some occupation of Tucson and Fort Bowie during the war years and Fort Yuma was continuously occupied. Even so, there was never enough security present to make it prudent for miners or prospectors to venture very far away from any of the few small settlements of the area.

In 1862, a contingent of troops had been sent from Tubac to establish Fort Mason near the junction of Sonoita Creek and the Santa Cruz River (dubbed "Camp McGee" in 1866) and abandoned in October, 1866. Camp Wallen, east of present-day Sonoita, was occupied from 1866 to 1869, and elements of the 1st Cavalry occupied Camp Crittenden in August, 1867. This post, built virtually on the site of Fort Buchanan (1856-1861) and occupied by units of the 1st Cavalry and the 32nd Infantry until June, 1873, and whose patrols were active from Tubac to Camp Wallen, and to Fort Lowell, gave a good deal more security to this district than it had ever known before. This area was well served by a throughway from the Salero to the settlement on the Sonoita Creek now referred to as "Old Sonoita." This hilly trail over high ground that ran directly from Toltec to Fort Buchanan and Camp Crittenden can still be seen and would have avoided the dangerous heavy brush along the Sonoita Creek and

saved several miles.

In these post-war years, the presence of the troops furnished most of the hard cash available to the few locals hardy enough to try to survive in the newly-formed Territory of Arizona. Virtually all of the balance of the "new money" brought in was by the federal and territorial payrolls, and by the activities of the several stage-lines running from Fort Yuma to El Paso and from Tucson south into Mexico. The lack of capital was exemplified by the bare shadows of a financial system where "greenbacks" had only half the purchasing-power enjoyed by gold and silver in the form of "hard coin." This situation, combined with the cost of transportation made futile consideration of mining any but the noble metals within the limits of Arizona Territory. The fact that this basic tenet of economics was recognized is illustrated by the Mexican proverb: "In order to work a copper mine, it is first necessary to own a silver mine."

The real solution to the problem lay in the creation of a system of transportation. By the end of the Civil War, there was a partial solution in the form of the steamboat service on the Rio Colorado, and considerable credit must be given to such pioneer overland freighters as Pedro Aguirre and the firm of (Pinckney R.) Tully and (Esteban) Ochoa, whose heavy wagons by then traversed all the principal routes in use from the late 1860s until the early 1870s. With an end to the Civil War, however, the glimmer on the horizon was the realization that long-awaited transcontinental railways were under construction. Two versions of a route approximately following the 32nd parallel were surveyed during the 1850s, one along the alignment later used by the Southern Pacific (El Paso-Tucson-Yuma) and the other by the El Paso & Southwestern (El Paso-Douglas-Tucson) and the Atchison Topeka & Santa Fe (Benson-Fairbank-Patagonia-Nogales) making the first rail connection between the United States and Mexico.

The post-Civil War period served as a time bridge between what was seen as a primitive era to what was believed to be a utopian period that would arrive the very moment the railway connected Southern Arizona to the outside world. This also began the time when prospectors and miners began to fan out southerly from Tucson to look carefully at the mineralized area to be known as the Patagonia Districts. The dearth of surviving records prevents giving proper credit for the accomplishments of these pioneers, but in considering the names of the lode claims of the Tyndall, Aztec, and

Santa Rita Mountain Districts, along with the names of their operators, one notes a preponderance of names from the British Isles — surnames such as Blake, Hamilton, Gladstone, and MacDonald together with claim names of Abercorn, Broghill, Robley, Sedgwick, Gibbons, Gedge, Allen, Bell, and Almoner, to name only a few. This may also be in part because of the operation and financing of many of these claims by Englishmen, and not the local population that included a predominance of Hispanic names.

The principal operators during this time included those financed from “outside” sources such as Poston’s “Cincinnati Syndicate,” and the “English Company,” represented by John E. Magee, and those locally financed partnerships that included Tom Roddick as the principal partner. Roddick was well known and liked throughout Southern Arizona during this period and ran his operations from alongside the then perennial stream flowing from Josephine Canyon three miles north of the Salero, just south of the vein covered by the still surviving Josephine and Emma claims. Roddick was a good practical miner and probably reasonably well financed by “grubstakers” according to the custom of the times. In 1877, some of the more predominant people noted in popular publications included Wm. G. Boyle, the managing engineer of the Aztec and Tyndall operations; John D. Graham, John E. Magee, and “professor” Thomas Davis, all officials of the Aztec syndicate, plus Charles Brown and a Captain Smith, whose affiliations are unknown.

At the same time operations were progressing in the Salero-Tyndall-Aztec vicinity, and the lode at the Trench⁶ mine, with a width of from four to ten feet was reported to have been traced over a length of over 20,000 feet.⁷ The operators, Archibald, Gardner, and Hopkins, of Tucson, stated that their ore was “low-grade argentiferous galena, easily mined and smelted, worth from \$30 to \$100 per ton.” They described the mine as “one of the few prominent mines in the Territory having an east-west trend” and that in 1877, 50 men were in the employ of the company with four smelting furnaces in successful operation with ores from two shafts of 40 and 120 feet deep and two adits 200 and 300 feet long.

As for Mowry’s claims, after his death in London in 1871, his heirs abandoned the ground and it was relocated on January 1, 1875, by Fish & Bennett and soon thereafter it was approved for patent to E.N. Fish and others. Like the Trench, the lode has an east-west trend and a full claim was added on each

end of the original “Enterprise” claim, giving the patented ground a length of 4,500 feet along the vein.⁸ In 1877 it was developed by several shafts, up to some 260 feet in depth, as well as numerous tunnels and drifts. Its ores were stated to be of two classes, one containing 30% to 60% in lead, with the argentiferous ores carrying from \$60 to \$400 per ton in silver, and the other carbonate ores of a value of between \$30 to \$60 per ton in silver. It was reported that “[m]uch of the ore is found in great pockets or caves (up to) 60 feet across, all filled with mineral.”⁹ The other activity in this same area included some claims in the Washington Camp, especially the Belmont, and during the period 1873-74, nine mineral surveys were made as a preliminary to mineral patent. Seven of these surveys were made by Theodore F. White and two by Sidney R. Delong.

Meanwhile, to the north and east of the Salero, placer gold was discovered in the Greaterville area in 1874 by A. Smith, and a minor rush began. Within a few years, almost 400 Mexicans and 100 Americans had settled in the area.

The “hard rock” operations of this period appear to have been running in much the same pattern (at least in the case of the Aztec and English syndicates) and they did continue for a considerable period. It is not known why they eventually “blew up” but had they been able to hang on until the early 1880s (by which time the railroads would have reached the area) it seems fairly likely their organizations would have survived for a long period of time. From what we hear of their individual deposits, many were of very good grade but were not continuous along the formation, or would vary greatly as to width when pursued to any considerable depth.

These later syndicates had good “talent” in their employ, and they all controlled enough ground that would allow them to be flexible in their operations. With the cheaper transportation afforded by the coming of the rails, they could have realized the bulk of their profit from the sale of their base metals, relying on the returns from their gold and silver to pay their operating costs. The sad part is that, by the time the “steam train” chugged up and down the valleys of the Sonoita and the Santa Cruz, the majority of the good mineral ground was in such diverse ownership that it was not possible to develop and operate the prospects in proper style.

The Early Railroad Years: 1880 to 1893

The district received a boost to its economy when the New Mexico and Arizona Railroad (a Santa Fe subsidiary) completed a link between the Mexican seaport at Guaymas to Nogales in 1882 and served the mining district from "Crittenden" siding (not to be confused with the old Camp Crittenden several miles to the northeast), some two miles northeast of the railroad siding of "Rollin" that had been constructed nearest the direct route to the Patagonia (Mowry) Mine. In fact, the arrival of the railroads didn't solve the miners' problems. It was true that there was an obvious reduction in the cost per ton-mile for incoming supplies and outgoing mine products with a resulting enormous increase in values of base metals, but the marketing of these metals also brought into play a major dependence on price stability. Prices were set in the highly suspect markets "back East," and could never be relied upon long enough for a prudent miner to put a property into production with any assurance that prices would hold. Miners soon realized that prices of lead, copper and zinc ran in cycles and bonanza prices never lasted for long. This fluctuation had been virtually unknown to the Western miners of the period who had previously been mining only precious metals whose prices had virtually been guaranteed almost from the very beginnings of the Republic. Gold, after all, had always been \$20.67 and silver at least \$1.00 per troy ounce. Not so with other metals whose markets depended on supply and demand.

We know now, based on experience between 1880 and 1940, that prices for copper, lead and zinc have run in loose cycles of from five to nine years. The silver miners of Arizona weren't particularly worried because the United States Mint provided an ever-present buyer, and an unusually large number of small smelters (most no larger than forges) sprang up in scattered communities alongside the railroad rights-of-way. First came "custom smelters" (that is, they were not set up to treat the ores from any one firm or mining property, but to buy and process ores and concentrates from any and all comers). These custom smelters were either "lead stacks" or "copper stacks" depending on the class of ore they were designed to smelt.

During this time, custom lead smelters were operating at Nogales during 1880-93, Crittenden during 1888-91 and at Rollin during brief periods between 1896-99. There was also a lead stack at Benson that

operated between 1882 and 1885 that no doubt afforded a good market for local ores.

The miners faced a difficult market during this period as prices for both silver and copper had been slipping since the early 1870s, and by 1885 silver broke (barely) through the price of \$1.00 per Troy ounce, copper to about eleven cents and lead to four cents per pound. Silver had long been tied to the price of gold at a ratio of 16:1, selling for \$1.29 per ounce, but when the United States Government stopped minting silver dollars in 1873, things began to look unsettled with copper trailing in a long, slow decline. The Bland-Allison Act remonetized silver in 1878 and proved to be a help, and many claims were filed in the late 1870s in response. The major political effort of the time was a push for "free silver," that is, to allow unlimited coinage of silver (and an unlimited buyer for silver production). When this effort failed, the substituted compromise was the Sherman Silver Purchase Act of 1890 that doubled the amount of silver the government was required to purchase. The repeal of this same act in 1893 resulted in the price of silver dipping to 64 cents per ounce, copper to eight cents per pound and lead to three cents per pound. Some hope remained for the district in gold production, but the only instance in the entire area of what could be thought of as a gold mine was in a series of narrow veins on the southeastern slopes of Mount Benedict and the Greaterville placers had largely fizzled out in the 1880s.

The mining fortunes in the Patagonia Districts during this era were preoccupied with the practical and legal problems associated with a Mexican land grant that covered one of the more important mining areas of the Patagonia Districts. This "problem" began in 1821, when Lu s Mar a Baca, a direct descendant of Alvar Nu ez Cabeza de Vaca, the famous original explorer/vagabond of the southwest was granted approximately 500,000 acres of land in and around Las Vegas, New Mexico. Unfortunately, when technical difficulties (the alcalde seems to have been opposed to the grant and held up the paperwork for a considerable time), troubles with the local Indians and a series of accidents prevented the Baca family from occupying their grant, the Mexican authorities in Santa Fe (now under the Territory of New Mexico of the Mexican Republic as opposed to the old Estado del Norte) granted the same land as a community land grant to other claimants representing 25 families who proceeded to develop the land and establish the town of Las Vegas. Under the Treaty of Guadalupe

Hidalgo and the Gadsden Purchase (known in Mexico as the Treaty of Mesilla), the United States Government agreed to recognize all valid land grants made by the Spanish and Mexican authorities. The Baca heirs hired a good lawyer and, after an evaluation, the United States authorities found both grants to be valid and the titles in the area where thrown into question. The Bacas, then consisting of 17 hijos (doubtless meaning the existing male and female off-spring), probably recognizing the political reality of the problems that would be created by displacing the residents of Las Vegas, offered a compromise and agreed to take substitute lands in lieu of their original grant. Thus, the United States Congress, in 1860, authorized the selection of five separate parcels of 100,000 acres each of non-mineral lands from the public lands acquired from Mexico under the treaties with Mexico. These selections eventually included two parcels in each New Mexico and Arizona and one in southern Colorado.

The third tract chosen was near Tubac and thus the name, the Baca Float No. 3 land grant (the "float" terminology was based on the fact that the boundaries of the grants were not initially fixed, although the number three "floated" a lot more than the others). The selection was tied to Salero Hill, and the position of the northeast corner of the grant was described as lying 2.5 miles northeast of this hill. This "tie" was readily recognized and accessible on the ground by anyone who was familiar with the area, but somehow (probably as a result of faulty maps of the time rather than intentional "fudging") was plotted¹⁰ with its northeast corner falling very near the center of Greaterville. When the extent of this error, about 11 miles, was discovered, it became apparent the grant would include much of the land adjacent to the Salero Mine, putting it into private ownership and effectively ejecting many homesteaders along the Santa Cruz River as well as those who had done so much to develop what they had thought were their own mineral rights.

A major problem with the selection was that the law required the land to be "non-mineral" in character. When the government survey was ongoing in 1903, it noted the existence of the Salero and other mines and known mineral deposits at the time in the northeast corner of the prospective grant therefore called the suitability of the selected land into considerable question. The owners of mineral claims within the prescribed boundaries obviously felt that they had a clear basis for their rights and an attempted solution was to survey the area around the Salero to be able

to exclude the mineral rights from the grant being processed for approval. This exclusion, a rectangle some three and one-half miles by four miles in the northeast corner of the grant, was dubbed the "Mineral Segregation" to theoretically preserve the rights of the mineral claimants under the federal mining law. Thus, no one ever thought to question the titles to the nine lode claims and three millsites that were taken to patent within the limits of the "to be" Mineral Segregation between 1881 and 1894. There were also 13 lode claims that had also been extensively worked and surveyed for patent. All of these claims were staked, bought, sold, leased and worked for well over 30 years with scarcely a thought but that their ownership was solid.

The end of the seemingly endless litigation came when the federal courts finally ruled in 1914 that title had vested on April 9, 1864, the date of the acceptance of the "No. 3" selection, and that any mineral (or homestead) titles acquired after that date were invalid, including those within the Mineral Segregation. The courts ruled that although the land selected by the Baca heirs was required to be "non-mineral in character," the determination of this mineral character had to be as of the date of the initial selection. Unfortunately, on the crucial date virtually no mining was ongoing in the area despite the fact that the Salero had been a known mineral deposit and mine since the 1770s.¹¹

Outside of the immediate boundaries of the Mineral Segregation, entrepreneurs in the area were generally "grubstakers" who would provide capital for practical prospectors in return for a half interest in any claims staked. These "capitalists" were Mark Lulley, Dr. J.C. Handy, A.P.K. Safford, Dana Harmon, Edward N. Fish, L.M. Jacobs, William P. Blake, and Howard Allen.

Also during this time several of the "ancient" mines were cleaned out and worked. George Clark and Jens Peterson held the Salero from the early 1870s until they sold it in 1900, and also worked the Eureka lode (known as the "Old Mexican Mine") at the turn of the century, as well as the Trenton for a ten-year period beginning in about 1901. Clark and Peterson also held a lease on the Montezuma in 1900 and shipped a 30-ton carload of ore to the smelter with values in copper- and silver-glance (chalcocite and argentite) assaying 125 ounces of silver per ton.¹²

Among the other mines in the area of the Mineral Segregation, the strong series of east-west veins known as El Plomo in Mexican times became

known as the Alto group and could well have been the original Salero of legend. These claims lie astride the northerly boundary of the Baca Float No. 3. The present-day Salero vein (the name was transferred to the present location in the early 1900s) is high in quartz and shows only copper values. The claims near the "original" Salero worked during this era included the Wandering Jew and Joplin groups immediately north of the Alto, and the Silver Sally, lying further to the north.¹³ Among the group of claims lying to the east of the Salero-Alto, the Jefferson vein appears to be the strongest and the remnants of the dump of a deep shaft lies where the vein crosses Trenton Gulch. These workings are reported to be more than 200 feet deep but have not been worked since a flash flood over the 4th of July weekend of 1900 wrecked the shaft and workings.

Away from the Mineral Segregation, the hub of activities for the silver "boomlet" of the time was the place known to this day as Durazno (Peach) by the Mexicans and "Harshaw" by the gringos. David Tecumseh Harshaw and his brother-in-law, Jose Andrada, discovered the Hardshell lode a half mile southwest of Durazno in 1879 and sold it to Rollin Rice Richardson in 1880. When operations began, the name "Harshaw" was bestowed and a United States post office was maintained there from that time until March, 1903, to serve a population that was said to have been well over 1,000. Richardson, the owner of the Pennsylvania Ranch on Sonoita Creek, was from Franklin, Pennsylvania, and became a long-time resident and booster of the area from the late 1870s until his death in 1923. He did a great deal of the shallow work on the Hardshell without much success until allowing the claim to lapse in 1890.

In 1873, the Trench mine became the 28th claim patented in Arizona Territory, and has included among its owners A.P.K. Safford, John W. Hopkins, Dr. J.C. Handy, Thomas Gardner, and R.N. Leatherwood. The Flux mine, two and one-half miles to the northwest of the Trench, was originally known as the "Goshen" lode and was mined for its lead-silver ores which were packed by burro the two miles northwest to the junction of Alum Gulch and Sonoita Creek where they were smelted in adobe furnaces. Some 1,000 tons of this material was reportedly shipped to the Benson smelter in 1882 alone. The Hermosa vein was the true pride of the Harshaw camp, and was situated three-quarters of a mile south of Harshaw. It was discovered in 1877 and its two principal claims, the Hermosa and

Bluff, were patented in 1885 by the Hermosa Mining Company, the predecessor of the Prietas Mining Company, which was prominent in Northern Sonora for many years. As a result of the ores available from these properties, a 20-stamp mill was erected near Harshaw and produced well over \$1 Million in silver by amalgamation during 1880-82.

During this time the inexperience of Sam Hughes as a U.S. Mineral Surveyor shows itself at the Mowry Mine. Hughes, according to his field-notes, arrived at Mowry in February, 1876, and made an observation on the star Polaris for true north as well as setting the magnetic declination (the deviation of the compass needle from true north) in his transit's built-in compass. Hughes then proceeded to run out the full exterior of the Mowry claim, then known as the "Enterprise." Unfortunately for Hughes, he had set his declination 12¾ degrees west of north, instead of 12¾ degrees east of north. The entire block would have been depicted in the public land records rotated 27½ degrees from its true position. Fortunately, the legal maxim that the actual monuments on the ground (in this case loose rubble stones) would govern the situation, saved the day and a subsequent surveyor took considerable pleasure in bringing the matter to Hughes' attention. The author notes, also, that he is not aware of any other mineral surveys performed by Hughes in the district.

The Railroad Steam Era: 1893 to 1910

Things weren't the same in the silver producing districts after the demonetization of the metal. The resulting "bust" forced the miners of the Patagonia District to depend less on silver and more on base metals for the bulk of their production. The timely arrival of the New Mexico and Arizona Railroad dramatically cut the cost of transportation and formerly marginal mines could now turn a profit. During this 17-year period, copper, lead and zinc enjoyed gradual price rises and with it also rose the fortunes of lead production from the Hardshell, Trench, Mowry and Flux mines. As for the overall operation of mines, this "age of steam" also provided steam-power for operating hoists and some even powered electric lights. The smaller operations most frequently still drilled and mucked wholly by hand and trammed the loaded ore and waste by either iron-tired wheelbarrow or in one-ton hand-dump cars running on narrow-gauge rail in the main adits and drifts. A notable exception to hand tram-

ming was through the use of draft-animals, almost without exception mules underground and horses on the surface. Some rock-drills operated by compressed air began to appear by the turn of the century, but did not play an important role in the hinterlands of southern Arizona until some time later.

At the Mowry Mine, according to an 1899 Report from the territorial governor to the Secretary of Interior, 12 Mexican blast furnaces had been erected, six of them being in blast alternately. The production of lead, in bars weighing about 70 lbs. each, was shipped to England, but high-grade silver ore was refined in Mexican vases to meet current expenses.

Metal prices slipped a good deal in 1901-03 and again during the financial panic in 1907-08. During these times, miners with some knowledge of local conditions could be expected to head to the districts where they could find scanty deposits of placer gold where a man who knew what he was doing could depend on earning \$1.00 a day. The mines that were seriously worked during this time included the Tia Juana, Salero, Montezuma, Three R, and the Four Metals.

The Tia Juana and the "modern" Salero were both strong quartz veins 10-20 feet wide that cropped out over considerable length on the surface. Each could be traced for a mile or two, and their titles were both clouded by the Baca family's land grant claim, but that didn't stop their owners from running some 800 feet of adits. The Montezuma also lay within the final location of the grant, and its vein, although not as "quartz" as the former two, contained remarkably high grade gold and silver stringers. During this time it had several shafts sunk to depths up to about 100 feet and was reputed to have been diamond-drilled to 300 feet.

The Three R, lying at the northwest corner of the Patagonia Mountains, about five miles southwest of the town of Patagonia, was put together as one unit by consolidating a group of individually owned properties in about 1899. The mine was named after one of its principal owners, Rollin R. Richardson, whose initials have now survived for almost a century. The deposit was mainly sulfide copper in the form of chalcocite in near-vertical shear zones. The veins were first prospected by hand-driven adits and the broken material cobbled and sorted by hand and packed to the foot of the mountain by burro. From there it was hauled by wagon to the "Bloxtan" siding on the railroad, a distance of about three miles. Some ores ran as high as 20% copper and thus

attracted more capital than most of the mines in the district. The Three R was to remain a good producer for many years and was the only copper property of consequence in all of Santa Cruz County not dependent on silver values to make it profitable.

The Salero was worked rather extensively in the early 1900s by experienced mining men, including famed geologist William P. Blake. Its development included some half-mile of workings and one of its two shafts reached a depth of 400 feet. It had a history of good silver values, but probably lower in copper than some of its neighbors.

The Four Metals Mine was another well-known copper producer. It is situated several miles west of the Mowry on the west side of the Patagonia mountains, and although its name implies that it had gold, silver, lead and copper values, only copper appears to have attracted much attention. The property was developed in the early 1900s by a series of inter-connecting adits clear through the mountain, totaling more than 3,000 lineal feet.

Within the Washington Camp and Duquesne (named by its Pennsylvania-based owner in honor of Fort Duquesne near Pittsburgh) area, in the southerly end of the Patagonia range, the Belmont (a 3,000-foot long claim located under the 1866 mining law), Empire, and San Antonio claims, along with a number of other claims located in the 1870s went to patent. It became apparent that it was not practical to try to operate all of these claims separately, and they were consolidated under a single management in 1905 when the Duquesne Mining and Reduction Company was incorporated with George Westinghouse (of railroad air-brake fame) as president. The company put together a group of 84 patented lode claims, sank the Bonanza shaft to a depth of 650 feet, built an aerial tramway from the Pride of the West shaft to a mill and smelter at Washington Camp, and otherwise had the capital, equipment and organization to run a "proper" mining company.

The ores produced by the various mines of the Duquesne Mining and Reduction Company were quite diverse, but their overall character was refractory, largely because zinc values were increasing at depth. Extensive tests began in 1899 by Arthur Wilfley, the inventor of the Wilfley concentrating table, trying with only moderate success to remove the zinc minerals without interfering with recovery of the lead and copper values. In the meantime, the national slump of 1907-08 halted the testing and the mines shut down until 1910. The Wilfley table

turned out to be a very valuable piece of equipment in separating minerals having different specific gravities, but the problem of separating sulphide minerals of different classes wasn't satisfactorily solved until the advent of differential flotation in the mid-1920s.

The traditional silver producers, the Mowry, Trench, Flux and Hardshell mines did reasonably well during this time, and by 1910, the Mowry had made a survey for the construction of a standard-gauge railroad up Harshaw Creek from Patagonia and had built a lead smelter and dry concentrator at the mine. Unfortunately, the mill burned down after only a few months' operation and the railroad was never built. During 1909-10, a large body of excellent lead ore was blocked out and efficiently mined by square-setting prior to block-caving. The ore was a soft, clay-like lead carbonate ore in a near vertical chimney some 65 by 180 feet in cross section. It was undercut by a series of square-sets allowing 80% of the ore to be extracted without powder or back-filling and without working the miners under an unsupported back.

Finally, the World's Fair mine is worthy of mention. Just before the big silver slump in the early 1890s, Frank Powers, a local blacksmith, bought the mine for \$100. Powers, although illiterate, had a "nose for ore" and unlocked the secret of the complex system of cross faults and was reputed to have blocked out \$600,000 worth of ore by 1903. Although the ore was ready to ship, Powers only processed the ore when he needed the money. Recorded production for 1907 totaled \$74,210 and \$42,730 in 1910. Local legend has it that Powers regarded the mine solely as his "bank" and made it a practice to extract and ship a "little stake" on occasion and then embark on a long trip on the proceeds. Powers and his wife, Josephine, are said to have made at least one trip around the world on the mine profits, and both lived to a ripe old age.

As the steam period drew to a close, the larger, better-financed, properties in the Patagonia district (such as the Three R and the Mowry) acquired compressors, machine-drills and power plants that provided electric lighting around the head works and the shaft stations. The foremen and shift bosses by now carried the carbide or acetylene lamps, but the ordinary miner still got along with his hand-held candle.

The Internal Combustion Period: 1911 to 1930

Things were beginning to look up at the beginning of 1911 after the short, sharp break in the economy of the first decade of the 20th Century. The smaller operations were largely south of Sonoita Creek, and were predominantly privately financed during this period by Rollin Richardson and Albert Steinfeld.

As for the action in the vicinity of the Baca Float No. 3, much of the ground was being worked by "locals," either locally financed or through the formation of stock companies with capital furnished by outsiders. Many of the older operators were still around, particularly partners George Clark and Jens Peterson, Albert Steinfeld and Mark Lulley, Josiah Bond, Mike Hogan, Herb McCutchan, and the Sheehy father and son team. With the settlement of the rights within the Baca Float, patent was denied for the portion of the Alto falling inside the Grant. In the 1920s, litigation occurred concerning this overlap of rights which was decided in favor of the Alto Mines Co. in 1928.

The principal operation involved combining the Alto and Wandering Jew groups by Steinfeld and Lulley (who called himself "the Wandering Jew"). These two tied the Alto to the Wandering Jew using a jig-back tramway. This tramway, powered partly by gravity but assisted with an internal-combustion engine, consisted of a steep mine track laid up the ridge from the camp to the portal of the principal adit, a distance of some 1,500 feet.

As for the area south of Patagonia, by 1912, the Alto Copper Company was working the Mowry Mine with 100 employees. They were well equipped with three steam-powered hoists good for 600 feet in depth, an eight-drill compressor, a 20-by 40-foot machine-shop and auxiliary buildings to augment a 100-ton concentrator and smelter. The smelter appears to have been a success as the author's experience in sampling the slag dump found metal values insufficient to be of interest. Even so, after litigation in 1917 the Mowry reverted to its former owners, the Mowry Mining Company, and in 1927, rumors were that the property was to be acquired by the National Lead Company, to no avail. By 1931 there were four shafts to the 400-foot level, plus a 200-foot winze from the 300-foot level to the 500-foot level and some 12,000 linear feet of workings. It was reported that some work had been done in the late 1920s, and the property was in the care of a watchman in 1928.

The World's Fair Mine continued to provide for Frank and Josephine Powers. A 1931 report noted another \$1 Million of production from the mine recorded since 1915, and that there was an adit 1,350 feet long with "backs" of 600 feet and a total of 15,000 feet of workings. Things couldn't have been as rosy as the Powers' were letting on¹⁴ as the mine was put into temporary receivership in June, 1926. It was optioned in February, 1927, but was reopened in 1928 and the contract set aside by the federal court in 1929. The opening included the neighboring Trench Mine, and the ores were milled in a floatation concentrator at the portal at the main adit of the World's Fair Mine employing 20 men in the combined operation.

Probably the most productive mine during this pre-depression era was the Three R Mine. In April, 1912, it was sold under an installment contract to N.L. Amster of Boston for \$500,000, payable \$20,000 down and the balance in three semi-annual installment payments. By the first of October, Amster's shipments had totaled 65 carloads of ore that were netting him \$1,000 each, and he was well on his way toward paying off the balance. Eventually, he brought his production up to four railroad cars per day and by August, 1914, he had shipped 30,000 tons of 9% copper ore.¹⁵

The Patagonia Superior Mining Company, a subsidiary of Magma Copper Company, acquired the claims at some time prior to 1924, and began to take advantage of the lower-grade ore that had been stockpiled by earlier operators, accounting for another 100,000 tons of copper ore. A total of 21 lode claims were patented in 1923 and regular shipments were being made as late as 1929, probably in the hands of the newly-incorporated Three R Mines, Inc., but falling prices soon forced the operation to be shut down. Records indicate that a total of \$2.5 Million was removed up to 1930, but very little activity has been noted since that time.

The bottom dropped out of the stock market in 1929, and the resulting depression had a devastating effect on mineral production in Arizona. United States copper production dropped from 830 million pounds in 1929 to 182 million pounds in 1932 and brought to a close the operation of mines in the Patagonia Districts. Thus, the individual miners again went to the small gold placers to eke out a bare living until the next recovery.

Notes:

1. The author's experience with possible connections to this remarkable find occurred in 1949 while examining an extensive ancient campsite near Oacuc (presently Ocuca) west of Santa Ana, Sonora. There a fine specimen of pure argenite (silver sulfide) was found roughly cubic in shape and about the size of a child's marble. Pure argenite contains about 87% silver and its weight would attract the attention of any observant human. One suspects that it is very likely that such a specimen could have been hand carried from the *planchas de plata* discovery and then carried to the campsite where it was found.
2. The validity of this grant was denied by the United States Court of Private Land Claims in 1892, although title was accepted under the Mexican law in Sonora.
3. The validity of the Arivaca grant was eventually denied by the Court of Private Land Claims in 1902.
4. Raphael Pumpelly, *My Reminiscences*, p. 199 (Henry Holt & Company, New York: 1918).
5. Pumpelly, *supra*, p. 243.
6. The Trench was said to have been worked in 1859 by Col. Harry Titus, while the nearby Flux Mine is thought to have been worked by Mexican miners during the early 1850s, prior to the Gadsten Purchase.
7. Richard J. Hinton, *Hand-book to Arizona: Its Resources, History, Towns, Mines, Ruins and Scenery*, pp. 124-27 (Payot, Upham & Co., San Francisco: 1878).
8. F. Biertu, in his report on the Mowry Mine, reported that the easterly extension of the same formation was named the Eagle. He does not identify its owner, but the author believes it to be the one patented as the "First East Extension of the Enterprise."
9. Hinton, *supra*, p. 128.
10. George Roskrige, the Pima County Engineer, made a field survey of the "Greaterville version" of the grant in 1877, and an excellent copy of his map still survives in the files of the Arizona Historical Society. Philip Contzen ran the accepted version of the grant in 1905 and most of his stone monuments at half-mile intervals still survive.
11. Ironically, the initial petition for the grant

included a certificate signed in New York City on May 1, 1865, by Charles D. Poston and John Moss stating that the land "is unoccupied and not mineral." Baca Float No. 3, *Land Decisions* (General Land Office), Vol. 36, p. 455 at p. 463 (1908). These gentlemen obviously knew better.

12. A friend of the author, Homer Mapes of Patagonia, has told of being hired (along with another hand) to alternate "riding shotgun" on a 30-ton shipment from the Montezuma to the smelter in El Paso in about 1900. He reported that the railroad carload was hand-sorted and ran 5% copper and 125 ounces per ton silver. Mapes also reported that a fortification of big rocks atop a small conical hill alongside the main shaft had been set up as a lookout for Apaches and was still there as late as the 1970s.

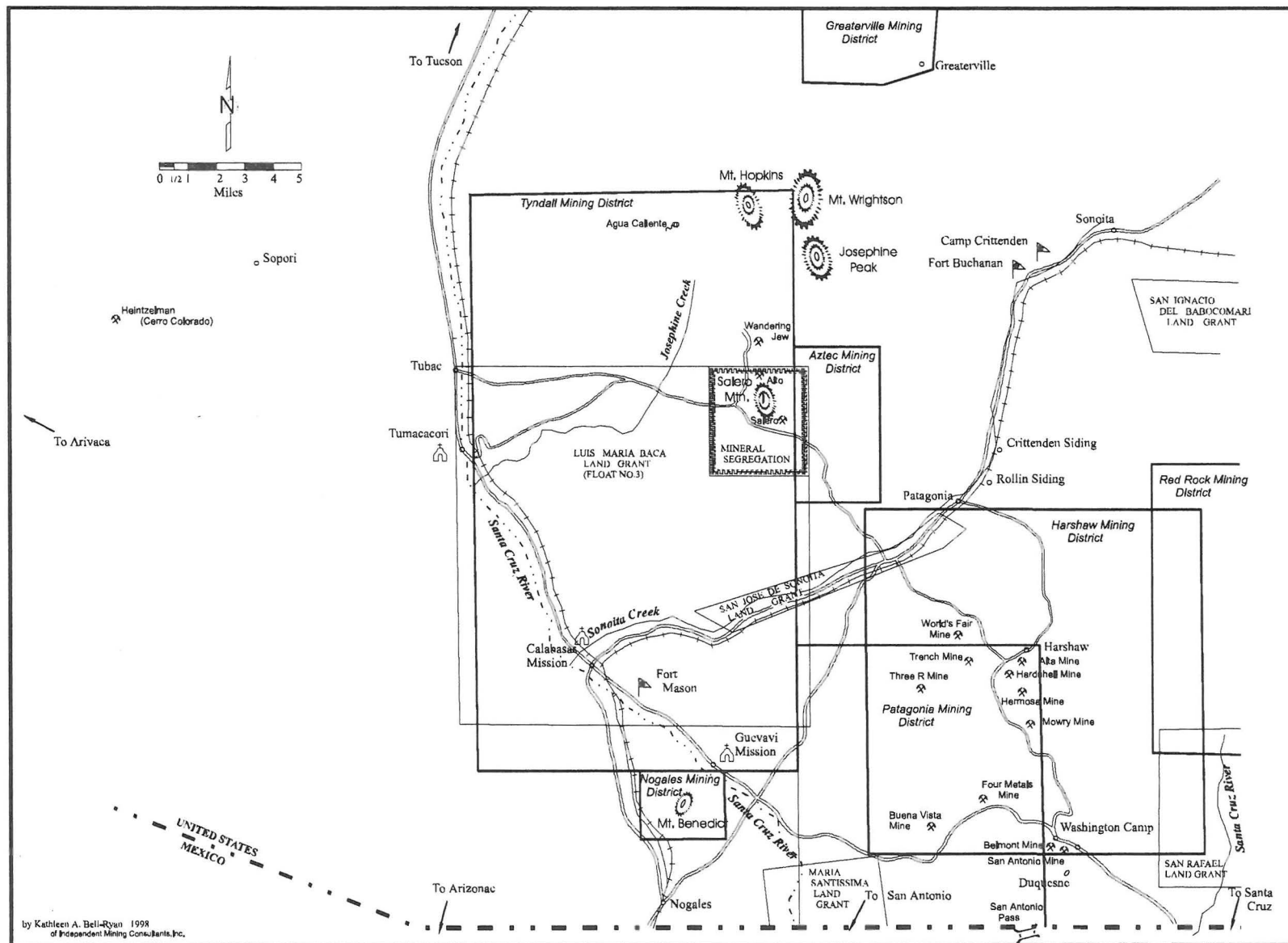
13. Local legend tells of a miner being surprised by an Apache raiding party while in the cabin at Silver Sally. He was reported to have shinnied up the chimney and hid for an almost interminable period to survive the ordeal.

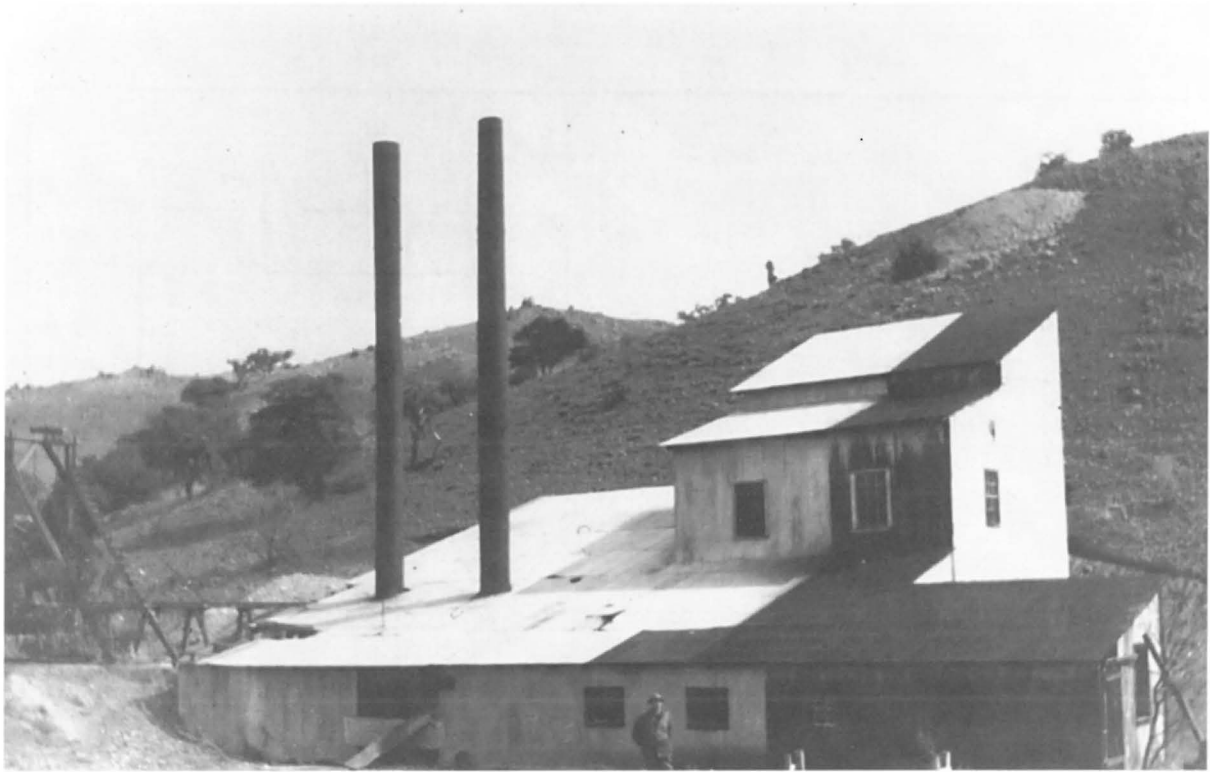
14. The author saw the Powers couple only once, in 1930 or '31 when they were living in a small adobe home just south of the portal of the main adit at the mine.

15. In 1913, the principal owners, R.R. Richardson and A.E. Crepin were said to have shipped 22,500 tons of ore averaging 9.1% copper. The author is inclined to believe that the same ore was being credited to both parties in error.

Table 1: Important Mines of the Patagonia District

MINE	OTHER NAMES	DISCOVERY	OWNERS	DEPOSIT TYPE(S)	WORKINGS
Alto	El Plomo, Salero, Goldtree	~1770, early Spanish(?) workings noted	1854-1861 Chas. Poston, et al (Sonora Mining and Exploring Company) 1875 restaked by Mark Lulley as "Goldtree" (name of a pioneer Jewish merchant) 1902 Alto Consolidated Mines Co.	E-W vertical quartz vein 5-8 ft wide, traceable for over half mile; values were in argentiferous galena with associated copper minerals increasing eastward	Over 10,000 ft of workings: adits drifting along vein, several shafts and winzes
Flux	Goshen	1850s	1882 Hugh White 1940 ASARCO, Inc.	vein carrying "excellent values" in lead and silver with high iron content giving good fluxing properties	N/A
Hardshell		1879 David Harshaw & José Andrade	1879 Harshaw & Andrade 1880-1901 R.R. Richardson 1905-1907 Heney 1944- ASARCO, Inc.	"flat" vein carrying mostly lead with minor silver	vertical shaft and incline
Mowry	Plomosa (Missionary times) Patagonia (probably from patagalana: Sp., having a short leg)	1857 (by a Mexican herder)	~1850 Ewell, Brevoort, Douglass, Johnson (US Army officers, from Ft. Buchanan) 1859 Titus & Brevoort Aug. 1860 purchased for \$25,000 by Sylvester Mowry June 1862 confiscated by US Army after Mowry's arrest 1871 Mowry died, property abandoned by his heirs 1875 restaked as Enterprise Lode by Fish & Bennett 1876 taken to patent by Fish, Steinfeld, & Jacobs 1904 Mowry Mines Co. 1907 Alto Copper Co. 1917 Mowry Mining Co.	Argentiferous galena and lead carbonate ores (replacements in limestone)	numerous shafts, some to 400 ft, adits and other workings totaling 12,000 linear feet
Salero	Darwin, Constitution "New" Salero (not the same as Alto, above)	?	~1866~1870 John H. Magee early 1870s Clark & Peterson ~1900~1935(?) Salero Mines Co. (C. H. Ferry & Wm. P. Blake et al)	12-25-ft wide near-vertical silver vein with minor copper values striking S65E, traceable for 4 miles. Ore minerals were cerargyrite near surface, argentite & chalcopryite at depth.	two shafts (one to 400 ft), ~one-half mile workings
3 R	Three-R, RRR	1897	~1900 Rollin R. Richardson 1912 N. L. Amster (lessee) ~1924 Patagonia Superior Mining Company (Magma Copper Co.) ~1929-? Three R Mines, Inc. ~1959-? Duane Bird & James Cook	chalcocite-bearing vertical shear zones, up to 20% copper, very scant silver	two adits, 558-ft shaft plus 20,000 ft of workings
Trench		unk., early work by natives for clay, iron pigments, etc. "rediscovered" in 1850s	1859 worked by Col. Titus 1873 patented by Safford, Hopkins, Handy, Gardner and Leatherwood 1877 operated by Archibald, Gardner and Hopkins 1880 Hearst estate 1937 ASARCO, Inc.	E-W vein, 4-10 ft wide with low-grade argentiferous galena(\$30-\$100 per ton), traced for over 20,000 ft	shafts 40 to 400 ft deep, two adits 200 and 300 ft long 4 smelting furnaces
World's Fair		early 1870s Sr. Padrez (?) 1879? McNamee	1879-1881 worked by McNamee intermittently and abandoned 1883 relocated by Wm. Moran 1884-early 1930s(?) Frank Powers ~1959- Powers estate	high-grade lead-silver vein(?) yielding direct-smelting ore reportedly worth \$10,000 to \$30,000 per rail carload ore changed to copper with gold values below water table	15,000 ft of shafts, tunnels, drifts and winzes to a depth of 600 ft





Mansfield Camp; east of the Morning Glory. Courtesy of Bob Lenon.



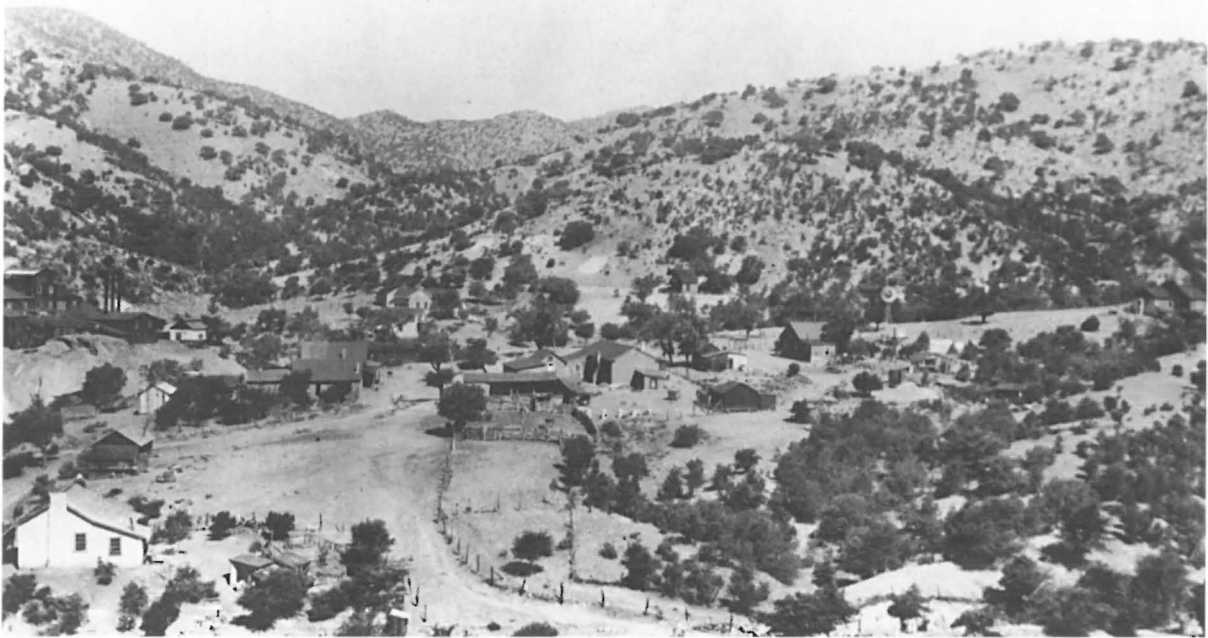
World's Fair Mine. Courtesy of U.S. Geological Survey Shrader, F.C. #1581.



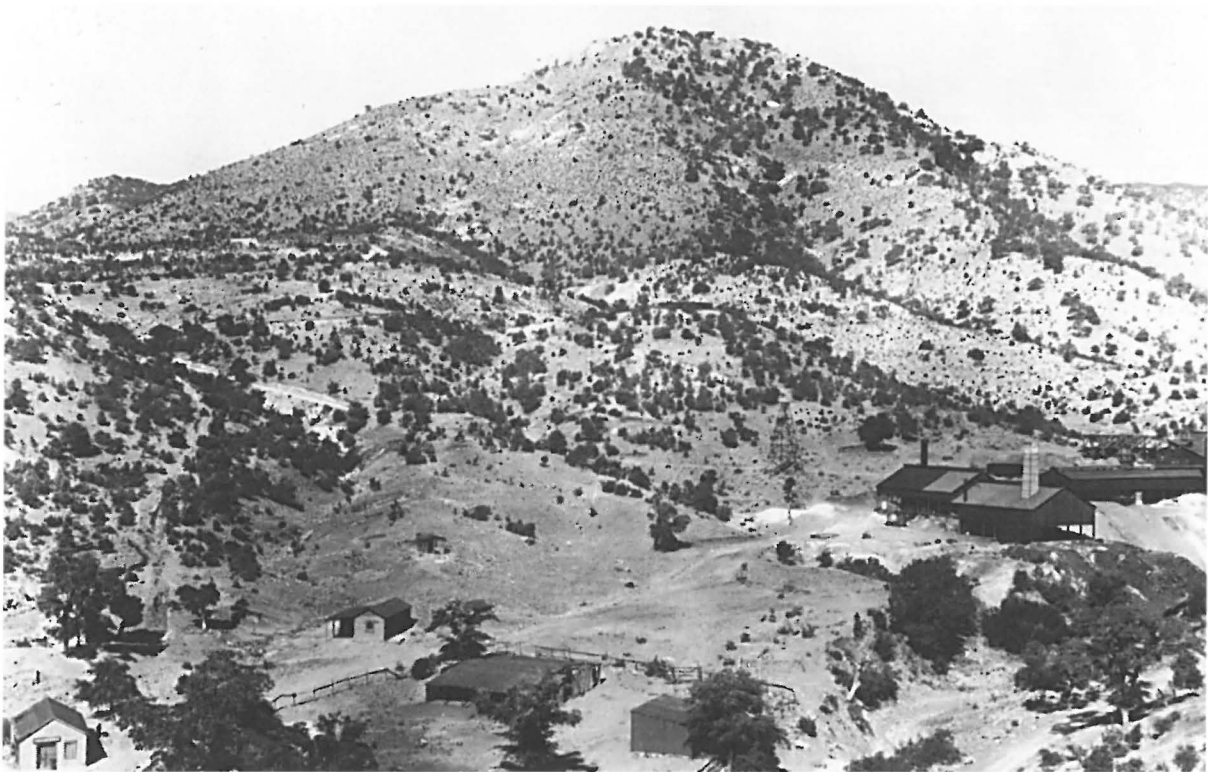
Sweet Mine and Smelter of the Mansfield Group. Courtesy of U.S. Geological Survey Shrader, F.C. #1571.



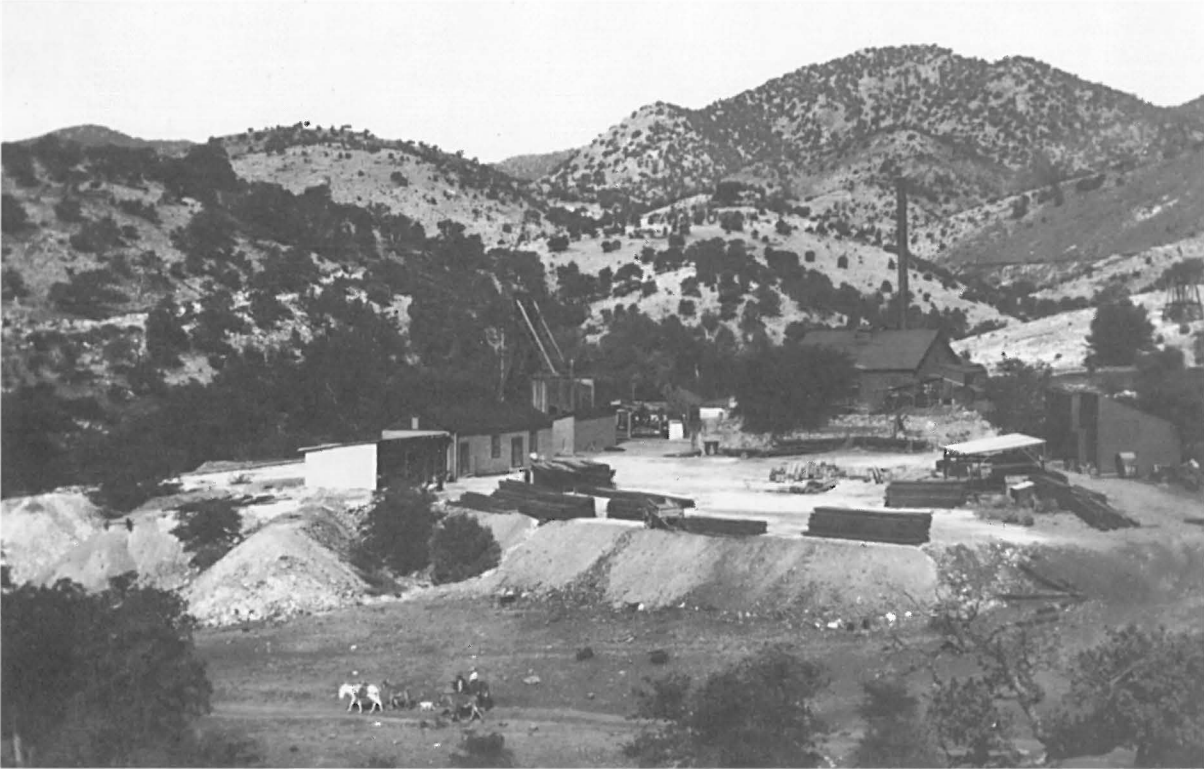
Castle Butte Mine. Sonita Valley and Red Mountain. Courtesy of U.S. Geological Survey Shrader, F.C. #1580.



Camp Washington and Duquesne. Reduction plant on Washington Gulch. Courtesy of U.S. Geological Survey Shrader, F.C. #1587.



Camp Washington and Duquesne. Reduction plant on Washington Gulch. Courtesy of U.S. Geological Survey Shrader, F.C. #1586.



Bonanza Mine. Courtesy of U.S. Geological Survey Shrader, F.C. #1548.



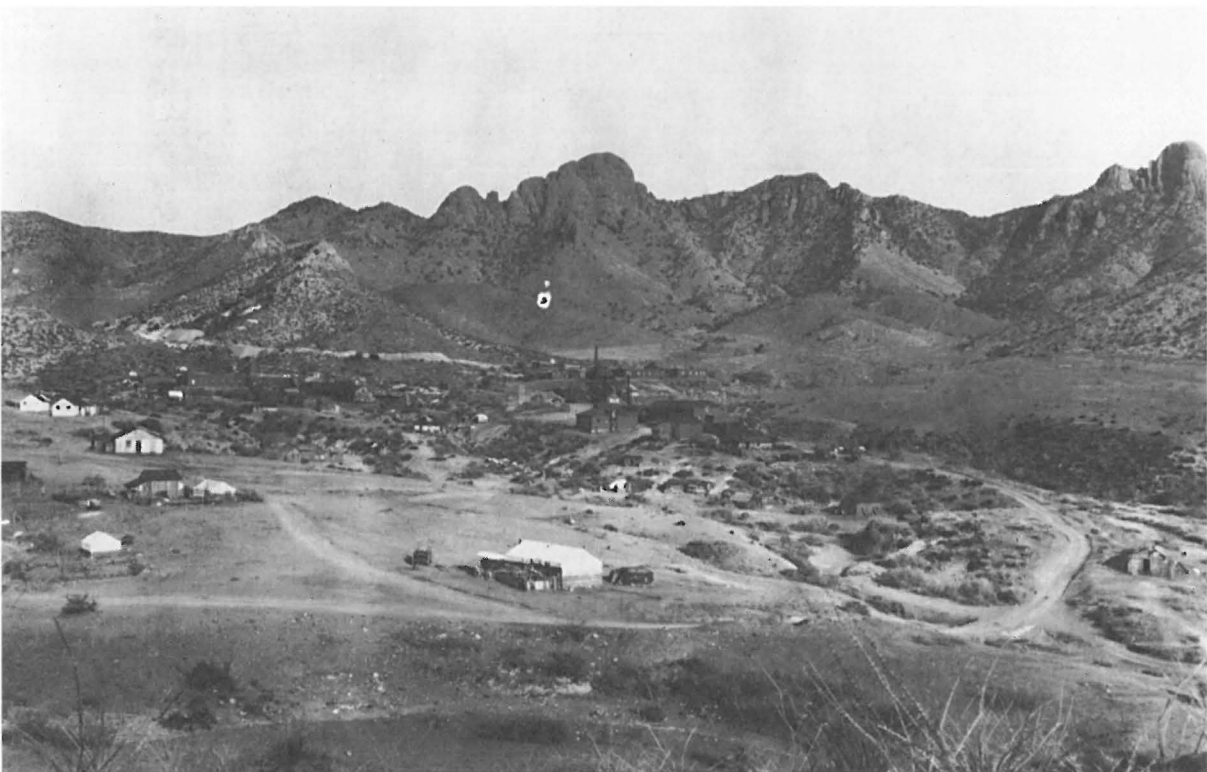
Mowry Mine. Courtesy of U.S. Geological Survey Shrader, F.C. #1585.



Alto Mine. Courtesy of U.S. Geological Survey Shrader, F.C. #1578.



Heavyweight Mine. Courtesy of U.S. Geological Survey Shrader, F.C. #1553.



Helvetia. Courtesy of U.S. Geological Survey Shrader, F.C. #1561.



Helvetia. Courtesy of U.S. Geological Survey Shrader, F.C. #1562.



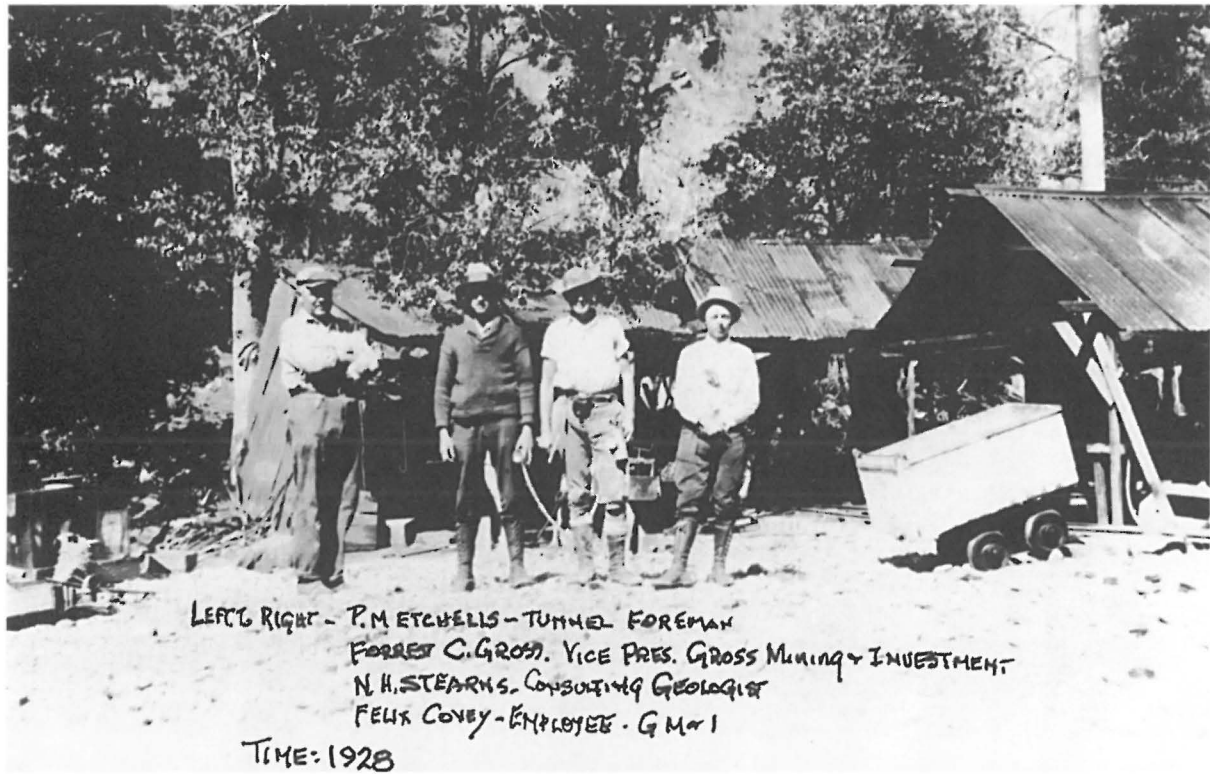
Solero or Darwin Mine. Courtesy of U.S. Geological Survey Shrader, F.C. #1575.



Old Dick, Mohawk Mine. Quartz Butte in crest of Santa Rita mountains. Courtesy of U.S. Geological Survey Shrader, F.C. #1552.



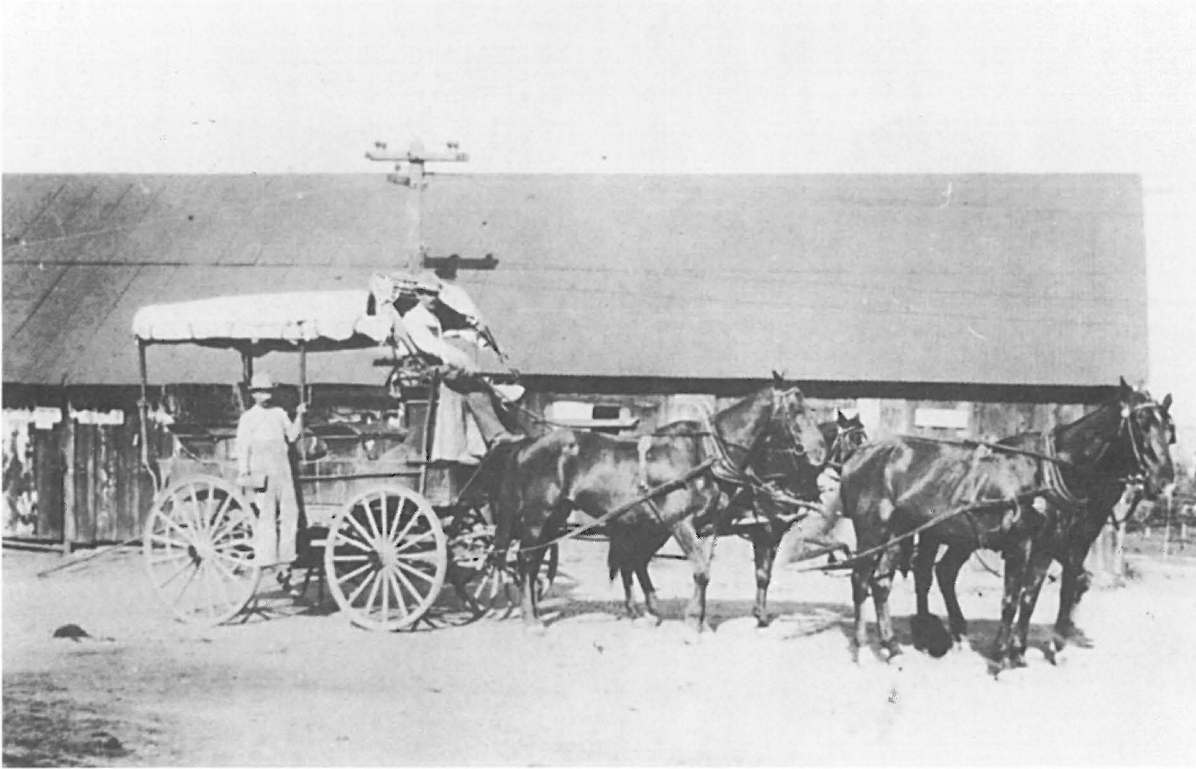
Total Wreck Mine c. 1885. Courtesy of Arizona Historical Society #3492.



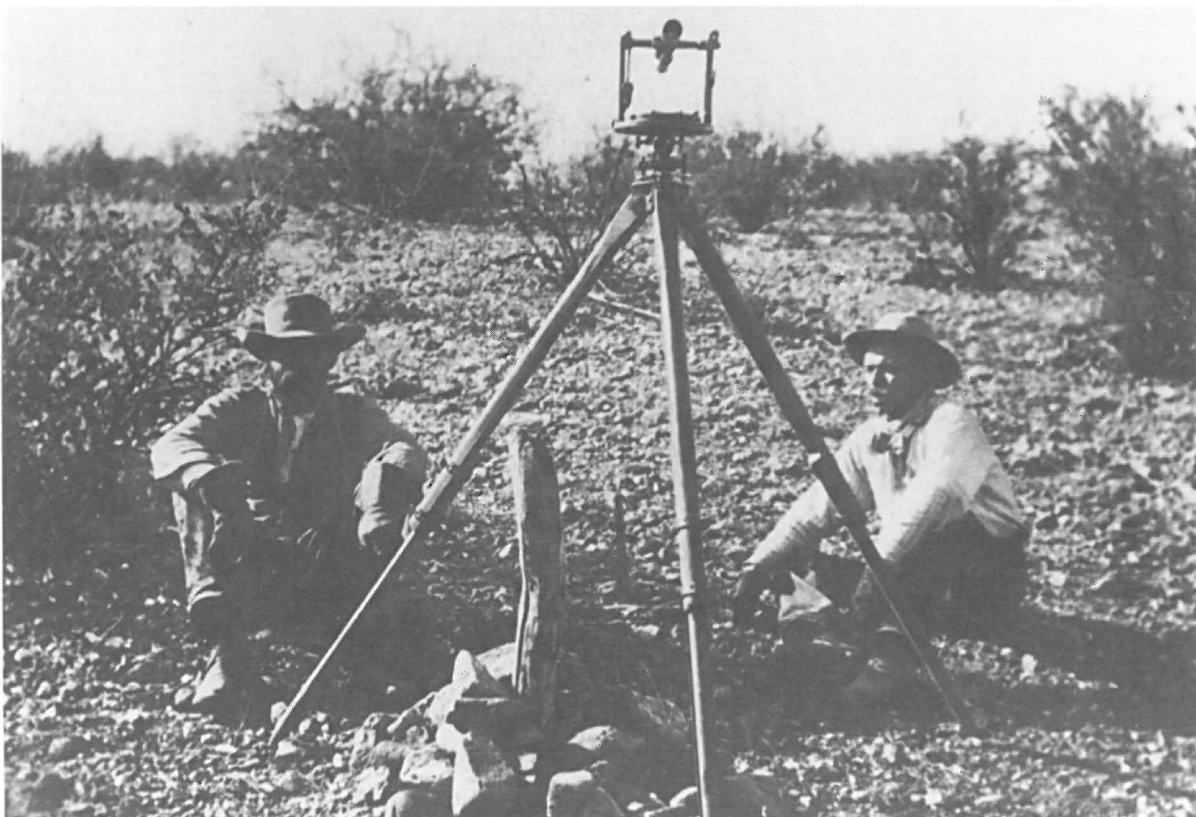
Courtesy of Bob Lenon Collection.



Duquesne Ave., Patagonia, looking east, c. 1930s. Courtesy of Arizona Historical Society.



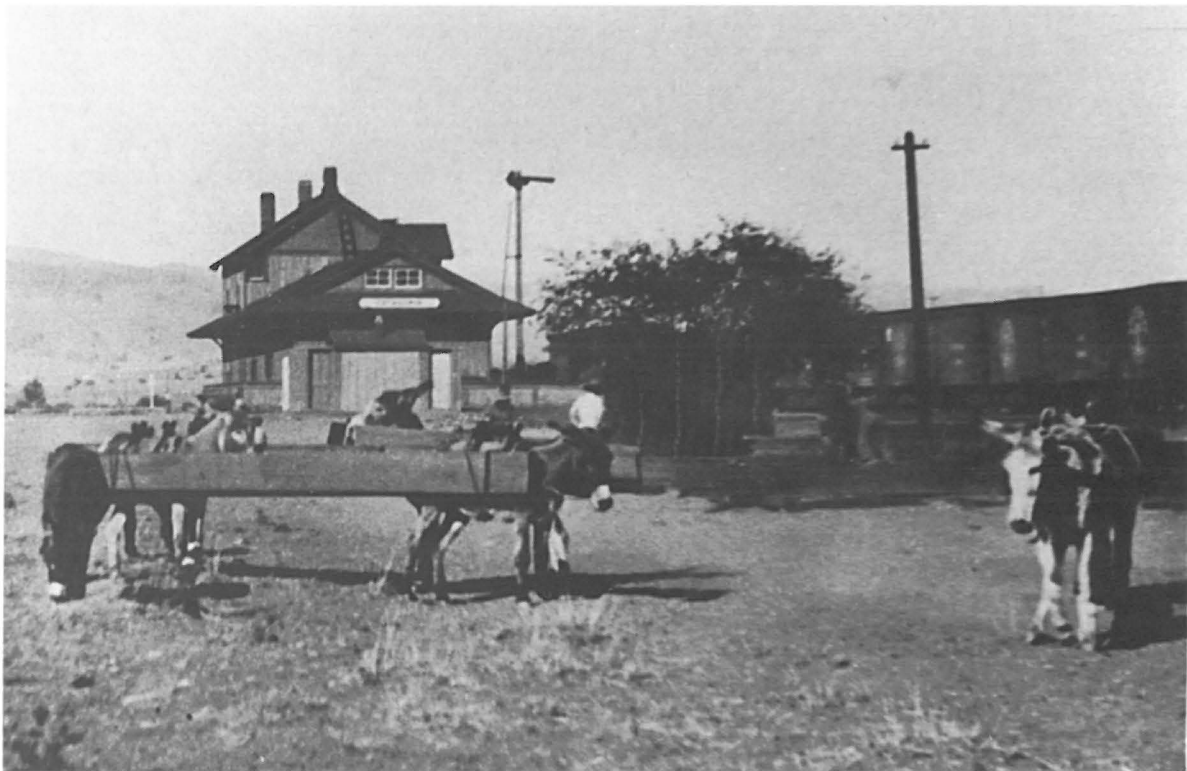
Stage, Duquesne Ave., Patagonia. Probably to Harshaw & Washington-Duquesne, c. 1910. Courtesy of Arizona Historical Society.



Surveying San Rafael land grant, c. 1842. Courtesy of Arizona Historical Society #46460.



Survey Crew. Courtesy of the Bob Lenon Collection.



Patagonia Station, c.1910. Courtesy of the Bob Lenon Collection.



This is "Railroad Crittenden." Two miles NE of Patagonia, c. 1900. Note yellowstone club (yellowstone was a popular brand of whisky) and lone tree on mesa. Courtesy of Bob Lenon Collection.



Corner of Third and McKeown Avenues, c. 1915. Courtesy of Bob Lenon Collection.



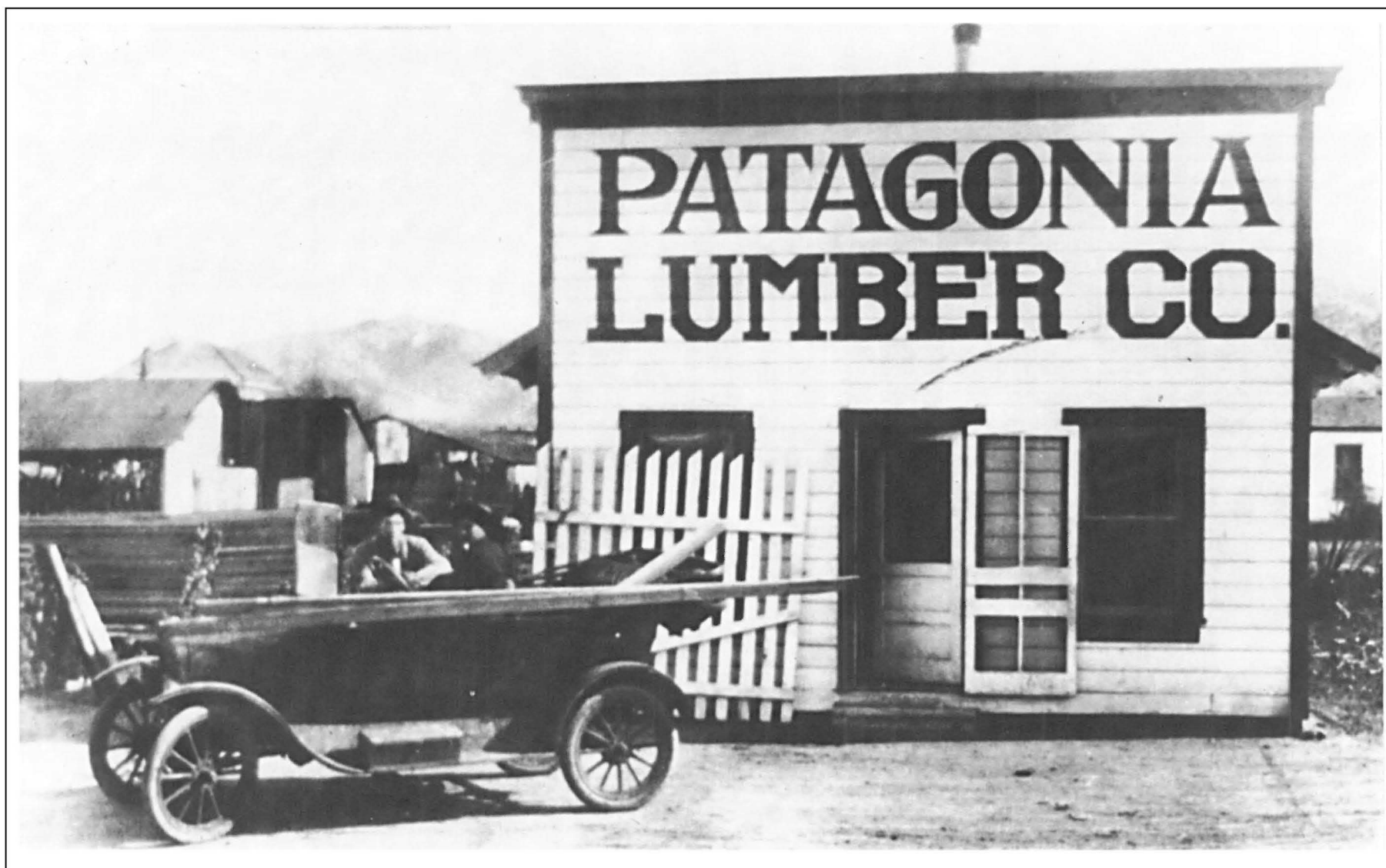
Courtesy of the Bob Lenon Collection.



Courtesy of the Bob Lenon Collection.



McKeown Avenue, Patagonia, c. 1915. Courtesy of the Bob Lenon Collection.



McKeown Avenue near 4th Avenue, Patagonia. Courtesy of the Bob Lenon Collection.

HISTORY OF MINING IN ARIZONA

VOLUME III

Editors
J. Michael Canty
H. Mason Coggin
Michael N. Greeley

Published By



MINING FOUNDATION OF THE SOUTHWEST
TUCSON, ARIZONA

TUCSON, ARIZONA