DESERT FEVER:
An Overview of Mining in the California Desert Conservation Area

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PREFACE

When I learned through Eric Redd and Paul Clark that the Bureau of Land Management was offering a contract for an overview of mining in the California desert, my own interest in mining in the American West led me to apply for the contract, which I subsequently was awarded. Although growing up in a mining family, working as a miner, and doing both my masters and doctoral research on mining topics, my specific knowledge of mining in the California desert was limited. As I began in earnest to obtain the background information that I would need to fulfill this contract. I began to have the unsettling feeling that I was jumping well-established claims to this scholarly gold mine. This uneasiness on my part grew considerably when I became acquainted with Larry Vredenburgh in the summer of 1978. Struck at once by the depth of his own background, the enthusiasm with which he had pursued his scholarly interest with no monetary inducement and his unselfish willingness to give me without charge the benefit of his research, I decided to invite him to participate in the compilation of this overview, sharing with him both the credit for this work and the stipend being offered by the Bureau of Land Management. Mr. Vredenburgh gratefully accepted this offer and began immediately to push research and writing on Riverside and San Bernardino counties, which represented his area of responsibility. A short time after this, Russell Hartill, who had just returned from a mission for his church in Chile, and was considering enrolling as a history major at California State University, Fullerton, came to see me at my office. It took only a few minutes to learn of his own background and interest in mining in the California desert, and shortly, Mr. Hartill accepted the same responsibilities (and financial and scholarly credit) for the Imperial, Kern, and Inyo counties that Mr. Vredenburgh had for Riverside and San Bernardino.

I have never regretted my decision to share this opportunity with these two excellent young scholars. Without exception, our association has been most agreeable and intellectually stimulating, and I am convinced that this study has a depth and quality, thanks to the dedication and background of these two, that it would not have had without them. Because of their primary responsibility for the information contained in this overview, those good things about it must be credited to them. Similarly, because I have ultimate responsibility for this study, and have carefully reviewed, edited and reworked each of the chapters, any defects are mine.

In addition to those individuals who have already been mentioned, several others have made significant contributions to this study. Russ Hartill's parents, William R. and Inza, graciously allowed many a side trip to visit old mining areas during family vacations throughout the West. Dr. Ray Allen Billington showed Russ the wonders of the Huntington Library and inspired him with a determination to continue his interest in mining history. Robert K. Hoshide accompanied him on many a "prospecting" trip into the California desert and has expressed his enthusiasm for the publication of their findings. Susan Rodriguez Hartill has continued, as Russ' wife, the interest and assistance she manifested as his fiancee. Tim Allen, Marion Arnote, Clota Bowen, Dixon Chubbuck, Dr. O. N. Cole, Every Darbin, Arda Hanszeal, Hugh Huebner, John Jordan, Cecil Lopez, Germaine Moon, Jack Moore, J. B. Roberts, and Fletcher Tweed, each provided Larry Vredenburgh with significant

information on different aspects of San Bernardino and Riverside county mining history. Stephanie Snair Vredenburgh, first as Larry's fiancee and then as his wife, assisted immeasurably in the first typed draft and critical review of his portion. Eric Ritter of the Bureau of Land Management Desert Planning Staff has overseen this study from its inception and has been a major factor in its having been an enjoyable undertaking. For graciously allowing us the use of photographs from the California Division of Mines and Geology Library, we wish to thank Angela Brunton, the Librarian. Mr. Chris Brewer, of the Kern County Historical Society, and Mr. Glen Settle, of the Tropico Mine, have also supplied several Kern County photographs. Bob Ford, Don Havlice, Dorothy Lynn, and Betty Mitson of the California State University, Fullerton, Oral History Program made a major contribution in typesetting this report. Finally, we would like to express appreciation to our wives, who continue to love and sustain us even though they have lived through the countless, lingering crises this study has occasioned.

Gary L. Shumway

February 20, 1980

INTRODUCTION

On August 20, 1896, D. A. Blue began walking carefully along the bottom of a gully on the east side of Rand Mountain. Blue had learned of the exciting discovery of the Yellow Aster Mine the previous year, and now of several additional promising locations in this same vicinity in eastern Kern County, California. Enticed by the allure of gold, Blue noted the fault zone that shimmered through the heat as he began walking up the gully, and remembered with rising interest what he had heard about hydrothermal solutions that at some time in the geological past had boiled up along fault zones, and, if conditions were right, deposited precious metals somewhere in the host rock of the area.

Stopping to break promising looking rocks with his prospector's pick as he went along the bottom of the gully, he suddenly found what he was looking for: a piece of "float," or ore that had washed down from a gold bearing vein somewhere nearby. If this float could be traced back to the vein outcrop, perhaps the deposit could be developed into a paying mine.

As Blue found additional pieces of float, his interest made him forget some of the discomfort of the California desert in August, and he began to sense the heady feeling of being on the verge of discovering great wealth. Carefully tracing the float to its source, Blue found himself standing in front of three parallel quartz veins, ranging in width from 18 inches to 3½ feet, in an outcropping of schist. He broke off a piece of quartz with his pick, looked it over briefly, then used his magnifying glass to look more carefully at a couple of promising specks. Enlarged by the glass, the tow dots became what he had hoped they were: two small but very real pieces of gold.

With the nation having codified, in the Mining Law of 1872, the common-law assumption that deposits of precious metals belonged not to the federal government but to the discoverer, Blue knew that he had the right to claim any deposit he discovered and to retain it or sell it as he wished, so long as he properly recorded the discovery and performed at least $100 worth of assessment work each year.

Blue staked his claim by establishing rock monuments at the four corners of a 1500 by 600 foot rectangle. A location notice was posted at the point of discovery, indicating the locator, date of location, geographic position, name of the claim, and the specific minerals being claimed. He then legalized his claim by recording it in the San Bernardino County courthouse.

After staking and recording his claim, which he named the Blackhawk, Blue then proceeded to obtain a more accurate sample of the veins for assay. Ten pounds of rock from different parts of the vein were crushed to the size of peas, and poured into the shape of a cone. The cone was quartered and two opposite quarters thrown out. The remaining quarters were further crushed and reduced until each weighed one pound and consisted of fine sand. One of these pound samples was sent to an assayer, while Blue kept the other for future reference. When the assay results came

back, Blue learned that his mine would indeed be a paying proposition: at the then prevailing price of $20.67 an ounce, his ore was worth $60 a ton.

With such a favorable assay, Blue could depend on financial assistance in developing his claim, and this assistance was soon proffered by a Randsburgh businessman, D. C. Kuffel. By the next February, the location had been expanded to include 17 claims, several shipments had been made which ran from $60 to $120 per ton, and 1,600 tons of milling grade ore had been stockpiled, awaiting the erection of a mill. The Blackhawk shaft was down 100 feet, with a 150 foot drift at the 60 foot level.

The following year, the Randsburg Railway reached the new town of Johannesburg, linking the area with the outside world, and making the Blackhawk Mine even more profitable.

The years from 1896 to 1903 were the golden years for the Blackhawk Mine. A ten-stamp amalgamation mill was constructed and put into operation during this time. Since ore from the Blackhawk was free milling, the rock needed only to be crushed and the gold caught by amalgamation with mercury. In the amalgamation process, copper plates coated with mercury were set at an angle so that ore pulp from the stamp mill flowed over the plates by gravity in waves. When the free gold came in contact with the mercury-coated copper plates, the gold adhered to it, as mercury's capillary action causes it to be repelled by most substances, but to cling to gold, while sand, sulphides and other materials were carried off by the water. At intervals, the gold was recovered by scraping off the amalgam with a rubber scueezed through a chamois to expel excess mercury, resulting in a glob of 40 percent gold. This substance was put into a retort and heated, which drove off the mercury into vapor. A collection system in the retort allowed the mercury to be recondensed and discharged into a bowl of water. The residue left in the retort was melted in a graphite crucible in a furnace, and fluxes (borax, soda and silica) were added to help the slag flow, pour and harden correctly. Furnace mill workers poured the gold into a cast iron mold and, after the gold was set, overturned the mold into a bucket of water, where the slag easily separated from the ingot. The amalgamation process was simple and could be performed as infruently as once a month, so it was never necessary to have more than half a dozen men working at the Blackhawk at any one time. It was, in its early years and throughout its productive life, a small mining operation.

In 1904, tungsten was discovered 2 miles southeast of the Blackhawk, and the area went wild during World War I. Blue still mined gold during this time, but all the area's attention went to the developing tungsten mines. The ensuing prosperity forced cutbacks at the Blackhawk. The stamp mill was reduced by five stamps, while a mile north, silver was discovered in 1919, causing Randsburg's third rush.

In 1921, control of the Blackhawk passed to a small financial group from Pennsylvania. Organized as the Pittsburgh and Mount Shasta Mining and Milling Company, J. J. Schneider, T. V. Scott, and D. F. McCormick embarked upon an ambitious plan in February, 1923.It involved the staking and development of other claims in an effort to reach underground extensions of the mineralized zone of the nearby Kelly silver mine. A vertical shaft 300 feet deep with 1000 feet of workings

yielded nothing spectacular. The rich silver ore zone that was so close by did not enter their claims, and their gamble did not pay off. They were better off mining gold.

Ten years later, the shafts were 250-300 feet deep, with levels at 50, 100, and 200 feet, and close to a mile of underground drifts and crosscuts. Electric hoists of from 20 to 50 horsepower were used to carry men and ore from the mine, and an air compressor was used to run the drills.

In another 10 years the main shaft was down to 600 feet, with levels at 100, 200, 250, 450, 500, and 600 feet, and with another 3,000 feet of underground workings added since 1933.

Executive Order L-208 stopped production at this mine in 1942, after having produced an estimated $700,000 dollars of gold, worth between $20.67 and $35 an ounce, from ore averaging ½ to 2 ounces of gold per ton.

Although perhaps the Blackhawk Mine was above average in terms of production, and some of the mines involved more complex milling processes, it to a great degree typifies mining in the California desert. Its story, multiplied thousands of times, is the story of mining throughout this area. The same patterns of discovery, development, deals, dividends, daring, decline, and death are found within the story of almost every mine.

Perhaps the most significant way in which the Blackhawk Mine is representative of most desert mines is in its premature closure due to legislative restrictions and price fixing of the 1930s and 1940s. The remaining gold values in the ore at the Blackhawk and at hundreds of mines throughout the desert at todays prices often would bring $200 or more per ton. The importance of this fact can only be fully appreciated when one considers that these same mines were worked at a profit years ago when ore values were worth only $12 a ton. Even with much higher labor and supplies costs, the often expensive process of reconditioning abandoned mines, and the nagging, costly necessity of complying with a plethora of government regulations, many of these mines could be more profitable now than they were 40 years ago. A new rush back to these mines may be imminent.

It is this fascinating story of gossans and glory holes, of stopes and stamp mills and especially of the unsinkable optimism of prospector and promoter, that this study details. While this volume was not intended to be a comprehensive history of all mining activity that has occurred within the California desert, the attention given to many of the significant mines should make it useful as an overview, and the extensive index of desert mines, owners and place names should serve both scholar and enthusiast. With gold, silver and other metals presently commanding unheard of high prices, increased attention is being given to mining in the desert, and an important new mining era may soon begin. We earnestly hope that this book will be helpful to those who seek values from the earth or from an understanding of mining's historical background.

CHAPTER ONE

IMPERIAL COUNTY

Imperial County, though the smallest, shortest, and youngest county in the California Desert Conservation Area, has an impressive and colorful mining history. Modern day patriots mined ore for tracer bullets here, businessmen produced ice in the desert from a gas field, a former California governor owned shares in one of its gold mines, and the county played host to "one of the most absurd engineering feats ever undertaken in the West".[1]

Imperial County's miners and prospectors chhose colorful names for their holes in the ground. Some spoke of beauty: the Butterfly, Dulciana, Fair Diane, Full Moon, White Christmas and White Swan Mines; others spoke of wealth : the Easy Pickins, Golden Casket, Golden Geyser, Million Dollar Gold, Rica Tierra, and Well Earned mines. Some were just downright amusing: the Caveman, Coffee Pot, Little Buckkaroo, Lost Donkey, Stoneface, Sweet Potato, Tee Wee, and the Thumbs Mine. One miner even had a colorful name for the mining company that employed him: the White Man's Slavery Company of California. Perhaps the greatest historical distinction of Imperial county, however, is that within it's present boundaries is the site of the earliest recorded mining activity in the State of California.

CALIFORNIA'S FIRST SPANISH MINERS

Soldiers, settlers, and laborers, part of two mission colonies under the administration of Francisco Garces, mined placer gold in the southeastern Chocolate Mountains in 1780 and 1781. Their mining methods were simple. Placer gold was recovered by winnowing (tossing the lighter materials away by gently shaking a blanket in the wind). Dry washers may also have been used. Their mining endeavors, almost recreational in nature (as they were not mining gold for a living) ended abruptly when the Yuma Indians attacked the two missions on July 17, 1781, killing at least 50 men and taking 67 women and children captive. Mining activity was resumed in this area only after the establishment of the Mexican Republic in 1823.[2]

Also worked in the 1780's were the placer grounds of Jackson Gulch and the oxided ores of Padre Madre Valley in the Cargo Muchacho Mountains. The Padre ŷ Madre Mine, located 13 miles northwest of Yuma and 3 miles northwest of Ogilby, was one of the most extensively developed early mines. The mine enjoyed a modest production from the 1780's until 1894 with few interruptions.[3]

Even the name of the mountain range speaks of the early interest in mining in the area. Reportedly in the early 1800s two young lads playing at prospecting in imitation of their fathers came into camp with their shirts loaded with gold ore. Their antics resulted in the name of Cargo Muchacho, for the mountains where they had made their find. Although it is difficult to estimate the area's gold production

during the Spanish and Mexican eras (1780-1848) it was probably not more than half a million dollars.[4]

William P. Blake, a geologist with Lt. Williamson's Pacific Railroad exploration party, was the first Anglo-American to visit the southern portion of the Cargo Muchacho Mountains with an eye toward mining. In 1853 he reported seeing several quartz veins from three inches to a foot or two in thickness. His observations were recorded in official government reports, but no one acted upon this evidence of possible mineralization until the Southern Pacific Railroad between Yuma and the coast was completed in 1877. With a safe means of transporting bullion to market now at hand, prospectors and developers flooded into the area.[5]

CARGO MUCHACHO MINE

One of the first deposits to be commercially developed on a large scale in the Cargo Muchacho Mountains was the Cargo Muchacho Mine. Located by Thomas Porter Neet in 1877, within 5 years 14,000 tons of ore had been mined, yielding $168,000 in gold. The ore averaged $12 per ton. The mine was surveyed for patent in 1892, but two years later it was idle. A six year renewal of activity began in 1936 when ore left on the mine dump was cyanided. Total production figures for the Cargo Muchacho Mine are estimated at more than 25,700 ounces of gold valued at $852,000.[6]

TUMCO MINE

Peter Walters discovered the Gold Rock Mine (located 4 miles northwest of the Cargo Muchacho Mine) in 1884, and shortly thereafter sold out to developers for $75,000. The developers renamed the mine the Golden Cross in 1892. The Golden Cross Mining and Milling Company immediately embarked upon a development program, and the flourishing town that sprang up around the mines was named Hedges, in honor of the firm's vice president.[7]

The company paid $3 a day wages. This was reasonable in those days, but the successful camps as a rule always paid $4. This caused one irate miner to write to the *Arizona Sentinel* suggesting the company's name be changed to the "White Man's Slavery Company of California."[8]

In 1910 a new company took over and the mine was renamed Tumco, (an acronym for The United Mines Company). The Tumco mine was also known as the Hedges, Gold Rock, Golden Cross, Golden Crown, Golden Queen, Good Luck, King, Sovereign, Sovereign East, and Sovereign West mines.[9]

Ore from both the Cargo Muchacho and Golden Cross mines wwas at first treated by the Yuma Mill and Mining Company's twenty-stamp mill located at El Rio, 6 miles south of Yuma. Later, the Golden Cross Mining and Milling Company began construction of a forty-stamp mill when their ore production overloaded the

twenty-stamp mill in the early 1890's. By 1896 they had increased their millling facilities to 100 stamps, but were experiencing considerable difficulty with recovering the gold from their low grade ore.

The company discovered in the spring of 1896 that finer crushing of the ore was needed to release the free milling gold from the matrix. Finer screens were installed as well, resulting in a greater percentage of gold saved. A 12 mile pipeline from the Colorado River supplied the mill reservoir with 250,000 gallons of water at a cost of about ten cents per ton of ore crushed. Worked continually from 1892 until 1917, and again from 1937 until 1942, the Tumco mines have produced 45 percent of the total county gold production, or some $2,863,000.[10]

In 1896, the shaft at the Golden Queen Mine was 550 feet deep on a 40 percent incline, and the Golden Cross and Golden Crown shafts were 250 feet and 350 feet deep respectively. By 1914, the Golden Cross shaft had been extended to 1,100 feet, and at that time the Tumco mines were said to be the second largest mine in the United States producing gold from low grade ore. Its underground workings total more than 8 miles. The town of Hedges (also renamed Tumco in 1910) supported a population of several thousand in the late 1800s. By 1900 there were several dozen buildings, two cemeteries, a dance hall, a volunteer fire department, and a miner's union. The population was reduced to 30 by 1942.[11]

PASADENA MINE

Between the discovery of Peter Walter's Gold Rock Mine in 1884 and the American Girl Mine in 1892, Thomas Grimes of Pasadena located the Pasadena Mine. Its ore ran 16 dollars to the ton in gold and was milled on the Colorado River. The Pasadena and the Guadalupe Mine (discovered in 1887) comprise with the Cargo Muchacho the easternmost mines of the Cargo Muchacho District.[12]

AMERICAN GIRL MINE

Johnson and Lohman discovered the American Girl Mine, located 2 miles north of the Cargo Muchacho Mine, in 1892. By 1900 it had produced 30,000 tons of ore that averaged $8 per ton in gold. Inactive from 1900 until 1913, during the next 3 years the mine went on to produce 20,000 tons of ore that averaged $6.50 per ton in gold. A cloudburst during the second week of November, 1914, flooded the lower workings, occasioning a 4 month delay while workers dewatered the mine and reopened the shaft.[13]

Inactive for 20 years starting in 1916 the mine was again worked from July, 1936, until 1939 and during that time delivered 150,000 tons of ore valued at $900,000. Total estimated production of the American Girl Mine is 205,000 tons of ore valued at $1,285,000. Although mined primarily for gold, other minerals found at the American Girl include silver, galena, and copper. Former state governor H. H. Markham owned shares in this mine.[14]

Other important mines in the vicintiy of the American Girl include the Blossom (known as early as 1894) the American Boy (an extension of the American Girl), Desert King, and La Colorado. The Blossom, also known as the Salamanca Consolidated, had 3 shafts 70, 240 and 280 feet deep, and several hundred feet of workings. It was in operation in the late 1890's. The La Colorado Mine, discovered in 1914, consisted of 400 feet of underground workings and has a recorded production of several hundred tons of ore. Some traces of sheelite (tungsten ore) is found at this gold mine.[15]

CARGO MUCHACHO DISTRICT

The Cargo Muchacho, Tumco, Pasadena and American Girl Mines comprise the major gold producers of the Cargo Muchacho District. This district is believed to be the northwestern extension of the famous gold beltt of the Altar District of Sonora, Mexico. Although essentially a gold mining district some copper was prooduced as a by product of gold mining here, mainly at the American Girl Mine.[16]

Ore in this district contains free-milling gold or gold in disseminated pyrite. Gold alone and in association with silver and copper, and some sericite and kyanite are the only minerals extracted from the Cargo Muchachos, the latter two minerals have been produced mainly since 1930. Good samples of kyanite and quartz are to be found in the Cargo Muchacho Mountains. All the mineral deposits lie on the west side of the mountain range and strike westerly. The quartz veins are up to 8 feet thick in this region and contain the highest grade of gold ore found in Imperial County.[17]

SOUTHEASTERN CHOCOLATE MOUNTAINS AREA

Located 8 miles northeast of the Cargo Muchacho District, the Southeastern Chocolate Mountains area was primarily a gold district, although silver, lead, and copper were also found and mined here. Placer goid deposits had been worked here in this area long before the United States acquired the territory.[18]

The Chocolate Mountains hold gold and silver values in narrow quartz veins with some high grade pockets. Placer gold deposits occur along the mountain's wetern and southern flanks. The loose gold would concentarte itself into bedrock depressions giving part of this geographuc area the nickname"Potholes,,. The area is located in the north half of section 25, Township 15 South, Range 23 Esat, San Bernardino Meridian, of the Bard &½ minute Quadrangle. This area is where the Spanish settlers mined gold for the first time in recorded California history, and lies one-quarter mile owest of present day Laguna Dam and adjacent to and underlying the All American Canal.[19]

The Potholes district had a reported total production of $2,000,000, taken out over a period of many years by a multitude of men (upwards of 400) working

independently. The miners usually operated in one or two man groups. They moved from gully to gully like nomads as old areas would cease to pan out and new ones were sought. The district, at gold prices of less than $35 an ounce, became uneconomical by 1900. Large scale hydraulic operations were attempted in this area and in the Picacho Basin, using the Colorado River as a water supply, during the 1890s without success. In 1942, evidence of old Mexican workings and arrastres were abundant in the area.[20]

Duncan, Trio and Senator mines

The Three C's or Duncan Mine, probably the source of the Potholes Distict gold, was one of the many mines in the Southeastern Chocolate Mountains area to be located close to the Colorado River. Owned by a R. J. Duncan of Yuma, the mine in the late 1800s consisted of a 150 foot shaft. Today it has 300 feet of horizontal workings and a 300 foot shaft with 5 levels.[21]

Located right next door, the Trio Mine operated during 1933 through 1935 by the Trio Mining Company. The All American canal flooded the mine workings in 1936. The Senator Mine, 1 mile northwest of the Imperial Reservoir, was located in June, 1877. It's peak period of production occurred from 1896 to 1900. Totaling the production from those years with it's production for 1935 shows 1,100 ounces of gold were recovered from its 3 to 8 foot wide quartz vein.[22]

Picacho Mine

Perhaps the most famous mine in this area, and in all of Imperial County, is the Picacho Mine (also known as the Dewitt C. Jayne Mine). Dr. Jayne was a New York drug manufacturer and one of the first to invest in this mine. His investment may have been profitable, but the Picacho Mine was beset with problems and bad luck every decade of its active existence.

David Neahr began construction for the mine of a fifteen stamp mill overlooking the Colorado River in 1879. In 1882, 8,000 tons of ore were mined, yielding an average of $21 per ton. Although the mill was profitable, Neahr was forced into bankruptcy when a dishonest employee stole $7,000. At approximately the same time, Neahr was seriously injured by a runaway horse and died in 1898.[23]

The California Gold King Mining Company, with former Colorado Senator Stephen A. Dorsey as president, consolidated the Picacho mines and operated them until 1906, when the Picacho Basin Mining Company took over. In 1902, a huge 450 ton mill was in operation, and by 1904 it had 700 employees with a monthly payroll of $40,000. A narrow guage train brought ore from the Picacho Mine to this mill, which was boasted as the largest cyanide plant in America. At this time the town of Picacho, which grew up and around the mill, consisted of some 2,500 souls.[24]

In July, 1904, a belt in the mill broke loose due to overloading, and the flywheel disintegrated, showering pieces through the roof and up to one-fourth of a mile downslope. Although workers repaired this damge quickly, construction of the Laguna Dam on the Colorado curtailed the hauling of ore concentrates by steamer to Yuma, and this, plus diminishing ore values, contributed to the final shutdown of the mill in September, 1910.[25]

In 1939, the Nipissing Mining Company of Canada hauled in a 200 ton mill from Tonopah, Nevada, in efforts to re-establish mining operations at Picacho, but World War II prevented the company from staging a comeback. Ruins of the mill, the machine shop of the 450 ton mill, and the boiler and tank are among the objects and buildings still standing. The total production estimate for the Picacho Mine is approximately $2,000,000.[26]

The townsite of Picacho is now partially covered by the Colorado River and is part of the Picacho State Recreation Area. To the east of the Picacho townsite lies White Gold Basin, named after the presence in that area of a gold with an abnormal amount of silver, causing it to appear white. Two mines, the Gilden Dream and the Mayflower, were both active in this area in the late 1890s and early 1900s.[27]

South of the Picacho townsite but north of the Picacho Mine were two placer mines, the Georgia Placer and Crescent Placer mines. Both are in Little Picacho Wash and were located in 1891. Source of the placer gold is presumed to be from the Picacho Mine area. Copper was discovered in the early 1900s in this same area. The Picacho Copper Mine is in a 100 by 1,600 foot mineralized zone. Although no recorded production is known to have taken place, the area is popular with rockhounders as malachite, azurite, black agate, chalcedony, and galena are found here and near Picacho Peak.[28]

California Picacho Mine

Placer deposits in Little Picacho Wash, first worked in the late 1780's were ignored for more than a century until the completion of the Southern Pacific Railroad to Yuma became a stimulus that led to a revival of interest in the area. In the 1890s the California Picacho Company consolidated title to these deposits, which were about 5 miles from the Picacho Mine referred to earlier. In 1893, a pumping plant was erected on the Colorado River and 5 miles of flumes were built by an English company, the Picacho Gold Mining Company. This group spent $240,000 before admitting the project was a failure in May, 1894.[29]

The stock promotion for this ill-fated venture was handled by Baron Grant, who had promoted the Emma Mine in Utah. A Liverpool soap manufacturer, R. W. Hudson, purchased most of the stock. The venture was labeled by a newspaper of the day as "one of the most absurd engineering feats ever undertaken in the West". The flumes leaked, and the pumps could not generate enough pressure to supply more than a trickle at the other end. By 1896, individual miners and prospectors were successfully mining the area by dry washing or hauling the gravel to the Colorado River by mule and were accomplishing through primitive methods what British technology could not.[30]

PAYMASTER DISTRICT

Productive as early as 1867, the Paymaster District, located 16 miles northwest of the Picacho District, includes the area between Quartz Peak and Midway Well. The

district is best known for it's silver and manganese production. Some copper at the Volunteer Group Mine was produced on a small scale throughout the 1920s. Chrysocolla, malachite, and azurite are found here. The Jet Black or Hodges Mine produced over 5,000 tons of manganese ore during World War I and II.[31]

The Paymaster Mine, located in the central Chocolate Mountains, has been and continues to be the most productive silver and lead mine in the county. After its discovery in 1867, supplies and a fifteen-stamp mill were shipped from San Francisco by boat around Baja California and up the Colorado River to a point near the mouth of Arroyo Seco, 13 miles northeast of the mine. Production continued until 1880, when at the 400 foot level the richer ore ran out. Shortly thereafter, the mill was dismantled and moved to the Cargo Muchacho Mine.

In more modern times the Paymaster was reopened when the remaining ore was discovered to have 6.2 ounces of silver per ton. It was operated from 1919 to 1921. The tailings were cyanided in 1922 and 1923, and in 1938-1939 the Paymaster again saw a brief period of operation. Total production from the Paymaster Mine was about 170,000 ounces of silver recovered from 25,000 tons of ore.[32]

Northeast of Glamis in the Paymaster District are a dozen or more gold lode and placer mines, all of shallow depth with little development. The oldest mine, the Mesquite Placers, date back to the 1880s, when 150 men were dry washing the area. This area most likely will become increasingly popular with the weekend prospector and the rockhound.[33]

NON-METALLIC AND STRATEGIC MINERALS[34]

Although not as glamorous as gold or silver, several non-metallic and strategic mineral deposits are mined in Imperial County. Most noteworthy is gypsum, which accounted for 50 percent of Imperial County's turn of the century mineral production. The Fish Creek Mountains District, located on the western edge of the county has produced more than eight million tons of gypsum , worth $24,000,000, since 1922.

Fourteen deposits, each different grade and texture of marble, are located in the Coyote Mountains in southwestern Imperial County. The Golden State Mining and Marble Company erected buildings and ordered machinery for a plant at National City to cut and finish the marble. Several carloads of the stone were shipped on the San Diego and Arizona Railroad in the early 1920s but the deposits are largely undeveloped.

Manganese and tungsten ore are among the strategic minerals found and mined in this county. Manganese accounted for only 6 percent of Imperial County's mineral production in 1907. The county now ranks first in total production in California. The Chocolate Drop Group and the Lugo Mine in the Palo Verde District of northwestern Imperial County were first developed in the years immediately preceding World War I. Most of the production occurred during a government buying program in the 1950s.

The county's most productive manganese mine, the Pioneer, is located several miles south of the Palo Verde District. Tom Clark and L. L. Morse discovered the manganese mine in the early 1910s, yet production did not really begin until J. J. Everharty acquired the claims in early 1917. The mine was intensively developed for two years, but the end of World War I caused a shutdown of operations due to lower ore prices. Five thousand tons averaging 39 percent manganese were mined during 1941-1944, the ore being concentrated in a mill about 6 miles northeast of the mine, near the Colorado River. Like the mines of the Palo Verde District, most of the production from the Pioneer Mine occurred in the early 1950s.

Imperial County supported the war effort by providing 8,000 tons of celestite, an ore of strontium, from 1939 to 1945 for use in the manufacture of tracer bullets and flares. This deposit, the Roberts and Peeler Mine, was located at the northwest end of the Fish Creek Mountains.

Tungsten is found at the P. K. Mine in the Jacumba Mountains, where most of the 2,128 tons of Imperial County's recorded tungsten production came from. Originally a gold mine, it was developed for tungsten during a government stockpiling program of the 1950s. The P. K. Mine is located 1,000 feet from the Mexican border. Tungsten is also found in the Cargo Muchacho Mountains, the Potholes area, and in the Paymaster District.

The Simons Brick Company mined 150,000 to 200,000 tons of clay at a location near El Centro from 1907 to 1928. The clay, a potentially important commodity in the county's future, was used in the manufacture of brick and tile.

Geodes are found at two locations nicknamed the Potato Patch and the Hauser beds. Both deposits are located in between the Palo Verde Mountains and the Black Hills, 9 miles southwest of Wiley Well. A variety of agates, jasper, and petrified wood are also found in the Palo Verde Mountains.

The aluminum silicate kyanite is found in southeastern Imperial County in the Cargo Muchacho Mountains. Kyanite is used in the manufacture of ceramic insulators and in the construction of kilns, furnaces, and boilers for a variety of industries. Located 2 miles northwest of the Cargo Muchacho Mine, the Bluebird Kyanite deposit was first commercially developed by the Vitrefax Corporation in 1925. The kyanite from this deposit was marketed under the trade names of "Argon" and "Durex". Ten thousand tons of ore were mined valued at $80,000.

Mercury was rumored to have been mined in the Palo Verde Mountains. A campsite there shows evidence of having been worked from the 1930s to 1940s but the only ore present there today is hematite.

Natural deposits of sodium sulfate occur 18 miles northwest of Niland and were developed into the Bertram Mine in 1919. Less than 1,000 tons of sodium sulfate was obtained during three years of activity (1923, 1941, 1942). A high magnesium content and steeply dipping deposit beds have caused the mine to become idle, yet large mineral reserves remain. Blodite, a mineral containing magnesium sulfate and sodium sulfate is collected at this mine by gem hunters.

Salt from the Salton Sea was recovered by solar evaporation from 1934 through

1945. The Imperial Salt Works were located 12 miles northeast of Niland along the southeast shore of the Salton Sea. The Mullet Island Salt Works were located 6 miles west of Niland and west of Mullet Island. The Mullet Island works produced salt that was mainly consumed locally for use in refrigerated railroads cars, and total production from both companies amounted to less than 25,000 tons of salt worth $75,000 to $100,000.

Carbon dioxide, one of the most interesting mineral resources in Imperial County is found at the southeast end of the Salton Sea. The geothermal steam potential of this area was first tested in 1927 by the Pioneer Development Company. The low pressure steam encountered was not economically productive, but large quantities of carbon dioxide in the steam were noted. For over a century explorers had noticed the presence of bubbles from this gas percolating up through the mud at thermal springs near Niland.

The first test hole drilled exclusively to test the commercial development potential of naturally occurring carbon dioxide occurred 7 miles southwest of Niland in September, 1932. Two years later the main carbon dioxide field, 5 miles long and 1 mile wide, was discovered 4 miles west of Niland. More than 160 wells were drilled over a 20 year period. Each well had an average productive life span of 2 years.

The Pacific Imperial Dri-Ice Inc., Natural Carbonic Products Inc., National Dry Ice Corporation and Cardox Corporation were among the companies that produced over the years an estimated 228,000 tons of liquid carbon dioxide and dry ice from the Niland field. Competition, a shrinking market, and the rising Salton Sea made production uneconomical by 1954.

IMPERIAL COUNTY-Looking towards the future

Imperail County has a rich historical mining heritage, being the site of the first gold production in California. In addition to its rich past, Imperial County may soon have an important role in the future of the desert. During the Depression, the Niland gas field area supplied southern California with ice, and was an important economic asset for the county. The geothermal steam present in the area, uneconomical by 1920s standards, is now becoming more and more attractive as America looks towards alternate energy sources.

Six KGRAs (Known Geothermal Resource Areas) are located in the southeastern Salton Sea area. These fields are being actively explored and studied by government agencies, and private universities and companys for their potential in supplying electric power, drinking water, and mineral salts.

Gypsum is presently an important mineral commodity of Imperial County and will continue to be one in the future. Gold and manganese will also play an important part in the future of Imperial County as sizeable deposits of these minerals also remain. The largest gold reserves are to be found in the Cargo Muchacho and southeastern Chocolate mountains, while a large reserve of manganese is found in the Palo Verde Mountains.

Gold, silver and tungsten values are found in the Chocolate Mountains Aerial Gunnery Range. The Mary Lode gold mine, Imperial Buttes silver mine, and Black Eagle tungsten mine are all twentieth century mines of limited development. The Mary Lode Mine produced at least 500 tons of $40 a ton ore. A rich pocket yielded $200 a ton ore, and was so rich that it was shipped without milling. The Imperial Buttes Mine was operated by the Marcella Mining Company in the 1910s. The Black Eagle was a World War II tungsten prospect with no recorded production. Although these particular mines are perhaps of no great historical significance, they point to the future and remind us of the mineral producing potential of our desert military reservations.[35]

FOOTNOTES

Imperial County

[1]*Arizona Sentinel*, February 16, 1895.

[2]N. H. Darton, *Guidebook of the Western United States, Part F, the Southern Pacific Lines, New Orleans to Los Angeles, U. S. Geological Survey Bulletin 845* (Washington, D.C. : Government Printing Office, 1933), pp. 242-257 ; George Daniels, *The Spanish West* (New York : Time-Life Books, 1976), p. 76.

[3]William B. Clark, *Gold Districts of California, Bulletin 193* (Sacramento : California Division of Mines and Geology, 1976), p. 154 ; Paul K. Morton, *Geology and Mineral Resources of Imperial County, Californrnia, County Report 7* (Sacramento : California Division of Mines and Geology, 1977), p. 7.

[4]P. C. Henshaw, "Geology and Mineral Deposits of the Cargo Muchacho Mountains, Imperial County, California," *California Journal of Mines and Geology* 38 (April, 1942) : 148.

[5]Ibid. ; Frank Love, *Mining Camps and Ghost Towns* (Los Angeles : Westernlore Press, 1974), p. 38.

[6]Paul K. Morton, p. 49 ; J. J. Crawford, *Thirteenth Report of the State Mineralogist* (Sacramento : California State Mining Bureau, 1896), pp. 333-334.

[7]Paul K. Morton, p. 60 ; Frank Love, pp. 115-116.

[8]*Arizona Sentinel*, December 7, 1895.

[9]Paul K. Morton, p. 60.

[10]Ibid. ; J. J. Crawford, pp. 337-33.

[11]F. J. H. Merrill, "The Counties of San Diego, Imperial,California," *Fourteenth Report of the State Mineralogist* (Sacramento : California State Mining Bureau, 1916), pp. 726-728 ; Paul C. Henshaw, pp. 147-196.

[12]Paul K. Morton, pp. 53,57.

[13]Ibid., p. 47 ; *Mining and Scientific Press*, November 28, 1914.

[14]Paul K. Morton, p. 47 ; Frank Love, p. 122.

[15]Paul K. Morton, pp. 48, 54.

[16]F. J. H. Merrill, pp.723-743.

[17]Paul K. Morton, pp. 1, 36 ; P. C. Henshaw, pp. 147-196.

[18]J. J. Crawford, p. 343.

[19]Paul K. Morton, p. 58 ; Kirk Bryan, *The Papago Country,, Arizona: a Geographic, Geologic and Hydrologic Reconnaissance, With a Guide to Desert Watering Places, U. S. Geological Survey Water Supply Paper 499* (Washington : Government Printing Office, 1925), p. 16.

[20]William B. Clark, p. 163 ; P. C. Henshaw, pp. 147-196.

[21]Paul K. Morton, p. 60.

[22]Ibid.

[23]Frank Love, p. 59 ; J. J. Crawford, p. 343 ; *Arizona Sentinel*, December 30, 1893 ; Peter Odens, *Picacho* (privately printed, 1973), p. 21.

[24]Paul K. Morton, p. 57 ; Peter Odens, p. 22.

[25]Frank Love, pp. 73-74.

[26]Peter Odens, p. 25 ; Paul K. Morton, p. 57.

[27]Paul K. Morton, pp. 52, 92.

[28]Ibid., pp. 38,50-51.

[29]J. J. Crawford, p. 333.

[30]Frank Love, p. 79 ; *Arizona Sentinel*, February 16, 1895.

[31]Paul K. Morton, p. 38.

[32]Ibid., pp. 92,93 ; Frank Love, p. 112.

[33]Frank Love, p. 179.

[34]The material in this section is based largely on the reports on each commodity found in Paul K. Morton, *Geology and Mineral Resources of Imperial County, California, County Report 7* (Sacramento : California Division of Mines and Geology, 1977), as follows: gypsum p.62; marble pp.66-68; manganese pp.72-78; celestite p.94; tungsten p.95; clay pp.34-36; geodes, gems pp.39-40; kyanite pp.65-66; mercury p.78; sodium sulfate pp.40,84; salt p.85; carbon dioxide p.33.

[35]Paul K. Morton, pp. 1,41,55,92,95.

CHAPTER TWO

RIVERSIDE COUNTY

Riverside, the fourth largest county in California, has been known for sporadic, small scale mining of gold, silver, lead, copper, uranium, fluorite and manganese. However, there have been sizeable, sustained mining operations at Midland for gypsum and in the Eagle Mountains for iron. The Mule Mountains became the site of the first gold discovery in the desert portion of Riverside County in 1865. It also appears that the iron ore in the Eagle Mountains was discovered in 1865. Matt Palen's 1880 discovery of copper in the Palen Mountains was followed by a modest amount of mining activity, but the gold-silver discoveries in the Chuckwalla Mountains in the late 1880s caused the most substantial gold rush to Riverside County in its history. Dry placer gold mining in the Eagle Mountains and at Chuckwalla Spring seems to have begun in the 1890s with some interest continuing until today. During this century there have been new discoveries, the reworking of old mines, the mining of iron at Eagle Mountain since 1948, and of gypsum at Midland between 1925 and 1968.

THE MULE MOUNTAINS (HODGES MOUNTAIN)

In the spring of 1861, nearly a year before his discovery of gold at La Paz, Arizona, Paulino Weaver discovered gold in the Mule Mountains. The location of his discovery was "on the west side of the river, twenty miles southward from this place [La Paz], and in a range of mountains a little below the road coming in." In July, 1862, a company was preparing to go and "prospect the place."[1]

Nothing more is heard from the Mule Mountains until April, 1908, at which time the newly constructed mill at the American Flag Mine was ready to start up on "enough ore . . . to keep the mill busy for a year." In September, 1911, the American Flag Mine resumed operations after shutting down for the summer, and the following spring ore from the Carnation group of mines was being run at the American Flag Mill. The Stanchfield Gold Mining Company operated the Carnation mines. That company hoped to erect a mill themselves to do away with hauling ore to the American Flag Mill, but it probably was never built. L. A. Stanchfield was part owner in the Senate Mine, as it was known in 1914, perhaps one of the Carnation group. Justus Smith owned two mines in the Mule Mountains, the Double Eagle and the Palo Verde, but it appears that no property was active here from 1914 until the 1930s. Justus Smith homesteaded in the nearby Palo Verde Valley, and in the 1930s was placer mining at the Chuckwalla Placers.[2]

In 1932, a *Palo Verde Valley Times* reporter visited the "old mining district," and wrote this interesting article: "*One of the historic but little visited places near*

Blythe, is the old Hodges mining territory about nine miles southwest of Ripley at the base of the Mule Mountains.

A Times *reporter made the trip and investigated the old seven-stamp mill, built possibly forty years ago, before highways or railroads were known in this territory. The old stamp mill is so out of date that some of the connecting rods were built of hardwood. Much ore had been ground there in the early days, judging from the dump pile. Motive power apparently had been by steam engine, and water was hauled for miles.*

Near the stamp mill is a four-room stone house, in good condition with the exception of the roof, and the concrete floor is in excellent condition. Dozens of shafts, drifts, and tunnels are found in the Mule Mountains. One interesting hoist near the summit was operated in the early days by burro power. Machinery with heavy castings had been transported in that almost inaccessible location. Heavy machinery was seen in several places, and the visitor cannot help but wonder what an effort it was to bring it in under the highway conditions of those days.

Not less than one hundred thousand dollars was spent here sometime at the beginning of the twentieth century to develop the property, judging from the relics found there today.

H. R. Sigfried and his father-in-law Mr. White are following up several good veins, and will ship a car of gold ore from the mines soon, loading at Ripley. They are busy building a road and already have out thirty tons. Their assay returned twenty-two dollars to the ton gross. They were kind enough to conduct Henry Waggoner, Mr. Brisson and myself through the mines. And if you should decide to make the trip, watch out for the shafts!"[3]

Other activity during the 1930s includes an interesting story of Sam Jackson, a young mining man from Colorado, who installed an electric powered concrete arrastre in a vacant lot in Blythe to work the ore from his mine in the Mule Mountains.[4]

The Stanchfield property, renamed the Roosevelt and Rainbow group of mines, and the American Flag Mine were described in detail by state geologists in 1945, but no mention is made as to when the mines were last active. This report does state, however, that ore at the American Flag Mine was milled in a "Gibson mill with a capacity of ten tons with amalgamation and cyanidation."[5]

In 1955 the whole Blythe area was infected with "uranium fever." In the Mule Mountains several companies made discoveries, and during March, 1955, the Mule Mountains Mineral Company, Inc. employed 8 men to begin mining.[6]

DOS PALMAS

Dos Palmas(two Palms) Spring was an important stop on the road to the La Paz gold diggings in Arizona. A correspondent of the *San Francisco Alta California* stopped at the spring in July,1862, discovering that some vandal had cut down one of the palms.

By noon that hot July day there were about 150 men camped at the spring. The *San Francisco Daily Evening Bulletin* later that month stated that at "Dos Palmos" there at one time was quite a little town, but now it was "nearly cleaned out." One fellow found an easier way to find gold than digging in the placer mines of Arizona, as in May, 1863, a "white man" had a hut there and sold liquor and grass (feed for horses), the latter of which was "brought from the mountains by Indians." It should be noted that Herman Ehrenberg, founder of the city of that name, was murdered here in 1866.[7]

Dos Palmas lay on the Bradshaw Trail, and when the railroad pushed its way down from the San Gorgonio Pass, a siding was graced with the name "Dos Palmos". This point became an important stage terminus for Ehrenberg, Wickenberg, and Prescott.[8]

It seems inconceivable that so many men, looking for gold, stopping at a place with such good accommodations, would not be lured into the nearby hills to prospect. In the 1880s and perhaps before, gold prospects were located 18 miles north of Dos Palmas Spring. By 1894, 2 tunnels with nearly 300 feet of underground workings had been driven on the claims, which oddly enough never were mentioned by name.[9] In 1896, 6 miles northeast of Dos Palmas, the Fish Mine owned by A.C. Fish of San Bernardino was active. The owner of the mine was building a two-stamp mill at Canyon Springs, 6 miles from the property. In 1916, it was reported that this mill was standing.[10]

In 1893, the Free Coinage and Charity mines were located 12 miles northeast of the spring. It was probably these mines which by the late 1890s were consolidated to form the Oro Copia Mine, and at that time a 2 inch pipeline was laid to the mine from Dos Palmas. The Oro Copia mine was tied up in litigation from about 1905 to 1912, but in 1912, the mine hummed with activity. Repairing and refitting of the pipeline in 1912 was carried out by Charles Brown of Mecca. At the spring there were 2 "curbed-up reservoirs 25 by 30 feet and 12 feet deep . . . the pump stands nearby and is a 3-cylinder Dean . . ." The pump was operated only 1 day a week to furnish ample water to the mine. At the mine there were 3 tunnels and "all the ore comes out the lower tunnel and is conveyed direct to the mill by a tramway in cars. The mill is a rotary, the equivalent of five stamps, and is fully equipped with a cyanide plant and complete in every respect."[11]

Although the mine was thriving in 1912, operations appear to have ceased shortly thereafter. In 1940, the old mine camp was about demolished. The tool house and blacksmith shop which had survived years of bad weather and vandalism had recently been blown down. The tailings and the foundation of the mill were all that remained.[12]

Frank Coffee, who had prospected the Chuckwalla Mountains and surrounding area since about 1885, built a cabin and settled at Dos Palmas sometime after the turn of the century. He located (or relocated and renamed) a mine in the hills north of the spring that he called the Good Enough Mine. Coffee died at the age of 77 in October, 1936. In November, 1940, his cabin was but "charred remains."[13]

The adobe walls of old Dos Palmas stage station had almost disappeared by the

winter of 1920, but this was still the camping place of prospectors, as it had been since the 1860s.[14]

AGLE MOUNTAIN

Gold and Iron ore may have been discovered in the Eagle Mountains as early as 1865. Certainly, by 1889 the existence of iron was established without a doubt. Some of the iron ore that was analyzed at that time yielded 64 percent iron, a trace of silver and some samples up to .8 of an ounce of gold per ton. Between 1889 and 1892, there was quite a bit of interest in this area. In 1892 it was reported that "the discovery of rich placers in the dry gulches of that section resulted in a more thorough investigation of its mineral resources and in the finding of some very rich gold-bearing quartz." With the proceeds of the dry placering, the miners paid for the construction of a "cemented basin . . . to catch rain water that falls during the winter season, with which it is intended to work the placer mines."

Dry placering has continued to the present in the Eagle Mountains.

In 1892, about 3 miles southwest of Cottonwood Springs (outside of Joshua Tree National Monument boundary), the Coyote Mine was established and 2 shafts 20 and 80 feet deep were sunk.[15] L. S. Barnes located claims in the Eagle Mountains, and about the same time William Stevens and Thomas Doffelmeyer located the Iron Chief Mine. Charles Lane of San Francisco purchased the mine in 1897. He installed a small mill on the property which produced about $50,000 worth of gold. The original owners took over the property and installed a fifty-ton cyanide plant when Lane failed to complete payments. They operated the mine and mill until about 1902. Total gold production from the Iron Chief Mine was $150,000. Water for the mine was piped 18 miles from Cottonwood Springs. In 1929, most of the camp was intact, consisting of a blacksmith shop, assay office and bunkhouse.[16] In 1901 T. J. Dofflemeyer, W. D. Stevens, John Mc Gregor and O. T. Stevens had 19 claims at the Iron Chief patented. In 1909 L. S. Barnes secured an option on these claims and sold them, as well as his own and those of Charles Brown of Mecca, to Henry E. Harriman of the Southern Pacific for a reported $300,000. Thus,the Iron Chief Mine, comprising 187 patented claims, 8 miles long and from¼ to 2 miles wide was in the hands of the Southern Pacific, and lay dormant until 1944, when Kaiser Steel acquired the property.[17] In 1945 the property was under option by Riverside Iron and Steel Company of St. Paul, Minnesota and under lease to Mineral Metals Company of Alhambra, California. Thirty men were employed in the process of mining, crushing, and trucking the ore to the railroad, where it was shipped to Wilmington, California for use as ballast on Liberty Ships. Up to 1945, 40,000 tons had been shipped.

In August, 1947, construction began for a new 52 mile railroad line from the Southern Pacific Mainline main line to the mines. This was completed June 23, 1948. In that same month, excavation was started by Kaiser at the Bald EagleMine, and the first shipment of ore was made on October 13, 1948. A pelletizing plant started operations on September 22, 1965. Eagle Mountain today is a thriving company-owned community on the flat east of the mines.[18]

In the meantime some other mines were opened in the Eagle Mountains. The most

notable of these was the Black Eagle Mine. Under option from 1923 until the latter part of 1928, the mine produced about $30,000 from 1,050 tons of ore. The ore yielded a respectable 23 percent lead, 6 percent copper, 16 ounces of silver and 15 ounces of gold per ton. In 1924, 6 men were working the mine. By 1928, there was a neat little camp here consisting of 3 tents with wooden floors. Water for the camp had to be brought in from Cottonwood Springs. A mill was constructed in the late 1920s, but it was unsuitable, and the mine and mill shut down. Between 1935 and 1940, some $200,000 were produced from the mine. In early 1939, a 100concentration and flotation plant was installed. Operating from July, 1939, to January, 1940, it yielded $53,706 worth of concentrates which were shipped to Midvale, Utah. During this time, 20 men were employed at the mine. Operations were suspended in December, 1940, and all the mine and mill equipment was removed. The property was leased to W. E. Covey of Indio in 1951. He mined 800 tons of ore and installed a small smelter, but it did not work out.[19]

Another mine of interest in the Eagle Mountains is the Storm Jade Mine. Barry Storm, the owner, had been hunting lost mines since the 1930s, when in the late 1940s, while looking for Henry Brant's lost gold mine, he stumbled upon a jade deposit. Storm built a tiny cabin for $150 and lived at the mine from 1956 until at least 1967. He was convinced his mines were the source of the Mayan jade. The biggest "nugget" of jade from his mines weighed 450 pounds; he broke it up and sold it in small pieces.[20]

THE COXCOMB MOUNTAINS

In March, 1911, J. J. Casey was in Blythe with some rich samples of ore discovered in the Coxcomb Mountains. Casey, Thomas Connors, and William Bailey were grubstaked by Gabe Lopez of Swansea, Arizona for a prospecting trip to the mountains. They discovered a ledge of gold-bearing rock reportedly 1300 to 1400 feet long and 5 feet wide. Samples of ore averaged $310 in gold per ton and 33 ounces of silver.[21]

In April, 1931, on the northeast side of the mountains, "Chuckwalla" Frank Webb and "Granite" Nick Molitor found some rusty tools and a rude stone house, the object of a long hunt. According to their story, in the 1880s, gold was discovered there. Some time after the turn of the century, the owner sold the mine, but the new owner was hit by an automobile which rendered him mentally impaired. Nick and Frank spoke with him and obtained directions. After looking for the mine for some time, they found it. Initial assays were from $65 to $850 per ton. Late in December of 1931, a truck filled with ore from the Longhunt Mine (belonging to Webb and Molitor) arrived in Mecca on its way to the Selby smelter in San Francisco. It is probable that these 2 mines mentioned in the 2 preceding paragraphs are the same.[22]

THE CHUCKWALLA MOUNTAINS

The first recorded mining in this mountain range, which was also called the

Hathaway Mountains, occurred in 1877. In January, 1877, Mr. Hathaway, in San Bernardino "from his mines back of Indian Wells (Indio)", had some ore assayed which ran $1,112 in silver. Another old mine in the range was known in 1888 as the Opulent (later the Red Cloud). This mine was described as "an old mine worked many years ago with good results, then abandoned."[23]

In the late 1880s, gold was rediscovered, a number of men rushed out to locate claims and in 1887, the Pacific Mining District was established. As organized, the district was some 12 by 30 miles in extent. By the end of October, 1887, 60 claims had been located, with ore assaying from $14,000 to $36,000 a ton in gold and silver! "Quite a little settlement" was reported to have grown up.[24]

The report of the State Mineralogist in 1888 briefly commented that "two five-stamp mills are running on gold ore." But James Orcutt, writing in 1890 of an 1888 visit to the area said, "Only one mill has yet been brought into the district and that has proved totally inadequate for the work, being but little better than a 'coffee mill' as it has been nicknamed." Eastern investors visited the area to select a site for a ten-stamp mill and a ten-ton smelter. At this time Frank Coffee laid the stone work at the Red Cloud Mine for a smelter, although it is doubtful that the machinery was ever installed. This impressive stone work still remains. The boom of 1887 fizzled, according to Orcutt, because the owners never had enough capital to work them properly.[25]

Two mines known as the Granite and the San Diego, were developed about 1894, near the northwest extremity of the mountain range south of Granite Well. John S. Brown observed in the winter of 1917-1918 that several buildings and a mill stood at the well. In 1924, the Chuckwalla Mining and Milling Corporation apparently reactivated this property. At that time, the property was equipped with a gasoline hoisting plant, compressor, aerial tram, pumps, tanks, pipelines and surface buildings. The mill was soon to be overhauled and re-equipped. After this work was completed, a small tonnage of ore, averaging $8 per ton in gold, was mined until 1929.

Southeast of the Granite Mine, on the south side of the ridge, the Lane Mine was operated in 1896 by Lane and Son, of Salton, who crushed the ore in an arrastre. Also, in 1912, the "Chuckwalla Express", made up of E. L. Blake and his 2 burros, operated weekly from Mecca to the Chuckwalla Mountains, a distance of 50 miles.[26]

In 1896, the Sterling Mine, operated by the Sterling Mining Company of Los Angeles, was the object of "considerable superficial work," and a ten-stamp mill was being constructed. About 1898, some 40 claims in the area were taken up by the Red

Cloud Mining Company, of which S. P. Crissinger was president. Three of the claims were the Red Cloud, Great Western and the Sterling. In February, 1901, the *Redlands Citrograph* reported the Red Cloud Mine consisted of 53 "heavily mineralized claims." A force of 50 men had been maintained for many months with a monthly payroll of more than $2,000, about $2 a day per employee. The company had installed a new hoist and a thirty-ton mill which was expected to be running in about a month. For 50 cents a share they were offering stock to raise money for the completion of a pipeline from Corn Spring to the mill, and construction of a tram from the mine to the mill.[27]

Some time before 1915, the property changed hands, being under the control of J. M. Huston of Los Angeles, who renamed the property the Red Head Group. His operation soon folded, and the stamp mill was moved to the Lost Horse Mine, now in Joshua Tree National Monument. George Blackburn of the Palo Verde Valley originally freighted this mill to the Red Cloud from Salton Station and Dos Palmas. In 1916, the mill was dismantled, and the 125 horsepower Corliss engine, 2 boilers, and seven-ton flywheel were hauled by Blackburn to Blythe for use in the Globe Cotton Gin. This monumental task took 36 mules 17 days to complete. In 1918, the Red Cloud was deserted, yet there were 2 tents in a side gully, and an occasional prospector would make camp here.[28]

The Red Cloud was idle until November, 1931, when it was leased and a small amalgamation plant was installed. The concentrates from the mill were shipped via Blythe to the U. S. Smelting and Refining Company at Midvale, Utah. In January, 1933, a shipment of about 20,000 pounds of concentrates was made which had an average value of $100 per ton in gold. In 1934, the S.&W. Mining Company secured an option on the property, and was active until December, 1936. In October, 1935, there were 12 men working on the property, and the County of Riverside was preparing to build a 10½ mile road to the mine from the state highway. The mine was leased by various parties from 1936 until 1940. By 1945, all equipment was removed from the property. Over $100,000 in gold was mined from this property.[29]

J. M. Huston, brief owner of the Red Cloud, also gained control of the Bryan Mine located 2 miles south of Corn Springs. This property was operated from 1898 to 1900 by two men named Adams and Pickering, who treated their ore in a two-stamp mill at Corn Springs. Some of the ore from the Red Cloud operation during 1898 to 1900 also may have been treated in this mill.[30]

Corn Springs seems to always have been an important place for local prospectors to camp. In the teens, a house at the springs was graced with a sign above the fireplace "Hotel de Corn Springs." A wall served as a register showing 20 to 40 visits a year. Tommy Jones, a prospector, lived at the spring until his death in 1923. Gus Lerder, sole resident and "Mayor of Corn Springs" lived in the cabin and occasionally prospected nearby until his death in 1932. Jones was a poet of sorts, while in his spare time Lerder painted. Gus Lerder kept up the springs, and after his death "the resort became badly run down." In 1935, with money from Riverside County, the spring was cleaned out and the underbrush cleared. The Blythe newspaper also reported "Corn Springs already has been set aside as a national monument, because of the great number of ancient Indian hierogryphics [sic], according to Talbot [county supervisor] . . ." The BLM has established a campsite at Corn Springs.[31]

CHUCKWALLA PLACERS—AUGUSTIN PASS

On March 28, 1912, the *Palo Verde Valley Herald* reported that a murder had taken place at the Chuckwalla placer diggings, thus for the first time thrusting the Chuckwalla placer diggings at Chuckwalla Spring into the news. For about 15 years following the turn of the century, there were always 2, 3, or as many as a half-dozen prospectors camped here, placer mining or prospecting the nearby mountains.[32]

Martin Augustin began prospecting in this area in 1917, eventually building a cabin 2 or 3 miles from Chuckwalla Spring. In May, 1924, Augustin discovered a vein that carried 46 percent lead, 8½ ounces of silver and $1.50 in gold per ton. He dug a shallow shaft at the site. J. H. Williams, another prospector and a friend of Augustin came to Calexico to try and interest investors in this new mine, but all is quiet as to the result of his trip. A map of mineral deposits in Riverside County published by the California Division of Mines and Geology shows Augustin's mine in Sections 8 and 17, Township 8 South, Range 17 East.[33]

The most recent mining in this area has taken place at the Cap Hunter Mine northwest of the spring. In 1951, a small shipment of ore was made from the property. This may be the same mine which was active in the beginning of 1912, owned by Captain Hunter.[34]

ARICA MOUNTAIN

The first recorded mining in the Arica Mountain appears to have been done by Lum Gray. Gray and a Civil War friend, John L. Thomas Brown, had prospected together for many years. Gray discovered gold here, probably in early 1894, and he, with help from his brother, opened a mine named the Onward. Not to be stingy with his success, he invited John T. Brown out, who opened a mine on the same ledge to the southwest. According to Camile Dekens, later involved in freighting in that area, Gray dug a well and shipped a three-stamp mill to the property. Lum Gray died sometime after the turn of the century and his brother Bud took over.[35]

In May, 1912, the property, then known as the Arica group of claims, was leased. Jack Gray, the son of Lum Gray by a former Negro slave, had pretty well taken charge of operations. In November, Jack visited Blythe and reported that 25 men were at work and shipments of ore would be made to Jerome within a few days. This activity seems to have been short-lived.[36]

About March, 1913, the mine was leased to Mr. J. V. Priest of the Assets Realizing Mines Company. In September, 1914, it was reported that "more than $100,000 has been expended on improvements on the property in the way of buildings and underground workings." This article continues by saying they "bought a ten-stamp mill and will have it on the property in the next few days . . . The stamp mill will be put up at the mine and water supplied by pumping from wells about 3 miles distant." In November, 1914, when state geologists visited the property, 10 men were working at the mine and preparations were being made to ship ore. No mention is made of the mill, but mention is made that water was being pumped from Brown's Well to the mine.[37]

By this time, John T. Brown had died, and his son, Floyd, and Jessie, Floyd's wife, were working the elder Brown's mine. In the November, 1914 visit, the state geologists reported that there was a three-stamp mill on the property. If this was the mill referred to earlier as being shipped to Lum Gray's mine, either Mr. Dekens was mistaken about the original location, or this mill was moved.[38]

It was about this period of time, Camile Dekens relates, that Al Eaton purchased the tailings from Jack Gray's three-stamp mill, which had processed Gray's and Brown's ore. Dekens hauled 3 metal tanks, a gasoline engine and a retort to the mine. Eaton worked about a year treating the tailings with cyanide, employing a Mexican to haul water from Brown's well and gather firewood. Every week Eaton would meet Dekens at Brown's well with a block of gold 2½ x 3/4 x 5 inches, which would be quietly given to the station agent at Blythe Junction (Rice). Eaton told Dekens he took out $100,000, which was more than was taken out of the ore the first time. The three-stamp mill and the donkey engine remained at the mine until junk dealers stripped the mine during World War I.[39]

In January, 1916, a hundred-ton mill was reportedly being built at the Priest Mine, but its existence is not mentioned elsewhere. On January 11, 1917, James Priest put on a crew of 17 men at the mine to repair the road and ship ore. In April, a Lane Chilean mill was moved on the property, and it was expected to be operational by June. More men had been hired; now the total was up to 25. However, shortly America became involved in the war in Europe, and early in the war the mine shut down.[40]

After a total lack of activity for 2 years, in November, 1919, the Assets Realizing Company again tried at the mine. Under the direction of Mr. A. Hoagland, "a force of men" began work at the mine. They had plans to replace the cyanide plant with a flotation process. Operations soon were suspended again, and it was not until the late 1920s that the mine was relocated by E. E. Schellenger and Henry Hartman, two local prospectors. In 1929 there was a ten-stamp mill and cyanide plant at the mine. It is difficult to say when this mill was installed; perhaps it is the mill installed in early 1917 by Priest. There is no mention of it after 1929.[41]

In the early 1930s, two properties were active in Arica Mountain. The Gray Mine, operated by J. M. Shiner and a Mr. Baker, was one of these properties. Shiner and Baker, in January, 1932, had just finished installing a new headframe and a twenty-five-ton ore bin, and had shipped a railroad car of ore to the smelter in Superior, Arizona. By the end of the month, it was reported they had shipped 2 more carloads, and 12 men were at work at the mine. A month later, on February 25, it was reported they were ready to ship their sixth carload of ore.[42]

About this same time, Edwin White and others opened the Arica Mine on Arica Mountain. Their first shipment of ore took place in early November, 1931. Early in December, 1931, a John Deere tractor was brought up to the mine to serve as an engine for the shaft hoist. These men also bought a truck for hauling out ore and began talking about installing a small mill in order to ship concentrates. Winter was busy and by February 25, they had shipped 5 carloads of ore via Rice, where an ore loading platform was completed January 8, 1932.[43]

Nothing more is heard about the Arica Mountain mines until September. The Arizona smelters were closed during the summer of 1932, a condition that forced White and his associates to put in a mill or quit. In September, a three-stamp mill was installed, powered by the old John Deere tractor, and White anticipated employing 7 men. In April, 1933, it was announced that Edwin White, P. B. Mc Intyre and Louis Facet sold interest in their mine to R. E. Douglas of Los Angeles,

who planned to install a mill, and had already built a house on the property. These plans may never have materialized, for nothing more is heard about mining in Arica Mountain.[44]

RIVERSIDE MOUNTAINS—BENDIGO DISTRICT

Over the years the Riverside Mountains have been quite a busy place. In 1911, it was reported about the gold property owned by the Steece Mines Company of Springfield, Massachusetts that, "several years ago considerable ore was shipped from here to the Selby smelter. The ore was trammed to the river then loaded on boats and floated to Yuma where it was transferred to [railroad] cars . . . This company [Steece Mines] has had it about 2 years." By May, 1911, the company had sunk a shaft to a depth of 350 feet (other reports put the depth at 800 feet). Sinking of the shaft continued all summer with a large force of men expected to be employed by late November, with the arrival of Mr. Steece from the East Coast. Activity continued at least until the winter of 1913.[45]

In 1898, the Mc Kesson group of claims were located and soon taken over by the Calzona Mines Company. In 1911, the Calzona property was owned by Dr. Robert Vermilyea of Redlands. At a depth of 50 feet, the miners struck an iron-manganese rich cap rock, known as a gossan. This gossan was void of precious metals, butthey continued to sink the shaft, reaching 300 feet and limestone in September, 1911. On the 100 foot level of the shaft, a cross-cut was driven which encountered "the ore body" which " reportedly was running $500 per ton." The Calzona camp during 1911 was outfitted with an assay office, equipment, and office buildings, including a company store. Water was pumped 5,000 feet from the Colorado River. During the summer, 10 men worked at the mine, during the winter, 30.[46]

Early in October, 1912, the Calzona mine was purchased by the Republic Smelting Corporation. This company immediately came in with big plans. They put in a wagon road costing several thousands of dollars. Without wasting any time, they surveyed a route from the Santa Fe tracks to the mines for a railroad. This was never constructed. In February, 1914, 4 men were employed mining the property. The Calzona Mines Company continued to operate the former property until 1916. In 1920, the property was sold to the Mountaineer Mining Company of Los Angeles. During 1934, 12 men were employed in construction and mining. An air compressor had been installed, and a twenty-four-ton flotation plant was erected for treatment of the ore. In September, 1935, the mill capacity was increased to 50 tons a day. Twenty-six men were employed, working 2 shifts on the mine and three shifts at the mill. The new mill operated only about a month, treating 1,460 tons of ore. Operations at the mine were suspended in October, 1935, due to low recovery of the gold by flotation. In 1938, it was reported that 15 men were employed at the mine. High grade ore was being shipped to the Magna Smelting Company.[47]

The Jackknife Group, known later as the Morning Star Mines was owned in 1911 by Cal Morgan and H. D. Bradley of Calzona. This mine, on the same ledge as the Calzona, adjoins it on the east. The first shipment, consisting of 25 tons of ore, per ton. Water for this mine was pumped 3 miles from the Colorado River. Between

1918 and 1919, an additional 400 tons of ore was shipped from the property, carrying 14 percent copper and $20 in gold per ton.[48]

PALEN, McCOY, MARIA MOUNTAINS

The area encompassing the Palen, Mc Coy and Maria Mountains, partially including the Ironwood Mining District, may have been mined as early as 1862. A portion of this area lies in the old Chemehuevi district which extended north from the present city of Blythe, opposite the mouth of the Bill Williams River, and back about 20 miles from the Colorado. Although the main activity in the Chemehuevi District seems to have been confined to the Copper Basin area in the Whipple Mountains, mining during this same time (1862-1865) is known to have taken place in Mule Mountain, and in the Turtle Mountains (in San Bernardino County) and some also may have taken place here. During the early 1880s, Matt Palen and William McCoy prospected in the area and opened mines.[49]

Palen Mountains

Matt Palen and H. Connor discovered copper in the west central part of the Palen Mountains about 1880. This discovery interested others in the remote mountain range, and more mines were developed. The *San Bernardino Valley Index* of May 13, 1881, reported that mines owned by "E. S. Short, Van Slyke, Sommers, McCoy, Cox, and others, have been bonded by R. J. Whitton and associates . . . Their mines are situated about 24 miles northwest of Ehrenberg, on the California side of the Colorado River. These mines are now being worked and are looking spendidly. The mines are valuable for copper, but contain both gold and silver. . . In this same district, the Moore Mine and what is known as the Palen mines . . . have been bonded by the same parties." Less than a year later, in February, 1882, some "nearly pure copper averaging 80 percent" was brought into San Bernardino from the Cox mine, but nothing further is heard from these mines until the turn of the century.[50]

Around the turn of the century, 3 small copper mines were developed in the Palen Mountains: The Homestake, also referred to as the Lightfoot, about midway down the range on the east side, the Orphan Boy, 2 miles south of Packard's Well, and the Palen Copper mines. The Homestake and Orphan Boy are never again referred to as being active, although Harwood Robbins, owner of the Crescent Copper Mine in the McCoy Mountains, relocated the Homestake in 1914. In 1914 the Orphan Boy is listed as abandoned. The Palen Copper Mine consisted of 2 claims: the Copper-Silver Glance and the Ophir. The Palen Mine was rediscovered by a prospector in 1969 and the Independence and Jackson group of claims were located. Tests reveal rich copper-silver-gold ore at this mine. In addition there is a stone structure, possibly Matt Palen's dwelling.[51]

In September, 1913, Tom Furgeson and Will Cummings of Mecca discovered iron in the extreme south end of the range. In 1945 several open cuts were on the property, but there has been no major development of this deposit.[52]

Copper in the McCoy Mountains

By 1902 the Badger State group of claims on the northeastern side of the McCoy Mountains had over 300 feet of shafts and cuts, and could no longer be termed a prospect. Mr. S. P. Cressinger, owner of the Red Cloud Mine in the Chuckwalla Mountains, also owned this mine and several other copper mines in the McCoys. About 1907 the property was reportedly sold to E. E. Schellenger and his associates. It was probably this same property which was operated by the Riverside Copper Company, perhaps on a lease.[53]

On December 27, 1908, a party of men headed to the mine for 5 months of labor. In March the mine closed for the summer, having taken out a "car load of fine ore for shipment" via Glamis. Altogether, until the property was sold in late 1909, five shipments were made to the El Paso, Texas, smelter by the owners.[54]

The mine was then sold to Harwood Robbins of Riverside. In 1911 Robbins, president of the Continental Mining Company, operated the property now known as the Crescent Mine. Initial work "with a big bunch of men" that November in part consisted of building reservoirs and other maintenance at the camp. The mine shut down for the summer of 1912 and was again reopened in September. At least 4 men were employed there during the winter of 1913. In April, 1914, Fred Goldsberry, one of the miners, came to Blythe for supplies and commented that "development work in charge of A. M. Hickley is going forward rapidly." In January, 1917, ten men were working the mine. This schedule of mining during the winter months continued until summer of 1917 when the mine was closed.[55]

The Palisade Mine

In March,1918, Mr. A. Villman, a Blythe undertaker and barber, sold his barber shop and became a real miner. Villman had prospected the area north of Blythe with Wiley A. Hanson, better known as "Zinc" Hanson, a wealthy "quiet retiring elderly man" known in several states as a pioneer and successful mining man. Together they discovered a deposit rich in zinc and other minerals such as lead, copper, silver, bismuth, and gold. The mine, known as the Palisade, lay "high on the side of a rugged mountain in the Santa Marias," 20 to 24 miles north of Blythe and 3 miles from English siding. Work began on the mine in late February, 1918, and progressed until April 20, when a tenthouse with many supplies were destroyed in a fire which did about $200 in damage. The fire, which destroyed the camp, took place while the workers were in Blythe and was caused by a stove.[56]

It was decided to wait until fall to begin operations again. In mid-September, 1918, Villman and Hanson returned and made an important announcement: The mine was to eventually employ from 200 to 300 men or more and "the mineral is present in quantities that seem likely to transform this region to another Joplin, Missouri." In September there was a 100 foot shaft on the property and before long 15 men were to begin active work. By November, when the Palisade Mining Company was incorporated with Hanson, Villman and C. E. Yost as the primary stockholders, 4 or 5 carloads of ore were on the dump waiting for shipment. However, a road to connect with the railroad was not begun until March, 1919, and the first shipment

of ore still had not been made. The mine probably maintained a low level of activity until January, 1920, when it was reported that the owners of the mine had contracted M. M. Davis to sink the existing 60 foot shaft another 60 feet. However, the price of silver, zinc, and copper fell significantly after this. Although the claims were owned in 1929 by a Mr. Neal of Kingman, Arizona and renamed the Neal group, they were idle until 1950. Dan Figueroa, a resident of Blythe renamed the property the Bald Eagle Mine, and operated it for two years. During that time he shipped 237 tons of ore which yielded lead, silver, zinc and copper.[57]

Manganese

Along with tungsten and other metals, manganese is used in the manufacture of certain hardened steels. During World War I, the demand for these minerals was high and as many as 10 mines were active in the vicinity of the McCoy Mountains north of Blythe. From 225 to 300 men were reported to have been mining these properties at one time in 1918. In all, 5,000 tons of ore, averaging 42 percent manganese were shipped during the war years from these deposits, via Brown Siding on the California Southern. In 1915 the Doran manganese claims, 6 miles south of Packard's Well, were located on the top of a ridge. While high grade ore is present, the deposits are virtually inaccessible, and because of this, they have never been developed. Also during World War I, the property later known as the Langdon Deposit, 3 miles west of Cox siding, was active.[58]

With the fall in price of manganese, these mines were dormant until World War II. Beginning in February of 1942 the Arlington Mine, one of the mines in the McCoy Mountains developed during World War II, shipped about 8,500 tons of ore via Inca (Cox) Siding. Twelve to fifteen men were working at the time. The camp in 1945 consisted of 5 houses. During early 1944 the Langdon deposit was leased to J. Figueroa who made several small shipments of ore to the Metals Reserve Company's stockpile at Parker, Arizona. The mines in this area were quite active until early 1945 when production practically ceased due to specifications of the government-created Metals Reserve Company's board, which none of the deposits could meet.[59]

Flourite

About 1910 Jack Gray discovered an unusual mineral 3 miles from the summit of the California Pacific Railroad. Taking some samples to J. H. Lightfoot, local prospector and mine owner, he identified the mineral as fluorite.

The market for fluorite at that time was not very good, so nothing further was done. However, by 1917 the price had risen enough to make the deposit marketable. In July the property was leased by the Riverside Portland Cement Company. Floyd Brown and Lightfoot received the contract for mining and hauling the ore. By September, five men were working at the mine, and it was hoped that 200 tons a month could be shipped. The property was relocated as the Red Bluff Fluorspar Deposit, owned by Tom Ashby of Rice and others. During 1944, 130 tons were mined and shipped from the property.[60]

Palen Mountains Gypsum

In 1904, just north of the Palo Verde Valley, Montague Mascot located 4 claims in the northwest end of the Palen Mountains for gypsum. This activity did not go unnoticed, and between January, 1905, and May, 1906, at least 13 claims were filed in the north end of the Palen Mountains, 2 miles south of Packard's Well, by H. R. Adams and others. The Palen Gypsum Deposit was purchased sometime before November, 1920, by Bob Montgomery of Rhyolite, Nevada fame, who organized the Standard Gypsum Company. On November 18, 1920, the *Blythe Herald* announced plans for the deposit that included a railroad from Packard's Well to a point on the Santa Fe west of what was then known as Rice Junction. In May, 1921, Montgomery himself was in the area inspecting his property, but there was no production from this remote deposit. Some of the gypsum in the Palen Mountains was claimed in the late 1930s by John Webb, and several former residents indicate that U. S. Gypsum purchased the Palen Mountain gypsum property in the late 1940s.[61]

Midland

The events surrounding the discovery of Gypsum at Midland have become clouded with a great deal of local folklore, and even early accounts disagree. However, all of the accounts have one person in common--Floyd Brown.

In a March 12, 1911, *Los Angeles Times* article the discovery is thus recorded:

It is said that Brown discovered his gypsum deposits in the most peculiar fashion. On one of his stage journeys two years ago, he was forced to camp out, owing to the swollen condition of a mountain stream. In the night one of his horses strayed away and, shortly after daybreak after following it several miles, he found the animal in a gulch.

The horse had injured its leg and was unable to rise. Brown sat down on a stone some distance away wondering what he would do, when of a sudden, looking toward the top of the opposite gulch wall, he saw the gypsum. He marked the place and later, when time was more auspicious, located the claims which are bringing him a fortune.[62]

In another version of the discovery, Camiel Dekens, a close friend and former employee of Brown, remembers that Henry Hartman, a prospector and a fellow responsible for the sinking of several desert wells "discovered the gypsum deposit at the place now called Midway on Brown's grubstake." The fact that Hartman's signature appears on the January, 1907, claim notice with those of Floyd Brown, his father and wife tends to confirm Dekens' story.[63]

After the initial discovery of gypsum in the Maria Mountains by Hartman and Brown, several additional claims were located by others. Jack Gray located a claim he named "Gray Gypsum" a few miles east of Brown's discovery. L. L. Schellenger, a mining man who had located gypsum in the Ironwood Mountains in 1906, located the Gypsum Mammoth claim just south of Brown's in January, 1908. These claims, as well as some located by P. A. English of the United States Gypsum Company in March, 1910, were the object of an extensive prospecting effort by the United States

Gypsum Company in 1910 to determine the value of the property.[64]

Once the United States Gypsum Company proved the quantity and quality of the deposit, they purchased the claims from Brown, Gray, and Schellenger. In March, 1911, Brown came to Los Angeles for final negotiations with the company and for payment. The *Los Angeles Times* reported that the selling price "was said to be $100,000." However, Dekens' account seems somewhat more believable. He states that Hartman and Brown split the $7,000 that U.S. Gypsum paid, because Hartman found the deposit on Brown's grubstake. When his company bought the claims, English stated that he had spent over 3 years in California, Arizona, Nevada, and other western states looking for and testing gypsum deposits, and except for one other deposit, located in Nevada, the Maria Mountain deposits were the only ones which filled the bill for profitable gypsum operations. Over the next few years until June, 1913, the company continued to put down drill holes and prospect its property. However, this site lacked two important things: good transportation and water.[65]

After many years of waiting, on April 1, 1915, work finally began on a railroad to the Palo Verde Valley from Blythe Junction. By June, 1916, the railroad had reached Mineral Station, 5 miles southeast of the gypsum deposit, and the line was complete to Blythe on August 9, 1916.[66]

On June 1, 1916, as the railroad was being laid past the deposit, large scale plans were announced for the gypsum property. A railroad line 2 miles long was to be constructed at the cost of $35,000 connecting the mines with the yet-to-be-constructed plant. The plant was to employ 200 people. At the same time as this announcement, 2 carloads of pipe arrived which were to be laid from the United States Gypsum Company's well to the mines. The company's well, drilled in the summer of 1914, was located 3 miles north of the deposit. Prior to this, water was hauled from a well near present Blythe at enormous cost by mule teams.[67]

From late 1916 until the spring of 1917, a force of about 25 men were at the mine shipping gypsum. On May 26, 1917, the *Palo Verde Valley Review* announced, "Bids are now being submitted for a three-mile railroad grade from Santa Maria station of the California Southern to the mine, work to be completed by September 1." The U. S. became involved in World War I in the spring of 1917 and these plans were shelved until 1925.[68]

In 1925 about a dozen men were employed in construction at the Maria Mountain gypsum deposit. The first thing constructed was the base for the 2,000 horsepower engine, and then the foundation for the crusher. The company hired an engineer to survey a line for a narrow-gauge railroad to the Brown Mine, but the company employees seem to have been responsible for its construction.[69]

The first shipment of crushed gypsum left Midland October 2, 1925. During that year, 4,742 tons were sold. The capicity of the plant at Midland continued to grow as did the population with each new addition. In 1928 a calcining plant was added, expanding the product list to include plaster. In 1933 the first wallboard plant was added and many new employees were hired. There was a critical housing shortage at the plant, and many people lived in tents until new housing could be built. In 1935

Midland finally got a permanent Santa Fe Railroad station, replacing the box car which had been serving that purpose. About this same time tennis courts were built which served as a gathering place for the whole town. The town also had a softball team, with the Blythe team being its arch-rivals. A fourth board plant (the last of the significant additions to the property) was added in 1937. During the construction of the plant, the company built a huge building for housing the construction people, which later was converted to a community center.[70]

In 1936, the Victor Mine opened on the site of the claims purchased from Schellenger. This mine was wholly underground. For many years, the rock was hauled out of the mine by 2 mules. Later, 2 battery-operated locomotives did this job. Rock from this mine was hauled to the plant in trucks.[71]

During the Second World War, the need for quick construction of armed forces installations boosted the employment to an all-time peak of over 400. However, the attrition rate was huge; during one year more than 5,000 men passed through the plant.[72]

The war was quite real to the people of Midland. On more than one occasion, the army of General Patton invaded the town. Tanks rumbled through the town as snipers hid under the buildings. One morning the workers woke up to find the main haulage road to the Victor Mine blocked by a raised mound of dirt, which tanks were using for crossing. The army refused to remove it, so the workers sat on the roof of the plant and watched the war games in the valley for a few days.[73]

In 1946 the Brown Mine shut down and the narrow-gauge was torn up, with some of the rails being used as clothesline poles. The Victor also shut down (to be converted into a civil defense shelter in 1962), and an open pit was developed. A serious slump in building during the early 1950s forced the layoff of many employees, but things were looking better by the late 1950s.[74]

During the period of 1956 to about 1960, many improvements were made in the living conditions at Midland. Television was cabled down from a neighboring hill, natural gas, and electricity was brought in from lines running through Blythe, and telephones were installed in each house. However, these improvements were enjoyed for only a short time, as the Midland plant was closed in December, 1966.[75].

There were several factors influencing the closure of the Midland plant. Among them were poor quality of rock,high cost of transportation to and from this remote location, high cost of water (which was hauled in from Blythe), and a downturn in construction. Besides, U.S. Gypsum had a new plant at Plaster City which didn't suffer from some of these problems.[76]

A Dallas company was awarded the contract for demolition of the plant and Paul Alewine, a resident of Parker, was going to move the houses and sell them. However, the city of Blythe, perhaps fearful of a sudden influx of substandard housing, put severe restrictions on moving any houses there. Many houses were moved to Parker

where they sit derelict today. In 1973 the remaining 22 houses at Midland were burned down in a training exercise for Arizona and California firefighters. Today about all that is left is the chimney of the school, the pad for the tennis court and some of the foundations of the mill.[77]

From the rubble a new industry has been established. "Palo Verde stone" is removed from the hills for use as decorative rock for building fronts, and is shipped from the site of former Midland.

Uranium

The first rumors of uranium in the Maria Mountains began about September, 1954, and in November the word was out. The Palo Verde Mining Company had staked 241 claims for uranium between Midland and the Colorado River at the weir northeast of Blythe. By February, 1955, plans were announced to drill the main ore bed to find out how much there was. Although this uranium fever did not subside for a couple of years, nothing more was printed concerning this deposit in the local newspapers at that time.[78]

FOOTNOTES

RIVERSIDE COUNTY

[1]San Francisco Evening Bulletin July 19, 1862.

[2]*Pacific Miner*, April, 1908 ; *Blythe Palo Verde Valley News*, September, 1911, March 23, 1912 ; Federick J. H. Merrill, "Riverside County," *California Mining Bureau Report 16*, 1919, p. 81 ; Randall Henderson, "We took the Old Trail to Chuckwalla Spring," *Desert*, January, 1957, p. 5.

[3]*Blythe Palo Verde Valley Times* February 11, 1932.

[4]Ibid., December 17, 1931.

[5]W. B. Tucker and R. J. Sampson, "Mineral Resources of Riverside County," *California Division of Mines Report 41*, 1945, pp. 142-143.

[6]*Blythe Palo Verde Valley Times*, March 24, 1955.

[7]*San Francisco Alta California*, July 21, 1862, May 29, 1863 ; *San Francisco Evening Bulletin*, July 28, 1862 ; Randall Henderson, "Waterhole on the Old Bradshaw Trail," *Desert*, January, 1947, pp. 4-7.

[8]Frederick E. Shearer, ed. *The Pacific Tourist* (New York : Adams and Bishop, 1884, reprinted 1970 by Crown Publishers Inc. : New York), p. 346.

[9]Henderson op. cit.

[10]J. J. Crawford, "Riverside County," *California Mining Bureau Report 13*, 1896, p. 371 ; Merrill, p. 81.

[11]J. J. Crawford, "Riverside County," *California Mining Bureau Report 12*, 1894, p. 221 ; *Indio Date Palm*, February 7, 1912.

[12]John W. Hilton, "Petrified Bacon," *Desert*, November, 1940, pp. 13-16.

[13]Henderson op. cit. ; Hilton op. cit. ; Nevada C. Colley, *From Malne to Mecca, (Indio : Nevada C. Colley, 1967), pp. 100,103,144 ; The Good Enough Mine was described near the Red Cloud Mine in the Chuckwalla Mountains in the* Indio Date Palm, February 7, 1912.

[14]Henderson op. cit.

[15]*Blythe Palo Verde Valley Times*, April 7, 1960 ; W. A. Goodyear, "San Diego County," *California Mining Bureau Report 9*, 1889, p. 154 ; W. H. Storms, "San Diego County," *California Mining Bureau Report 11*,, 1892, p. 386 ; *Indio Daily News*, April 8, 1967.

[16]Tom Patterson, *Chronology of Eagle Mountain Iron Ore Mine*, Unpublished copy in Indio Library files ; W. B. Tucker, "Los Angeles Field Division : Riverside County," *California Mining Bureau Report 20*, 1924, pp. 191-196.

[17]Tucker and Sampson, pp. 145-146 ; Tom Patterson *op. cit.*

[18]Tucker and Sampson, op. cit.

[19]J. Grant Goodwin, "Lead and Zinc in California," *California Journal of Mines and Geology* 53 (1945) : 604 ; Tucker, pp. 191-196 ; W. B. Tucker, "Riverside County," *California Mining Bureau Report 25*, 1929, pp. 474-476 ; W. B. Tucker and R. J. Sampson, "Current Mining Activity in Southern California," *California Division of Mines Report 36*, 1940, p. 47 ; Tucker and Sampson, 1945, pp. 146-147.

[20]*Indio Daily News*, May 26, 1967.

[21]*Blythe Palo Verde Valley Herald*, March 16, April 20, 1911.

[22]*Indio Date Palm*, November 20, December 18, 1931.

[23]*San Bernardino Daily Times*, January 31, 1877 ; Charles Russell Orcutt, "The Colorado Dessert," *California Mining Bureau Report 10*, 1890, pp. 900-906.

[24]Redlands Citrograph October 29, 1887, February 16, 1901.

[25]William Irelan Jr., "San Bernardino County," *California Mining Bureau Report 8*, 1888, p. 500 ; *Redlands Citrograph*, October 29, 1887 ; *Riverside Enterprise*, May 12, 1978 ; Orcutt, pp. 900-906.

[26]Merrill, pp. 78-80 ; R. B. Saul, et. al., *Map of Riverside County California, Showing Locations of Mines and Mineral Resources, California Division of Mines and Geology Open File Release 68-7*, 1968 ; Crawford, 1894, p. 224 ; Crawford, 1896, pp. 310,313-314 ; John S. Brown, *Routes to Desert Watering Places in the Salton Sea Region, California, U. S. Geological Survey Water Supply Paper 490-A* (Washington, D. C. : Government Printing Office, 1920), pp. 79-80 ; John S. Brown, *The Salton Sea Region, California, U. S. Geological Survey Water Supply Paper 497* (Washington, D. C. : Government Printing Office, 1923), p. 239 ; *Los Angeles Mining and Oil Bulletin*, February, 1924, p. 199 ; Tucker, 1929, p. 480 ; Tucker and Sampson, 1945, pp. 133-135.

[27]J. Smeaton Chase, *California Desert Trails* (Boston : Houghton Mifflin Co., 1919), pp. 347-350 ; Crawford, 1894, p. 224 ; *Redlands Citrograph*, February 16, 1901.

[28]*Blythe Herald*, March 12, 1936.

[29]*Blythe Palo Verde Valley Times*, January 5, 1933, October 31, 1935 ; Tucker and Sampson, 1945, pp. 140-141.

[30]Merrill, 1919, p. 79.

[31]Chase, 1919, pp. 347-350 ; *Blythe Palo Verde Valley Times*, July 11, 1935 ; *Blythe Herald*, March 8, 1923 ; Colley, p. 97.

[32]Blythe Palo Verde Valley Herald, March 28, 1912 ; Henderson, 1957.

[33]Harold O. Weight, "Augustine Pass Agates," *Desert*, May, 1956, pp. 4-7 ; *Blythe Herald*, May 29, 1924 ; Saul, 1968.

[34]Goodwin, p. 601 ; *Indio Date Palm*, February 7, 1912.

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[67]*Blythe Herald*, July 31, 1913 ; *Blythe Palo Verde Valley Herald*, June 1, 1916 ; Brown, 1923, p. 260.

[68]*Blythe Palo Verde Valley Review*, December 17, 1916, May 26, 1917.

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CHAPTER THREE

SAN BERNARDINO COUNTY

San Bernardino County is not only the largest county in California, but it is the largest in the United States. As a county it has been uniquely endowed with rich mineral deposits. Large deposits of gold have been mined at Stedman and Vanderbilt, with smaller but still important deposits at Alvord, Oro Grande, Old Dad Mountain, Dale and Nantan. Calico, Ivanpah, Waterman and Providence were the largest silver deposits, with lesser, but important deposits in the Mescal Mountains and at the Death Valley Mine. The most important copper mines are the Copper World and the Bagdad Chase (known usually for its gold production).

Salt Spring, along the Mormon Trail that connected Salt Lake City and San Bernardino, became the first confirmed gold discovery in the county in 1849. The 1850s are a silent period, but in the 1860s, the prospectors who fanned out looking for another Comstock Lode or La Paz gold placers, discovered ore in the Clark, Providence, New York, Whipple, Turtle and Sacramento Mountains and in the Slate Range. Most of these discoveries were made within two days travel of major transportation routes: the Mojave Road or the Colorado River. Between the late 1870s and World War I, mining activity continued with fairly even intensity, with gold mining surpassing silver early in the 1890s. Vanderbilt, Stedman, Hidden Hill and a host of small gold rush boom-towns followed the discovery of gold at Goldfield and Bullfrog, Nevada early in this century. Except for a brief period after World War I when silver prices were high, low metal prices and inflation put a damper on mining in the 1920s. However, with the great Depression of the 1930s, and an increase in the price of gold by nearly $15 an ounce, many small operators reactivated old mines. The region around Barstow, Vanderbilt, Stedman and Dale were the principal centers of mining activity until World War II. During World War II, iron was extracted from the Vulcan Mine in the Providence Mountains, and the Bagdad Chase Mine remained active. Since the war there has been sporadic mining of gold, silver and tungsten in the county. A major new mine opened during the 1950s; the Mountain Pass rare earth mine. Recently, exploration has outlined potential large tonnage molybdenum properties in the New York and Ord MOuntains, a copper mine in the Copper Basin area of the Whipple Mountains and gold in the Clark Mountains.

BAKER AREA

The north central portion of San Bernardino County has been mined longer than any other portion of the county. Turquoise located north of Halloran Springs was first mined by Indians, and after its rediscovery around the turn of the century was mined again. The rumored discovery of Gold at Salt Springs in the 1820s and an authenticated discovery in 1849 establishes this as the oldest gold mine in the

county. Gold discovered at numerous locations resulted in rushes into the area and camps springing up; the most iportant discoveries were in the Halloran Springs-Old Dad Mountain area. Silver was first discovered in the Avawatz Mountains in 1870 and has been mined intermittenly since. However, the silver mines near Riggs seem to have been more productive. Talc, iron and manganese are intermittent products from the area.

Stone Hammer Mine

The Baker area is not only the site of the oldest mine worked by Anglos in the California Desert, it may be the site of the oldest mine worked in the desert by anyone. With the exception of quarries used by Indians to obtain obsidian or other materials for tools and weapons, the turquoise mines north of Halloran Springs are among the few, and may be the only confirmed California Desert mines worked in prehistoric times. These mines were rediscovered in 1897, and "two aboriginal stone hammers were met with, as is usual at all the turquoise localities in the southwest and from this circumstance the location was named Stone Hammer Mine."[1]

Two compainies known as the Himalaya Mining Company and the Toltec Mining Company set to work on the property. The Himalaya Company sank a well and erected bunkhouses, working until March, 1903. In the beginning of that year, 6 men were working. The Toltec Company operations were spread across 6 miles of desert and centered at 3 camps known as East Camp, Middle Camp and West Camp. They found it necessary to haul water a mile to the nearest camp. Stone hammers were found at a depth of 18 feet in their operations. Most of the turquoise from the operations was sent to New York. In 1900, it was estimated $28,000 worth of turquoise was shipped. Both companies' operations have been idle since 1903, and today this is a favorite collecting locality for rock hounds.[2]

Salt Spring

The earliest recorded gold discovery in San Bernardino County occurred at Salt Springs, at a point on the Santa Fe-Salt Lake Trail.Persistent rumors have it that gold was panned in the gravel near here by the Mexicans that passed through in the lucrative trade between Santa Fe, New Mexico and Los Angeles from 1826 until it ceased in 1848. On December, 1849, a Mr. Rowan and other members of a party of Mormons led by Jefferson Hunt discovered a quartz vein in a small canyon near the spring, in which they found nuggets, the largest about the size of a pea. In 1850, Frank Soule, later a state senator, relocated the gold deposit and took some samples back to San Francisco, where he organized a company that never developed. A Mormon party headed to San Bernardino in December, 1850 met William T. B. Stanford (Phineas Banning's brother-in-law) near the present site of Daggett, as he was hauling a mill to Salt Springs. Reportedly Ben Sublette, a "noted mountaineer" worked the mines from 1850 to 1852 with great success. However, after several men were killed by Indians, he abandoned the enterprise.[3]

The mines were deserted from 1853 through 1859, but in September, 1860, a Los Angeles company employed 30 men and had 3 arrastres running. Shortly before this, Charles Crismen acquired the engine and boiler from the mill and hauled it into the San Bernardino Mountains, for use at a lumber mill. Also in 1860, placer ground was discovered about 2 miles away and the gravel was hauled in wagons to the springs, indeed an expensive way to placer .

In 1863, the Amargosa Gold and Silver Mining Company of San Francisco acquired the mines at Salt Spring and in the fall of 1863, they installed a new mill that "met with good success for over a year." The company, however, went broke and the mill was sold in a sheriff's auction to Augustus Spear. On October 29, 1864, news broke in Los Angeles concerning the death of three men who were caretakers at the property. One of the men had been killed by Indians, and the mill had been burned. The other two men were found 20 miles away, having committed suicide by putting bullets through their skulls. Two months later on December 4, 1864, Dr. J. A. Rousseau's party passed the mine and saw the destroyed mill. There were 4 buildings standing at that time.[4]

In the middle of the 1860s, a new company took over the mine and operated it successfully for a couple of months. Yet, even though they later were reported to have grossed $11,000 from one blast of two tons of ore, and during a period of one month, the five-stamp mill produced $58,000 in gold, in 1870 the property was idle again.[5]

In September, 1881, J. M. Seymore sold the mine at Salt Spring to the South Pacific Mining Company of New York. Rumor was that they intended to erect a twenty stamp mill. In 1902, J. B. Osborne worked the mine. In a week's run of his five-stamp mill, $60,000 of gold was produced. A few years later, in 1909, Walter C. Mendenhall described the site as follows: "At the old mine there is a little canyon that descends sharply to the north, in which are the ruins of a twenty stamp mill. Near the mill are two wells, protected by curbing and covered..." About 1920 another company attempted to reopen the mine, but after spending a great deal of money they abandoned the venture and sold the mill in 1939.[6]

Avawatz

Avawatz, also spelled Ava Watts, Ivavwatz, Iva Watch, and Ivanatz is probably derived from the Mohave word Avi-Ahwat meaning red boulder. Silver in the Avawatz Mining District was discovered about 1870 by John Moss, discoverer of the first mines in the Ivanpah district. Between then and September, 1872, the district proved to be rich in gold and silver, with the San Francisco Mine yielding values of $300 per ton. That next January (1873), Samuel Strong, a man with a large number of claims located there, came into San Bernardino with ore he expected to yield $3,000 per ton. He then left for Truckee for machinery he had there, which he intended "at once to forward to his mine."[7]

In August, the *San Bernardino Argus* described Avawatz in glowing terms: "Besides the New York, we have the Clark and Ivawatts Districts, yielding the richest ores on the coast." In spite of these hyperboles regarding Avawatz, nothing more is heard from them during the 1870s, except a notice in January, 1877, where H. H. Cook was

trying to collect money due him for assessment work performed from 1872 on the Ada Mine, owned by Frank Chase and E. F. Way.[8]

Although there were no Ivanpahs or Bonanza Kings in the Soda Lake region south of the Amargosa River, there were numerous mines worked off and on by one or two people from the 1880s until the 1910s. In 1885 the *Calico Print* printed two letters that capture a glimpse of mining on the west side of Soda Lake and Silver Lake. Colonel Alonzo W. W. Smith at this time was living at Shenandoah Camp or Soda Springs. He had driven a 12 foot drift into a hill just southwest of the springs. The Iron King Mine, west of Silver Lake, at this time was owned by William Robinson and others of Daggett. There were numerous other mines and claims mentioned, but their locations are uncertain, and the operations appear to have been small. In fact, in 1885 it was reported that "there are only a few prospectors in the district."[9]

In 1887, seven mines or claims imaginatively named Numbers One, Two, Three, Four, Five, Six and Seven, located on the highest part of the Avawatz Range, were active. The Number Three Mine shipped three tons of ore to Barber's Mill at Calico, yielding 66 ounces of silver per ton. Ore from the Number Five Mine was shipped to smelting works in Reno, Nevada. During this same year, about 8 miles north of Soda Spring and west of the present site of Baker, several mines were located on "Joe Dandy Hill." The Gambetta Mine, consisting of a 12 foot shaft, was on the east side of the hill. On the north side of the hill was a 500 foot tunnel, and on the west was the Grant or Gift Claim and the Lydia Hetzel. These silver mines were inactive until 1890 and were probably relocated years later.[10]

Frank Riggs, born in November of 1845 in Michigan, may have come to the Silver Lake area as early as 1880. The Alta Silver Mine established by Riggs was incredibly rich. Invariably he made all of his shipment by express, which, in 1903, cost him $135 per ton. In the early 1890s, before the construction of the California Eastern, he brought his ore to Daggett and then shipped it by express. In 1914, it was reported that no ore less than $500 per ton was shipped. Some of the shipments were an incredible $4,000 per ton. Riggs jealously guarded his rich mine with a heavy massive door that gave his mine the resemblance of a safety deposit vault. Riggs, with occasional employees, worked the mine fairly consistently until April, 1914. In April, 1914, Sarah Riggs, Frank's wife, died. Shortly after, in June, 1914, William Polland of the Riggs Mining Company leased the mine and almost immediately shipped seven sacks of ore by express and seven sacks of ore by express and seven tons via the Tonopah and Tidewater Railroad. Before 1914, $100,000 was taken from the Alta, and by 1920, another $100,000. In 1920, Christopher Baker of Silver Lake leased the mine, employing 4 men. The mine was reported idle in 1931, but in 1939 a 1,700 foot tunnel was driven to intersect the vein. Also at that time a 1,500 foot tram connected the upper workings with the ore bin near camp. In 1943, three men were employed there.[11]

The Five Points, or Five Points Mountain, north of Silver Lake and immediately north of Riggs Siding, has been the center of a great deal of mining activity. In 1885 mines named the Highland Mary, Sara Belle, Five Points, Clifton and James Blaine were active there. In February, 1911, the Garrison Investment Company was active in this locality and shipped 20 tons of ore. The T and T Mine "at Riggs" had a shaft down 125 feet in January, 1912. This lead-silver mine was doing so well the owners

made substantial investments, to bring in more employees to develop the mine. By February they were building a bunkhouse and cookhouse, with plans for a boarding house as well.

Some of the other mines near Riggs that were busy were the Uncle Tom and the Blondie. The Uncle Tom, with a 1,200 foot tunnel, at that time employed 3 men. The Blondie Mine was being worked by Tom Cunningham and Joe V. Robinson. Robinson was one of the "pioneers" of the camp, having located claims in the 1880s. The Blondie, in June of 1911, had shipped a carload of ore which netted $67 per ton.[12]

One other property that was being mined in 1911 was the Jumbo claim of the Wonder (or Wanderer) Mine group 5 miles northwest of Halloran Springs. James S. Hyten with a Mr. Dunwoody worked this mine near Washington Wells. In 1931, rich gold was discovered northeast of Halloran Springs at the Telegraph Mine and re-awakened the whole area. At that time, Mr. Hyten leased his mine to a company which employed 4 men. Today, Washington Wells has been renamed Hyten Well after the man who spent so much time there.[13]

The Halloran Springs-Old Dad Mountain area was the site of gold discoveries around 1900, with interest lasting until about 1914. With no doubt, the biggest mine during this period was the Paymaster or Whitney Mine in the northern part of Old Dad Mountain. The point at which the Mojave Road rounded this northern tip of Old Dad Mountain was called Point of Mountain. Odometer surveys in 1866 and 1867 determined Point of Mountain was nearly midway between Soda Lake and Marl Springs, roughly 17 miles away from them both. When gold was discovered near there about 1900, the camp that was established was know as Seventeen Mile Point, a name that has survived until today on the topographic sheet and a sign near the site. [14]

In April, 1909, the Precious Metals Development Company was formed by some Los Angeles men to develop the Eaton group of claims (later known as the Whitney Mine) south of Seventeen Mile Point. It was reported they then were making arrangements for a water line from Indian Springs and the installation of a mill. By February, 1911, the mill was running. In January, 1912, J. T. Keough, manager of the mine, came into Silver Lake with a gold brick weighing 32 ounces, the result of a 72 hour run of the mill. The mine continued until 1914, when it was closed on account of litigation after having produced from $50,000 to $100,000. In 1930, another company attempted to reopen the mine, installing two-inch pipeline to a well on the east shore of Soda Lake. In 1952, three men were working this mine. [15]

Gold was discovered by 1905 at what was later known as the Brannigan Mine but real interest did not develop until March, 1930, when M. A. Sisley and John Herrod found some high grade gold ore and relocated the claims. The Brannigan was worked until 1935, and yielded several railroad cars of ore averaging as much as $110 per ton. The Oro Fino, discovered in the 1890s, was reactivated, and from 1930 to 1943 produced about $50,000 in gold. [16]

The largest non-metallic mine in the area is the Silver Lake Talc Mine just east of Riggs Siding. The original claims were located in 1911 and 1912. In 1918, the Pacific Coast Talc Company acquired two of the claims, and erected a mill in Los Angeles.

They operated the mine until 1941. Between 1942 and 1953, the Pacific Coast Talc and Clay Company operated the property. Sierra Camp, in 1953, consisted of about four buildings. [17]

In October, 1906, a gold rush began to the nearby camp of Crackerjack (or Day Break as shown on one 1906 map), located about 2 miles southwest of Cave Springs. Soon, as one observer reported, men were coming from "Goldfield, Bullfrog, Rhyolite, and other southern Nevada camps." The new miners discovered they were not the first ones to the area, finding "many scattered arrastres", proof, at least in their estimation, that "Spanish miners worked the surface nearly a century ago." To lend support to claims that were being made about the importance of this new location, in November, a gold brick worth $1,200 was produced from Crackerjack ore. On February 26, 1907, a post office was established for the town composed of "tent saloons and tent stores." O. J. Fisk, an enterprising merchant at the railroad supply town of Silver Lake, operated a stage line to the camp, and in June, 1907, the Crackerjack-Bonanza Company was readying a shipment of 450 sacks of high grade ore for the smelters. [18]

In October, 1907, 2 miles northwest of Crackerjack at Dry Camp, a "new" camp was founded. Avawatz or Avawatz City grew out of the ill feelings over the firing of a Chinese cook at Crackerjack. With the formation of the new "city", the Turner Mercantile Establishment building was moved, as was the post office, although the latter was not officially moved until August, 1908, upon the demise of Crackerjack. Mail continued to be delivered to Avawatz until December, 1910. [19]

News about Crackerjack is quite scarce in 1908, in part due to new discoveries at Hart, just west of Searchlight, Nevada. However, some work was continuing at Crackerjack, for in July, 1909, the main shaft was down to 200 feet with a level being driven. [20]

In 1909, there were two other camps in the Avawatz Range know as Harper's North Camp and Harper's South Camp. North Camp was in Arrastre Gulch, at a spring almost due west of Riggs,and may have been the camp for the Crown Mine. The Crown silver mine was worked in 1908 and made a small shipment of ore. The property was dormant until the end of 1917 when there was an attempt to re-open the mine. A telegram to Goldfield announced a new strike, and a rush to Avawatz was started, but ended abruptly when it was discovered the Avawatz Crown Company had staked all of the area.[21]

In April, 1907, a camp was being built north of Cave Spring at Denning Spring, named for Frank Denning, a resident prospector. Over 60 prospectors and miners were in the vicinity and there was talk of beginning an automobile stage service from the Tonopah and Tidewater Railroad at China Ranch. The ore at the prospects showed gold, lead, silver and copper. In February, 1911, Harry Wallace employed 4 men at his mine near there. [22]

Quail Spring, west of Denning Spring, was the scene of new discoveries in 1907. In July, high grade silver-bearing copper ore was under development, but it was high grade gold 1½ miles northeast of the springs that created the biggest excitment. The

strike was made by Milt Armstrong, who discovered ore that ran a reported $8 a pound. By October, a "grand rush" had begun that lasted at least until December. Armstrong had a camp here through 1912, and during 1911 and 1912, there were several miners working small mines nearby. [23]

Armstrong's discovery was not the first mining at Quail Spring. In March, 1895, Tom and William McFarlane, and Gus Yager discovered rich rock showing free gold on a lone butte near the springs. They named their mine the Lone Star, and the Lone Star Mining District encompassed the whole region.[24]

Within a short time, another metal attracted some attention to the area. At Owl Hole Spring, the Owls Head Mine was the source of somewhat more than 15,000 tons of manganese ore. About one-fifth of this, averaging 45 percent mananese, was mined from 1914 to 1918. During this time, ore was hauled to Riggs Siding on the Tonopah and Tidewater Railroad by a Yuba Ball Tread Tractor. The remaining four-fifths was mined between 1941 and 1946, and averaged 20 percent manganese. Additional tonnage resulted from operations that continued until the fall of 1950. [25]

Cave Spring was long a favorite camping spot for travelers and prospectors that operated small mines nearby. In 1925, Adrian Egbert erected a house here, where he sold groceries, gas and oil for the needs of travelers. Egbert stayed here providing this service until at least 1939.[26]

ARGUS-SLATE RANGE

John and Dennis Searles came from New York in the 1849 California gold rush and settled near Oroville. In the spring of 1860, Dennis Searles left with a party led by Dr. Darwin French to try to locate the Lost Gunsight Mine near Death Valley. Needless to say, they did not find the lost mine, but they did explore a lot of desert, and aroused the interest of the mining public. Not long after returning from many months in the desert, Dennis Searles began making plans for a second expedition to the Mojave. On this trip, Dennis took along his brother, John, and they investigated some gold and silver possibilities in the Slate Range. They did discover silver and gold there, and a district was organized November 10, 1861, with Willet P. Dean, W.S. Morrow, A. H. Clarke, and the Searles brothers the prime motivators. [27]

The district was quiet until early 1863, when interest began to pick up and a 12 cabin camp called Constitution was established. The Albany, owned by the Searles' was one of the first mines located and yielded $150 per ton in gold in a badly managed arrastre. By February, 1863, a mill had been moved to the mine, and on July 20, a "large quantity of aqueduct lead pipe" left Los Angeles for the mill at the Slate Range. [28]

In the meantime, during the month of June, two shipments of 10 tons each left from the Antrium Lode. People were flocking to the range. On one trip in from the

mines, Dennis Searles met 13 inbound pack trains in one day. Earlier, in February, over 100 men had left, "for the mines in the Slate Range and other desert areas by ones and twos since the arrival of the last steamer from San Francisco." In spite of all this optimism, the Slate Range produced more mining companies than holes in the ground. Between March,1863, and March, 1864, the *San Francisco Alta California* recorded no less than 22 companies, incorporated for over $8,600,000, and there doubtless were more. Chalfant puts the result this way: "The Slate Range system of working the public rather than the ledges began to produce natural consequences. In one issue of the Visalia paper, August 7, 1863, were notices of assessments on eleven companies..." Things still managed to hold out at some of the mines. In April, 1864, the Rochester Consolidated Gold and Silver Company shipped 200 pounds of bullion. The mill was still running that October, but met a fiery death in November, 1866, when it was burned down by Indians in a general uprising that vacated nearly all of the desert mining camp.[29]

With the discovery of gold near the mouth of New York Canyon, men returned to the mines in the 1870s. George Hearst and associates worked the Lone View and the San Fransisco mines in the 1870s and 1880s, and the ore was milled at the Slate Range Millsite, perhaps on the site of the first mill, located between Layton Canyon and New York Canyon. The Copper Queen Mine, later known as the Gold Bottom Mine, is located northwest of Copper Queen Canyon. Located in the 1880s, this mine produced about a million dollars worth of silver-lead ore before it shut down in 1943. Before World War II a twenty-five ton flotation mill was erected west of the mine.[30]

The Ophir Mine was a late comer to the Slate Range, being opened in November, 1915. The mine produced about $800,000 worth of silver-lead ore in operations between 1915 and 1950. In 1968 a 120-ton mill stood on the property. [31]

In 1901 G. L. Dean acquired the Arondo gold mine across the valley in the Argus Range. The mine was actively worked by Dean until 1906, with the ore hauled to the Slate Range Millsite, now known as Dean's Millsite. Various operators worked the mine until 1934, when the Arondo Mines Company of Los Angeles took over the mine. This company installed a fifty ton mill and employed 10 men until 1937. Work resumed, and the mine was active from 1939 until 1941, then from 1946 to 1950. [32]

Homewood Canyon, south of the Arondo Mine is the site of two major mining operations. The largest of these is the Ruth Mine. It is unclear when the Ruth Mine was first operated, but in the late 1930s the mine was under development by 10 men. At that time there was a cyanide plant at the mine and a 700 foot tunnel with several hundred feet of additional underground workings. Work continued at the mine until 1941 when operations were suspended by War Production Board Limitation Order L-208. About $550,000 worth of gold was produced. Numerous people still live at this mine. Another major mining operation in Homewood Canyon was the Davenport Mine worked in the late 1930s and early 1940s. Also, just south of Homewood Canyon, the Mohawk Mine was worked in 1941 and 1942 by the Burton Brothers. The Burton Brothers also worked the Davenport and Ruth mines during this time.[33]

Anthony Mill Ruins

In the Argus Range, there is a site known as the Anthony Mill Ruins. Marion T. Arnote of Johannesburg and the late John Cuddeback relocated this old silver mine in 1968. Both Arnote and area residents have tried in vain to uncover any concrete information on this mine and mill. Dr. O. N. Cole, a freelance historian who lives in Trona, talked with the late Ed Teagle, who recalled coming to Trona in 1900 and finding the site in ruins then. However, Arnote corresponded with a woman who lived in Millspaugh about 1906, and she indicated the site was inhabited at that time.

There is an almost certainly spurious story circulating that this mine was worked by Mormons. One Sunday while they were having services, 300 were killed by Indians at the large flat south of the mill ruins. Their bodies are suposed to be buried east of the massacre site. If there is a shred of fact to this story, this massacre probably would have taken place about 1866 or 1867, when the Slate Range Mill was burned.

Others have surmised, after looking at the extensive labor that went into the dressing of stones for the mill, the hillside honeycombed with mine workings, and the numerous stone dwellings that cover the area, that chinese labor may have been responsible. The stone work here reportedly matches that at the "Chinese wall" on the Trona Grade. Since this is a silver mine it may have been worked at the same time as Lookout or Panamint. The iron mine less than a mile south of here was a source of flux for the smelters at Lookout, and undoubtedly many men were in the area at the time.

At Anthony Mill Ruins there are remains of an arrastre probably used during this century, but the square nails at the building sites attest to a much older occupation. The roof on one of the dwellings was built by Arnote. A pipeline, whose trace is clearly visible, connected the mill with Water Canyon. Some residents can remember when it was still there.[34]

SOUTHEASTERN SAN BERNARDINO COUNTY

During its early history, the southeastern part of San Bernardino County was inseparably linked with the Colorado River. The early mines in the area were seldom more than a two days walk from this important transportation route. Soldiers stationed on the river are credited with the first discoveries in the Dead and Whipple Mountains, although it seems that they were not responsible for any serious mining.

There were flurries of activity in the 1860s and 1880s for copper and silver, but with the exception of the Ibex Gold Mine in the early 1890s, the most serious mining activity was for copper and gold early in this century. The centers of activity were the Whipple, North Sacramento and Turtle Mountains. There has been mining for manganese during both world wars. With the high price of gold, the Savahia Mining Company of Las Vegas in 1979 reopened the Savahia Mine in the Whipple Mountains, while ten million tons of copper ore, blocked out in the Copper Basin area, sits unmined.

Whipple Mountains

Within the Whipple Mountains area, the Chemehuevi District extended from opposite the Bill Williams River to the La Paz ferry and "from twenty to fifty miles" back from the Colorado river. Immediately north of it is a "river bottom of about six miles in length and three miles in width." John Jennings, a miner in Copper Basin in the early part of this century, related that Pete McGuire told him the area was "located and worked by soldiers as far back as 1862. Copper Basin is within the Chemehuevi District and is probably where the majority of mining took place. In May, 1863, the district was said to contain "rich copper ores with a small percentage of silver. There are a few men there prospecting but there is no regular working." In November it was claimed the ore was "so rich in copper that it can be pared off with a pen knife. In that month the "Chimawave Consolidated Mining Company" was working on two claims or lodes known as the Union and the Colorado. A bar of metal weighing almost 6 pounds was sent to San Francisco, smelted from 14 pounds of ore. In March, 1864, two companies, the Monte Cristo Copper Mining Company and the Black Mining Company were incorporated for nearly a million dollars each. However, nothing more is heard until the 1870s.[35]

In 1875, John S. Jennings came west and visited Copper Basin. He found one white man, Pete McGuire, on the California side of the Lower Colorado, holding property that later was owned by the Copper Basin Mining Company. McGuire came to San Francisco in the "early days", probably meaning the rush of 1849, then went to Signal and the Rawhide mines on the Bill Williams when they blossomed, before drowning in 1904 in the Colorado.[36]

The Black Metal Silver Mine probably was first discovered by a Chemehuevi Indian in 1879, and sold to McGuire and the Levi brothers of Signal, although another story claims McGuire found the mine. Thousands of dollars worth of high grade ore, grossing $200 to $400 per ton was shipped from the Black Metal Landing, where it was loaded onto the river steamboat, eventually bound for Swansea, Wales. Charles Battye recalls that "During his brief season of prosperity, Pete declared his intentions to equip his faithful burro with silver shoes, but whether or not he did so is not now remembered. At that time he had some financial dealings with an established mercantile firm over in Signal, Mojave County, Arizona, and perhaps they dissuaded him from carrying out his high-flown idea."[37]

In 1881, there was a store and a saloon at Black Metal Landing as well as a thriving little mining camp. Also, around that time the Grand Central Mine was located in the Copper Basin and a five-stamp mill was installed, but the ore proved too refractory for amalgamation and the mill was later moved to the Blossom Mine near Yuma.[38]

About 1886, Charley Monaghan, Frank Murphy, Pete Murphy and Pete McGuire owned the Black Metal and did a small amount of work in it until 1890. During January, 1889, ore from the mine had assayed a fabulous 2,442 ounces of silver and 41 percent copper per ton.[39]

About 1887 Colonel I. R. Dunkelberger had a "large stamp mill" installed at his Rincon Copper Mine, by Mr. J. C. Hoy of Needles. The Rincon was on the river about 5 miles north of the Black Metal Landing. The ill-fated ten-stamp mill only

ran a short time.[40]

In 1889 there was renewed interest in the area. In April, it was noted that Arizona miners had drifted into the Whipple Mountains and were chloriding ore. Several parties held claims in the vicinity, and the whole area began to be known, at least in some circles, as Rincon. The owners of property near the Rincon Mine were reportedly "making arrangements to have a smelter erected in that vicinity " at a time when clamor for a smelter was coming from the owners of the newly discovered mines in the Old Woman Mountains.[41]

An agent for a "powerful English Syndicate" was based in Needles to keep the company posted on California mining news. Probably three mining experts from this syndicate were the individuals who accompanied Issac Polhamus of the Colorado River Steam Navigation Company on a tour of the mines from Yuma to Needles in January, 1890. One of the mines of interest was the Black Metal.[42]

The early part of the 1890s was very quiet, probably due in part to the fall in the price of silver. However, the Manning property directly across from Empire Landing was located in 1893, and John S. Jennings located the Klondike about 3 miles up the river from Rincon Flat in 1897. The Klondike was extensively worked prior to 1911 and produced hundreds of tons of gold ore running more than $100 per ton. A mill was at the property around the turn of the century, and was mapped in 1920.[43]

Adjoining the Klondike, the Golden State Mining Company in February, 1911, had a "fine showing of free milling ore." More importantly, it was the center of a rush to the area a year later. In late January, 1912, Col. Kit Carson of the company brought an $8 nugget into Parker, and numerous smaller nuggets were found by employees of the Golden State Company. This generated considerable excitement and numerous parties of prospectors went out from Parker to stake claims.[44]

Overall, there was a high level of activity during this time in the vicinity, and this only added to the interest. Ewing and Sutter, owners of the Klondike, were sacking ore and had 10 tons ready to ship. In the vicinity of the Black Metal, Superintendent Clyde Stewart had a force of men at work on the Eaton property. Miles Garrett, who was developing property in Whipple Wash, had a well installed near his camp in February, 1911. There was so much activity that soon a townsite named Whipple had been located and lots laid off.[45]

To publicize the district, O. T. James and F. A. Rendant, two Nevada prospectors who had claims in Whipple Wash, left for a trip to Los Angeles with two burros packed with 150 pounds of high grade ore taken from the February, 1912, strike in Whipple Wash. They intended to walk along the Santa Fe and stop at the principal points, advertising the new gold camp by panning the ore. After arriving in Los Angeles they planned to exhibit the rich ore in the window of the ticket office.[46]

The Humbolt Mining and Milling Company, of Humbolt, Kansas, purchased a second-hand Huntington mill which was delivered to Needles. D. T. Jackson went to Needles to attend the loading of the mill on the steamer Iola about May 30, 1912. The mill was piloted down the river by Captain Williams, unloaded at Drennan Landing near Rincon Landing, then installed in Whipple Wash. Things just did not

work out, for no sooner was the mill installed than the employees levied claims against the property for unpaid wages.[47]

June was a busy month for Captain Williams, for as soon as he had shipped the Humbolt Company's mill, another mill arrived in Needles destined for the Whipple Wash area. In March, H. B. Hull examined the area for his company, and without delay they decided to install a ten-ton mill, manufactured by the Histed Company and working much like an arrastre. During late June, the mill was moved to a site near Rincon Landing, and the work of assembling the machinery and erecting camp buildings began at once. The mill was erected at Billy Smith Landing and in October, 1912, it was finally ready for a test run, with full operation expected to begin after November 1. What happened after this is unclear, but nothing more is heard from the Whipple Wash area during this decade, except a note on October 2, 1913, stating that the mines were "laying dormant waiting for a large up-to-date plant to treat the large tonnage of ore[48]

At the Rincon Mine in 1922, there was a small twenty-five ton experimental sulphuric acid leaching plant on the banks of the river, where the crushed ore (implying a means to crush the ore) was leached and the copper precipitated on scrap iron. About 80 tons of ore was shipped to the Humbolt smelter, yielding 5 percent copper and $22 per ton in gold. The Black Metal Mine was reactivated shortly before World War II, but little was done.[49]

Copper Basin

Mining in Copper Basin is what sparked interest in the Whipple Mountains during this century. As was mentioned above, Pete McGuire is credited with some of the first locations here. However, about 1899, Joseph L. Curtis relocated the Copper Basin Mine. During the years he owned it, he expended thousands of dollars in development work. In November or December of 1904, the Copper Basin Mining Company was organized with $200,000 in stock to raise more capital for development, with Curtis as one of the principal stockholders. T. M. Drennan also was a principal stockholder. The company held the Copper Basin and the Black Metal mines. The Copper Basin Mining Company in October, 1906, had a 65 foot shaft on its property, and was reportedly opening the Black Metal Mine.[50]

At least two other companies were working nearby during 1904: the Mount Whipple Gold Mining Company, adjoining the Copper Basin Mine, and the Colorado River Gold and Copper Company. These three companies, along with the White Eagle Mining Company, consolidated their interests and formed a company to build a seventy-five-ton smelter on the Colorado. It is not known if this smelter was in fact constructed, but a 1921 map shows a structure labeled the California Gold and Copper Mining Company on the river just south of Copper Basin.[51]

One stimulus for mining in Copper Basin was the anticipated arrival of the Santa Fe Railroad, then working its way across Arizona. But the Santa Fe did not show up in 1904. In fact, it was nearly 6 years later that it reached Parker. This delay took much of momentum out of mining activity in the Copper Basin area, but with the arrival of the railroad, things picked up nicely.[52]

In March, 1911, a new road was nearly complete into the Basin. The road was put in by Harvey Hon to connect to the mine he and A. W. Martin owned. A month earlier, the Bowman brothers were erecting an ore bin and were preparing to make shipments, dependent on the completion of the road. On March 8, the road was complete, but nearly a year later, in December, 1912, the Bowman brothers were "taking out an initial shipment of ore." Mr. Hon, with the Hon Mining Company of Los Angeles, was ambitiously spending money with the hope of a return. He left Parker in May for his mine with a load of lumber and supplies,planning to continue work all summer sinking the 100 foot shaft another 200 feet.[53]

In June the Grand Central Mine, which as already mentioned was located in the early 1880s, shipped eight tons of high grade gold ore to the Humbolt smelter via the *Iola*[54]

Although some small scale mining continued throughout 1912, the highlight of that year was in December when Wesley Martin, a retired cattleman from Mohave County, Arizona, jumped the claims of the Copper Basin Mining Company. Apparently things were cleared up, for a little more than a year later about 22 tons of ore were shipped from the mine.[55]

Just west of Monument Peak, in the Copper Basin area there was considerable mining activity of another kind during World War I. The Hidden Treasure and Hidden Cross mines, and adjoining them to the southeast, the Red Cloud, were developed for manganese. These 3 mines produced a total of 160 tons of ore. With the renewed demands of World War II, they were again active. On the Red Cross, renamed the Moulton, a tramway was installed and 5 men were employed in the early 1940s.[56]

Savahia Peak Area

West of Copper Basin, probably one of the first mines to be developed was the American Eagle. A somewhat confusing account in 1905 linked McGuire to the discovery of the claims, perhaps as early as 1875. At that time a large quantity of high grade gold and copper ore was shipped to Swansea, Wales. In 1902, five men were employed at the mine, and by 1905, the American Eagle boasted a 110 foot deep shaft with 200 feet of additional underground workings. In 1908, they were completing arrangements to begin work again, and it appears they did, sinking the shaft to 300 feet and making a small shipment, with which they failed to break even. In 1912, the property was leased to James S. Douglas, and it was last operated in the winter of 1918-1919.[57]

The town of Vidal was founded as a trading post in 1907, and soon after, Wyatt Earp, the famous lawman, and his wife settled there. He had a small mine in the Whipples on which the deepest shaft on the property was 100 feet. Earp operated his mine intermittently until he died in 1929 at the age of 80. In 1971, his house still stood "in the shifting sands and tumbleweeds east of the highway."[58]

Other mines worthy of mention in the vicinity are the Tuscarora, the Savahia, and the D&W. The D&W, named after the locators Dayton and Wilbur, was by far the

biggest. The D&W was incorporated in 1906 and work then began in earnest. The main shaft probably reached about 300 feet during 1907. In November, 1909, good ore was showing up at considerable depth, and by 1911, the shaft had reached 700 feet. While cutting a drift on the 700 foot level, a vein of free milling gold ore, running $10 to $14 a ton was discovered. Additional work on the other levels also discovered this vein. Up to that point, work had concentrated on a vein carrying mostly copper values. In October, two shifts were at work, after being closed down from June to September because of the heat.[59]

There was some talk of installing a mill as early as January, 1912, and after a busy season of mining, when the mine closed for the summer of 1912, the D&W Company felt enough ore had been developed to warrant a mill. Water was to be obtained from the third level of the mine.[60]

Grading began that November for the mill, which was to arrive in "Vidal most any day," but in January of 1913 the machinery for the mill still had not arrived. That did not dampen spirits much, as plans were announced for a real celebration party when the mill began on March 1, 1913. Two Pullman coaches were to be run from Los Angeles with the stockholders and friends, an estimated 200 people. This bash was going to last two days "and everyone is assured the time of their lives. There will be plenty to eat, and plenty to drink . . . Besides a barbecue, there will be dancing." March came and went, and it was not until November 6, 1913, that the mill began operation. While three shifts worked for awhile, the operation soon slowed. The mill was idle from the beginning of 1914 until April, 1916, when work resumed on a small scale.[61]

The G. A. M. Mines Company, with G. A. Marsh and R. C. Sanfley of Parker as principal stockholders, at least during 1911 and 1912 owned the Savahia mMine. In February, 1911, the Cedar Rapids Claim was leased to Bert Hitt, mentioned elsewhere as a co-discoverer of gold at Hart in 1907. He soon was sacking gold ore that ran better than $100 a ton from the bottom of a 30 foot shaft. His brother, Clark Hitt, who was still living in Hart, was going to join Bert and help out. This ore was shipped in the fall to the El Paso smelter, and returned a good profit to the G. A. M. Mines as well as to Hitts. In November, 1912, work resumed at the mine for another year.[62]

After tracing stringers of ore for two years, in early 1912, John Jarvis of the Tuscarora Mining and Milling Company discovered a huge fissure vein 7 feet wide. He sank a 30 foot shaft at one promising point, and 2,000 feet away, dug a prospect pit at another outcropping of the vein. The announcement of this stirred interest among stockholders, and funds were obtained to continue development. By December, the shaft had been sunk to 100 feet and the company was going to open the ledge at several places. By July, 1913, they made some shipments of ore to the Douglas smelter. Five men were employed at the property when geologists from the California State Mining Bureau visited the property in 1916.[63]

Freeman District

North of the Whipple Mountains and south of the Irataba District was the Freeman Mining District. In October, 1863, it was described as "quite a large one [district] containing many leads, but at present not an inhabitant, all its miners having skedaddled to the new placers about one hundred and twenty miles east of here. No work has been done in this district." The district would have included the Chemehuevi Mountains, and it is possible that it went as far west as the Old Woman Mountains. The above is the only description found of early mining here, and there has been little subsequent activity.[64]

Marengo District

In the same year of 1863 the Marengo District, to the south of the Freeman District, was described as follows: "This like the Freeman its neighbor, is without an occupant, save its native Indians. I think it has no recorded leads." Except for some prospecting for niter just after the turn of the century, nothing further developed in the area.[65]

Irataba District

The Irabata Mining District, heralded as the "richest copper district on the Colorado," was probably discovered early in 1863 by soldiers from Fort Mojave. Named after the chief of the Mojave Indians at the time, the district extended from Fort Mojave to the Needles and about 25 miles west of the river. Discovery of the district is also attributed to the Colorado Prospecting and Mining Company, a group of men who spent three months examining country along the Colorado River. In an advertisement, the company listed 12 mines that were located. It is likely that discoveries made by the soldiers from nearby Fort Mojave lead the Colorado prospectors out of Fort Mojave to look for and find good copper ore in mid-August. In November, the Pocahontas Copper and Silver Mining Company was incorporated for $200,000, with most of the same people as directors that headed the Colorado Prospecting and Mining Company.[66]

The majority of the mines in the district lay from 2½ to 6 miles from the river, in sight of Fort Mojave. Steamboats ran regularly to the fort and a good road connected the mines with the river. Before the end of the year, Irataba City was established 2 miles below the fort, high on a gravel bluff safe from the river, but where boats could land at all stages of the river.[67]

Despite these encouraging developments, only three shallow shafts had been sunk at the mines by January, 1864. Within the next year, however, the district was transformed from a drowsing interest to wide-awake excitement, though the center of activity seems to have moved as well. William R. Stiles arrived in Wilmington from the mines and wrote a letter to the *Wilmington Journal* on May 17, 1865. In his

letter he indicated the Irataba District was 20 miles from Fort Mojave, and 6 to 9 miles from the river, a great deal farther than was reported two years earlier.[68]

Work began on the Evening Star Mine on November 19, 1864, and by January, five mining companies were at work. On a couple of lodes, workers intended to go to a depth of 50 or 75 feet. Although water was a real problem, as it had to be packed 6 miles from Sacramento Springs, by April the Evening Star, and Long Island companies each had 20 or 30 tons of ore ready to ship, and the Brother Jonathan Company had a 40 foot shaft.[64]

In May, the number of active lodes or mines had swelled to 12. The Evening Star now boasted a 60 foot shaft which yielded 12 tons of 50 percent copper ore. This was shipped down the river and to San Francisco. The Long Island had a 25 foot shaft, and its operators too had shipped 12 tons of ore. Mr. C. C. Nason was the recorder, and lived in the district. There may have been excellent copper ore here, but shipping costs ate up the profits. Operators could not make money on anything that ran less than 30 percent copper. In January, 1866, a few men were still in the district, shipping small, very high grade quantities of ore to a firm on the Bill Williams River.[70]

The only other activity in the area took place during World War I in the Dead Mountains, 2 miles west of Fort Mojave. At that time, one of the copper prospects that carried some manganese was mined. In the spring of 1918, a severe rainstorm uncovered several discontinuous bunches of manganese ore, and T. E. Gallagher and J. W. Arrington of Needles removed several hundred pounds of ore.[71]

North Sacramento Mountains

In another part of the district, the Ibex Mine, 3 miles southwest of Ibex (Ibis) Siding, attracted a great deal of attention in the late 1880s. The quartz ore was reported to be so rich that gold literally shook out when handled carelessly. In April, 1893, the new Needles Reduction Works started up on ore from the Ibex. By May, 1894, the Ibex had its own ten-stamp mill, situated near the mine, and a well was sunk to supply water for the new mill. In September, a six day run of the mill yielded $8,400 in gold. The property was idle in 1895, but some mining resumed in 1896.[72]

In 1906, an attempt was made to recover placer gold from Klinefelter Wash just east of the Ibex. Operators even shipped in engines and pumps, but their efforts did not prove rewarding.[73]

Northeast of Goldbend (see the next section) while that camp was drawing attention late in 1909, the Kane Copper Company "resumed" operations at the Josie K. Mine. Even though they boasted of an 87 foot shaft, little work was done subsequently. However, gold found near this mine early in 1908 by Mr. C. E. Kane did attract some attention.[74]

Goldbend

With the discovery in early 1906 of gold southwest of Needles by C. H. McClure, numerous prospectors began to flock to the area. In January or February, McClure bonded the Gold Dollar Claim to the California Mining Company. During the summer, they made a shipment to the Needles smelter which yielded an amazing 13 ounces of gold a ton. By December, 1906, plans were being drawn up for the townsite of Goldbend by the California Hills Company. In conjunction with these plans, they were to immediately begin work on a boarding house, company office, other buildings, and a deep well for a water supply. Nothing more is heard in 1907, but in November, 1908, it was reported that Goldbend was attracting much attention. There were 6 shafts on the California Hills property, the deepest being 112 feet. Fifteen miners were employed.[75]

Turtle Mountains-Sunrise District

Perhaps as early as 1862, rich gold and copper deposits were being worked in the Turtle Mountains. While little is known about this early activity and the precise date of its beginning these mines were located when the nearby Planet and Rawhide mines in Arizona were in operation, which suggests a period from 1862 to 1884.[76]

About 1900, some of the old mines were reactivated. Also, a number of new prospects were developed and several mining camps were established. In the northern part of the range, the Sunrise District was located, sugggesting that the old mines were located in the southern part of the Turtle Mountains.[77]

Sunrise Camp was established in 1906, in a remote spot on the west central part of the Stepladder Mountains (then known as the Sheep Mountains). In January, 1898, J. C. Clennel, metallurgist for the Charles Butters Company of Johannesburg, South Africa, took some 2,000 pounds of rock for testing. He was pleased at his findings, and offered the owners, the Monumental Gold Mining and Milling Company of St. Louis, Missouri, a liberal offer to begin developing the mines. Some work was accomplished, including the sinking of a 120 foot shaft in which water was struck. This was the source of water for the camp that sprang up here in April, 1906.[78]

Carson's Well on the north end of the range used to be known as Mesquite Springs, until a man named Kit Carson, who claimed to be the grandson of the original Kit Carson named the spring after himself. In 1912, this Kit Carson waas involved with the mining in the Whipple Wash area. Tom Schofield had a mine named the Mountain King 4 miles from this well in the 1930s.[79]

In 1908, the Horn Copper Mine on the southeastern side of the range, was active. In 1951 and 1952, about 200 tons of ore was mined from this property, and it was active again in 1958.[80]

PROVIDENCE MOUNTAINS

Like the New York Mountains to the north, the first discoveries made in the Providence Mountains were for silver. These discoveries, made in 1863, transformed the Macedonia Canyon area into the mining camp of Providence City. In 1880 another significant silver discovery was made at the Bonanza King. With the decline in silver prices, however, attention was turned toward gold, and the Hidden Hill, Gold Valley and Out West mining camps sprang up. During World War II, the immense iron deposits in Foshay Pass were mined, and silver, gold and copper mining has occurred at various places in the range during this century.

Rock Spring

Charles Hamilton and Francis B. Austin on March 12, 1863, discovered some rich silver ore about 10 miles west of Rock Spring. This first ledge was known as the Dona Carolina. Later these men,"in company with Messrs. Taylor and Nicholson . . . discovered Silver Hill, nine miles from Rock Springs." Thus began recorded mining in the Providence Mountains, but according to legend then current, this was little more than a revival of mining, as "From traditional accounts, these mountains were long supposed to be rich in mineral deposits, but never been explored by Californians until this year. In some places there are yet to be seen traces of old inclines running into the mountain, no doubt workings of the Spaniards many years ago."[81]

The Rock Spring Mining District, established in April, 1863, was thirty square miles and embraced Macedonia Mountain in the north and Silver Hill Mountain on the south. The Government Road essentially split the district. Mister J. J. Downie of San Francisco was recorder, Mr. Hilton of Sacramento was president and the "bylaws and regulations are similar to Virginia laws."[82]

In May, Mr. P. J. Gillford's party was prospecting Silver Hill, and with Hamilton and Austin, several extensive ledges were discovered. Preparations were being made to begin work on the Dona Carolina and on Silver Hill. On July 3, 1863, Thomas Wheeler, Joseph M. English, A. J. Seales and Charley Neal discovered the Macedonia and Blue Ophir ledges.[83]

Work progressed rather slowly. In October of that year, the Great Western and the Pride of the Union mines were resuming work after a forced shutdown due to lack of workers. Work also was just beginning on the Dona Carolina, although the Mammoth boasted a "fine tunnel." Two months later, the Macedonia Silver Mining Company of Buffalo, New York, was sinking a shaft as was the Blue Ophir. On the Wheeler property, an optimistic 3,000 foot tunnel was contracted for. Also in 1863

the townsite of Providence-"a string of stone cabins and tents"-was laid out and briefly prospered.[84]

The directory of mining companies with offices in San Francisco, for March, 1864, listed five with interest in Rock Spring: "The Donna [sic] Carolina , Jefferson, Miquadowa, Empire, Mammoth and San Francisco." The last three appear to have been run by the same company.[85]

In November the Rock Spring, Macedonian, and Silver Hill are mentioned as three separate districts, reflecting areas of greatest activity. Evidently work had been progressing on the Blue Ophir Ledge, for it had a 125 foot tunnel, while the Silver Hill District lay essentially undeveloped. A year later, in December, 1865, Mr. Ensign Bennett, superintendent of the Macedonian Mining Company, purchased an "outfit for the mine" in Wilmington and headed out with others to "test its value."[86]

The first rumors of "serious Indian problems" at Rock Spring began in November, 1865. It was not until the next year, however, that the district was abandoned after Moses Little, a miner, was killed by Indians on June 12, 1866, while alone in his cabin. Camp Rock Spring was established December 30, 1866, by the U.S. Army to protect mail carriers on the Government Road. Interestingly, they used two abandoned 25 foot long tunnels driven into the hill near the spring for storage.[87]

When the Indians were subdued, activity resumed in the Rock Spring area, after laying idle for years. Now called the Macedonian District, work began sometime in 1871. Around June, 1872, Matt Palen erected an expensive smelting works. Also during the month a team hauled a load of supplies from San Bernardino to the area. In July came this report: "We have heard of many persons who have already left and are preparing to leave for the newly discovered mines in the Providence Mountain ." Enough mining took place to ship 15 tons of ore to San Francisco in September, which grossed $650 a ton.[88]

A long time elapsed before the mines in the old Macedonian District were again active. The Macedonia Mine, renamed the Columbia, was apparently active just after the turn of the century, for in January, 1903, we learn the property had been attached to satisfy a $3,700 debt.[89]

In December, 1910, C. F. Dayton, general manager of the Columbia Mining Company, was supervising installation of a five-stamp mill at the mine. Mark Neumayer and George Martin, more at home at their mine in Gold Valley, were employed mining on the Columbia early in 1911. By March, the mill was in operation, and the company soon began shipping concentrates. These concentrates reportedly were running $365 per ton. In 1935 and 1936 this property was leased to the Columbia Mines Inc. They rehabilitated the five-stamp mill and added a flotation plant.[90]

The Francis Copper Mine, not far from the Columbia, was active in 1917 and 1918 when 307 tons of ore were shipped to the Valley Wells Smelter. In 1931 there was a bunkhouse and a boarding house at the mine.[91]

Providence

In the spring of 1880, George Goreman and P. Dwyer, prospectors from Ivanpah, discovered rock that assayed from $640 to $5,000 a ton in silver. Their discovery, about 15 miles south of the old Macedonia District, was the birth of the Bonanza King Mine. By April the Trojan District had been organized, and a rush to locate claims had resulted. Andy McFarlane and Charley Hassen, "concluded to try their luck, and were rewarded by the discovery of a wonderful bonanza." Some of the other nearby mines included the Rattler, the Treasury, the Lucknow, the Mozart, and the Cashier.[92]

On July 3, 1880, it was reported that ore was being prepared to ship to the Ivanpah Consolidated Mining and Milling Company at Ivanpah from the Bonanza King. However, further development was hampered by a lack of capital. Sometime around the spring of 1881, J. D. Boyer and H. L. Drew, San Bernardino businessmen, purchased the mine. In June, 1881, they also paid $20,000 for the Pierce Mine. This was probably a good investment, seeing that $28,000 in ore had already come out of it, yet the remainder of 1881 is notably lacking in information from the mines. In December, 1881, J. B. Osborne, H. L. Drew, J. D. Boyer, and N. Hasson sold all their interest in the old Amargosa Mining District for $22,500. This sale gave H. L. Drew and Mr. Hassen, now in partnership with Mr. Osborne (of Calico fame), some extra money. Work was to begin at once on the Bonanza King, and negotiations for sale of their mines in the Providence Mountains were stopped.[93]

On the Bonanza King, in January, 1882, a rich vein assaying $100 to $1,200 per ton was discovered and a plan was "on foot to erect a large mill there in a short time." Instead of going through with these plans themselves, they sold the mine to the Bonanza King Consolidated Mining Company, reportedly for $200,000.[94]

In July, 1882, a new hoisting works arrived for the Bonanza King Mine via Colton,and a ten-stamp mill built by Prescott, Scott and Company of San Francisco was freighted from Mojave by Remi Nadeau. All was in preparation for the mill. Between 100 and 150 men had actively been employed since May or June. The main shaft was being sunk by 3 shifts of men, and some 2,000 tons of ore worth $230 a ton sat waiting on the dump. A post office had opened in June, and the town of Providence was born.[95]

In the meantime, the Southern Pacific was rushing its way east from Mojave to stop the A and P before it reached California. The S. P. Railroad was open to Waterman (Barstow) on October 23, 1882, and to Goffs on March 19, 1883. This no doubt was pleasant news to the owners of the Bonanza King who, in January, 1883, shipped their first 11 bars of bullion worth $19,000. During the first 12 days of February, they shipped an additional $28,300 in bullion. The mill was turning out 2,000 ounces of 930-fine silver a day![96]

In July, 1884, Thomas Ewing, the superintendent, reported "the Bonanza King is better opened up, better worked, and we have obtained better results from the ore than any other mine in this great mineral desert. Nearly one million dollars has been taken out from the mine in 18 months and ten days."[97]

The mine continued to make good profits, but at a high cost. A February 3, 1885 letter to the *Calico Print* blasted foreman H. C. Callahan and shift boss John O'Donnell for being "heartless task masters . . . forcing men to work more than their health and strength will permit."

On March 11, 1885, the mines and mill were shut down, and virtually all the miners left. About a week later, the mines reopened with only 15 miners who earned $3 instead of the previous $4. The owners claimed the low price of silver forced the action. By the end of March, 35 to 40 men were back at the mine, which previously employed from 150 to 200. In order to attract additional workers, the company purchased advertising space in the *Calico Print* .[98]

It was not until about June 20 that the mill started up again. The company was milling 24 tons of ore a day, and in one month, 24 bars of bullion had been produced. However, just two weeks later, on July 31, 1885, the mill burned to the ground, "the mines closed down and the owners, after collecting the insurance, went east, probably with a sigh of relief."[99]

In 1890 Dr. Henry DDe Groot reported that the mine had produced $60,000 a month, "the ore averaging one hundred dollars per ton." The mill operated more or less continuously from January, 1883, to March, 1885, and during June, 1885. This is a total of 28 months which would equal about $1,700,000.[100]

The spring after the mill burned, the *Wallapai Tribune* reported that a railroad was being surveyed to Providence and that a smelter would be erected at Needles as soon as the railroad was completed. In 1890 it was rumored the company intended to erect a twenty-stamp mill to replace the old mill, but this was not done.

Little took place on the Bonanza King property in the 1880s after the mill burned,

but at the nearby Kerr Mine, a five-stamp mill was erected late in 1885. This mill ran continuously at least until 1890 and paid good dividends.[101]

In 1906 the Bonanza King Mine was reactivated by the Trojan Mining Company. They installed a ten-stamp mill powered by three gasoline engines. The mine was active only until September, 1907, but the property was examined and a thorough report was written. This aroused a great deal of interest, and in 1914 Hall Rawitser and Company of Massachusetts purchased the mine, beginning development work. With Mr. J. C. Gerney as superintendent, the mine was again a producer by 1915.[102]

The company totally revamped the mill, and during 1919 was treating 40 tons of the old dumps a day. Some rich ore at this time was shipped and reportedly carried 100 to 500 ounces of silver a ton. Operations were suspended in 1920. During 1923 the property was leased to the Bonanza King Consolidated Mines Company, and 6 men were employed, working on the third, fourth, fifth, and sixth levels. One carload of ore was shipped in May, 1924.[103]

Providence Mountains (Gold-Iron)

The gold mines in the Providence Mountains that were first worked lay south of Foshay Pass, and were discovered as early as 1882. In May, 1886, the Queen Mine, Relief, Red Cloud and Mexican Mine were being developed. A mine district named the Arrow encompassed the mines, with Sam King recorder at Arrow Camp (later known as Hidden Hill.) By 1890 little actual work had been done. On one mine known as the Domingo (or Mexican), "Mexicans" had sunk a 40 foot shaft and milled ore in an arrastre.[104]

After the fall of silver prices in 1893, here, like everywhere else, gold became a much sought after commodity. In February, 1894, a discovery of gold 9 miles south of Providence, at Hidden Hill, aroused extreme interest. At a time when the Vanderbilt Mine was waning, Pat Dwyer (one of the discoverers of the Bonanza King in 1880) with Jim Walker discovered ore that ran 54.5 ounces of gold a ton. P. H. Keane located the Hidden Hill Mine, and after a few shots of dynamite, took out over $25,000 in gold ore that was worked in an arrastre. The Goldstone District, as the area was dubbed, experienced only a short-lived flurry of interest. About 1895 Monaghan and Murphy of Needles purchased 5 claims, including the Hidden Hill, and Golden Queen (or Queen) and formed the Hidden Hill Mine. They erected a small two-stamp mill. In the intervening years, until 1901, the shaft on this property was deepened from 35 to 165 feet, a modest development that yielded $36,000 (including the $25,000 discovery at Keane.)[105]

In the spring of 1913 there was a serious revival of interestt in this section of desert. The Mable Mine, also known in 1913 as the Gannon property, was discovered in the rush of 1894. Lying north of the Hidden Hill, 94 sacks of high grade gold ore were shipped from there in June, 1913. The Hidden Hill was gearing up for renewed mining in December, as "several tons of supplies and material" were sent to the

mine. Two weeks later it was reported "A. E. Nescus, E. M. has men working building a camp on the Hidden Hill Group at the Golden Queen Mine. Myles Lund has charge of the work. John Domingo is busy with a stage and freight team."[106]

By January the camp was constructed and Mrs. Nescus moved in to join her husband. In February, eight men were employed mining on the property. On April 9, 1914, the Hidden Hill Mining Company was incorporated for $100,000. Also, it was reported that "Buildings are still going up . . . and the camp is assuming the appearance of a village." In June, 1914, the miners struck an ore body heavy with free gold. This may be the pocket of ore that reportedly produced $13,000 from 300 pounds of rock. In spite of these incredible discoveries, the mine appears to have closed down about this time. The buildings were attached by the contractor, then Sid Dennis, who was building roads, attached the contractors' team and wagons for debts incurred. Little additional work is recorded from this mine.[107]

As was mentioned above, the Mable Mine was active in 1913. The property was again active from late 1918 to 1919. Production up to 1920 was about $100,000. In 1924 two men were working at the mine, and in 1940, four were. In 1940 there was a neat little camp at the mine, but the mine has been idle since.[108]

The Vulcan iron deposit, on the west side of Foshay Pass, probably had been known for many years prior to its patent in August, 1908. About that time there was a 100 foot tunnel at the mine, but economic consideration forced the mine to remain inactive. It was not until the demands of World War II that the mine was opened. A camp was constructed to house 65 men near the mine, and another 35 men lived with their families in trailers at Kelso. Between December, 1942, and July, 1947, over 2,000,000 tons of ore were shipped by Kaiser Steel Company, the owner of the property, to the Fontana Steel Mill. When the Eagle Mountain deposits were finally opened up in 1948, the Vulcan property closed down. Since 1947 some iron has been mined for use in the manufacture of cement.[109]

Gold Valley

In late summer of 1908, high grade gold was discovered 28 miles southwest of the new boom town of Hart. This discovery, known as the Lost Burro, was made by D. G. Warfield and Mark Neumayer. By the middle of September, the townsite of Gold Valley was laid out and a city of over 50 tents sprang up.[110]

The shaft at the Lost Burro Mine was 100 feet deep, and yielding $65 a ton in gold worked in an arrastre. In the beginning of December, Warfield and Neumayer sold half of their interest to James N. Williams of Los Angeles, who agreed to have a stamp mill in operation at the property. In August, 1910, four men were working the mine, and in January of the following year it was announced "properties are all looking good at Gold Valley."" A month later, Mark Neumayer, with George Martin was putting up a stamp mill there to mill high grade ore. On private property in a hidden part of the valley, an old stamp mill has recently been uncovered, perhaps one of the only remnants left of mining in Gold Valley.[111]

Out West was a small mine camp on the extreme north end of Gold Valley about ¼ mile east of the head of Black Canyon. In 1909 the Out West Mining Company was active here. At that time, there was a stone house, about 3 frame-tent houses and a 40 foot well at the camp.[112]

CLARK MOUNTAIN

In 1868 a Piute Indian brought a piece of metallic copper to Johnny Moss, "a frontiersman and well-known prospector." After finding the source of the native copper, Moss took some samples to San Francisco to interest investors in developing the find. The Piute Company was organized on April 13, 1869, and without delay a company-sponsored party set out from Visalia to examine the Moss discovery and explore the area. Accompanied by James H. Crossman, a Massachusetts born "forty-niner" who had joined the company as a mining expert, this party discovered silver in addition to the copper, and staked some 130 claims in the Clark and nearby Yellow Pine District. These locations included additional Copper World claims staked on September 24, 1869, around the original Moss discovery of the year before. Later that year "a number" of experimental shipments, involving a few tons of ore, were extracted and sent from the Copper World to San Francisco. On the east side of Clark Mountain near the silver mines, the Piute Company laid out Ivanpah townsite. This work was the first in the Clark Mountain District, at least in historic times.[113]

On the east side of Clark Mountain, 2½ miles from Ivanpah, the Piute Company party found "a curiosity well-calculated to arrest their attention and excite inquiry." A contemporary source describes this curiosity as follows:

Into the face of a smooth cliff, more than two hundred and fifty feet high, and at a point a hundred feet above the base, have been deeply carved, in Roman letters, the letters I.L.D., preceded by the figure of a cross. These letters are all of gigantic size, being not less than sixty feet in length; their magnitude, and the depth to which they have been cut, rendering them clearly visible at a distance of five miles. They were evidently carved many years ago, but by whom, or for what purpose, is unknown; the Indians themselves having no knowledge nor even traditions concerning their origin. That they were the work of Christian men, the figure of the cross would seem to indicate, having most likely been carved by the Catholic missionaries who are known to have penetrated these regions centuries ago in propagating their faith among the native tribes.

But why so much labor should have been expended by these devout men, or what meaning these letters were intended to convey, are questions for the archaeologist to solve. Disposed to utilize these characters rather than to speculate upon their origin, they have been adopted as the name of a valuable silver-bearing lode in the neighborhood."[114]

The silver discoveries at Ivanaph drew immediate attention, and men were soon flocking from "White Pine, Washoe, California and other places." On June 30,1870,

the Piute Company was reorganized, and incorporated for $5,000,000. Johnny Moss was superintendent, and Crossman (a trustee) was the company representative at the mine. The company hired a rider to bring mail from Camp Cady to the mines. One of the company's principal mines was the Eugene, about 2 miles up the canyon from Ivanpah townsite. At this mine about 50 white men and 50 Indians were employed. In August, 1870, ninety sacks of ore were shipped to San Francisco via Anaheim and Anaheim Landing.[115]

On Monday, August 21, a meeting was held in San Bernardino discussing the problem of transportation from the mines to the coast. A route via Morongo Pass, claimed to be 25 to 30 miles shorter, was proposed, and a party of men was going to survey the road. Judge Boren urged the constructing of a "railroad or otherwise" to connect San Bernardino with Anaheim. In September, Mr. L. F. Loveland, vice-president of the Piute Company, and David Alexander headed to the Copper World to survey a 40 mile tramway to the Colorado River. Apparently some of the early shipments were made via the Colorado from near Cottonwood Island. Indeed transportation was of great concern for these remote mines, as indicated by a letter to the *San Bernardino Guardian* in which the Piute Company manager stated, "Should the Districts prove as valuable as we think they will, perhaps we may help matters by building a narrow-gauge railroad for a part or the whole of the distance."[116]

The other great concern was reduction of the ore. Obviously a mill would greatly reduce the transportation costs, since silver bars would be shipped from the mines instead of crude ore, but a mill takes a great amount of capital. John Moss in August, 1870, was in San Francisco making arrangements for the purchase of a reduction mill to be erected in the Clark Mountains. By March, 1871, a furnace was operating, "producing bullion," and the Searles brothers had gone to the area with intentions of erecting furnaces or mills. However, in September, 1871, mine owners still complained "the great need of this district is a good mill." There were at least two arrastres set up about ½ mile below the springs that supplied Ivanpah as early as July. These arrastres were operated by "Mexicans" who were working some second-class ore from the Eugene Mine. The amalgam was retorted, and the resulting high grade ore was shipped to San Francisco.[117]

Some time in 1871, perhaps as early as July 10, the Piute Company suspended operations after shipping at least 20 tons of ore. The rumor was that they devoted their funds to keeping a large number of men prospecting instead of systematically opening the mines. In any case, the company still had a superintendent, Mr. France, on the property in September.[118]

The Piute Mining Company, though short-lived, had a significant impact in terms of the permanent place names of the area. Superintendent France lent his name to France's Spring, now known as Francis Spring, north of Halloran Spring. Also, it is interesting to note that T. I. Cronise and William H. V. Cronise were both officers of the company in 1870, probably accounting for the name of Cronise Lake. The chief's name of the local Piute tribe at this time was Pachoca, a name transferred to the spring known today as Paechalka on the west side of the mountains. In 1870 a 160 acre townsite named Pachoca was laid out here by the Piute Company. At Mineral Hill, where the majority of the silver mines were located, an 8 acre site was named Cave City. According to Burr Belden, one of the major silver mines of the area was

located when Tom and Andrew McFarlane and Ed Southwick took refuge in a cave to escape a downpour. Undoubtedly these caves were the city.[119]

By August, 1871, the town of Ivanpah was just that, a town consisting of buildings: a hotel, two stores and the office of the Piute Mining Company, with the remainder being small dwellings. Three of the buildings were at least 40 by 60 feet, the largest being the hotel. About 20 Indians were in the camp, employed attending pack trains, and engaged by the miners in work.[120]

Even though the Piute Mining Company had ceased to exist by the end of 1871, many of those who had come to the area remained. John McFarlane and his brother had already begun making a paying venture of their mines discovered in the spring of 1870. Their mines included the Beatrice Number 1 and 2 and the Monitor. A Mr. Hite and Mr. Chatfield discovered a mine over the hill about ½ mile from the Eugene which they first named the Chief of Sinners but later renamed the Lady Bullock. The McFarlane brothers' camp, located among dwarf pines near this mine, consisted of a very large tent with bunks and their office. Mr. Thompson of Holcomb Valley had a blacksmith shop nearby.[121]

Throughout 1871, the Ivanpah mines were busy shipping ore,with the wagons coming back to the mines full of provisions and groceries. The spring of 1872 was particularly busy with 28,000 pounds of ore going through San Bernardino in the first 15 days of April.[122]

The *San Bernardino Guardian* on August 24, 1872, reported that "some beautiful specimens of gold and silver bricks were exhibited to us this week from the Ivanpah smelting works." However, there is no further mention of these smelting works. Other than this, 1872 was business as usual, with the mines shipping ore to San Francisco. The Lizzie Bullock (referred to earlier as the Lady Bullock) made $20,000 in profits for its owners in this year.[123]

In 1873 Ivanpah finally had a smelter. In March, 1873, material for a furnace left San Bernardino. By April 26, it was erected near the McFarlane camp, but not yet running. While it was eventually made operational, despite continued success at the mines, this smelter doesn't seem to have been a success. In February, 1874, there was plenty of ore in sight at the McFarlane mines, "only awaiting the necessary machinery to transform it into bullion." By now the McFarlanes had a very comfortable house at the mines to replace the tent they first lived in.[124]

Ivanpah was very much alive in September, 1875, when 60 to 80 men were there. The next spring rumors of the pending sale of the McFarlanes mines to a New York company surfaced in the *San Bernardino Weekly Times, and on April 8, 1876, the* mines, machinery, and teams reportedly sold for $200,000. By June 3, three bars of bullion weighing 500 pounds and valued at $5,000 were received in San Bernardino from the mines.[125]

On May 27, 1876, it was reported that a new mill at Ivanpah was ready to start up. A June 4 letter gives more information concerning the mill and camp:

Not an idle man in camp! Such is the expression heard on all sides nowadays. The

new ten-stamp mill, just completed by Messrs. Bidwell & Ladd is under full headway at work at the Lizzie Bullock ore but at present it only runs on one-half time, and so the ore is not used up as fast as otherwise would be. The mill of the Ivanpah Company is running along as usual under the management of that prince of good fellows, Wm A. McFarlane.

Further on, the informant, writing under the pseudonym of Justice, indicates ore from the mines at Tecopa were being milled at the Ivanpah Company's mill.[126]

That fall there were 24 registered voters. By comparison, in 1875, when there were at least 80 men in the camp, there were only 7 registered voters, indicating the population may have grown,or someone came in and registered the men.[127]

More research will probably explain the seemingly anomalous bankruptcy of the Ivanpah Mill and Mining Company in January, 1877, and subsequent sheriff's sale of the property to satisfy about $3,000 in debts. The camp experienced a new boost in 1878, for something warranted the establishment of a post office on June 17, 1878. That "something" probably was the purchase of the McFarlanes' Mines by the Ivanpah Consolidated Mine Company. In November, 1879 the Ivanpah Consolidated Mine property changed hands again, now owned by San Francisco investors. Already over half a million dollars in bullion had been shipped and a fifteen-stamp mill was on the site. The smelter apparently was operative to produce the bullion. A month later nearly 11 tons of machinery left San Bernardino for the "Ivanpah Consolidated Company" mines.[128]

In the spring of 1880, Ivanpah flourished like it never had. The ten-stamp mill owned by J. A. Bidwell was running on ore from his mine, the Lizzie Bullock, which was then leased to A. F. Johnson. The Ivanpah Consolidated Company's mill started up again, and a reduction in milling charges by Superintendent William D. McFarlane stimulated interest by chloriders in some of the abandoned mines. The company employed about 70 men, earning $4 a day, with board costing $8 a week. Robert Hamilton was storekeeper at the company store.[129]

This new excitement, in part was fueled by exceedingly rich discoveries at two new mines, the Alley and the Alps. The Alley, discovered by Tom McFarlane and J. B. Alley, had its ore milled at the Ivanpah Consolidated mill. During one day in the last week of March, 1880, the Alps took out over $1,000. The Ivanpah Consolidated was not doing too bad either, having shipped $10,000 worth of bullion during the month of April. A letter from Ivanpah on June 20, indicated $7,000 in bullion left "on the last stage" from the Ivanpah Consolidated mines.[130]

"Ivanpah," states an article in the Colton *Semi-Tropic* "for three or four days after pay day, was as lively as the camps of '49. Everybody had money and consequently nearly everybody was drunk, or trying to get that way. Fights were the order of the day." At least one of these fights ended in a murder. On April 20, 1880, a letter from Ivanpah told of the murder of D. C. Sargent by A. J. Laswell and Jack Riley, stemming from an argument at a poker game. The two were hauled off and tried in San Bernardino that fall.[131]

Bullion continued to arrive in San Bernardino from Mr. Bidwell's mine and the

Ivanpah Consolidated on the Ivanpah Stage up until March, 1881. However, by April, the prosperity became tarnished. William A. McFarlane arrived in San Bernardino and related the disturbing news that he had been fired and that J. A. Bidwell would take his position as superintendent. Also, for some time no one had received pay.[132]

Things continued to get bleaker and bleaker, finally culminating in one of those violent if not colorful kinds of events so often associated with mining history. On Monday, May 8, "Mr. E. F. Bean, revenue collector, left for Ivanpah . . . for the purpose of attaching the property of the Ivanpah Consolidated Mill and Mining Company for a claim of the United States against the company for issuing scrip in imitation of money."

Bean, arriving on the afternoon of May 16, went to the company office and left his valise. Soon thereafter, as later reported," *he met J. B. Cook, a former employee of the Company, who, knowing the business of the officer, commenced to use threatening language, telling him he was not a U.S. Marshal, and he could not take the property. Mr. Bean told him he was a U.S. officer, and was there under the authority of the government and must discharge his duty. Cook appeared to be reconciled and Bean left him. Bean made inquiry as to the character of Cook, and was assured that his talk was merely bluff.*

Next morning Bean served notice on Wm M Farlane, Superintendent, posted his notices and took possession. About 4 o'clock an appraisement was made, Mr. Bidwell being selected by Bean, and Killbride and Brookfield by McFarlane. The appraisers, with Bean, went to John McFarlane, who was at work in the mill and asked him how much quicksilver there was on hand; he at once flew into a passion, was very abusive, and, seizing a hammer, ordered the party from the mill. As they retreated McFarlane followed them, and seizing a double barrel shotgun, which stood handy by, overtook Bean, threatened him, using the most abusive language, and applying the most opprobrious epithets, drew his gun on him and threatened to shoot him. Bean being about 12 feet off, sprang forward and thrust the gun away, telling him he was sent there as a U.S. officer to take the property, and should do it If he lived, if they killed him a force sufficient to take it would be sent, it was useless to resist, etc., and succeeded in pacifying him; McFarlane cooled down, apologized for his rash conduct, and afterwards, at Bean's request blew off steam and shut down the mill.

Cook, Fred Hisom and Bob Poppet were appointed watchmen to protect the property, each to be on 8 hours at a time. About 7 in the evening Bean went to the mill with Hisom, putting him in charge, and relieving Poppet, who preferred to take the watch from 12 to 8. Poppet went to his saloon where Cook sat playing cards. Cook asked who was in charge at the mill, and being told it was Hisom, he immediately started for the mill, saying that d--- --- -- - ---h should not stay there, he would drive him out. On the way he met Bean and John McFarlane to whom he made the same threats and rushed past them to the mill. Bean followed as closely as possible, and as he entered the mill saw Cook with his revolver drawn on Hisom, the hammer partly raised. He seized the revolver with his right hand and struck Cook with his left. The two then clinched when McFarlane rushed in to assist Cook. Hisom who had drawn his revolver when Cook aimed at him, stepped up and told

McFarlane to let Bean alone. McFarlane then stepped back to the door, where his double-barelled shotgun stood ready, seized it, and drew it on Hisom, who was about 15 feet away, and threatened to blow out his brains. Hisom, instead of firing sprang forward, dodged quickly and struck the muzzle of the gun up just as it was discharged, the charge passing over his head. He then rushed heavily against McFarlane, crowding him against the side of the building, and causing him to drop the gun. McFarlane then clinched Hisom, drew a knife and struck him on the back of the head, cutting a bad gash. The latter, realizing his danger, thrust his revolver under his left arm, pressing it against his antagonist, and fired three shots, one of whlch reached his heart and killed him instantly. McFarlane fell, drawing Hisom down with him.

Cook, who had fallen in his struggle with Bean, seeing McFarlane fall and hearing his groan, surrendered and begged for his life. Other voices were heard outside, and further trouble was feared.

Cook and Bean left the mill, and Hisom, after blowing out the two candles which were burning, went over to Bidwell's mill. Just as they went out Bean slipped and fell, and two shots were fired by unknown parties, one of which passed close to his head. Hlsom had the wound on his head dressed by Bidwell, and then gave himself up to Deputy Sheriff James. Cook was also arrested and both parties arrived in town about 10 o'clock on Monday morning. Bean, Bidwell and Jack Cochrane arrived on Sunday.

*McFarlane was buried at Ivanpah. Hisom had a hearing before the Superior Court and was at once discharged, it being a clear case of justifiable homicide. Cook's case was continued to June 15th,and he was admitted to bail in the sum of $2,500. H. Brinkmeyer, J. Meyerstein, Smith Haile and Jack Cochrane being his bondsmen.*133

During the week of December 31, 1881, John McFarlane's body was disinterred at Ivanpah and moved to San Bernardino at the request of his widow.[134]

On June 3, 1881, the *San Bernardino Valley Index* published an advertisement for the sale of the Ivanpah Consolidated Mill and Mining Company to satisfy a government claim of $1,471.94. But the company was not going to surrender that easily. In July, the Ivanpah countered with a $50,000 damage suit against the U.S. government.[135]

While the Ivanpah Company was embroiled in turmoil, work continued as usual at the Alley Mine, which shipped four silver bars worth $1,200 that fall. However, after the excitement of 1880, mining at Ivanpah slowed and was overshadowed by Calico and the Bonanza King.[136]

During the waning days of Ivanpah in the 1880s, ore was ocassionally run at the Bidwell mill from the Lizzie Bullock and Alps mines. In May, 1886, Tom McFarlane was working the Alley, which he had leased, and several men were chloriding (mining) various claims. In 1890 the two mills were still running, but by 1891 life was essentially finished for the silver camp of Ivanpah. Although Bidwell's store and boarding house was open in December, 1892, and two tons of ore were sent to Kingman for milling by William Daily in December, 1893, the crash of silver prices

in 1893 sounded a death knell for Ivanpah. The often quoted figures of James Crossman, a man who helped usher in the camp in 1869, are as follows: combined output of the Monitor, Beatrice Number 1 and Beatrice Number 2, $2,500,000; the Lizzie Bullock, $1,200,000; and $100,000 in dividends from the Alley.[137]

Nantan

In the declining years of Ivanpah during the 1880s, there was at least one mine, the Cambria, about 6 miles south of Ivanpah, that brought encouraging news. The Cambria was a gold and silver mine discovered sometime before the spring of 1880 by "Messrs. Morgan and Orr" and was "turning out all that could be desired" that spring. In 1882 the mine was sold to William A. McFarlane. McFarlane and S. A. Barrett, in the year 1885, aggressively began developing the mine. They leased the "Old Ivanpah Consolidated Mill at Ivanpah" that May. During the last week of the month, "a number of miners and woodchoppers" left Providence for the Cambria Mine.[138]

The *Calico Print*, on June 3, announced the "Mescal mining camp has commenced to boom. About 20 pack animals of John Domingo are making daily trips from the Cambria mines to the mill at Ivanpah." The mill was started up on Wednesday morning June 17, 1885. Seven or eight men were employed at the mine. By the middle of July, the first two bars of bullion worth $2,720 were shipped by Wells, Fargo and Co.[139]

In 1886 the property was bonded to a Los Angeles company that erected a ten-stamp mill. They began driving a new tunnel 125 feet below the old one, and a 350 yard rail tram connected the mines with a road below. In 1890 it was reported "a ten-stamp mill is kept running." But this probably closed down shortly after. Nearby, the townsite of Nantan sprang up and had U.S. postal service from March, 1887, to December, 1890. A small amount of silver ore was shipped in 1908 and 1909, and a carload in 1915 yielded 2,000 ounces of silver and 3½ ounces in gold.[140]

Rosalie

After laying idle for 30 years, the Copper World was reactivated in 1898. The Ivanpah Smelting Company of Los Angeles sank two wells 5 miles from the mine, on a site known variously as Valley Wells or Rosalie Wells (or simply Rosalie). Nearby, in January, 1899, a fifty-ton furnace was erected, and that April there were 85 men employed, with Mr. V. C. Reche as superintendent.[141]

A post office was maintained at the Ivanpah camp until April 24, 1899, at which time it was moved to Rosalie. In a sense, mules were the backbone of this mining operation. There were 140 of them there in April. A 20 mule team hauled 35 tons of ore with every trip to the smelter, also, up to 20 tons (a carload) of copper bullion was shipped every 4 days to the California Eastern Railroad at Manvel, 30 miles southeast. Coal from New Mexico for the smelter and supplies came with the return trip.[142]

Obviously, transportation to and from Manvel cost the owners a great deal of money. To cut these costs, they persuaded the California Eastern Railroad

management to extend the line down the steep canyon from Manvel. While the railroad was busy being constructed, operations at the mine ceased, around July, 1900, because of litigation, and the post office of Rosalie was abandoned July 31, 1900. During the year or so of operation, the mine had produced 11,000 tons of ore averaging a respectable 13.5 percent copper.[143]

In the meantime, in 1902, the California Eastern line was extended to the flat Ivanpah Valley, within 15 miles of the Copper World. A settlement named Ivanpah (the second place with that name) sprang up at the end of the line. This new Ivanpah consisted of about 20 to 30 people.[144] .

When the railroad reached the Ivanpah Valley, the mine and smelter resumed operations for a short time, with 50 tons of ore a day coming out of the mines. However, the operation ceased, blamed on a high loss of copper in the slag. Operations up to this time are reported to have produced $750,000 in copper.[145]

Dr. L. D. Godshall acquired the title to the property in 1906, organized the Cocopah Mining Company, and operated the mine from August, 1906, until 1908. Good accommodations were available at the mine for the workers, who during this period put out 3,638 tons of ore averaging about 7 percent copper. The ore was hauled by teams to Ivanpah, and shipped via the California Eastern and Santa Fe Railroads to the Needles smelter, run by Godshall.[146]

The Cocopah Mining Company, reorganized under the name Ivanpah Mining Company, resumed operations in May, 1916, and continued steadily until late 1918. In November, 1917, a 100 ton capacity blast furnace for making copper matte opened at Valley Wells. About 100 tons of ore a day were hauled to the smelter by tractor. Also, 13,000 tons of slag from earlier operations was being treated, which averaged from 2 to 10 percent copper.[147]

The copper matte was hauled 25 miles to Cima (by 1916 the California Eastern had ceased operations to Ivanpah) and shipped to the smelter at Garfield, Utah. Sulphur, in the form of iron pyrite for the smelter charge, was obtained from Jerome, Arizona, and from the Francis copper mine (another enterprise of Dr. L. D. Godshall), located on the southwest slope of the Providence Mountains. The Francis Mine shipped about 30 tons of copper-lead-silver ore a month to the Valley Wells smelter. When operations were just getting underway in 1916, there were only 6 men employed at the mine, but two years later, 60 men were at work. Operations were suspended in 1918 due to the low price of copper. The average value of the ore for these operations was 4 percent copper, 3 to 5 ounces of silver and .04 to .1 ounces of gold per ton. In 1944, 3,743 tons of old tailings were treated, and in 1949 copper furnace matte was shipped in a cleanup operation.[148]

In 1977 Philip Rivera acquired a long-term lease from the Dan Murphy Foundation, the owners of the Copper World. In June, 1977, he commenced mining for "Royal Gem Azurite," a combination of malachite, azurite, and tenorite. Work continues at the mine today.[149]

IVANPAH MOUNTAINS

The Bullion Mine, on the north end of the Ivanpah Mountains is reported to have been discovered and first worked in the 1860s with the rich silver ore shipped to Swansea, Wales, via the Colorado River. In March, 1880, large quantities of ore were coming in " regulary every other day" from the Bullion Mine to Ivanpah for milling.[150]

About 1905 Jim Connolle and a Salt Lake City company mined several carloads of ore. After lying idle for 4 years, in May, 1909, George Bergman, an Eldorado Canyon mine owner, leased the mine and posted a $50,000 bond. At that time the mine was owned by "the Movahan Brothers of Victorville and Heber Robinson." At the mine were "fair mine buildings and a whim." It was developed by a half dozen shafts the deepest being 250 feet with levels every 50 feet that were driven 100 feet through the rock. There were about 250 tons of lead-copper-silver ore produced from the mine in 1916-1917 but it apparently has not produced any since.[151]

The Standard Mine on the west side of the range was discovered in 1904 and was in continous operation between 1906 to 1910. With additional production between 1917 and 1919 the mine produced almost 700,000 pounds of copper and 20,000 ounces of silver. In 1908 there was a substantial camp near the mine consisting of a bunkhouse and a boarding house sufficient for 100 men, a small store and an assay office.[152]

The Kewanee Mine, discovered about 11901, was most active between 1907 and 1911. In July, 1908, it was reported that "fifty miners have been employed for nearly a year," and a mill had recently been erected. A small camp was situated near the mine. An unsucessful attempt was made in 1952 to reopen the mine.[153]

The Morning Star Mine, west of the Kewanee was also first active about 1901, but was mainly active between 1927 and 1939. Since 1970 the mine has been intermittently active, developing the 100,000 ounces of gold the property was estimated as containing in 1953.[154]

There has been and continues to be activity at the New Trail Copper Mine and the Carbonate Mine in the Ivanpah Mountains. Near the Carbonate Mine in the 1920s a miner named E. P. Dorr discovered the Kokoweef Caves, and claimed that he found a river of gold. However, it seems that much of the legend about these caves is of recent origin.[155]

NEW YORK MOUNTAINS

James Crossman indicates that mining commenced in the New York Mountains in 1861 when prospectors looking for another Comstock stumbled on a rich silver lode. During 1862, according to Crossman, a small mill was erected, but it was burned down by Indians not long after. It is curious that newspapers, which gave the nearby Rock Spring Mining District much attention, make no mention of this mine and mill.[156]

The New York Mining District was organized April, 1870, with Thomas McMahan as recorder. It embraced 15 square miles on the south slope of the New York Mountains. Nevada claimed the area, perhaps accounting for the extreme silence in the San Bernardino papers regarding the area, for it was not until the spring of 1873 that any news is forthcoming from the area. In May, 1873, Bennett and Company of San Francisco were making arrangements to erect a mill at their mine during the summer.[157]

At this same time, the Montezuma Mine was attracting the attention of the curious. While prospecting in 1872, Matt Palen discovered an old shaft filled with debris, near the Elgin Company mine. Upon cleaning it to a depth of 100 feet, the walls were said to glisten with crystals and were bright with silver, yet no tools of any kind were found. The mine was offered as "evidence" of Spanish occupation and certainly not the only "evidence" to be uncovered in the desert (see sections on Rock Springs, Ivanpah and Dale.) Indeed the Spanish reportedly carried out the practice of filling mine shafts with rocks when they intended to leave them unattended for long periods of time.

Further "evidence" of the antiquity of mining in the area was furnished by the published account of a "reliable French gentleman" named Eugene D'Estey who, *"while hunting mountain sheep in the Rock Spring range, struck upon an old trail, long in disuse (a few fresh signs were visible, he followed the trail some distance) in places it was worn a foot deep in the solid granite, in waves similar to the trail crossing the Isthmus of Darien. His foot struck against something that gave him intense pain, with a muttered* sacra *at this mishap he stooped to examine and report on the wound inflicted upon his toes (which were protruding from his old boots) when, lo, and behold! there lay a silver brick, coated with mould and mildew as though it had lain in some damp place since the building of Solomon's Temple.*[158]

Though apparently never seriously worked, the location of the Montezuma was still known in 1890, when James Crossman described it as:*"a strong vein, carrying an abundance of ore rich in silver, galena and carbonates of lead. Though but little developed, the camp possesses every facility for economical workings, wood (nut pine and juniper) being abundant, with water sufficient for practical purposes. The water level is reached at a depth of from three hundred to four hundred feet. Elevation five thousand feet above tidewater; distance from A and P Railroad, thirty miles, over a natural highway of easy grade."* The mine had not faded from memory beyond the turn of the century, for in 1904 Ingersoll briefly summarized earlier accounts.[159]

In early 1872 the Elgin Mines Company of Elgin, Illinois, dispatched a prospecting party to the New York Mountains, with a Dr. Winchester along as assayer. The party set out from their property in Eldorado Canyon, and discovered some abandoned mines in the New York Mountains that looked quite promising, lending credence to at least part of Crossman's story. About a year later, 5 tons of ore was shipped to San Francisco, and grossed $468 per ton.[160]

All of this activity by the Elgin Company took place virtually without the knowledge of the residents of San Bernardino. One can imagine their surprise in

August, 1873, when seven teams passed through from Los Angeles to the New York Mountains, each loaded with 9,000 pounds of freight. The cargo consisted of a 40 horsepower steam engine and a boiler to power a fifteen-stamp Stevens crusher. The *San Bernardino Guardian* reported on December 6, 1873, that the mill was "at work and business improving." On January 24, 1874, the mill was going "full blast," and the first silver bricks were brought into San Bernardino during the middle of February by Dr. Winchester.[161]

This mill and in particular this bullion is historic. The *Guardian* reported these were the first silver bars produced in the county, and the mill was the "pioneer mining mill in the country [area]." This statement is in a way perplexing, for there had been reports of Matt Palen erecting a reduction works in the Macedonia District a year earlier and somewhat conflicting accounts of mills at Ivanpah as early as March, 1871. Maybe these others are more in the realm of wishful thinking than fact. In any case, this "historic mill" proved to be inadequate in treating the ore, and shortly was shut down. By May, 1874, Dr. Winchester settled in San Bernardino to practice medicine.[162]

In 1880 and 1881 there was a modest revival of activity. Andy Fife, in April, 1880, arrived in Colton to get teams to haul his mill from Lone Valley, Nevada to the New York District. One month later a party composed of San Francisco men headed to the mountains to try and relocate mining claims they had abandoned several years before. In March, 1881, the *San Bernardino Valley Index* listed eight silver mines, the Keystone, Gladiator, Long George, Centennial, Texas, Kiestler, McBride, and Duplex, all of which had modest development work done. Also listed were the Summit, Alto Copper, Vanderbilt and Pinkey copper mines.[163]

Between 1881 and March, 1885, the Centennial had a shaft sunk from 20 to 80 feet and a 230 foot tunnel to connect the bottom of the shaft. To accomplish this work, 4 men were employed, and in 1885, ore was shipped to Pueblo, Colorado via the A. and P. Railroad, 25 miles away.[164]

Isaac C. Blake, a Denver mining man, saw the mineral potential of the New York Mountains and the Yellow Pine District of southern Nevada. In the early 1890s he implemented a dream that involved milling, hauling and mining in the area. On April 22, 1892, the Needles Reduction Company, a mill built by Blake in Needles, began operations. To supply transportation from the mines to his mill, he built the Nevada Southern Railroad, from the Goffs north to the New York Mountains. Construction for the railroad began in January, 1893, and was completed to Barnwell in July, 1893.[165]

Some time in the early 1890s, Blake purchased a group of eight silver mines, probably the eight listed above, and named them the New York Mine. In March and April, 1893, eighty men, living in dugouts and tents, were busy developing his mine and making roads. The ore was being stored until the railroad reached its terminus. It was claimed large shipments of high grade ore were made, however, the panic of 1893 and the subsequent fall of silver prices silenced the operations not long after.[166]

The New York Mine came back to life in 1907 after being tied up in litigation with

the failure of Isaac Blake's empire. On April 13, 1907, Mr. N. P. Sloan and associates purchased the mine and formed the Sagamore Mining Company of Philadelphia, Pennsylvania. Mining commenced at once, and while deepening one of the shafts, the company encountered ore that ran 200 ounces of silver a ton. By July over 100 sacks of high grade ore had piled up.[167]

In early 1908, a fifty-ton roller concentrating mill was erected. However the property was only active about 6 weeks during that year. In 1913, tungsten was discovered here, and a small concentration mill was erected. During 1914, 15 men were working the mine, and they continued mining until 1917, when it again became dormant.[168]

Vanderbilt

At the same time that all of Blake's energy and money was being poured into the Eastern Mojave, the ephemeral but thriving town of Vanderbilt literally sprang up overnight. The gold at Vanderbilt was discovered by Bob Black, a Piute Indian, about 1890. However, he "had the usual experience of great discoverers and inventors, . . . no one wanted to go with him and see the prospect." Eventually, he interested M. M. Beatty, who had an Indian wife, a member of the same "family group" as Bob Black, and after whom Beatty, Nevada is named. It was Beatty who staked the first claims.[169]

In 1892, Beatty was joined by Mr. Allen Green Campbell of Salt Lake City in developing the Boomerang Mine, and they had a 100 foot shaft sunk by the end of the year. Joe Taggart, George Hall and James Patton owned the Chippy and the Gold Bronze. That fall Campbell, Patton and Taggart announced that both groups would erect ten-stamp mills and not long after, a rich strike by Taggart sent people flocking to Vanderbilt. On March 18, after only ninety days had elapsed, the town had swelled to 200 men, with but 18 regularly employed. The camp was recorded as being located in a narrow wash "with about a dozen tents, consisting of one lodging house, three boarding houses, two saloons, one general merchandise store and a Chinese laundry." There was also a Chinese restaurant. One of the saloons, the only two-story building, was run by Virgil Earp, the one-armed brother of Wyatt Earp. The general store was run by William McFarlane and housed the post office after it was established on February 1, 1893.[170]

In March, 1893, two transactions were made, although accounts are not consistent. It appears the Gold Bronze was bonded to William S. Lyle of Los Angeles, and John W. Mackay and J. L. Flood of San Francisco for $40,000. At the same time, the Gold Bar Mine was sold, and the California Mining and Development Company was incorporated by these three men, along with G. R. Wells and J. E. Walsh, for $10,000,000 to work the mines.[171]

In April, William McFarlane was elected district recorder for a year. During this time, the township of Vanderbilt was formed with a justice of the peace and a constable and a newspaper named the *Vanderbilt Shaft*. By June,1893, the town had grown to include "four saloons, three restaurants, four general merchandise stores, a lumberyard, lodging house, drugstore, butcher shop, post office, two doctor shops, and a population of over 400". Mr. Will A. Nash ran a "Justice Shop besides".[172]

In January, 1894, Mr. Campbell's mill,was moved from Utah. Great excitement was stirred up when about January 12, a blast in the Gold Bronze Mine opened a big cave of crystalized quartz, which ran up to 60 ounces per ton in free gold. By February, another ten-stamp mill had arrived for the Gold Bronze. Campbell's mill started up March 15, 1893, and the first day yielded a neat 25 ounce bar of gold. In March the Boomerang shaft was down to 260 feet, and the Gold Bar, also known as the St. George, was down to 250 feet and had hit water. Not just the big companies were at work, but the majority of the population was opening up holes all over the place. The Vanderbilt Mining and Milling Company, working the Gold Bronze, finally had their mill running about May, 1894, and the first of June announced they would devote half of the capacity of the mill to custom milling of ore, a break for the number of men simply digging holes.[173]

In the meantime, beginning in May, Pat Flynn had been working 7 men on his Queen of the Night Mine. The Queen of the Night had a 75 foot and a 180 foot shaft, and ore was raised from the shaft with a horse whim, sorted and shipped to eastern reduction works. Messrs. Marrs and Congdon and Mr. Ewing, had leases on the Chippy.[174]

In the beginning of June, 1894, it was announced the Boomerang had hit water at 375 feet, the Gold Bronze had hit water in April at 280 feet, thus all three major mines in the district had hit water. In September, 1894, the Gold Bronze employed 25 men, and the Boomerang was down to 500 feet, working 3 eight-hour shifts a day. However, after hitting water, the character of the ore changed and, unable to recover the gold in the ore, the Gold Bronze mill shut down in 1895. Mr. Campbell leased the Gold Bar and was hauling the ore a mile to his mill on the Boomerang. Eventually, in 1895, the Boomerang reached a depth of 550 feet,but it shut down also.[175]

In August, 1896, it was reported that Mr. Campbell had ordered heavy hoisting machinery to sink the Boomerang to 1,000 feet, with great hopes of riches below the water level, but it does not appear this scheme was ever carried out. In 1899 Campbell purchased the St. George (Gold Bar) Mine, and in mining it, uncovered a 10 foot wide vein. In June, 1899, he was taking out 20 tons a day, and was offered $300,000 for the property.[176]

About a year later, a cyanide plant was being built by Karns and Eckins of Manvel (Barnwell) to work the tailings of the Camppbell mill, of which there were 10,000 tons supposed to carry $6 in gold per ton. These operations were all part of a quiet, but substantial, revival of mining in and near Vanderbilt. In the 1900 census, there were 329 people living in the Vanderbilt Township, 96 of which were miners. In 1902 there were an estimated 150 to 200 men in the camp. In December, 1902, the St. George and Gold Bronze were leased to the Federal Mining Company which was working 30 men. Mr. Campbell died in 1902, however his estate continued to manage the property.[177]

After laying idle for about 7 years, the Gold Bar and Gold Bronze mines at Vanderbilt were leased in 19099 by A. L. White and associates of Ohio. They put the ten-stamp Gold Bronze mill into shape, and it was again running by

mid-July.[178]

In July, 1910, Mr. C. C. Porter had put in a big cyanide plant and began treating some 7,000 tons that were in the ore dump at the Campbell Mine. He expected to gross about $5 a ton in gold. The next year, in April, a Mr. Sharp, with five others purchased the tailings from the Campbell mill and started treating them. These operations lasted off and on for much of 1911. In the first week of January, 1912, the Pomona Mining and Milling Company began installing a three-stamp mill at Vanderbilt. This company may be the same group represented by Mr. Sharp. By April it was reported they were mining at the Vanderbilt mines, and their mill was running.[179]

In March, 1924, the Vanderbilt Mining Company had built new bunk and boarding houses and a completely equipped assay office at Vanderbilt. In addition, a 75 ton ball mill sat on the ground ready to be installed, and two shifts of men were employed sinking the main shaft.[180]

In 1929, the property was again leased, and this company shipped about 800 tons of ore which averaged .7 ounce of gold and 3.5 ounces of silver per ton. Another company leased the property in 1934 and 1935 and, upon installing a twenty-five ton flotation plant, began shipping concentrates to the Garfield, Utah smelter. Smaller scale operations continued until 1942.[181]

In 1965, Heavy Metals Corporation began drilling the property to determine the extent of the orebodies. Satisfied at their findings, they proceeded to erect a huge mill with a capacity of 500 tons a day. In production from 1969 to 1970 and during 1974 and 1975 about 100,000 tons of ore were treated in the mill from this mine. On February 24, 1978, Transcorp Corporation leased the property and are preparing to mine it.[182]

The Garvanza Mine

The Garvanza Mining and Milling Company of Michigan first worked its mine in Cliff Canyon on the north slope of the New York Mountains in 1907. In June of the following year, arrangements were being made for the installation of a twenty-five ton reduction plant to be ready in 90 days. Surprisingly, this was accomplished toward the end of August. The claims which had been bonded to Los Angeles and Eastern parties were worked for 9 months in 1908. However, the power plant for the mill proved inefficient, and it ran for only 3 months. The mine was first worked for values of silver, copper, gold, and lead, but by late 1909, the owners became aware of the presence of molybdenum and thorium. In fact, they were planning to erect a plant to produce thorium nitrate from the ore, even though this rare element amounted to only about .05 percent. Nothing more is heard of the attempt to mine this exotic element, and the mine is primarily known for the tungsten that was produced in small quantities during the First World War. Some time before 1916, three gentlemen from South Ivanpah, J. R. Comerford, Matt McCarthy and George Carruthers, took over the property, but soon becoming dissatisfied, they were willing to "sell this property on very reasonable terms."[183]

Hart

On December 19, 1907, Jim Hart, with Bert and Clark Hitt, discovered gold, soon transforming a corner of the eastern Mojave into the thriving town of Hart. By January there was a "stampede to Hart" with people leaving Needles and Searchlight "in automobiles, buggies, wagons and on bicycles and burros." Many men came from Goldfield, Nevada. By the end of the month, telephone wires that connected with the Western Union at Barnwell had been strung up (probably on the Joshua trees), and an estimated 200 men were in camp, working leases on the claims that had been staked.[184]

February had seen considerable excitement in the young town, with gunplay and litigation over the townsite and some of the original mining claims. There were about 600 to 700 people in the camp. The much anticipated water line from Barnwell was completed by the beginning of March, and in April a siding was built on the Barnwell and Searchlight Railroad. The siding was named Hitt, in honor of one of the discoverers, and a freight house was constructed there.[185]

Daily mail service had begun by April I, even though a post office was not established until April 30. A businessmen's league was organized, in order to "encourage legitimate mining," and a law-and-order committee of the league was formed "to assist in the maintenance of a quiet camp."[186]

Townspeople celebrated with a banquet and a ball the opening in April of the first class two-story Norton House hotel. In May buildings were going up all over the town, and "many substantial business blocks" were being constructed. Also in May a Little Giant mill, with a capacity of eight tons arrived from Goldfield. This mill was purchased by George Foster, owner of the Big Chief, and Hart and Hitt, owners of the Oro Belle Number One. The mill was installed, but the poorly constructed foundation literally vibrated apart by the heavy machinery, and it was not until November that, with modifications, the mill was finally running.[187]

Summer was a busy time in Hart. Another two-story hotel, the Martin House, was constructed. There were two general stores, a one-story rooming house, a bookstore, real estate offices, a candy store, two lumberyards, a bakery, and eight saloons. From early 1908 until about November, 1909, Hart had a newspaper named the *Enterprise*. There even was a cemetery that was the final resting place for five souls. A son born to Mr. and Mrs. Emory C. Peters in May,190,8 was the first child born in Hart, and as a token of honor, they were promised a golden loving cup to be made from Hart gold.[188]

It was not until July that the first major ore shipment was made from Hart. This ore was treated at the Cyrus Noble mill in Searchlight. Nearly all the ore from Hart was shipped to Searchlight for milling at a cost of $3 a ton.[189]

After the excitment of the first year, things settled down to just hard work extracting gold-rich rock from the mines. The principal mines were the Oro Belle, purchased from Hart and Hitt in April, 1908, the Big Chief, the Sloan lease on the Jumbo claim, the Quartette shaft on the Jumbo claim, the Oro Belle Number One

and Oro Belle Number Two. The Oro Belle One and Two were worked by Hart and Hilt until November, 1908, when it was purchased by A. B. Hall of Philadelphia, Pennsylvania. The Quartette shaft was being sunk by the Quartette Mining Company of Searchlight. The Jumbo was operated by the Big Chief group who built a twenty-stamp mill, pprobably in 1910. Indeed, there are ruins of a substantial mill about 1 mile south of the site of Hart.[190]

Sparks from a chimney ignited a fire that destroyed much of Hart during the last week of December, 1910. The fire destroyed the Martin Hotel, the townsite office, a general store, and other buildings. Although these buildings were never rebuilt, Hart lived on, and the mines continued.[191]

In 1913 Hart became a boom town of a different sort. Many people began taking up homesteads in that area. Two men passed through Barstow in June on their way there, for the purpose of erecting "several buildings on their business property," probably to supply the incoming homesteaders with supplies. In 1915 the Tonopah and Belmont Company optioned the Oro Belle and worked it for awhile. The post office shut its doors December 31, 1915.[192]

About 1 mile south of Hart, the Standard Sanitary Manufacturing Company mined clay from time to time from 1929 at least through the 1950s. Another clay quarry was opened immediately adjacent and to the east of the site of Hart in 1947. In September, 1974, the mill structure at this quarry was in the process of being dismantled. A quonset hut bunkhouse which was standing near the quarry in 1974 has since been razed. However both clay mines remain intermittenly active. Only a chimney remains at Hart, and one collapsed stone building about ¼ mile south. Yet there are possible signs of life. Transcorp, a Los Angeles based company, leased the patented Oro Belle Mine (owned by the Bagdad Chase Company) on February 24, 1978. They have thoroughly sampled the mine and may reactivate it.[193]

Death Valley Mine

The Death Valley Mine was discovered in 1906 by J. L. Bright of Kelso. In July, 1906, the Death Valley Gold Milling and Mining Company of Denver took over the mine, and by September, 1906, the camp of Dawson had sprung into existence, named after the directors of the company, the Dawson brothers. The first shipment of ore left during that month, consisting of several wagons full of ore hauled to Cima by a team of 12 horses. From Cima the ore was hauled via the Salt Lake Railroad and California Eastern to the Needles smelter. At the same time, the Arcalvada Mine, adjoining the Death Valley to the northwest, was active. Both companies mined rich lead-silver-gold ore running up to 634 ounces of silver and .48 ounces of gold per ton.[194]

In January, 1907, the Death Valley Company made their first ore shipment to the American Smelting and Refining Company in Salt Lake. During September, 1907, the Death Valley and Arcalvada companies merged to form the Death Valley Arcalvada Consolidated Mining Company, and by November there were 75 men employed. The mines were quite busy until June, 1908, when the company became involved in litigation which was not cleared up until 1915, although some mining continued throughout this period. In 1915 a new owner took over the property, and

these operations continued until 1921. Water was pumped from the shafts until June 11, 1927, when the plant and mill were destroyed by fire. The mine had produced about $131,000, $93,000 before 1915. In 1930, there was a camp that could accommodate 100 men, a thirty-ton concentration plant and a 6 room residence. Today the residence still stands, as do 3 other buildings. The property is patented and occupied. An electricity line connects the camp with Cima.[195]

EXCHEQUER DISTRICT

In the 1870s an old German named Erick Vontrigger made some mineral locations, and camped at what is known as Vontrigger Spring, about 9 miles north of Goffs. The story of his mine reads like that of the Lost Dutchman Mine of Arizona. The location of Vontrigger's mine was a jealously guarded secret from which he "periodically brought forth rich pouches of gold." He died in San Francisco in 1880 after an accident, and with him died the location of the source of his gold. Of course, the story of Vontrigger and his mine was hardly downplayed after his death, as one person, intending to capitalize on the allure of the legend in his own way wrote: "Around many a campfire was the tale repeated, undoubtedly with many additions and exaggerations." By the late 1880s, the Exchequer District was organized, encompassing Hackberry Mountain and the southern part of the Piute Range, the territory the lost Vontrigger Mine was supposed to be in.[196]

In fact in 1890, nine miles north of Goffs, the "Vontrigger Mines," as they were fancifully named by their owners, were active and at least one small shipment of copper-gold ore was made to San Francisco. Evidentally few at the time were convinced this was the old German's gold, for in May, 1895, a party of 7 men, looking for the mine, became lost near Vontrigger Springs and almost lost their lives because of dehydration. The conclusion was "the mine is still lost and the seekers have returned to Los Angeles."[197]

In the meantime, Cashier Camp, probably at the site of the Leiser Ray Mine, was a small but active place. In 1890 the Exchequer Mine, the Drednaught, and the Cashier mines were yielding silver and gold. All of the mines were worked by shafts, and the Cashier had one 150 feet deep. Development was slowed by a lack of water, yet by 1895 some new people showed interest. William McFarlane owned a gold mine here, and Albert H. Cram owned the Old Dominion and Nonpareil gold mines which were located in January, 1895.[198]

Cram had other interests in the area as well. Supposedly, in 1892 he located the Vontrigger Mine. People were still looking for the real mine in 1895, however, and the location of Cram's discovery matches closely with the property mentioned above as the "Vontrigger Mines" active in 1890, thus the authenticity of his "Vontrigger Mine" is equally dubious. By 1902, Cram, with C. W. Page, had located numerous claims, with the most extensive work consisting of a 70 foot shaft. In September, 1904, Cram purchased 4 claims that adjoined his from Sarah Weeks, a widow whose husband may have been mining there in 1890. Sometime later that year, the California Gold and Copper Company was organized and soon set to work, not at the mines, but to raise capital to develop the property. After sufficient money was

raised, the company began sinking 3 shafts, and in December, 1905, two shifts of men were busy. In August, 1906, 25 men were employed. Water was appropriated February, 1907, at a spring on the north side of Hackberry Mountain, and immediately a pipeline was begun to the mine which was completed in July at a cost of $20,000. Also, that February, the claims were surveyed as one of the requirements for obtaining a patent. By May, 1907, a substantial camp had grown up to include a general store, blacksmith shop, boarding house, rooming house, bunkhouse, about 7 cottages for the men, a large barn and an engine house. Altogether there were about 20 buildings.[199]

In July, 1909, a leaching plant was "near completion" yet in November it still was not in operation. In February, 1911, machinery for a new mill arrived, consisting of a crusher, an electro-chemical reduction plant and a cyanide plant capable of handling 100 tons of ore a day. By July it was operating 24 hours a day. A year later, in July, 1912, the plant was "running day and night, working ore from a large vein." However, operations were suspended prior to 1915. A year later the mine was leased, but the leasees do not appear to have put the mine into operation.[200]

From 1926 to 1928, 3,917 tons of ore, mostly from the dumps, were shipped from the property of the California Gold and Copper Company. In 1941 there was an attempt to precipitate copper on tin cans, which was unsuccessful. Then, from 1944 to 1945, the property was leased to the Dutch Oven Mining Company, which shipped about 1,175 tons of ore from the mine.[201]

In 1907 when the mines of the California Gold and Copper Company were going strong, other property was active in the Exchequer Mining District. In fact, a new district named the Crazy Basin District was established in the Vontrigger country. E. L. Lanfair and his partners were sinking a shaft 4 miles northwest of the Cram property, but others were working this mine too. A half-mile southeast of the Cram property was a mine operated in the fall of 1906 by the Dessie-Boyer Copper-Gold Mines, Ltd.[202]

As a further indication that many did not believe that the lost "Vontrigger Mine" had been found earlier, in February, 1911, the "Mining and Milling Company" started development at a gold mine "near where the lost Vontrigger was supposed to have been located."[203]

In 1925 another "Vontrigger" camp sprang up. This mine, also known as the Getchell, was discovered about January, 1925, by J. L. Workman and was kept secret until Senator Getchell of Nevada, apparently Workman's partner, could arrive. The mine was purchased by Al Meyers in May for $50,000, upon learning that the ore assayed as high as $23,000 per ton in gold and silver. A small camp consisting of 30 tents had sprung up, with new ones going up "every other day." As a contemporary account described the camp, "There is a store, a restaurant, and a cold drink resort. Work has begun on a 30 room hotel." Little else is known about this mine except it was reported to have been worked from 1930 to 1931 and in 1938, 1939 and 1941. In 1953 this mine was named the Denver Mine.[204]

The Exchequer Mine in 1909 was going full blast. Between 1905 and 1915, a 900 foot mine shaft with 6,000 feet of underground workings was dug in the rock, and

west of that shaft was a 200 foot shaft. In 1908 the property was sold to the Leiser Ray Company then in 1911 it was taken over by the Louisiana-California Mining Company. A large mill was installed here about 1914 to mill the ore from this mine and to custom mill ore from nearby mines. In 1920 the Vanadium Gold Company purchased the property (the Exchequer was one of the few mines in the California Desert in which vanadium was found) and in 1922 that company was busy getting ready for operation. Between 1936 and 1937, about 30 men were employed here by the California Comstock Gold Mines, Ltd.[205]

OLD WOMAN MOUNTAINS

In one tongue or another, the Old Woman Mountains have been known as such for centuries. The Chemehuevi Indians called the range *No-mop-wits*, literally meaning "old woman," a name derived from a tall rock that resembles the form of an old woman.[206]

About March of 1873, Mr. S. C. Hammer discovered a ledge "situated between the Old Woman Mountain and the Colorado," while employed on a surveying expedition for the 35th Parallel Railroad. However, it was not until 1889 that real interest in the mountain range appeared in the newspapers. During that year the *Redlands Citrograph* boomed the discoveries there, beginning with its April 27 announcement of the discovery of "the richest mineral deposits in the world. The ore on the surface is so abundant that it would keep smelting works such as those at Argo, Colorado, busy for fifty years." Superlatives had subsided slightly by August 10, but the newspaper was still assuring its readers that the deposit was "the largest body of low grade carbonates in the world."[207]

The Scanlon Mining District which sprang up was named after Pete Scanlon who, after a tip from the local Indians, discovered a spring, probably in the canyon on the west side of the range that also bears his name. The ore deposit in the Old Womans was silver and gold bearing limestone, and since it was refractory (only treatable by smelters), clamor for a smelter began to be heard. In the summer of 1889, Captain Bethune, one of the property owners, arrived in Redlands to escape the hot weather and pronounced, "Our mining prospects are grand and . . . we must have a smelter at Needles." Despite the high hopes of the year before, in 1890 the Scanlon or Old Woman District was described as being "so little developed as hardly to merit . . . mention."[208]

Although it was primarily silver that caused the excitement in the late 1880s, it was gold that continued activity through the next two decades. In November, 1893, and April, 1894, shipments of gold ore were received at the Kingman smelter from Danby, which was the shipping point for the Winton Mine.. This mine, located 7 miles southeast of Danby, was active in 1895 and may have been the source of the shipments a year earlier. Ore was packed from the mine 1,000 feet down the mountain by burros to a two-stamp mill. Water was obtained from a neighboring canyon, ¼ mile to the south.[209]

Close by this mine, the Wheel of Fortune Mine was discovered about 1897. While

little is heard about this mine for several years, Walter G. Pinkett, a Danby saloon owner, owned the mine in March, 1911, and had a "force of men" working on a 60 foot shaft on the property. In December, 1913, Pinkett and 3 men lived on the property. At that time, there was a bunkhouse and a blacksmith shop on the property. The next spring they planned to begin development work.[210]

Carbonate Gulch, in 1895 on the west side of the range, was the site of the Courtwright and McDonald gold mines. Even at that early date, there was a 200 foot tunnel and a 100 foot shaft. In March, 1911, Duke McDonald, in partnership with Jack McClush, were planning soon to ship lead-zinc ore from their mine in this canyon. The next glimpse we have of the canyon is in the spring of 1919. At that time the camp of the Yellow Metal Mining Company was deserted, and there was pipe from a spring "found by going up Carbonate Gulch to the first large branch gulch entering from the north in the vicinity of the mining prospects."[211]

Milo James Smith was born in Ravenswood, West Virginia, September 10, 1858. In 1897, at age 39 he came to California and was well rewarded with an exceptional discovery of silver in the Old Woman Mountains. Nothing more is directly heard about this discovery, but M. J. Smith remained interested in silver in the Old Woman Mountains. Nothing more is directly heard about this discovery, but M. J. Smith remained interested in silver in the Old Woman Mountains.[212]

The Silver Wave Mine, high on the west side of the range in Scanlon Canyon, was first worked prior to 1890, but was inactive until late 1899 when it was purchased by Smith for $150. He did considerable work on the property, but failed to find any ore. Ready to give up, he was persuaded to drive a drift in another direction. With that action, he hit what he was looking for. Shortly after, Mr. D. Jackson, representing Mr. A. P. Morrison, who had interest in Colorado mines, secured a bond on the property for $35,000. Between the purchase and March, 1902, $12,000 had been expended in development. A five-stamp, steam-powered mill was erected and running about March 10, 1902, and 18 men were employed on the property. In 1909 the mine camp, which was near a spring, was in ruins, and the mill appears to have been dismantled.[213]

On the southwest end of the range the Black Metal Mine was first located before 1896. In 1902, when the Silver Wave was so busy, the Black Metal was relocated. M. J. Smith and George B. Parks of Barstow owned the Black Metal Mine in 1910 and were arranging to lease it to C. H. Scheu, a Los Angeles mining man, for $30,000. In September Scheu and Parks visited the property, but the deal apparently fell through.[214]

Smith and Parks, in February, 1911, dissolved their partnership in the Black Metal and other property they owned. Parks became owner of the Black Metal and the Desert Butte Group near Kilbeck Siding. In March, 1911, he was preparing to move to the mine. He purchased a "fine span of mules" from Seymore Alf, of Barstow, to haul ore from the Black Metal and Desert Butte Group. That April, finally ready, George Parks and his wife left for the mines with a "carload of goods and supplies."' About the time they arrived, news came of another strike at the adjoining mine of Joe Holbrook and Ernest Morrison. Parks was busy during the next two months, and he was ready to ship 20 tons of ore. The shipment was made and grossed $27 a ton.

In August he was ready to ship another 20 tons of ore, yet in November, 1911, Parks and his wife left the Black Metal. She was probably suffering from a bad case of cabin fever and he, looking for a better return for his time and money, went into general contracting, leaving mining to others.[215]

The Grass Roots Mine, adjacent to the Black Metal, was discovered about 1889 by Scott Price. He sank a small shaft and took out some high grade ore, but seeing he would be unable to work the mine because of the distance to transportation, he filled up the shaft. After the Parker branch of the Santa Fe was built, Price, in partnership with Bert Day, began working the mine. In March, 1911, the shaft was down to 60 feet, and Day went into Parker to secure a team to haul supplies between Milligan and the mine camp. In April, twenty tons of ore were shipped. In June the Garner brothers of San Bernardino purchased the interest of Day. Sinking of the shaft was resumed that August, but was halted when tragedy struck in October. Harry Nelson, employed sinking a 25 foot shaft, was killed when it caved in on him. Two men set to work to remove the tons of rock on Nelson, but when they found him, he was dead. Apparently operations stopped until September, 1912, when, with Fred Schmickle, Scott Price resumed operations. There was plenty of water nearby and they expected, in February, 1913, to put in a large mill, but nothing further is heard about the mine.[216]

The Warwick Mine, owned by Mr. A. W. Warwick of Martinez, Arizona was also active nearby in late 1898. By January, 1900, he had completed a ten-stamp mill at the mine. The Stemwinder Mine was "doing well" in January, 1900, but it was not until 1905 that this mine, located 20 miles south of Danby (perhaps in Carbonate Gulch), began to draw attention. During that year, the Stemwinder Mining and Development Company, capitalized for a quarter of a million dollars, was developing the mine. In September, 1911, a brief note indicated that the owners were waiting for cooler weather before mining. Poker Flat is a locality in the Old Woman Mountains, whose identity has been lost to time. In 1911 some mining was being carried on there, and in February, 1911, Sam Houston was overhauling his stamp mill. On the Consolidated Mining Company claims at Poker Flat, owned by Walter G. Hopkins, a new strike was made in March, 1911.[217]

Elsewhere in 1911, the Lucky Jim Mine, on the southeast side of the range, was located by P. W. Daton. The property was purchased by the Maricopa-Queen Oil Company, and by June, 1913, a camp known from old maps as Wilhelm was established here, with water piped from a natural tank about 3 miles southwest. In 1914, the camp consisted of bunkhouses, a boarding house, and a barn. In 1930 there were 3 men employed working the mine, and the camp was reported to have consisted of 3 cabins and a blacksmith shop. Between 1911 and 1930, some $53,000 worth of silver was produced from here, probably the bulk of that in the teens.[218]

During World War II, two tungsten mines on the west side of the range, the Hidden Value and the Howe, were active. At the Howe, a small mill was erected in 1952.[219]

CHUBBUCK

The history of Chubbuck begins with the immigration of Charles Ingles Chubbuck

from Ottawa, Canada to San Francisco in 1906. Chubbuck opened a building supply business here just prior to the great earthquake and fire and cashed in on the demand afterward. In the late teens, Chubbuck found a somewhat unusual source of lime for cement at his own back door. Union Carbide Company shipped calcium carbide from its plant at Niagara Falls to other plants in South San Francisco and Los Angeles where it was converted to acetylene gas. Lime was produced as a by-product. But lime is also the principal constituent of cement. So Chubbuck made an arrangement to remove the lime from the Union Carbide plant and he sold it as cement. However, the lime still had bluish flecks of carbide in it, a drawback that made it less desirable for marketing.

Thus, in 1921, Mr. Chubbuck purchased the claims to 1,600 acres of limestone along the Parker branch of the Santa Fe railroad to obtain a whiting agent for his cement. These claims were purchased from Marcus Pluth and Tom Scofield, two well-known prospectors. From 1922 to 1925 a town was built, and a narrow-gauge railroad 1 mile to the quarry was also constructed. Full scale production began in 1925 with rock being shuttled from the crusher near the quarries to a kiln at the town of Chubbuck. Crushed limestone was also produced at the Chubbuck operations in a plant near the Santa Fe.

Chubbuck was truly a town. It had a company store, post office, and a school. There were perhaps as many as 40 buildings, including residences for the some 24 predominantly Mexican workers and their families. The school was opened by 1932, housing grades one through eight. The post office was established in May, 1938, and was housed in the company store.

During the construction of the Colorado River Aqueduct in the late 1930s, Chubbuck supplied lime products. The open aqueduct was lined with a coating of highly reflectant "metropolitan white" that aided in the proper curing of the concrete. While for years Chubbuck had a stability rare among mining towns, by the late 1940s, it too belonged to the desert, as the processing of lime products from the Chubbuck mines had ceased. One of the reasons for the abandonment of operations included the fact that Union Carbide stopped shipping calcium carbide to the West Coast. Also, a new process of producing plaster was developed, and the company did not receive patent rights for this process.

In 1950 the school and post office were closed. In 1951 the Harms Brothers Construction Company of Sacramento acquired the property with the equipment intact. The Harms brothers probably intended to make concrete for roadways, but there was simply too much silica in the limestone. The Harms brothers trucked the rock to the crusher near the quarries instead of using the narrow gauge that had been constructed for that purpose. However, another narrow gauge running from the crusher to Chubbuck was utilized. For a short time, a few workers employed by the Harms brothers lived at Chubbuck, but operations ceased and the equipment was auctioned off, about 1954.

In the winter of 1975-76, the Santa Fe relaid the entire track of the Parker Branch in California and removed the siding at Chubbuck. At that time, someone had built a house and garage on one of the mammoth foundations. A small ore crusher operated by an automobile engine,probably used to sample gold ore, sat in front of the house.

In the summer of 1977, the house was gone, except for a heap of trash and the automobile engine. The only structure that remains in its entirety is the explosives building, a concrete hexagon about 6 feet in diameter. The last 8 years have taken a heavy toll on the buildings that once stood there, and shortly, only the massive foundations will remain.[220]

BAGDAD AREA

The Bagdad area lies in the heart of San Bernardino County, roughly bordered on the north by Interstate 40, the east by the Parker Branch of the Santa Fe Railroad and stretching as far west as Ludlow. Mining does not seem to have flourished here until 1898, with the discovery of the Bagdad-Chase Mine, the biggest gold producer in the county. However, gold-copper ore was discovered one year earlier at the Orange Blossom Mine.

Bagdad-Chase Mine

About 1898 John Suter, a roadmaster for the Santa Fe, headed into the hills south of Ludlow looking for water. Instead of water, he discovered gold, and by 1900 John Suter and Company employed a dozen men at his mine. In December, 1901, the first ore was shipped to the Randsburg Company mill at Barstow, which yielded excellent returns. Early in 1902 the Bagdad Mining Company acquired the claims and a standard gauge railroad was laid from Ludlow to the mines. By November, Camp Rochester, at the terminus of the Ludlow Southern Railroad, had telephone service, and a contract had been let for construction of "forty cottages of three, four and five rooms."[221]

Between 1904 and 1910, $4,500,000 in gold was mined from the Bagdad area and treated in the mills in Barstow. The Pacific Mines Corporation operated the property for the next 6 years, with the ore milled at Clarkdale, Arizona. The railroad was torn up in the summer of 1935, after laying neglected for many years. However, the mine was active continuously from 1940 until the early 1950s.[222]

Although there was a substantial camp at the mine at one time, by October, 1971, it had completely vanished. Some of the buildings lay totally collapsed in a heap. In 1971 the Bagdad-Chase Company acquired the property and by 1975 had mined 14,000 tons of ore from an open pit. This ore was trucked to the huge mill at Vanderbilt where it was treated in three months.[223]

The Orange Blossom Mine

In 1897 a Chemehuevi Indian named Hikorum discovered ore north of Amboy. Hikorum, "a prominent man among his people, a great hunter of mountain sheep," was also an excellent prospector. By October, 1900, the Desert Prospecting Exploration and Development Company was incorporated to work the Orange Blossom group of mines. John Denair, division superintendent for the Santa Fe and a resident of Needles, was president of this concern and Judge L. V. Root was

secretary. Quite a bit of Orange Blossom stock was sold in Needles to railroad men who followed Denair.[224]

In December, 1902, it was reported that work had resumed at the mine, but it was not until 1906 and 1907 that work began in earnest. The first shipment of ore, destined for the Selby smelter at San Francisco, was made in May, 1907.[225]

At this same time, the Orange Blossom Extension Mine adjoining the Orange Blossom to the north was active, as was the Lady Lu two miles north of that. However, great confusion occurred in the reporting of developments at the Orange Blossom and Orange Blossom Extension mines, as it appears that at times the name Orange Blossom was used interchangeably for both. Water was piped from Budweiser Springs, owned jointly by both mines, in the late summer of 1907. On May 28, 1908, *Mining Science* reported "The Orange Blossom property is developing rapidly and the twenty-stamp mill will soon be in operation. The electric power plant at Bagdad will soon be ready to furnish power."[226]

A report a week earlier indicated both the Orange Blossom and the Orange Blossom Extension were installing mills. Later reports make no mention of a mill at the Orange Blossom. In fact the Orange Blossom Extension far outshines the former from 1908 on. In August, 1908, an eight-stamp mill, housed in an impressive structure, was started up at the Orange Blossom Extension. By November the mine was down to 720 feet, and the ore was running from $8 to $10 per ton in gold and from 1 to 1.5 percent copper. At this depth, water was encountered which was pumped to the surface and stored for use in milling the ore.

The mining camp, described as "picturesque," was located on "an eminence overlooking the valley below." The *Mining Review* provided an excellent description of the camp in November, 1908 as follows:

The company constructed a number of fine buildings of Oregon pine and California redwood, including a large nicely furnished office, boarding house, rooming house, two cozy cottages, a stable, and a corral, all of which are painted. The houses, barn and corral are all electrically lighted and water is piped into every building . . . everything about the camp being in order and clean and neat. The assay office and laboratory is one of the most finely equipped establishments to be found in the West. At Amboy the company has a frame lodging house for the convenience of visitors who come in on the night trains, and also a storage and warehouse building 50 x 100 feet in dimension, where supplies are housed preparatory to haulage to the mine. A Locomobile auto is maintained which makes one or more trips daily between the mine and the railroad, and it is the intention of the management to put on two more seven-passenger autos at an early date.

Just below the mine and mill a short distance, just far enough so that the music of the stamps will be subdued . . . the town of Hodgman will be established about the first of the year. The little city will be called after President James A. Hodgman . . . . Here, according to plans, a number of neat and cozy cottages will be built for employees of the company having families. The plans also include a big and fine hotel, post office building, large general merchandise store, and other buildings necessary to the opening up of a mining district so prolific in promise as is the Orange Blossom region. Water will be piped into each building in the new town of Hodgman, and the place is to be electrically lighted."[227]

It seems the only thing the camp lacked was that "essential" of Western life: a saloon.

Work progressed at the mine at least until January, 1909, but the mill had run for only two months. In April, 1909, it was admitted the mill was a failure, and the blame was laid on mismanagement. The company went bankrupt and John Denair became sole owner in November, 1910, when he paid $23,640 that the company owed. In spite of fresh bimonthly rumors to the contrary, the mines remained inactive. In 1942 there was not a building standing, and all of the machinery had been hauled away.[228]

Gold Belt Mine

The Great Gold Belt Mine, 14 miles northeast of Amboy, was quite a discovery. When stumbled upon in 1907, the remains of old arrastres were found in the wash, and the previous miners were surmised to have been Indians.[229]

The Great Gold Belt Mining Company was organized, and in June, 1909, I. Plummer and William Heath were working 30 men there running tunnels for water and sinking a shaft. They had hoped to have a stamp mill running by winter with 100 men employed, but it was not until 1911 that the mill finally was received. In January, 1911 twenty-five men were employed there, and later that month, a new Chilean mill was shipped to the mine. By April 1, the mill was in operation. Work continued through the summer, but the mill was shut down in September. Some mining continued off and on until 1914.[230]

The mine was relocated and renamed the Camp Castle Mine in 1923, and a larger, more modern mill was installed, but in 1930 the property was idle.[231]

Clipper Mountains

Some mining was going on in the Clipper Mountains in January, 1913, and when large gold-bearing quartz veins were discovered in 1915, they were subsequently developed by 3 companies; the Clipper Mountain Mining Company, the Gold Reef Mining Company and the Tom Reed Mining Company, operated by the Tom Reed Mining Company of Oatman. These mines were active in 1917 and 1918, when they were attracting considerable interest within the mining community. Both the Clipper Mountain Mine and the Tom Reed Mine in 1917 were in the process of sinking 500 foot shafts in order to explore the extent of the gold ore. Large amounts of water forced the suspension of the operations at the Clipper Mountain Mine at 300 feet. The Tom Reed Mine did reach 500 feet, but water was encountered there as well. Just prior to 1920, large pumps were installed, but the mine was forced to suspend operations. About 1920 the Gold Reef Consolidated Mining Company of Los Angeles acquired the interests of the Gold Reef, Clipper Mountain and Tom Reed mines, and the mines were operated for a short time under that name.[232]

TWENTYNINE PALMS

The first discoveries in the Twentynine Palms area were made by Dave Gowen and

Joseph Voshay. The *San Bernardino Guardian* on November 29, 1873, gives the account of the discovery of the Blue Jay Mine as follows:

In the month of January last, Dave Gowen and Jo. Voshay, two old and practical miners, of whom it can be justly said, have discovered as many valuable mines in this State and Arizona as any other two men that can be found, and whose word and opinion in regard to mines carry about as much weight as any--were prospecting the country around the Twenty-nine Palms. Mr. Gowen, one day, while passing along a gulch or sand wash, picked up a piece of float rock full of free gold. On returning to camp that night the specimen picked up was shown his partner, Mr. Voshay, who, upon examining it, immediately pronounced it "bully." The next morning early they both started from the place where the float was found, separating and going in different directions they traced along the hill tops and sides--which we will here remark par parenthesiss,, to the experienced eye of an old miner, indicated that they were filled with mineral. That day a ledge was discovered and the "Gowen" and other claims located. The following day while Mr. G. was up among the hills picking away, he encountered an old Chimehueva[sic] Indian, who, surmising his purpose there, remarked in broken English, pointing to a separate and distinct range of hills across a plain some twelve or fifteen miles off, "mucha heep." After some conversation with the Indian, Gowen persuaded him to go and bring him to his camp a piece of the rock. The Indian left and next day returned bringing some beautiful specimens of ore, which, to the quick and experienced eyes of Voshay and Gowen, were indicative of being rich in gold. The following day the two men mounted their animals and "packing" the indian along as guide, on another, proceeded to the spot where the ore was found. It was some of the ore from the now rich and famous "Blue Jay" ledge. On arriving in town an assay was made of the ore, and it exceeded in richness the most sanguine expectations of its discoverers; a company was soon formed and work commenced on the mine. The present Company is composed of the following named persons, J. R. Frink, David Gowen, N. Noble, Jo. Voshay, H. Pattridge and James Grant.[233]

The Gowen Mine was located 4 miles southeast of Twentynine Palms over the summit of a range of hills and on the north side of a ridge. The Blue Jay was located 12 miles northeast of Twentynine Palms, about 1 mile east of Mesquite Lake. Numerous other mines were located to the south of the Gowen Mine, in the general vicinity of the Gold Park Camp of 1908. In October, 1873, two arrastres were in operation in the area, but by 1883, and probably a few years earlier, the gold mining at Twentynine Palms had died out.[234]

About 1883 Lew Curtis discovered placer gold east of the oasis of Twentynine Palms. This placer deposit lay in the canyons that drained into the northern end of Pinto Basin. At Burt's Dry Lake (later named Dale Dry Lake), John Burt dug a well and built an arrastre to work ore from the hills to the south, the source of the Pinto Basin gold. At this well, the town of Virginia Dale took root and grew to an estimated 1,000 people. The Virginia Dale Mining Company was organized about 1886. Work had been suspended by 1889, but the activity around Virginia Dale stimulated a heightened interest in mining in the area during the late 1880s. Activity continued throughout the early 1890s, but by 1898 there were only 21 miners left in the area.[235]

The Supply Mine was worked in the same area from around the turn of the century until about 1917. The discovery and subsequent operation of the mine by the United Greenwater Company was the primary reason for the relocation of the town of Virginia Dale to New Dale. In 1915 there were a total of about 75 people living at New Dale.[236]

Southeast of Virginia Dale, the Brooklyn and O.K. mines were located in 1890 by John Burt. Burt and F. J. Botsford worked the mines until 1899. The Brooklyn Mining Company was formed in 1901 and was quite active until 1916. A one-inch pipeline was laid from Dale Lake to the mine for milling operations which used about two 2,000 gallons of water for every ton of ore treated. Before the pipeline was laid, water was hauled from Cottonwood Springs.[237]

Gold Park consisted of a group of mines about 8 miles south of Twentynine Palms. Gold Park even had a post office during the brief period from January to July, 1908. The Italie Mine was one of the biggest newsmakers here during this time.[238]

The Virginia Dale mine was active off and on until 1937. The Carlisle, or Carlyle Mine first worked about the turn of the century, was most active from 1939 to 1941, when a substantial mill was on the property. After World War II, a few of the gold mines in the area were active briefly but the high cost of supplies forced them to close.[239]

This might be the end of the story except for a couple of recent discoveries in the area. There had been persistent rumors of a lost Spanish Mine in the Gold Park area for as far back as anyone can remember. One version of the story is that the Spanish sunk a shaft and removed a metal rich in what looked like silver ore, but when smelted proved to be something else. The name they gave this mine was the Sick Silver Mine, and they rode off in disgust. In the 1970s a San Bernardino area resident named Hugh Huebner discovered a shaft deliberately filled with boulders, with an old forge nearby. Prospecting and assaying the outcrops, Mr. Huebner found that he had discovered a rich bismuth mine, and in his estimation, the lost Spanish Mine.[249]

DRY LAKE AND VICINITY

In the fall of 1879, George G. Lee, the man who generally is credited with the discovery of silver at Calico, died on the desert near Emerson Lake. That next August a large party of men headed out to prove the existence of gold in that area, perhaps looking for one of Lee's mines. The party was headed by Dr. C. G. Campbell a San Bernardino doctor who had been given half-interest in any discoveries. They were successful in their search and the *Colton Semi Tropic* a month later predicted that "a lively camp will spring up and much wealth come from there."[241]

In March of 1881 both the Ridge and the Desert Chief Mines boasted 50 foot shafts. Two months later Dr. Campbell and his partners announced they would erect a stamp mill, while in the interim, several arrastres were employed in crushing ore

which when handpicked, ran up to 5 ounces of gold per ton. A ten-stamp mill was reportedly erected in 1887, however it never ran steadily. Small-scale operations continued through the nineties, including 1893, when a Mr. Means was reported to be working his property.[242]

In September of 1894, Messrs. Fry and Nisson were sinking a well near their mine in the Fry Mountains in the vicinity of Old Woman Springs. Old Woman Springs, 16 miles from the heart of activity in the Dry Lake District, was the site of its own gold strike during 1894 when a Mr. Dryden and his sons struck a gold-bearing ledge in June. However, a real curiosity was the reported discovery of gold-bearing "scoriaceous basalt" (lava) in July and August. That of course proved to have "no foundation in fact."[243]

In the spring of 1905, the Dry Lake Mining Company was getting under way at their mine 22 miles from Lavic. Recently having sold 50,000 shares of stock, they had enough money to purchase a hoist for their shaft, at that time 125 feet deep. They already owned a five-stamp mill and cyanide plant. In 1906 this mine was listed among the productive mines of the county, sharing the limelight with mines the caliber of the Copper World and the Bagdad-Chase. The *Engineering and Mining Journal* on May 6, 1908, reported "a new hoist and new mill are to be purchased, there is a three-stamp mill on the ground now." In July the hoist was installed and in operation, but the stamp mill had not yet been operated. The location of this mine or the mill can at best be termed vague. In 1909 Walter C. Mendenhall of the U.S. Geological Survey recorded that Mean's Well, on the north end of Mean's Dry Lake, was sunk by the Gold Pin Mining Company. They installed an engine to pump water directly north (possibly west) of the lake to their mine.[244]

At Ames Well, near Ames Dry Lake, in 1917, there was situated "an old stamp mill," perhaps one of the first ones in the district. This mill was probably utilized by the mine situated about a mile to the north, known in the 1940s as the Crystal.[245]

In 1923 L. S. Emerson began developing a gold prospect, and the nearby "Old Fortuna Mine." He built a mill whose ruins stand at the southwest edge of Emerson Lake. The Emerson Mine produced a small amount of gold, operating intermittently from 1927 to 1938. The Lost Padre Mine, southwest of Emerson Lake, was described in 1940 after the mine had become idle. A twenty-ton mill had been erected and a well sunk about ½ mile west of the mine. The mill foundations remain and the words "Green Hornet Millsite" appear on them. The main tunnel at the mine now has a highly sensitive seismograph installed by Lawrence Livermore Laboratories of Palo Alto.[246]

ORD MOUNTAINS-FRY MOUNTAINS

Sandie Lochery located the first mining claims in the Ord Mountains in 1876, naming them the Ord Group. In the late 1880s, most of the holdings were sold to J. L. Osborne of Daggett. From 1908 to 1909, the Hansen brothers mined about 500 tons of gold and silver ore. Copper was mined here during World War I. From 1917

to 1925, the St. Joseph Lead Company leased the claims, and in 1942 copper again was mined from here.[247]

In the East Ord Mountains, the Grandview Mine was worked in the early 1930s when a three-stamp mill and blacksmith shop stood on the property. The Ord Belt near the Grandview was worked in the 1920s, at which time a twenty-stamp mill was to be erected at the mine, part of which was moved onto the property but never erected.[248]

There are numerous small mines in the Fry Mountains, including the Elsie, which was first active in the early 1900s and later in 1935 and 1940. Ore from the Gold Peak was milled at Old Woman Springs in 1906 and later at a mill 4 miles away. The Camp Rock Mine was a placer mine. Dry washers were used prior to 1932 when a washing and screening plant was installed and operated until September, 1932.[249]

ORO GRANDE-SILVER MOUNTAIN

On April 25, 1872, the McKinzie Mining District was organized, encompassing everything from about the modern site of Hesperia north to about Barstow and east to the Rodman Mountains. A. G. Lane, a captain during the Mexican War, had a ranch on the Mojave River, near the present site of Oro Grande. Lane's, as it was known, was a supply point for travelers. In January, 1873, the *San Bernardino Guardian* reported that near Lane's Ranch, ore that ran $160 in gold and $18 in silver per ton had been discovered. Lane christened the discovery site the Silver Mountain and thus was born mining in what was to be known as the Silver Mountain Mining District.[250]

In May, 1880, A. J. Spencer brought a rock into San Bernardino that assayed $2,000 a ton in silver: nearly pure metal! Nearby gold had been discovered that assayed $18,000 per ton in gold! By July, 1880, the Red Mountain Gold and Silver Mining District had been formed, encompassing 6 square miles, whose western border was about 6 miles east of Lane's Ranch. Activity in late 1880 and early 1881 was nothing less than feverish. A post office opened on January 3, 1881, and a ten-stamp mill was being erected on the Mojave River by Dr. G. H. Conger. The mill was operational by April 15 on ore from the Oro Grande and Oro Fino gold mines located in the Silver Mountain District. The mill, "probably one of the finest mills of the kind ever put up in the state," was powered by water. In April, it was predicted that 1,000 to 1,500 men would be engaged in mining, a long way from the 90 to 100 men there then. The mill continued to run through the summer. In September, a $600 gold bar was turned out from the mill. In October, 1881, the mine favorably impressed some Milwaukee capitalists, who purchased the mine and formed the Oro Grande Mining Company. In late October, another $1,000 in gold left the mill. The Oro Grande Company built a new office at Oro Grande in November at a time when work was being concentrated on the Oro Grande Mine, where a new hoist was being installed.[251]

Sometime during the 1880s, operations at the Oro Grande Mine were suspended due to the lack of water and the high cost of transportation. However, even as the Oro Grande Mine was closing, another enterprise of the Oro Grande Company, the Silver

King Mine at Calico, began supplying the newly built mill with ore.[252] In the late 1880s the Carbonate Mine was discovered by a man named Collins who was employed at a nearby limestone quarry. He discovered outcrops that carried silver, and worked it to some extent before the claims were sold to a Los Angeles company. In 1889, gold was discovered here and at the Embody Mine to the south. The Carbonate Mine was "in the course of active development with a full force of miners" when at a depth of 180 feet a discovery was made that caused the entire camp to buzz with excitement. At first a small wedge of quartz with flakes of gold apppeared, then just below, the wedge of quartz widened to several inches, and the rock was a mass of glittering sheets and shotlike pieces of gold. Assays gave fabulous returns. The ore was broken up on canvas and every ounce of it was sacked on the spot. The mine was worked intermittently until 1942, producing no less than $50,000 worth of gold.[253]

Silver mining caught on in a big way west of Oro Grande. By 1890, almost every hill or group of mines was being referred to as a mining district, but nearly all of them actually were not organized. These camps were known as East Camp (also known as the Oro Grande District), located due east of Oro Grande; Galena Camp,including all of Silver Mountain; Central Camp, in a distinct hill midway between Galena and another group known as West Camp; and a group north of Central Camp known as North Camp.[254]

None of the mines in these areas were very significant. However, someone thought the Clinker, in West Camp, was worth $60,000, at least that was the sale price. Ore from these silver mines proved impossible to reduce in the Oro Grande Company's mill, and as a result, a fifty-ton smelter was built, starting operations in 1890. However, the drastic fall in silver prices soon put an end to silver mining in the area.[255]

Late in the 1880s, the Sidewinder Mine, about 12 miles northeast of Victorville began operations, and in 1887, a ten-stamp mill, driven by water power, was erected to handle ore from this mine. The Sidewinder Mine was worked until about 1895 by a small force of men, and in 1899, mining resumed until 1909. In 1927, the Sidewinder was again reactivated and a mill and cyanide plant were built. War Production Limitation Order L-208 closed this mine in 1942. In 1967, the mine was cleaned up and turned into a fallout shelter, complete with a 72 bed first aid station, library, and a communications post. By 1973, the shelter was badly vandalized.[256]

About 1906, the Ozark Mine was discovered by V. E. Jones and sold to a man named Garrison. The claims were jumped in 1914, and the new owner renamed the mine the Midas Group. The Ozark Mining and Milling Company of Los Angeles was incorporated, with one million shares selling for five cents apiece. The company built a ten-stamp mill and made two test runs on ore from shafts sunk on the property. In December 1918, the mine was idle and the mill had been dismantled. Today a structure and headframe for the mine remain intact.[257]

The Yankee Maid Mine, just south of the Oro Grande Mine, was discovered about 1881. Not much is heard about this property, but in 1914, the owner had a five-stamp mill and fifty ton cyanide plant on the river, and employed four men. In the 1920s, the Western States Mining Company owned this mine and worked it until

about 1925, when the company was sued by an employee who had a forge blow up in his face. In the early 1950s, Tim Allen relocated the mine, and installed a small mill. Since then he has done a modest amount of mining. A small camp is situated just below the mine, and the remains of a concrete arrastre used during this century are on the property.[258]

Mining resumed at the Oro Grande Mine in the 1920s and continued intermittently until 1941 . Today, a mining camp, which the owner occupies, remains near the mine.[259]

NORTHWEST SAN BERNARDINO COUNTY

The northwest portion of San Bernardino County has been one of the most prolific sources of silver in the state, and has produced less important quantities of gold and copper. The rich mines near Calico produced tens of millions of dollars worth of silver prior to 1890, and hold potential for millions more. Dry placer mining for gold was successfully carried out at least as early as 1900 at Coolgardie and also at Williams Well, Murphys Well and Goldstone. Hardrock gold mining was carried out at Goldstone, Fremont Peak, Kramer, and the Olympus Mine. Copper was mined at Copper City and at the Camp Vera Group just before and immediately after the turn of the century, and sometime later at Slocum's Mine. The area is the site of the only commercial opal mine in the California Desert.

Waterman

Nearly 5 years before the famous silver discoveries at Calico, nearby, in fact only 4 miles north of the present site of Barstow, a man named George G. Lee discovered silver, but he did not know it. Lee prospected the property, thinking he had a cinnabar mine, until he died mysteriously on the desert in the fall of 1879. In June, 1880, Robert W. Waterman and John L. Porter visited the property and took samples for assay. After they learned that they had discovered silver, in December they staked claims.[260]

Full scale operations began in 1881. A ten-stamp mill erected beside the Mojave River, was powered by the river. Trees which grew along the river supplied fuel for the furnace, with ore teamed downhill to the mill, and water back up for the steam hoisting works at the mine.[261]

Between May 1, 1881, and March 15, 1887, $1,611,429 in silver was produced. Near the mill the town of Waterman thrived until the price of silver dropped and the mine was shut down. Prior to 1890 the tailings were worked profitably, and the mine was worked on a small scale until 1909. There was an attempt to recover barite from the tailings in 1931, but the last serious mining took place in 1887.[262]

Calico

News of the silver discovery made by Waterman and Porter at George Lee's old mine spread quickly and soon hundreds of new locations were made. On April 6, 1881, S.

C. Wardan, Hues Thomas and John C. King located claims on Calico Mountain. They named their discovery the Silver King Mine.[263]

Below the Silver King Mine the town of Calico grew slowly. In the spring of 1882 there were only 100 people living there. In July, 1882, the Silver King Mine was sold to San Francisco interests for $300,000. This, along with the consolidation of many individual claims led to more efficient mining. There were no less than 46 mines of note near Calico with the most important being the Waterloo, Bismarck, Oriental, Garfield and Burning Moscow.[264]

At first the ore from the Silver King Mine was hauled to Oro Grande, 40 miles away, but in 1882 a ten-stamp mill was erected beside the Mojave River at Daggett. There were numerous other mills in the area. Hawley's mill at Camp Cady ran on ore from the Cuba Mine, located west of Calico, and from the mines of the Silver Odessa Mining Company. The ores from the Garfield mines were worked between 1883 and 1885 at Barber's mill, northwest of the mouth of Mule Canyon. The Odessa, Oriental and Occidental mines' ore was processed at the mill owned by the Silver King Mining Company of London, England, and located between the mouth of Wall Street and Odessa Canyons.[265]

In 1887 the Oro Grande Company began building a mill next to their mill at Daggett (which had been enlarged in 1884 to fifteen stamps). Just before completion, the mill burned to the ground, but work was resumed at once. To reduce transportation costs, a narrow gauge railroad was constructed in 1888 to bring ore from the Waterloo and Silver King mines to the mill. The falling price of silver shut down these mines in 1892. By 1896, the Silver King Mining Company also shut down. The mines of Calico produced between $13,000,000 and $20,000,000 worth of silver.[266]

Around 1917 cyanide was used to recover silver from the Silver King mine dumps, and during the early 1930s there was a small operation, the Zenda Gold Mining Company, which mined silver. Gold was mined from the Total Wreck (Burcham) Mine from the 1930s until 1941. There is a strong possibility that the enormous quantities of low grade silver ore present at Calico will one day be mined.[267]

As a town, Calico, with its one street perched on an inclined mesa, had a turbulent existence. It burned to the ground in the fall of 1883, and was rebuilt. After it was vacated in the 1930s, the remains of Calico sat derelict until 1950, when Walter Knott, owner of Knotts Berry Farm in Buena Park, converted the ghost town into a tourist attraction.[268]

Three miles east of Calico, the town of Borate was formed near borax deposits mined since 1884 by "Borax" Smith. A railroad named the Borate & Daggett was laid into Mule Canyon in 1898. The borax mines were abandoned in 1907 after yielding nine million dollars worth of borax minerals.[269]

Alvord Mine

The Alvord Consolidated Quartz Mining Company, in February, 1881, agreed to issue 75,000 shares of stock to raise money to develop their newly found mine,

located about 20 miles east of Calico. Alex Del Mar, writing for the *San Bernardino Valley Index* in March, 1881, cynically remarked,

*"Here the gold is found in a quarry of very hard chocolate colored slaty looking rock, called 'quartz agate' by the miners. This is said to go from $100 to $120 a ton; but if so I think the owners ought to be willing to take back something about the reported amplitude of the deposit. No excavations."*270

However, by April, 1885, work had begun. Ore was being hauled daily to Camp Cady where the existing Huntington Centrifugal Mill had recently been augmented with the addition of the Huntington five-stamp mill. Later reports indicate an arrastre was used to mill the ore at the very beginning. Ore was treated at Hawley's, in addition to Camp Cady in the late 1880s.[271]

In the early 1890s, a mill was built, probably at Alvord Well, at the mouth of the canyon below the mine, which ran until it burned in September, 1891. Alvord Mine figures for July and August, 1891, showed an assay of between $6 and $18 a ton in gold. During the last 10 days before the mill burned, $1,430 in bullion was produced. Total production of gold from the Alvord Mine up to that time was placed at $50,000.[272]

The mine changed owners several times before a group of Pasadena businessmen, incorporated as the Carter Gold Mining Company of Pasadena, gained control of the property and operated it from 1885 until late 1891. This company owned the water rights for Paradise Springs, 9 miles north of the mine, and for Mule Spring 1 mile east. The water at Mule Spring is weakly saline and was used only for camp purposes. In 1895, considerable prospecting was done on the property and in order to test the ore, the Alvord Mining Company of Pasadena erected a five-stamp mill 2 miles from the mine, probably at the site of the burned mill.[273]

From 1906 to 1910, the Alvord Mining Company of San Diego operated the mine and installed a six-stamp Nisson mill near the mine. The Tintic Bonanza Mining Company of Salt Lake City operated the mine from 1916 to 1920. Mr. McCormick, a resident of Yermo, was the owner in 1923 and planned to open the mine. In 1925, the Dell 'Osso Gold Mining Company acquired the property and 6 claims were patented in 1931. The property was active for several months during 1932 and 1933, and was under lease to Roy Waughtel of Manix from December, 1950, to January, 1952. Since 1952, the property has been idle. The mill has been removed and one of the wooden buildings and a small bridge were burned in the early 1970s. Two stone buildings remained in the early 1970s.[274]

Kramer

In July, 1884, the Kramer Siding on the Santa Fe Railroad had but one inhabitant, the depot agent. However, with the discovery of copper 3 miles to the south, Kramer was the jumping off spot for the prospectors. Discouraged by the low price of copper and the lack of water, soon all but a few prospectors had left. J. R. Maxey was one of these hardy few, and his discovery of gold sent people flocking to Kramer. A district was organized on November 20, 1884. By February, 1885, the camp was still so crude that it was advised "As yet there are no hotel accomodations

here, and the visitors will do well to come prepared with blankets." The camp was still alive in July, 1885, but the high cost of milling and transportation discouraged miners, and they gave up.[275]

In May, 1899, three men named Duncan, Clark and Goldsberry discovered a rich ledge, and a "new" camp was again springing up, but this boom was even shorter lived.

The most substantial camp, known as Kramer Hills, was born in April, 1926, with the discoveries made by the Herkelrath brothers. This town was located a short distance downslope from the previous one and it boasted at least one store, owned by J. B. Ross, and a newspaper, printed in Barstow. Thousands of people from Los Angeles, San Bernardino and vicinity visited, and hundreds of claims were located. Many shallow shafts were sunk but none of this work resulted in the development of a mine. Only the Herkelrath property amounted to much of anything.[276]

Coolgardie

About May, 1900, placer gold was discovered in shallow gravel 20 miles north of Barstow by Dick Duncan. Duncan was one of the co-discoverers of gold at Kramer about this same time. He named his discovery the Black Nuggett after a famous mine in South Africa. Another claim, the Coolgardie, was named after a famous Australian gold camp. In August, 1900, ten men were operating 2 dry-placer machines at Black Nuggett Camp, and the *Engineering and Mining Journal* reported that, "The whole country is said to be located from Coolgardie to Lane's mill, both west and south of Camp Vera."[277]

Dry-placer machines do not work with wet sand, thus during the winter of 1900-1901, the camp was shut down. In June, 1901, they began again. Nothing more is heard from the placers at Coolgardie until 1908. In October, the Coolgardie Mining Company, which had devised a dry washer capable of treating 100 tons of gravel a day, was working here. In 1909, Coolgardie was described as "a small mining settlement, the cabins of the miners scattered over several square miles of dry-placer workings. In 1911, it was stated $100,000 in gold had been taken from the rich placers at Coolgardie.[278]

Reference was made above to Lane's Mill, and Camp Vera. Lane's Mill, located at Lane's Well (now known as Noble Well), is at best vaguely described. In 1909 Lane's Mill was still standing, and a photo shows several structures. A description of the well in 1917 fails to mention the mill. It is not known what mines supported this mill.[279]

The Camp Vera group of claims were 6 mines northeast of Lane's Mill. At this copper mine, owned by W. J. Rodgers, there were 20 shafts from 10 to 60 feet deep. There is no record of mining at this mine since 1902.[280]

Just 3 miles north of Lane's Well (and one and a half miles north of William's Well), M. J. Smith (see Old Woman Mountains section) discovered the First Chance Mine in 1906. This mine, also known as the Golden Eagle, was worked by Smith through 1911, and in November,1913, there was a 12 by 24 foot building, arrastre and

blacksmith shop on the property. Reportedly, $3,000 in gold was taken from here.[280]

William's Well, not far from Coolgardie, was the site of a placer operation that had probably been going on since the excitement in 1900. In 1910, four men were working the gravel there and making good wages. This well probably was dug in late 1909 by M. W. H. Williams, a resident of Redlands since about 1898. He and his associates spent a number of months in 1909 examining mining property north of Barstow. By digging the well, they enabled many new prospectors to work near there, since water is scarce. The dry placer operations are still worked from time to time.[282]

Slocum Camp-Opal Camp

Slocum Camp, near Copper City, derives its name from Dr. Samuel Slocum. Dr. Slocum and his wife lived at the mine during the winter of 1910, and they employed 5 miners. He was the general manager of the Desert Chief Mining and Milling Company which had done 2,000 feet of development work, sunk a 300 foot shaft, developed water and constructed 8 buildings which formed the camp. In June, 1911, the company began drilling the mine to determine how extensive the ore body was. Drilling continued through December, 1911. In November, 1916, the *Barstow Printer* indicated the mine was being worked for copper and molybdenum. However, the report continued, "During cessation of work for a short period, a blood-sucking low-lived vandal broke into the mine buildings and carried away at least one thousand dollars worth of equipment."[283]

While this setback may have retarded activity at the mines, it didn't destroy the Slocum's interest in that area. As late as June, 1927, the *Barstow Printer* reported that the Slocums came back to " do assement at their opal mines. Doctor and Mrs. Slocum returned by auto to their home in Pasadena."[284]

These "opal mines" may not have been the same mines as those being mined for copper and molybdenum in 1916. As early as 1910, opal mines in the vicinity were owned and worked by the American Opal Company. Three men were working there in September of 1910, and a shipment had recently been made to Pasadena where the stones were dressed. Mr. Archibald Ferguson of Pasadena came onto the mine from time to time to supervise operations. Work continued at a steady clip at least through the spring of 1912.[285]

In August, 1911, Mr. F. M. "Shady" Myrick, a resident of Johannesburg (and no relationship to David F. Myrick), discovered agate with bright red inclusions. This stone, dubbed 'myrickite', was found near Myrick Springs, now inside Fort Irwin.[286]

Copper City

Copper City reportedly was first discovered in the 1880s. In 1898, Copper City was alive and the Juanita Mine was active. During December, 1898,a "large force of men" was employed here by a "New York syndicate." The main shaft was nearing 90 feet deep at that time. In 1902, the main shaft at the Juanita was 212 feet deep, indicating a fair amount of work had been done. Also, there were numerous other developments on the various claims in the area.[287]

David Myrick indicates that in 1907, Silver Lake was a jumping off spot for people headed for Copper City, but little else is known about activity there at this time. In 1909, Copper City is referred to as a "small mining camp," but by 1916, the Juanita Mine was described as having been idle for many years, and the next year, the camp was reported to be desolate and in ruins.[288]

Goldstone

Gold was reportedly discovered at Goldstone as early as the 1880s. During the late summer of 1910, a well was being sunk by G. W. Toennies and a Mr. Goodrich for San Bernardino County at Goldstone. The well was sunk to 260 feet, when it bottomed in granite, without finding water. Several people were involved in mining during this same time, including John Harper and Goodrich.[289]

One of the most active mines before the 1916 gold rush here was the Big Drumm Mine discovered by J. L. Drumm on March 17, 1910. In November, 1910, it was planned that a 50 foot shaft would be sunk on this property, and by December, a ton of rich ore was brought into Barstow. In February, 1911, John S. Cook, a former Goldfield banker, bonded the mine, had 2 men working the mine for a week, then dropped the bond. At the Drumm Mine, in November, 1913, there was a small stamp mill.[290]

Things did not really begin to stir in Goldstone until October, 1915. About October 15, 1915, gold was discovered on the Redfield claim that ran from $1,400 to $3,000 per ton in gold. Soon, this young camp was attracting many prospectors. By March, 1916, the camp had grown to over 150 men. In addition, there was a lodging house, daily delivery of mail and supplies, and for $5, one could obtain a round trip ticket from Barstow to the nearby camp. Mr. Belander, of Los Angeles, began construction of a custom mill at Seeber Well (the source of water for the camp) 3 miles to the south. In May, it was reported: "There are now nine buildings and ten houses at the site. The rooming house has been fitted up with 25 new sanitary spring beds and the restaurant, a separate building, is fully equipped to care for one hundred or more daily guests."[291]

Work continued full blast at the camp that fall and winter at Goldstone Mining Company mines, the Redbridge as well as others, although the Big Drumm did not get under way again until January, 1917. Almost all of the mining was done by leasing portions of the claims, a practice that had been carried out with success at Goldfield, Nevada. By February, 1917, there was a mill operating, probably at the Goldstone Mining Company. On March 15, 1917, a post office named Goldbridge had finally been established, and there was talk of connecting the camp with Barstow by telephone. The reason for Goldstone's sudden decline in late summer or early fall of 1917 may never be known (for one thing, the Barstow newspapers are missing for this period), but by November, 1917, there were only 3 or 4 miners left in town. Goldstone was one of the last of a series of boomtown gold rushes that began about 1906 with the discovery of Goldfield, Nevada. The post office of Goldbridge officially closed August 15, 1918.[292]

In 1934, some dry placering was going on at Goldstone. Then, during the late 1930s, the Belmont Mine began operations again on a large scale and installed a mill. Mining never really ceased altogether. In 1924, the Goldstone Mine had a blacksmith shop, assay office and one other building. A bunk house stood in 1973, but by November 1978, this had collapsed. In November there was a maintained cabin not far from

the ruins of the bunk house. Two unoccupied structures have survived and the seemingly occupied Goldstone Mine and Belmont Camp looked well maintained. A handful of other structures still stand within a radius of about 3 miles of Goldstone.[293]

Crutts

About the time Goldstone sprang into prominence, another dot appeared on the map a few miles southwest, named Crutts. There never was a town of Crutts, although a post office with that name was established in April, 1916. Mr. D. K. Crutts settled in the Superior Valley at least by 1915, built a ranch, drilled a well, and took up farming, and as a sideline, well-drilling. Soon there were settlers' cabins scattered throughout the valley, with ambitious farmers trying to make a living, trucking their produce to market via the bumpy dirt road to Barstow. Most of the wells drilled in the valley for these farmers were drilled by Mr. Crutts. In April, 1917, the *Barstow Printer* reported "Three years ago there was hardly a house in the valley, now it is dotted with homes. . . Superior Valley is on the map to stay."[294]

It is not known why they left, perhaps there never was quite enough water, but by January, 1920, almost all the wells were pulled up, or were not working. Only Crutt's well was still working, but even he was not home. Two years later, on August 31, 1922, the post office, which was housed in one of the ranch houses, closed and the mail henceforth only came as far as Barstow.[295]

Paradise Mine

In 1868, large deposits of gold ore were known to exist at Paradise. The ore was reported to pay $10 per ton even though it had not been developed to any extent. By 1920, the Olympus Mine was well established. Paradise Springs, 2½ miles away, supplied water for the mine. There was a gasoline driven ten-stamp mill at the mine. In 1922, a fifty ton capacity Victory ball mill was in the process of being installed. The hoist for the incline shaft was driven by a gasoline engine as there was an Ingersoll-Rand compressor on the property[296]

FOOTNOTES

SAN BERNARDINO COUNTY

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[9]*Calico Print* March 1, May 31, 1885.

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[11]1900 Census Camp Cady, ED. 233 sheet 6; San Bernardino County Misc. Records, *Book B* pp. 535-538 ; *Redlands Citrograph* June 20, 1903; Barstow Printer September 22, 1911, April 17, June 16, December 11, 1914; New York *Engineering and Mining Journal* April 25, 1908; W. B. Tucker, "Los Angeles Field Division, San Bernardino County," *California Division of Mines Report 39* 1943p p. 474.

[12] *Calico Print* February 1, 1885; *Barstow Printer* February 3, June 2, August 4, 1911, January 12, 1912.

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CHAPTER FOUR

KERN COUNTY

Kern County ranks first in overall gold production within the California Desert. The dollar figure has been estimated at over 46 million dollars, with almost half of that coming from just two gold mines: the Yellow Aster near Randsburg and the Golden Queen near Mojave. Two hundred and seventy-six gold mines exist in Kern County. By comparison, San Bernardino County (twice as large as Kern) has produced a total of only 12 million dollars in gold from approximately 145 mines.

Kern County's entire mineral production (including pertroleum products) from 1880- 1957 has been 5.34 billion dollars, making Kern County the top ranking mineral producer in the entire state. Although accounting for an impressive 90 percent of Kern County's entire mineral production figure, petroleum fields are not found within the study area and this commodity is not discussed herein. Kern County's most important mineral contribution from the California Desert is gold.

The Sierra Nevada (known for it's gold bearing areas in Northern California) becomes a part of the California Desert Conservation Area at the range's southern extremity in Kern County. The southern Sierra Nevada saw its share of gold mining booms, starting with the Kern River rush in 1851, just three years after Marshall's famous discovery at Sutter's Mill, followed by Keyesville in 1852, the Cove District in 1860 and Halivah in 1865.[1]

SAGELAND MINING DISTRICT

Shortly after the town of Claraville was founded in 1861 (some 12 miles southeast of the present site of Halivah) prospectors discovered rich quartz veins 8 to 10 miles east of town. They formed the Eldorado Mining District in 1866, and by 1867, some 30 to 40 claims had been filed. These included the 2 most successful mines in the region: the Burning Moscow and the St. John. The success of these 2 mines brought about the creation of Sageland, which by the spring of 1868 had a saloon and a billiard room, hotel, miner's store, sawmill; two stage lines to Halivah, and an opera house.[2]

Eight hundred to a thousand people called Sageland their home until the White Pine County, Nevada silver discoveries caused a mass exodus to that district in 1868-1869. At the Burning Moscow, an eight stamp mill averaged 15 tons of ore per day. The St. John had a twelve-stamp mill producing $3,000 to $7,500 a week. Eventually, the St. John was to have 2 mills located near Tunnel Springs working the ore. In 1875, the mine was 720 feet deep with a vein 4½ feet wide at that depth. The St. John Mining Company spent $50,000 erecting a hoisting works and pumps. 3

The St. John survived "White Pine fever" and as long as the St. John remained open, Sageland had hope. John P. Jones and William M. Stewart, senators from Nevada who invested heavily in mining throughout the West, operated the St. John from the mid-1860s until its closure in 1875. A year later little was left of Sageland. In 9 years the St. John had produced $700,000 in gold. [4]

The San Antonio Mine, located 8 miles southeast of the St. John Mine, was discovered in 1887, bringing a renewal of activity to the district. The St. John was again worked from 1891-1900, and by 1904 the Granite King and Granite Queen mines were mining a quartz vein 4 feet wide for free-milling gold. A small two-stamp mill was located in a wash 1 mile east of the mines, which are located at the intersection of the Kelso Valley-Hoffman Canyon Road with Butterbread Canyon Road. No extensive mining was ever accomplished at the Granite King, and that mine has only a 60 foot shaft and 60 feet of drifts.[5]

Notwithstanding the early discovery of the St. John, Burning Moscow, and San Antonio mines, the real activity in the Sageland District came in the 1930s. The Piute Mining Company worked the Burning Moscow Mine in 1933. The St. John also was worked from 1935-1938 during which time miners cyanided the tailings and recovered $5 to $15 in gold per ton.

In the vicinity of the St. John, a number of other mines or prospects were discovered during the 1930s. Upwards of 200 people came from the cities during the Depression to scrape a living out of the shallow veins in this area. One of these depression era mines, the Esperanza, eventually had about a thousand feet of tunnel, and around $26,000 worth of ore was taken out of the hillside. A little to the south, the Dearborn Mine and Henry Ford prospect were located. Near the San Antonio and Granite King, the Great Unknown Mine was developed by J. S. Bishop, followed by the Red Strike, Sidewinder, Lone Star, and Pay Day. To the east of the St. John were the Summit prospect, Plymouth and Gold Peak mines. These mines all had much in common: all were relatively shallow mines, 50 to 100 feet in depth. Indeed, some were nothing more than prospect holes. All were worked by a handful of men trying to and succeeding in recovering the gold values present. All, with the exception of the Kelso Creek Placers near Sageland, were lode mines and prospects containing quartz veins with free-milling gold.[6]

Many of the miners built small mills near their mine. The Gold Peak had a two-stamp mill and crusher at Dove Springs. The Esperanza had a ball mill, and water was obtained from the mine and a spring through half a mile of 2 and 4 inch pipes. With the exception of the Summit prospect, Skyline and Hub, which were developed in the late 1930s, most of the mines had fallen into inactivity and/or abandonment by the mid 1930s .[7]

Gold is not the only mineral occurance in the Sageland District. Chrysotile asbestos in serpentine was discovered in nearby Jawbone Canyon in 1912. The outcroppings are 10 feet wide and 150 feet long. No real production has ever been undertaken.

Antimony, with its price inflated by World War I, was discovered 6 miles WSW of Cinco on what is now Antimony Flat. The Amalia and Antimony Consolidated mines were worked during both world wars.[8]

RADEMACHER MINING DISTRICT

The Rademacher Mining District, organized in the 1890s, is located east of the Sageland District some 15 miles north of Randsburg and 5 miles south of Ridgecrest. This district was most active in the early 1900s and again in the 1930s, although one mine in the area , the Jolliver, is said to have been discovered in 1851 as a silver-lead mine. It is on the south slope of El Paso Peak. The free-milling gold ore of this district averages a half-ounce or less in gold per ton. Thirty or more mines exist in this area, ranging in depth from 50 to 200 feet. The Gold Bug and Bellflower are two of the oldest mines in the district, and both were reworked in the 1930s. Two-thirds of the mines in the Rademacher District appear to be shallow prospects worked during the Depression by one or two men at each claim.[9]

EL PASO MINING DISTRICT

The first recorded mining activity in the El Paso Mountains predates the Sageland discoveries by a few years, but the majority of mining activity here took place in the early 1890s. A Manzanillo Mine was being operated in 1864 and 1865 by the Yarborough Gold and Silver Mining Company. Thirty five thousand dollars were invested in equipment and development resulting in 40 tons or ore being dug out and placed on dumps. Mining operations ended shortly after Mr. Yarborough was found murdered at Mesquite Springs (between Kane Dry Lake and Randsburg). Whether or not white bandits or Indians committed the slaying, Yarborough's death was enough to convince the miners that the area was too hostile and too remote from civilization to justify their continued presence.[10]

With silver discoveries in Inyo and San Bernardino counties during the 1870s and 1880s drawing so much attention,prospectors overlooked the El Paso Mountains. It wasn't until the depression of the 1890s that men returned to the El Pasos in search of gold. In 1893, two prospectors, Reed and Benson, were prospecting in the Red Rock Canyon area. After moving east to the mouth of Goler Canyon, they found gold, in the gulches that now bear their names. Ramsey Cox, G. F. Mecham, Clyde Kuffel, Frank Yeager and Charley Shellman all filed claims at approximately the same time as Reed and Benson.[11]

On March 15, 1893, the Goler Mining District was established. John Wasserman acted as chairman that day with N.J. Ayers as secretary. After all the votes were counted, R.G. Willard became district recorder. The first claim recorded in the district was the Jackass Placer. One of the first men to capitalize on the new strike

was Charlie Koehn. He had homesteaded some acreage adjacent to Kane Springs,only 12 miles from Goler Gulch, in 1892, intending to capture the trade running between Tehachapi and the Panamint Range. He already had a profitable way station going, to which he added a post office on September 22, 1893, and began delivering letters to the local miners at 25 cents each. He also sold and hauled supplies, mining tools, food and drinks.[12]

By December, 1893, good gold diggings were discovered in Bonanza Gulch, east of Red Rock Canyon. Over $50,000 in gold had been taken out of the El Paso Mountains by year's end. During 1894 camps sprang up at Red Rock Canyon, Goler, and at Summit. In the fall of 1895, Eugene Garlock hauled an eight stamp mill, the first in this area, down from Tehachapi. This was located at Cow Wells due to the water supply and it's centralized location for various mining districts.

Garlock's small stamp mill was soon swamped with ore, and more mills, the McKernan, Kelly, Smith, Henry and Visalia, sprang up nearby. All but the Smith mill were steam driven. As business increased, the town felt it needed a constable. John Kelly was given the job. He reportedly had a policy of talking men into surrendering without the use of a weapon, as he reportedly disliked carrying a gun. The crossroads assembly of tents, frames, and adobe buildings soon became known by the name of the man whose mill brought in so much business. Cow Wells officially died on April 10, 1896, when Ida Kelly, the constable's wife, became postmistress of Garlock. At it's heyday Garlock had at least two bars, two hotels, a stage depot, a laundery, doctor's and dentist's office and a school.[13]

The completion of the Randsburg Railway in early 1898 spelled the beginning of the end for Garlock's stamp mills, and the town began to die. With the railroad complete more efficient mills were within reach and the small amalgamation mills of Garlock lost most of their business. By 1900 most of Garlock's citizens had moved to Randsburg. In the twentieth century Garlock experienced two revivals. In 1911 the track laying crews of the Southern Pacific briefly camped at abandoned Garlock while laying track from Keeler to Mojave. In the 1920s, a J.D. Voss tried reopening the Apache Mine in Iron Canyon, while a salt company was busy at work on Koehn Dry Lake and a Mesquite Springs prospect looked promising. Garlock awoke, reopening its post office, a new store and a boardinghouse run by Sarah Slocum. But this respite was short lived, and the post office closed on June 30, 1926.[14]

COALDALE (1894-1898)

The El Paso Mountains are also the scene of one of Kern County's few coal boom towns. Coaldale was a small settlement of about 75 men situated 2 miles south of Black Mountain in Colorado Gulch. The coal camp sprang up in 1894. The quality of coal was poor, which led to the rapid decline of the camp. Coaldale apparently died during the rush to Randsburg in the early summer of 1895, but not due to any depletion of mineral values. Just 5 miles away, Randsburg was booming and the men

employed by the coal company found it more attractive to dig for the yellow metal.

An electric power plant was orginally planned to provide Coaldale with electricity. Poles were placed to hold the line but the enterprise never becme a reality. The steam boiler never arrived in Garlock due to an unpaid freight bill. The total coal production for the mines in this area, now known as the Colorado group, is unknown, but 220 tons of coal, worth slightly more than $1,000 was reported in Kern County production figures for 1898 and probably came from Coaldale mines.[15]

MISCELLANEOUS EL PASO DISTRICT MINES

In 1939, a pumice deposit, now known as the Calsilco, was first worked northwest of Bonanza Gulch. The Insulpum Corporation worked this deposit in 1945. A year later the Calsilco Corporation took over operations. The pumice is worth approximately $50 to $80 a ton for use in a variety of products ranging from paint fillers and oil absorbers to toothpaste.[16]

The Copper Basin group was composed of 26 claims formerly owned by William "Burro" Schmidt who had single-handedly dug a tunnel 1,872 feet long to provide better access to his mines. By 1938, when he had completed his access tunnel, his copper mines were largely undeveloped. He was so interested in finishing his tunnel that the mines had completely escaped his attention. This engineering feat, located 9 miles northeast of Cantil, earned Schmidt recognition in Ripley's "Believe it or Not" newspaper series. The Apache Copper Mine and Holland Camp were developed in the late 1930s . A mill at the camp in 1940 recovered a few ounces of gold and less than 100 pounds of copper. The mill was located 14 miles northeast of Cantil. The Zuna Copper Mine, located on the south side of Last Chance Canyon, yielded 30 tons of copper bearing quartz in 1941.[17]

SALTDALE (KOEHN DRY LAKE)

In between Mojave and Willow Springs in southern Kern County is a cave where desert Indians reportedly stored salt from the Koehn Dry Lake area. Koehn Dry Lake is located at the base of the El Paso Mountains near Last Chance Canyon. Modern mining of salt on Koehn Dry Lake began when the Diamond Salt Company performed development work there in 1911 and 1912. However, significant production didn't begin until 1914 when the Consolidated Salt Company began its operation.

From 1919 to 1927, the Fremont Salt Company also produced salt by the solar evaporation of surface brine. Both companies were bought in 1928 by the Long Beach Salt Company, who continues to mine salt on Koehn Dry Lake today. In these early days the salt plant would shut down for years if rainfall and storm runoff

did not supply enough water to make brine.Today, salt on Koehn Dry Lake is "harvested." The brine is pumped from wells and channeled by ditches and flumes to ponds where it spreads out and evaporates. In 4 months, about 6 inches of salt has formed..

Years ago the salt was cut in foot-square "cakes" and hand loaded into dump cars. Now the salt is scraped into a pile and loaded mechanically. A mill is located at Saltdale, and Plymouth locomotives haul the dump cars of salt to be processed. The salt produced here is used in cattle feed, for icing refrigerator cars, and in water softening devices.[18]

GYPSITE (KOEHN DRY LAKE)

Charley Koehn discovered gypsite near his homestead and staked claims on it in 1909. A year later a small calcining plant was put into operation to manufacture wall plaster, and in 1912, the Crown Plaster Company produced a small amount of gypsite. Koehn leased his deposits to various companies from 1910 to 1930. Claim jumpers hired gunmen in 1912 to force Koehn off his claims, but Koehn won out in a small and short-lived gun battle. After this, companies began to sue Koehn over contracts and percentages.

One of these was the Alpine Cement Company, or Alpine Lime and Plaster Company. This company was involved in litigation with Koehn, demanding $50,000 from him in damages. Judge Campbell Deaumont heard the case and asked that the suit be continued for further study. In May 1923, Koehn was arrested as a suspicious character when found running from the judge's home in Fresno. He was jailed and charged with attempting to bomb Deaumont's home. The explosive device contained fuse and newspaper, and remnants of both were found in Koehn's car. However, there is some doubt as to Koehn's guilt in this matter, and he pleaded his innocence throughout the trial. He was found guilty and sent to San Quentin where he died in prison, only days before his scheduled release in 1938.

From 1926 to 1935, George W. Abel mined Koehn's claims and sold a product known as Mojave Desert Agricultural Gypsum. A mill at Gypsite ground and sacked part of the gypsite and bulk-loaded the rest, sending all of it to the San Joaquin Valley to be used as a soil conditioner in agricultural production. Increased output from the Lost Hills deposits in the San Joaquin Valley caused a decreased output at the Koehn deposits from 1935 to 1950.[19]

RANDSBURG DISTRICT

Wandering prospectors from the El Paso District discovered that the Summit Range, located northeast of the El Paso Mountains, also contained placer values and began to dry wash for gold there in the early 1890s.No more than 100 men lived at Summit

Dry Diggings, a tent and dugout camp. Supplies came in from Goler and water from El Paso (Willow) Spring.At least two prospectors from the Summit Dry Diggings, Frederic Mooers and William Langdon, ventured south to explore the Rand Mountains in 1894. Finding only traces of gold, they returned, content at the time to work what seemed to be richer earth.

Frederic Mooers never forgot what he found on Rand Mountain, and a year later was startled into taking a closer look at his earlier find. A group of miners, displeased with the scant returns from their present claims, were talking of looking into that ground on Rand Mountain that he and Langdon had discovered earlier. Concerned with the thought of outsiders cashing in on a find that was his, Mooers planned his own trip.

Mooers and his new partner, John Singleton, decided to take a careful and well-planned look. This required a wagon and team to carry their mining equipment and camping supplies. Charles Burcham was one of the few citizens of the camp endowed with a vehicle and animals, thus the partnership became a trio.The three left camp without informing anyone where they were going, and faked a heading to Goler. Once out of sight of camp, Burcham swung his team south and up the gentle grade to the Rand Mountains. After prospecting the sandy gullies, Burcham and Singleton climbed to the top of a red stained peak,while Mooers stayed in camp. Singleton knocked off a specimen with his hammer and turned it over to see the freshly broken side. Singleton was a carpenter, with little prospecting experience, yet what he saw caused him to yell for Burcham. Burcham, nearing the end of a two year prospecting adventure financed by his wife, Dr. Rose La Monte Burcham, took one look at the rock and exclaimed,"We're rich! By george, Singleton, we've found it!"[20]

The partners originally entitled their discovery the Rand mine, but later changed it to the Yellow Aster. The former name was frequently misused in stock promotions and in describing the whole district (i.e. the Rand mines). The Yellow Aster was chosen because Mooers was reading a pulp novel by the same name at the time his partners approached him about a name change. Reflecting upon the inspiring view of wild flowers he had seen while prospecting, Mooers suggested the Yellow Aster, and it stuck.

On April 25, 1895, Mooers, Singleton and Burcham staked their claims. The location work was rushed because the three realized that a discovery like theirs could not be kept quiet long. Hadn't a group already made plans to come even before Mooers got the idea? Keenly aware of the importance to properly record their ground before a rush could get started, Burcham devised a clever scheme that bought them a few days extra time. Fearful that miners from the Summit Diggings would soon be over to investigate their activity, the trio postponed any fancy celebrations until the mine was safely recorded and legally theirs. Instead, Burcham loaded a couple of sacks with worthless iron stained bull quartz, threw them in his wagon and rode to the water hole. Curious miners asked if he had found anything worthwhile. He stubbornly admitted, "Well, I just don't know. But I think we've found something pretty good." He volunteered no more, but inquisitive miners soon found the

planted sacks while Burcham was away from the wagon. It soon spread throughout camp that three fools were digging bull quartz. Burcham had the extra day or two he and his partners needed.[21]

With the location work complete in June of 1895, Burcham returned to his wife in San Bernardino to report the good news, and to turn over one-half of his one-third interest to her to pay off the grubstake. She strongly counseled him not to sign any document until the true value of the mine could be determined. Her advice saved the Yellow Aster's discoverers from the usual fate of selling out too soon and too low. Having existed on bacon and beans for months, if not years, those lucky prospectors who do stumble on a real bonanza are overwhelmed upon receiving offers of $3,000 to $20,000 from someone with a large sum of ready cash. To one so used to scratching out a living, an offer of $3,000 to most prospectors of the past has been a huge temptation, often equivalent to 3 years wages as a miner. And if $3,000 was a huge temptation, $20,000 was unbelievable, and $500,000 was beyond anyone's wildest imaginations.

Mooers and Singleton were giving in to this common temptation while Burcham was away in San Bernardino. O. B. Stanton promised to open and develop the mine, construct a ten stamp mill, and spend $10,000 doing it in return for a 30 day option in a half interest in the mine and an option to purchase the entire property at any time before December for $500,000.

Stanton had the signatures of Mooers and Singleton on an agreement dated June 22, 1895, but upon his return, Burcham remembered his wife's advice and refused to sign. The agreement later caused the discoverer-owners numerous legal headaches. Even William Langdon claimed a piece of the Yellow Aster by virtue of his being present with Mooers a year prior to the discovery when the 2only found traces of gold. The Yellow Aster went on to produce over $12,000,000 in gold, more than enough to pay for all the litigation and give the owners a handsome profit. Yet in July, 1895, Burcham was bemoaning that so much could be accomplished if only they had $500.

Worried about the temptation of selling short, and having been strongly bitten by the gold bug herself, Dr. Burcham closed up her practice and traveled to Rand Mountain in July of 1895. She adapted to the rigors of camp life quickly, and was soon cooking for the men in the camp while they drywashed placer ground and crushed high grade ore in mortars.

The men left much of the business details to Dr. Burcham and she became bookkeeper and secretary. When the Yellow Aster Mining and Milling Company opened their account with the National Bank of California in Los Angeles, two signatures were required: that of John Singleton (president) and R. L. Burcham. Later the men were to bemoan that at times she ran too tight a ship, yet it was her advice and dominance that kept the Yellow Aster under the control and ownership of it's original discoverers.

Pat Reddy, a local lawyer, approached Dr. Burcham once in high hopes of being able to buy or bargain for some of the Yellow Aster holdings. She turned him down cold, and he returned to Mojave swearing he'd never have anything to do with a woman again. Later Reddy gained a partial interest in the mine by offering his legal services, and he had to use his law skills against the Yellow Aster when Dr. Burcham took him to court to pay him off and regain control.[22]

In July of 1895, when the Yellow Aster Mining and Milling Company began to fully understand the magnitude of its bonanza, other prospectors and promoters began to share the fever. Ed Maginnis and J.T. O'Leary, along with a fellow named Hansen, were busy 1 mile due west of the Yellow Aster staking their location notices on a claim called the Minnehaha. Soon, a tent city, Pioneer Camp, grew up at the foot of the draw leading up to the Yellow Aster. The first frame building was erected October, 1895, and was used as a post office. The second frame building was Starkey's saloon.[23]

On December 20, 1895, the Rand Mining District was organized. Twenty-six persons signed the document creating this district out of the Summit Range District. Randsburg had 13 buildings at the time, mostly tents. Ed Maginnis was elected recorder by a margin of 1 vote. In 1897 he was appointed Justice of the Peace by the Kern County Board of Supervisors, and he retired from that office in October, 1935.

The Randsburg rush was in full swing by 1896 when the Ashford brothers discovered the King Solomon Mine, and the Ramie brothers staked out the Butte Mine. The Baltic was discovered by William and Wilson Logan in January, 1896. The Sunshine, and Operator Divide mines also came into being that year, as did the Pioneer Liquor and Gentlemen's Furnishings Store and Mrs. Kern's Miner's Hotel. George Clover started printing the *Randsburg Miner* in 1896, and that fall 686 voters cast their ballot in Randsburg. By December the population was 1,500, up 33 percent since that summer. Randsburg boasted 50 frame buildings by the end of 1896, and the St. Elmo Hotel was feeding 400 persons a day and lodging 100 a night.[24]

The Little Butte and Santa Ana Group mines were discovered in 1897 and Randsburg received its first mill in March of that year. The two stamp mill of John Quinn and George Pridham was located two blocks from the center of town and could crush 10 tons a day. With such a small capicity, most of the Randsburg District ore was shipped to Garlock for processing until 1898. At that time the completion of the Randsburg Railway made it more economical to ship ore to the Barstow Reduction Works. In addition to the mill, Randsburg received it's first church and bank in 1897.[25]

By October, 1897, it was reported that the Rand District had produced over $600,000 in gold. Also, the Randsburg Railway was nearing completion as a standard gauge line running 28 miles from the Santa Fe line at Kramer to within 1mile of the Yellow Aster. The Randsburg Railway Company was incorporated May

18, 1897, with John Singleton as a member of the board of directors. The Randsburg Railway began operation January 17, 1898. Two days later fire struck Randsburg. Businessmen and citizens rebuilt the town on the smoldering remains, only to be smitten again on May 6. After each fire, buildings were rebuilt a little bit further apart than before. Although water was available, dynamiting buildings was the most effective and exciting means of fire control. On at least one occasion careless firemen lit a bundle of dynamite under a house, only to find a small boy still on the premises. Quick action saved the boy. Another time, a well-stocked hardware store became the candidate for dynamiting, and the explosion caused a shower of dishes, pots, pans and washtubs to rain down on that part of town.[26]

Randsburg soon became one of the great boom towns of the West. In fact it even enjoyed the luxury of having a neighboring town rival. In December of 1896, when Randsburg was little more than a cluster of tents, the Johannesburg Water and Townsite Company was busy laying out a Christmas present for its neighbor, a rival town (Johannesburg) that would be well-planned, even to having piped water in the homes.

Johannesburg at its height had a post office, two general stores, a real estate office, stationers and variety store, billiard-pool room, music hall, boarding houses, lunch counter, two laundries, two lumber yards, two livery stables, a barber shop, telegraph line with Mojave, and a telephone exchange with Randsburg. This greatly facilitated courting between the two towns, yet the party lines gave such unequalled privacy that two lovebirds found their conversations the subject of printed inquiries by the *Randsburg Miner* as to who had been making love to whom over the phone.[27]

Johannesburg got a golf course in 1900. It began at the Red Dog Mill and ran around town, crossing the railroad twice, and ending where it began. Sporting 9 greens, the course was used by a golf club having 13 members, 7 of them ladies. The *Randsburg Miner* saluted its neighbor with the words "Johannesburg is an up-to-date town". Miners from as far away as Pleasant Canyon and Ballarat could now enjoy a weekend of golf, stay at the Hotel Johannesburg, and board W. K. Miller's stage on Monday for the trip back to work.[28]

In the Spring of 1898 the Yellow Aster Mining and Milling Company purchased the Skillings Well east of Johannesburg. The mine owners proposed laying a 5 inch pipeline to Randsburg, with a pumping plant to push the water over Gold Hill, a low ridge between the two towns.While Randsburg bought her water by the gallon or barrel ($2 a barrel delivered in town, 40 cents at the well) Johannesburg had several water companies (Squaw Springs and Johannesburg Milling and Water Company, among others) and piped water. In patient expectation of the arrival of piped water to Randsburg, the Citizen's Committee saw to it that fireplugs were placed and a pipeline laid. Randsburg also bought a chemical fire engine from Bodie, a gold mining camp in Mono County, California.[29]

Ore from the Yellow Aster was worked at the Barstow Reduction Works after January, 1898, when the Randsburg Railway became operational. The shipped ore

averaged $40 to $50 per ton. Lower grade ore was being kept on dumps at the mine site to be run once the Yellow Aster mills were completed. Yellow Aster dividends for April, May and June totaled $24,000. On July 2, the *Randsburg Miner* reported the Yellow Aster as having produced $350,000 in bullion. Plagued by highgrading, the Yellow Aster announced in the summer of 1898 it was erecting a changing room to discourage the habit of pocketing away in one's clothes an exceptionally rich piece of ore.[30]

Although the Yellow Aster dominated Randsburg, other mines were being found and developed. The Big Gold Mine was discovered in 1898, and three years after the discovery of the Butte Mine, the Butte Lode Mining Company was formed in 1899. It had produced $140,000 during those 3 years and later went on to produce a total of two million dollars in gold and silver.[31]

Randsburg's population reached 3,500 in early 1899, and by year's end the Yellow Aster employed 150 men and had a $13,000 monthly payroll. Underground miners were paid $3 a day and those topside received $2.50. Early the next year a pumping plant was finished at Goler, forcing water up an 8 mile grade to Randsburg in preparation for the completion of the Yellow Aster's 100 stamp mill.[32]

Singleton, Mooers, and the Burchams began to enjoy their wealth. Mrs. Burcham began planning a trip to Europe, while her husband invested in mining interests over a wwde territory. All three men wore handsome watch chains, stickpins, and jewelry made from Golhr nuggets. While Mooers died in the spring of 1900, never having been completely healthy for years, the others enjoyed the level of affluence that comes to the very fortunate in mining.[33]

Around Christmas of 1901, smallpox broke out in Randsburg, and before it was contained over 500 cases appeared in the vicinity. However, this was only a minor setback in the development of the California Desert's largest mining town, and soon production soared to new heights. The Yellow Aster's new 100 stamp mill was completed in 1902, producing gold worth $100,000 a month. With the new mill in operation, the older 30 stamp mill was used to treat only the higher grade ores. Both mills ran 24 hours a day. In the 100 stamp mill, consisting of 20 batteries of 5 stamps each, 4 batteries a week would be shut down and cleaned up. This allowhd each stamp to be run at least a month between cleanups. Two men handled the amalgamation process, each in charge of 50 stamps. With a 12hour shift, a man would make $4.50 per day, and many worked 7 days a week, holidays included. Nevertheless, when fire struck town, the mine and mills closed down completely, and everyone fought the flames on company time.[34]

Labor troubles erupted at the Yellow Aster in 1903. The Yellow Aster didn't need any state help to break the strike, but labor dissatisfaction persisted throughout the next 15 years, and several mysterious acts of mischief were noted. Chief among these was a fire that broke out in town 2 days after the miner's union went on strike. It was soon discovered that the fire hose and rope to the firebell had been

cut, and the water turned off.[35]

(The Atolia tungsten mines and the California Rand Silver Mine are actually located in San Bernardino County near the San Bernardino-Kern County line. Their story is included here as the logical continuation of the Randsburg area mining history)

Atolia-Randsburg's tungsten boom

Randsburg by the beginning of the twentieth century has settled into a calm period of average, modest mining production. No new gold discoveries were made after 1900 and the easy diggings had been worked and reworked. The lode mines were being run by companies and corporations, and the gold placers yielded less and less. Since 1896 miners and prospectors in the Stringer District (southeast of Randsburg) had been cursing the unwanted appearance of a creamy white substance in their pans and dry washers that was interfering with the gold recovery. The nasty stuff was nicknamed "heavy spar."[36]

It was actually scheelite, tungsten ore. Hundreds had discovered " heavy spar " before, cursing it for getting in the way. Yet when George Gay and Pat Burns found float at the St. Elmo Mine in 1904, they recognized it as scheelite. In trying to trace the float back to its source, the two missed the rich Atolia veins but discovered that the Stringer District veins contained tungsten values.[37]

Randsburg stirred and yawned as men ran back to the Stringer District to relocate that "heavy spar." What was once cursed was now coveted! Gay and Burns missed the rich veins of the Atolia District because the veins were entirely covered by detritus except at one location. In the excitement that the two created, this was soon discovered as the Papoose which from 1908 to 1911 was the leading scheelite mine in the world. With the Papoose discovery and the later location of the Union Mine, Randsburg had something to shout about. Her second boom was on, even though, due to the more glamorous Nevada strikes (Tonopah, Goldfield, Rhyolite), and a few California booms (Skidoo and Greenwater), Randsburg's jubilation went largely unnoticed outside the county.

Atkins and De Golia put up the first tungsten mill in 1907. Combining their names, the prospectors gave the name Atolia to their camp, located 4 miles south of Johannesburg. Atolia's 60 citizens drywashed the area for high grade float, and many worked for the Atolia Mining Company, which very quickly bought up all the good ground, becoming the owners of 56 claims accounting for 95 percent of the entire district's tungsten production.[38]

Atolia was becoming very wealthy and being very quiet about it, arousing no outside interest. The Atolia Mining Company produced close to $100,000 worth of ore in

1906, their first year of operation. By 1913, just 7 years later, they had produced $1,000,000 worth of ore. In 1914 the Atolia Mining Company sold 28,000 units of tungsten ore worth a total of $182,000. A unit is 20 pounds of ore containing 60 percent or more of tungsten trioxide. At that time a unit of ore sold for $6.50. Because of the wartime demand for tungsten (used as an alloy to harden steel), its price more than doubled in 1915 to $14 a unit. The Atolia Mining Company nearly doubled their production that year to 54,000 units, raking in $763,000 from ore worth only $360,000 the year before. The outside world began to notice Atolia and the population that year rose to 300.[39]

Atolia's biggest year was 1916, as the value of tungsten was skyrocketing. Doubling its production again, the Atolia Mining Company produced 108,000 units of ore at $33 a unit for a total of over three and a half million dollars. Atolia's population swelled to 2,000. Storekeepers took tungsten ore in exchange for groceries and merchandise, and Illingsworth and Dunnell, a local merchant house, received $200,000 worth of ore by May, 1916.

Eastern manufacturers sent buyers to Atolia to bid on tungsten ore like bushels of wheat or cotton, with prices for small amounts of high grade ore, in at least one instance, reaching $90 a unit. The buyers didn't ask too many questions as to where the tungsten came from, as highgrading was all too common. However, miners were watched as if they were mining South African diamonds; lunchpails were inspected daily, and ore was sealed before shipment by rail. Tungsten had become a precious metal.[40]

Water was almost just as precious in Atolia. Shipped in by rail from Hinkley, a tank car of water cost between $15 and $28. Until 1917, when the Randsburg Water Company pipeline reached Atolia, the mining company was doing it's best to conserve water and even caught rainfall with gutters on every building.

People in the Randsburg area made thousands of dollars from tungsten overnight. One S. E. Vermilyea purchased a lease for $2,000 and worried that he'd never recover his initial investment. Three days later he hit high grade ore and refused an offer of $25,000. A canvas bag the size of a shopping bag filled with high grade scheelite float was worth $350. Even children gathered the ore and made big money.[41]

Such an opportunity was too good to last. In 1917 the Atolia Mining Company sold 116,000 units, 8,000 more than were produced in 1916. Although this was worth more than two million dollars, this represented a loss of one and a half million dollars over what the same amount would have brought in 1916. The price of tungsten had dropped to $18 a unit.

Atolia tungsten production for 1918 was $1,525,000 from 61,000 units of ore at $25 a unit, and in 1919, when only 4,000 units whre sold at $16 a unit, the Atolia boom was over. The next year the Atolia Mining Company didn't ship a single unit of ore. With demand down (World War I was over) and tungsten being quite inexpensively mined in China, Atolia seemingly died.[42]

The California Rand Silver Mine-Randsburg's silver boom

Randsburg's third boom was caused by silver. One of the greatest silver mines in the desert West, the Kelly, or California Rand, was discovered by two men who were out locating red paint. Jack Nosser, an oldtime prospector and miner, had some claims near Atolia that he felt lacked only development work in order to become paying mines. He offered John Kelly, sheriff of Kern County, a share in the claims if Kelly would raise the money needed. Kelly and County Assessor Edith Coons put up the cash. Kelly, Coons, W. H. Williams (a good friend of Kelly) and Nosser formed a partnership.

Development work failed to reveal anything worthwhile, and Miss Coons was beginning to believe she was only throwing her money away. This was her second gamble that hadn't paid off, her first being an unsuccessful stab at relocating the Lost Padre Mine. Kelly, in order to help offset some of the grubstaking expenditures, recalled some red paint pigment claims that were eligible for relocation. He told Nosser and Williams they were on the side of Red Mountain, and the two left to relocate the ground in their names. It was hoped the claims would generate a small amount of quick cash.[43]

Williams picked up specimens of horn silver on his way back from having located the paint claims, and forwarded the samples to Kelly in Bakersfield. Within days Kelly was back in Randsburg with an assay report that read $60 in gold and 436 ounces of silver per ton. The specimens were found on idle property owned by the heirs of one D. J. Mc Cormick. The claim is a few hundred feet from a main road, and there was a 130 foot shaft on another part of the claim. The operators were looking for gold, not silver. It seems amazing to some that such a wealthy mine (it later produced more than $13,000,000 worth of ore) was passed right over by two waves of prospectors who combed the hillsides during the last two rushes. Actually Williams was extremely lucky. The silver veins only appear, due to a fault zone, at the discovery outcrop, and even that is almost hidden. It is even possible that the outcrop was not exposed at the time the original owners sunk their shaft.[44]

Silver has always played a minor role in Randsburg's early mining history. In 1908, the Randsburg District produced $650,000 in gold and over $5,000 in silver. The silver was entirely a by-product of gold mining. This calculates to a maximum gold fineness of about 750. (The Yellow Aster bullion averaged about 790 fine) The silver content was nothing to brag about. It lowered the value and purity of the gold bullion and would have been considered to be a poor reflection of the gold camp's richness. Although silver was present here and noticed from the beginning, no major attempt to discover silver was made at Randsburg because no large silver vein was ever suspected in this gold district. Now, all of this changed abruptly.

Kelly, Williams, Nosser, and Coons immediately secured an option on the McCormick property for $5,000 and claimed all the adjacent land they could. Miss Coons and Kelly disposed of a small portion of their individual one-fourth shares in

the mine for $50,000. The mining world sat up and took a heavy interest. Was it only a rich surface deposit or a second Comstock?[45]

Circumstances heavily favored the partners. No development work was needed to get at the ore; they just scooped it out. After two months $1770,000 worth of ore had been extracted and the mine was still just a hole 50 feet deep, with no waste dump. With a railroad in the front yard and the Pittman Act pegging silver at one dollar an ounce, the California Rand Silver Mine certainly was found at the right time and in exactly the right place, enabling its owners to make millions.

With the discovery of silver, Randsburg went wild for the third time. The towns of Osdick and Hampton were born in the summer of 1919. The post office came to Osdick on February 14, 1922. The production of the California Rand Silver Mine from June 1, 1919, to August 1, 1923, was over $7,000,000. In 14 months from 1921 through February, 1922, one claim (the Grady Lease) produced 18,245 tons of ore valued at $1,613,074! Silver mines and prospects popped up along a 2 mile by 1¼ mile area. Shafts were dug south and north of the Kelly in hopes of meeting the extension of the high grade mineralization. Most failed, except the Coyote on the southeast edge of the Kelly and the Santa Fe on the northeast edge.[46]

In June, 1923, with the provisions of the Pittman Act fulfilled, silver prices dropped to 65 cents per ounce. However, by careful management and increased production, the California Rand was able to continue mining silver profitably. By 1926 the mine had a total gross production of over $13,000,000 with dividends totaling $4,500,000. In 1929 the mine could not be operated profitably, and it was sold to Henry W. Klipstein of the H. W. Gould Company for $50,000. In the fall of that same year, the post office at Osdick changed its name to Red Mountain.[47]

Atolia after the silver boom

The California Rand Silver Mine had stolen the show in April, 1919, while Atolia apparently breathed its last breath. While 1921 was the California Rand Silver Mine's biggest year, with silver production for the whole county over $3,000,000, the Atolia Mining Company shipped no tungsten ore whatsoever during 1920, 1921, or 1922. However, tungsten was still to play a supporting role in keeping Atolia alive. Between 1923 and 1939, the Atolia Mining Company sold over $3,000,000 worth of ore. Atolia had not died at all.

When tungsten prices collapsed after the war, the Atolia mines experienced a brief inactivity. The Union Mine, the chief producer in the district, was reopened in 1924, and production increased substantially in 1925 to nearly a quarter of a million dollars worth of ore. In 1926 production surpassed a quarter of a million dollars, and in 1927 and 1928, production was slightly under $200,000 for each year. By 1929, Atolia was again on the decline, plumetting from a production of $100,000 that year to a low of less than $15,000 in 1932.

While production increased slightly in 1933 (to $78,000), it wasn't until 1934 that things really started up again. Since 1915, the Flatiron, Spanish, and Par mines were considered exhausted and lay in a state of abandonment. In 1934, they were reopened by lessees, new ore bodies were located, and $1,000,000 worth of tungsten came out of these "worked-out" mines between 1934 and 1940. The Atolia tungsten district is an extremely rich zone. A U.S.G.S. report declared that "the tungsten-bearing fissure veins at Atolia contain the largest bodies of high grade scheelite discovered in the United States, and possibly the world." The ore processed by the Atolia Mining Company averaged 4.14 percent WO3.[448]

The Atolia District in 1940 consisted of over 61,000 feet of underground workings with 71 shafts. Of the 56 claims owned by the Atolia Mining Company, the most productive mines in the group have been (in order) the Union, Papoose, Amity, Par, Spanish, and the Flatiron. The Union Mine by 1940 was the deepest Atolia mine, at 1,021 feet, with close to 5 miles of underground workings. The Papoose was 361 feet deep that year with less than a mile of underground workings. The Amity ore was very rich, averaging 11.62 percent WO3. The Paradox Number 3, a mine developed since 1936, was found in 1940 to be the most complex mine structurally in the district, due to its having a thick high grade ore body broken by many small faults.[49]

AWhile the Atolia Mining Company produced 95 percent of the tungsten from this district, a Mr. P. J. Osdick owned 7 claims east of the AMC properties and reportedly produced nearly a quarter of a million dollars from his Skylark Mine during the boom of 1916-1918. J. C. Raynor, N. H. Myers, and G. T. Ingram jointly owned the Federal mine group which lies south of the Atolia Mining Company property.[50]

In 1937 over 250 men were employed in Atolia, many of them working for one of the more than 50 lessees who were operating various parts of the Atolia Mining Company properties. The company usually operated only a few of its mines, dedicating themselves instead to milling all the district's ore. In 1938 and 1939, lower prices drove some of the lessees away, but in 1940 there were still 27 of them operating. By 1940 the price per unit of tungsten had once again reached the $20 level, as the metal was once again needed for the war effort. By the end of 1941, the United States Government had put tungsten ore on the list of minerals to be stockpiled. In 1942 the Atolia Mining Company, along with five other producers accounted for 92 percent of the state's tungsten production and helped make California the leading tungsten producer in the nation.[51]

Gold during the tungsten and silver years

In 1905, when "heavy spar" was recognized as valuable tungsten ore and the rush to Atolia was on, Randsburg was still producing gold. The Yellow Aster had over 7½ miles of underground workings. By 1912, miners had dug another 7½ miles of workings, bringing the total to 15. In comparison, Randsburg's second biggest mine, the Butte, has a little over 2 miles of underground workings.[52]

The Yellow Aster experienced a brief inactivity during World War I. When the mine

reopened in 1921, only 50 of the 100 stamps in the big mill were crushing ore. It wasn't until 1933 that the mill once again operated at full capacity. During the 1920s, when the nationwide economic atomsphere was that of prosperity, the Yellow Aster was leased to various companies. Lessees produced during this time $850,000 from ore averaging $20 to $27 per ton.

In 1933, the Yellow Aster was leased to the Anglo American Mining Corporation. Its president, Henry W. Klipstein, is the same man who purchased the California Rand Silver Mine in 1929. Most of the ore mined from 1905 to 1933 came from a large glory hole, and in 1938 open-pit mining began on its walls until the mine was closed in 1939. Although the Anglo American Mining Corporation was contemplating shutting down operations due to a diminishing profit, the immediate reason for the closure of the Yellow Aster in December, 1939, was an employee strike. With the price of gold pegged at $35 an ounce and a wartime inflationary economy driving up prices and wages, gold mining simply became unprofitable. Employees could work in aircraft and automobile factories and make much more money. It was not shut down due to any lack of ore. In 1940 the glory hole of the Yellow Aster was estimated to still contain several million tons of rock with an average value of .02 ounce of gold per ton.[53]

Limitation Order L-208 wasn't needed at all to close the Yellow Aster. Economic and political conditions immediately prior to World War II had already knocked the wind out of Randsburg, and a half-century tradition of continous mining in this district came to an abrupt end. The Yellow Aster has proved itself to be the principal source of gold in Kern County. It's production of over $12,000,000 is one-fourth of the entire amount of gold production in Kern County from 1880 to 1957. The entire Rand District produced over $20,000,000 in gold. It's ten biggest producing gold mines and their production figures (in dollars) are: Yellow Aster,12,000,000; Butte, 2,000,000; Sunshine, 1,060,000; Blackhawk, 700,000; Operator Divide, 600,000; Big Gold, 500,000; Buckboard, 500,000; King Solomon, 500,000; Little Butte, 400,000; Santa Ana Group, 400,000.[54]

MOJAVE DISTRICT

Coming in a close second to the Yellow Aster, the Golden Queen Mine Group on Soledad Mountain is the Mojave Mining District's brightest star. With an overall gold production of $10,000,000, the Golden Queen Mine Group (with the Yellow Aster) are jointly responsible for almost half the gold output for the entire county since 1880.

This district, although discovered a year before Randsburg, never really received much attention in it's early years. It wasn't until the depression years of the 1930s that the Mojave District was finally able to wrestle the spotlight away from Randsburg by producing more than $12,000,000 in gold and silver from 1932-1942. Limitation Order L-208 severly affected this district, shuting its mines down almost overnight. Never able to recover from the rapid closures, The Mojave District's post war production was less than one-tenth that of it's pre-war days.

Standard Hill

Five hills or mountains lie within the Mojave District, four of which contain a quantity of mineral wealth. The first of these is Standard HIll, where George Bowers made the first discovery of rich gold float in 1894, developing his find into the Yellow Rover Mine. He shipped two carloads of ore worth $1,600 in gold and silver, triggering a rush into the area. Soon the Exposed Treasure and Desert Queen mines were located and developed near the Yellow Rover.[55]

In 1900 the Yellow Rover and Exposed Treasure were consolidated into the Exposed Treasure Gold Mining Company and a year later a twenty-stamp mill and sixty-ton cyanide plant were constucted. In 1921, the mines became known as the Standard group and were mined by the Standard Mining and Milling Company. Various owners worked the mine until 1942, when it was shut down by L-208. It was intermittentlly mined after the war. Estimated total production is $3,500,000. The Whitmore Mine, a mile west of the Standard group, was being operated in 1912 and perhaps earlier by the St. Mary Mining Company. Its most productive period, however, was from 1936 to 1942 when 4,500 tons of ore were shipped, worth a little under $100,000. The Yellow Dog Mine, north of the Whitmore, originally was located around 1902, but no real development was undertaken until 1922 when Percy Wegman discovered high grade ore. That year the Yellow Dog Mining Company was organized to develop the claim, and it was worked until the early 1930s. Total production from the Yellow Dog amounts to approximately a quarter of a million dollars.[56]

Soledad Mountain

On Soledad Mountain, richest of the four mineral bearing mountains, the Queen Esther and Echo mines were originally located during the excitement created by George Bowers in 1894. The Queen Esther ore was treated at a 75 ton cyanide plant built in 1903. The next year the plant was enlarged to twice its capacity. The mine closed in 1910 after having produced $1,000,000 worth of ore. In 1933 both the Queen Esther and Echo mines were idle. George Holmes, along with Bruce Minard, discovered the Silver Queen Mine in December of that year which revived mining activity throughout the district. In the first 11 months of 1934 Holmes shipped 300 carloads of ore to the American Smelting and Refining Company smelter at Selby. The carloads yielded $600,000. The *Los Angles Times* reported a "huge gold strike" in the Mojave and a rush was on. Holmes sold out on January 11, 1935, to the Consolidated Gold Fields of South Africa, for $3,170,000 plus royalties. The Golden Queen Mining Company was organized in 1935 to consolidate and mine the Queen Esther, Silver Queen, Echo and Golden Queen mines. Two years later the company was producing 300 tons of ore each day.

The Golden Queen Mining Company produced over $6,000,000 in gold and silver from 1936 until it shut down in 1942. The mines from 1894 to 1942 produced more than $10,000,000, making the Golden Queen Mine Group second only to the Yellow Aster in Kern County gold production. This mine more than any other brought the Mojave Mining District to new heights. For 10 solid years between 1932-1942, all 4 hills southwest of Mojave were humming with activity. The Golden Queen, and the entire district were dealt a fatal blow when Limitation Order L-208 shut down mining operations. High costs after the war prevented a renewal of

activity.[57]

The Wegman Mine, originally the Karma, is located just east of the Golden Queen Mine and was discovered in 1896. A twenty-stamp mill constucted in 1904 was shut down in 1909 along with the mine, due to poor recovery. Ore mined between 1896 and 1909 contained 50 ounces per ton of silver. In 1917, when reopened, the average ore value was from 5 to 9 ounces of silver per ton. By 1933, the Wegman Mine had 200 by 50 foot glory hole, an assay office, shops, dwellings, and a twenty-stamp mill.[58]

The Bobtail Mine, west of the Golden Queen and between the Elephant and Excelsior mines, was discovered about 1900. About $80,000 worth of ore was produced during its most productive period, 1923-1942. The Elephant Mine was discovered in 1896 by E. T. Baker. By 1916, he had driven a 100 foot shaft and a few hundred feet of horizontal workings. An exceptionally rich part of the mine averaged $2,000 in gold and silver per ton. In 1930, a twenty-five ton ball mill was installed on the site, and ore was no longer sent to the American Smelting and Refining Company at Selby. Ore was hauled to the mill by way of a 2,500 foot tramway. The mine produced 3,000 tons of ore worth $60,000 from 1931 through 1942. The total production is estimated at a quarter of a million dollars.[59]

Middle Butte

Besides Standard Hill and Soledad Mountain, gold and silver production also came from Middle Butte. The Middle Butte Mine was worked by Walter Trent in 1935 after the Burton brothers found rich outcroppings the previous year on a nearby claim. One hundred and fifty thousand dollars worth of ore was quickly mined by Trent from surface cuts, with the ore being sent directly to the Selby smelter. The ore shoot was 200 feet long, 10 to 15 feet wide and 100 feet deep. The mine, consisting of over 2,500 feet of workings continued operation until 1942, when shut down by the War Production Board. The Cactus Queen Mine was discovered in the fall of 1934, at Middle Butte. For eight years the mine was operated at full steam, producing more than $4,000,000 worth of ore. It too, was closed by Limitation Order L-208. Mine workings total 12,000 feet with a 1,000 foot shaft providing access.[60]

Tropico Hill

The fourth area of production in the Mojave District was Tropico Hill. In the late 1870s, a Dr. L. A. Crandall noticed a red coloration on a hill near Willow Springs. Taking some samples, he found it to be suitable as fire clay. The hill became known as Crandall Hill. Dr. Crandall sent samples to various potential buyers of the clay, including Ezra Hamilton, whose Los Angeles Pottery Company was a growing business. Hamilton ordered a carload of the clay shipped by rail from Rosamond. In 1882, Hamilton bought the clay pit.[61]

In 1894, business was going through a depression. Many men turn to mining during hard times because of the potential of sudden wealth, and the possibility of at least equaling current wages at a time when few jobs are available. Perhaps Hamilton was not thinking of riches, but when he decided to pan some of the clay that came from

his hill, he noticed specks of gold. After two years of occasional prospecting with his son, Hamilton traced the gold float to an outcropping on his hill that assayed $35 per ton.

Charles Graves had come from Kentucky in 1882, and owned a ranch on the south side of Hamilton Hill. Graves invited the Hamiltons to stay at his ranch while they worked. When Graves got curious, Hamilton told him of his discovery and suggested to Graves that he stake some claims. His Home No. 1 and No. 2 were so named because they lay close to Graves' ranch.

Hamilton's first ore shipment yielded him $46,000. With some of this money, he built a two-stamp mill in 1898. In 1900, Hamilton had sold one of his claims for $100,000. In 1902 a five-stamp mill was built a mile south of the claims. During this period, Hamilton purchased 160 acres of Willow Springs from the Beale estate for $3,500. With his riches, Hamilton built attractive stone houses at Willow Springs, which he attempted to develop as a health resort. He dabbled in the silkworm industry, grew fruit and shade trees, grapes, and constructed an ice plant in Willow Springs. Hamilton even built a hotel in Rosamond for the travelers coming into the area his mine made popular.

After an ill-fated stock promotion attempt in 1907 by the Tiger Head Mining Company, the Antelope Mining Company acquired most of the claims in 1908, selling them to the Tropico Mining and Milling Company in 1909. The Tropico Company was so named because several stockholders were from Tropico, California (located near Forest Lawn Memorial Park). V. V. Cochran was president of this company, which consolidated and patented many of the mines.[62]

H. Clifford Burton began working for the Tropico Mining and Milling Company in 1912. By June, 1914, he was promoted to superintendent due to his previous studies at an assaying school, which helped him to solve problems in the milling process. The Tropico Mine had a ten-stamp mill and a thirty-ton cyanide plant. The Tropico Mine was inactive during the First World War, and Clifford Burton returned from the war with his brother Cecil to work again at Tropico. During the inflationary 1920s, the company was not operating at a profit and assessments were levied on Tropico stock. The only ones who wanted to buy Tropico shares were the Burton brothers. By 1934, they had acquired all outstanding stock.

From 1933 to 1942, after having successfully predicted the location of orebodies, the Burton brothers' Tropico Gold Mines prospered at its highest level ever. The custom ore mill reached a peak production in 1939 with 400 miners shipping their ore for treating. Burton Company trucks would haul much of the ore to the mill. The Burtons paid for this ore as it was assayed. The Burton brothers owned the Ruth Mine near Trona in 1942 when Limitation Order L-208 shut it down. The shutdown was so rapid and improperly carried out that the Ruth Mine, and many others throughout the desert were never reopened.

Tropico was closed by the same order, but rock from Tropico Hill was used in the construction of airstrips in the Antelope Valley, and for this reason the Burton brothers could keep a small crew on site that helped keep the mine dewatered and timbering intact. Cecil and Clifford Burton died in the late 1940s. Tropico is now a

popular tourist attraction, with guided tours being conducted of both the mine and mill.[63]

KRAMER DISTRICT

This district, located some 30 miles east of Mojave, contains the most important source of borax and borate related products the world has ever known. It's discovery led to the closure of every other major borax mine on the West Coast. Together with the Searles Lake deposits, the Kramer District supplies the world with 95 percent of it's boron compounds. This amazing deposit is 1½ miles long, half a mile wide, 200 feet thick, and outcrops nowhere. It was discovered by someone looking for water!

Dr. J. K. Suckow was drilling a well for water 4½ miles northwest of Boron when he discovered colemanite, a borax ore, in October, 1913. After his discovery, mining claims, mostly placer, were located in the area. The Pacific Coast Borax Company, upon recommendation of its field engineer, Clarence Rasor, acquired many of these claims, including the discovery well. The company then started explorations to determine the extent of the orebody. Suckow continued to have an interest in the area, working prospects east of his discovery well.

In 1924, anxious to repeat his good fortune, Suckow sunk a shaft one-half mile away from his first and he struck basalt at 190 feet. The Pacific Coast Borax Company did their own prospecting in the same area, with almost the same results: basalt at 190 feet. However, persistence paid off. That same year Suckow sunk another shaft just a little south of his last one and found a 70 foot thick bed of colemanite at 210 feet. In 1925 the Suckow Chemical Company produced a few hundred tons of colemanite from this shaft.[64]

In the Spring of 1925, William M. Dowsing and J. L. Hannan discovered a huge deposit 120 feet thick just 1½ miles west of Suckow's shaft, which they kept a secret until its extent was proven. Sold to the Pacific Coast Borax Company in early 1926, it became known as the Baker Mine. Beginning production in 1927, it yielded a substantial percentage of the borates produced in the Kramer District until 1935.[65]

Production began in December, 1929, at the Suckow Mine, located near the Baker Mine. Suckow Borax Mines Consolidated, Ltd. shared half-interest as tennant in common of the Suckow Mine with Borax Consolidated, Ltd. The two companies became involved in litigation which resulted in the closure of the mine in 1932. It was reopened in 1935 as the West Baker Mine with the Borax Consolidated, Ltd. as owners.

The Western Mine, southwest of the Baker Mine, was found in July, 1927, by W. M. Baling who transferred ownership to the Western Borax Company. He remained on as the mine superintendent. Between 1927 and 1933, the Western produced about 160,000 tons of ore before being sold to the Borax Consolidated, Ltd. in mid-1933. These underground borax mines became obsolete when the large open-pit Boron Mine was formally opened in November, 1957. The deposit is expected to last several generations.[66]

Kern is Southern California's "Golden County." If a gold rush in the California Desert is eminent, it will manifest itself first in Kern County. Gold mines near Randsburg and Mojave contain large reserves of gold ore considered low grade 40 years ago (when gold was worth $35 an ounce and silver, less than $1 an ounce). They are certainly not low grade any longer-and it is quite possible that gold mining will be revived in Kern County on a large scale within years, even months, if present economic conditions persist.

Placer gold is abundant in Kern County but a lack of water presents recovery problems that will make mining this gold on large scale difficult, but not impossible. High grade gold veins and gold placer pockets yet to be discovered in supposedly worked out mines and districts will provide many small miners and mining companies with modest profits over the next ten years. A few lucky individuals could make fortunes in Kern County during the next gold rush.

Part of the Yellow Aster's glory hole was tested and estimated to contain millions of tons of ore averaging .02 ounce of gold per ton. When screened it ran as high as .06 ounce. The Golden Queen (Kern's second largest gold mine) like the Yellow Aster, was forced to shut down by L-208 in 1942 when it was producing 300 tons of ore a day. Production at the Golden Queen since then has only been 8,000 tons of ore worth $20 to $25 per ton (at $35 an ounce gold). Ore still remaining in the Golden Queen is estimated at $350 to $430 per ton. The Tropico Mine, inactive since 1952, has a tailings dump from its custom mill that contains an estimated 3.75 million dollars in gold at 1975 prices.

Just across the Kern--San Bernardino County line, the Kelly, or California Rand Silver Mine produced over 16 million dollars before production dropped off in 1929. High grade gold ore was discovered on the 19th level of the Williams vein but being too far from the main shaft, the state mine inspector halted work for safety reasons. Silver prices having dropped to 28 cents an ounce, the owners did not wish to sink a new shaft, and sold the mine. Lessees had extracted less than $750,000 in ore from 1933-1937 and no real production has since occurred.

Due south of the Kelly lies the Atolia District. Except for a brief activity during the Korean conflict in the 1950s, and in 1973 when Mines Exploration Inc., was reprocessing old mill tailings, no real production has occurred in this tungsten area since World War II. In 1940, the U.S. Geological Survey reported that, "The Atolia District is not exhausted , but the easily discovered and richest ore bodies have probably been mined. Future production can be expected from the extension of present ore bodies in depth, new ore shoots in known veins and ore shoots in veins to be discovered... The Flatiron, Papoose, Paradox, and Amity mines have the best chance for future production and will probably provide the bulk of the output."

Low grade uranium ore is found at several locations around Kern County. Kern will become a modest supplier of this commodity as demand for it increases in order to meet the growing energy needs of our nation. Kern will continue to supply borax, borates and petroleum products for many years to come.

Mines such as the Yellow Aster, Golden Queen, Tropico, Kelly, Atolia and many more are by no means mined out. Todays prices for precious metals are making these mines much more profitable now than they were during their boom days.

FOOTNOTES

Kern County

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[16]Troxel and Morton, p. 261.

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[20]Wynn, pp. 72, 73, 76.

[21]Ibid., pp. 78-79, 81.

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[23]Troxel and Morton, p. 117; Wynn, p. 95.

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[27]Wynn, p. 137; *Randsburg Miner*

[28]Wynn, p. 135; *Randsburg Miner*

[29]Wynn, pp. 137, 145.

[30]*Randsburg Miner*, July 2, 1898; Troxel and Morton, p. 100; Wynn, pp. 149-150.

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[43]Wynn, pp. 240-242.

[44]Thompson, p. 229.

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[57]Troxel and Morton, pp. 43-44, 108; *Lets go Gold Mining* (Santa Cruz: privately printed, 1964), pp. 45-46.

[58]Troxel and Morton, p. 108.

[59]Ibid., p. 125.

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[61]Ibid., pp. 103-104, 117; Glen A. Settle, *Tropico-Red Hill With a Glamorous History of Gold* (Rosamond: privately printed, 1969), p. 1.

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CHAPTER FIVE

INYO COUNTY

Inyo is the second largest county in California, with 10,135 square miles of area. The highest (Mt. Whitney) and lowest (Badwater) elevations in the continental United States are located here. Inyo's recorded mineral production has been more than $150,000,000 worth of silver, lead, zinc, copper, gold, tungsten, talc, borax and soda products. Several of the major gold producing areas (Reward, Skidoo and the Keane Wonder Mine) and most of the tungsten mines (located near Bishop) lie outside the California Desert Conservation Area under study and are not mentioned herein.

Inyo County owes much of its development to a single incident that occurred in the winter of 1849-1850. Approximately one hundred impatient emigrants, drawn west as part of the great California gold rush, found themselves trying to escape Death Valley after having attempted a "shortcut" to Sacramento.[1]

These visitors, the first white men, women and children to visit this area, split up upon entering Death Valley into several different groups, each searching for a way around the Panamints and on to Sacramento or Los Angeles. They burned their wagons, slaughtered their oxen for food, and jettisoned everything not essential for survival. Water was as valuable to them as gold or silver.

In their search for the precious water, scouts found silver. Turner and Martin, young silver miners from Georgia, found a chunk of black rock containing 50 percent silver. They told scattered groups whom they met up with at camps in the Panamints of their find. No one then cared much about wealth. Turner carried a small sample out with him, later having a gunsight fashioned out of it.[2]

This silver discovery, known as the Lost Gunsight Mine, soon created a rush of it's own, and became a major incentive in the exploration and development of Inyo County. Inyo County's mining history is best related in terms of "looking for the Lost Gunsight".

Discouraged by the northern gold fields, Turner returned to Death Valley in May, 1850, to look for his silver mine. Unsuccessful, he solicited financial help from a Dr. E. Darwin French. The two returned to Death Valley without finding the mine. A third trip was planned, but aborted after snows set in the Panamints.[3]

Turner apparently gave up his search shortly thereafter and Dr. French moved to Oroville in the mid 1850s. The Lost Gunsight Mine was temporarily forgotten until the Comstock Lode of Nevada generated a rush for silver throughout the Great Basin. Miners from Mexico began exploring the California Desert during 1859-1860, in an attempt to discover the vein that surely extended from the silver mines of Mexico to the Comstock itself. Dr. French returned to Death Valley in March, 1860, as a guide for the Butte Mining and Exploring Company. Excited by the chance at discovering a second Comstock, French's expedition was anxious, diligent and

successful, not in finding the Lost Gunsight Mine, but gold, which developed into Coso.[4]

COSO

Located within the confines of the United States Naval Weapons Center at China Lake, Coso was discovered in March 1860 by Dr. E. Darwin French who was looking for the Lost Gunsight Mine.

His Butte Mining and Exploring Company quickly changed it's name to the Coso Gold and Silver Company. A group of prospectors who had been following French's expedition down from Oroville soon arrived, staked their claims, and the Coso Mining District was organized. This second group was led by Dr. Samuel Gregg George. W. T. Henderson, a member of this party discovered and named Telescope Peak, and was among the first white men to view the hot mud springs at Coso.[5]

Ore found in 1860 by M. H. Farley, a prospector in French's party, assayed over $1,000 per ton in silver and $20 per ton in gold. By June 24, 1860, 500 men had stormed into Coso. In August, mines were being discovered with ore assaying $2,000 or more of silver per ton. This caused a flurry of stock promotion companies trying to raise capital for a district plagued by unfriendly Indians who for many years had visited the healthy hot springs, and probably feared their loss to white miners.[6]

After several battles with the Indians, and with the stockholding public having lost trust in Coso's riches, the Anglo miners abandoned Coso, leaving it to "Mexicans" who reorganized the district on March 23, 1868. The Coso Range experienced sporadic production during the 1890s and again in the 1930s, though no activity proximated the fever of the 1860s. However, $17,000 worth of cinnabar (mercury ore) was mined near Coso Hot Springs between 1929 and 1939. At the time of military land withdrawal, the area contained over 100 validated gold, silver, tungsten, copper, zinc, and quicksilver mining claims, a rather large reserve of mineral wealth.[7]

WHITE MOUNTAIN CITY

A year after the discoveries at Coso, J. S. Broder, Col. L. F. Cralley, the Graves brothers and Dan Wyman (all miners from Aurora, Nevada) came to the east side of the White Mountains seeking placer gold values said to exist there. By 1864 White Mountain City and Roachville (on Cottonwood Creek) both had regularly surveyed town plats. By 1881, the Tarrytown District was located on a mineral belt 6 miles long and 2 miles wide that was 6 miles west of Deep Springs Valley. It was both a silver and gold district. Ore values ran from $75 to $150 per ton. The principal mines of the Tarrytown District were the Heritage, which boasted a 3½ foot wide vein that averaged $124 in silver and $15 in gold per ton, and the Alta, which had a 2½ foot wide vein and 80 tons of ore on it's dump.[8]

At least 8 mines, among them the California, Indian, Greenly and Cairo, were listed

as being in the Deep Springs area. Although it was said that "the development on these claims has been sufficient to show that they will become permanent mines" not much is known about them. It is presumed that they became unprofitable, due to the drop in the price of silver, by 1893.[9]

Although little is known about White Mountain City and Roachville, they most likely served as supply centers for prospectors exploring these gold-silver mines and for those working in the White Mountains gold region in southeastern Mono County. As late as 1918 the area experienced some activity with D. F. Shively filing 11 tungsten claims on the north edge of Deep Springs Valley to develop a series of parallel quartz veins in granite up to 4 feet in thickness.[10]

CERRO GORDO

Wandering prospectors from the Coso area were responsible for the discovery and early development of Cerro Gordo. In 1865, Pablo Flores discovered rich silver float at the foot of Buena Vista Peak in the Inyo Mountains. He and his friends later located the Ygnacio, San Francisco and San Felipe mines. Their efforts were limited, having no capital to invest except their own labor. Ore was smelted in crude "vaso" furnaces.

A man named Ochoa developed his San Lucas Mine, becoming the first to make a committed effort to establish mining at Cerro Gordo. The San Lucas Mine treated its ore at the Silver Sprout mill, several miles west of Fort Independence. The Lone Pine Mining District (including Cerro Gordo) was formed on April 5, 1866. The first claim was the Jesus Maria. By the end of 1869, over 900 locations had been filed.[11]

A prospector, who in May, 1867, displayed Cerro Gordo ore samples in Virginia City, Nevada, is credited with bringing Cerro Gordo into the public's eye. One of the first persons to arrive in Cerro Gordo after this was Mortimer W. Belshaw, a mining engineer from San Francisco. Six years earlier, Belshaw was working mines in Sinaloa, Mexico and while there became knowledgable in the silver smelting process. He arrived at Cerro Gordo in April, 1868.

Recognizing Cerro Gordo's potential, Belshaw set out to control the whole hill. As lead ore was needed to smelt the silver ores, Belshaw obtained a one-third interest in the Union Mine on May 6, 1868. He obtained his one-third interest by ingeniously promising the Union owner, Joaquin Almada, one-fifth interest in a smelter yet to be constructed.[12]

He extracted several tons of ore from his new mine, smelting it down in "vaso" furnaces, and went to Los Angeles and then on to San Francisco to secure financial backing. Belshaw and Egbert Judson, president of California Paper Company, formed the Union Mines Company. Belshaw returned to Cerro Gordo with A. B. Elder, his mining companion from his Mexico days. The two began a systematic development of the hill that was soon to be theirs.[13]

In July, 1868, Belshaw graded a steep and winding eight-mile-long toll road, charging a dollar for wagons and twenty-five cents for a horse and rider. The toll road finished, Belshaw started hauling in the machinery for his second project, a smelter that was going to produce an unheard-of four tons of bullion a day.

His "Belshaw water jacket" invention proved to be so efficient that soon after having first fired up his blast furnance in September, 1868, the output rose to five tons of bullion per day. Regular ore shipments to San Francisco via Los Angeles began on December 1, 1868, with each trip from Cerro Gordo to Los Angeles taking a month. The steammer *Orizaba* shipped the ore in three days to San Francisco, where Thomas H. Selby smelted it further, sending the silver to the United States Mint.[14]

The opening of Belshaw's smelter caused the population at Cerro Gordo to swell from 200 to 700, as people began pouring into the "four-dollar camp." In 1869 Cerro Gordo began to boom, and by 1870 it had stage service with Independence and, a year later, with Nevada, San Francisco, and Los Angeles.[15]

Victor Beaudry, who came to Cerro Gordo in 1866 as a merchant, built a blast furnace in 1870 patterned after Belshaw's. This increased Cerro Gordo's bullion output to nine tons a day. Beaudry acquired many valuable mining claims by extending credit to miners with whom he did business, including a one-half interest in the Union Mine. By 1870 Belshaw owned one-half of the Union as well, and the two went into partnership.[16]

Beishaw and Beaudry charged $50 a ton for reducing ore at their furnaces. The ore needed to have a silver value of $100 per ton or higher in order to turn a profit. All of the silver mines worked during 1872-1874 had become indebted to the furnaces on the sale of ores, and many, if not all, had closed down. This left Belshaw and Beaudry in control of the whole hill.[17]

The payroll at the Beaudry furnace, where 25 men worked, was over $3,000 a month. The furnace also consumed $750 in water and $7,800 worth of charcoal a month. It took 8 tons of charcoal to smelt 25 tons of galena sulphate and carbonate lead ores.[18]

Few timbers were used in the Union Mine, causing frequent accidents for the 20 underground miners, but by 1876, these men were raising 60 tons of ore a day from the mines. The ore was brought to the surface with the help of a 16 horsepower engine where it was loaded into wagons for the 150 yard trip to the furnaces. A little under one million dollars was produced by the district in 1872, and two years later the district produced over one million dollars in silver and more than one-half million dollars in lead.[19]

Freighting at Cerro Gordo

Remi Nadeau received the contract to haul Cerro Gordo's bullion, and had begun work by December 1868. In 1870, with 32 teams, Nadeau agreed to haul 130 tons a month, which was only half of the capacity of the furnaces. Wagons would start out on the 200 mile, 3 week trip by chaining their wheels in place for the ride down Yellow Grade.

Practically every day, $50,000 worth of Cerro Gordo silver and lead were hauled by Nadeau's company into the streets of Los Angeles. Three hundred and forty tons of bullion were hauled from December 1868 to the end of 1869. The amount doubled to 700 tons in 1870.

Nadeau's contract with Belshaw expired December 1, 1871 and was taken up by James Brady, who in 1869 came into Inyo County as superintendent of the Owen's Lake Silver-Lead Company. Brady founded the town of Swansea, some three miles north of Keeler, and built a furnace there to work Cerro Gordo's ores. In an effort to save expenses, Brady built a small steamer 85 feet long. It was launched June 27, 1872, and by churning across Owen's Lake, it cut a few days off the 3 week trip to Los Angeles. Christened the *Bessie Brady* after his daughter on July 4, 1872, it carried 70 tons of bullion a day across Owens Lake. This only transferred the pile of bullion from Swansea to Cartago, where wagons still couldn't haul it away fast enough.[20]

That fall, rains hampered freight teams, causing 12,000 bars of bullion to accumulate at Cartago, and 6,000 each at Swansea and Cerro Gordo. The bars became building blocks as creative citizens constructed rooms out of them with canvas roofs. In March, 1873, a disease effecting horses was widespread in Inyo County. It subsided in April, but not without causing even greater freighting complications. By May the pile of bullion had grown to 30,000 bars, and Belshaw and Beaudry were desperate.[21]

Finding Nadeau finishing up a Nevada contract, they approached him in hopes that he would once again accept the contract. He agreed only if Belshaw and Beaudry joined him in forming the Cerro Gordo Freighting Company and were willing to spend $150,000 in establishing a line of stations a day's journey apart. With all three accepting the conditions, Nadeau was, on June 6, 1873, once again in Los Angeles with a load of Cerro Gordo's buullion.

By late fall of 1873, the teams were catching up with the backlog. Belshaw did some furnace remodeling, shutting down his furnaces and thus allowing the freighters even more time to catch up. In 1874, with bigger furnaces, the two mills produced a total of 400 bars a day, twice the output of 1871.[22]

Mines needed lumber for fuel and mine timbers, and the wood supplies on Inyo Mountain were getting scarce by 1873.A Colonel Stevens proposed constructing a mill high in Cottonwood Canyon, west of Owens Lake, with a flume six miles long running down the canyon to the wagon road. His mill began operation in 1873, the flume being completed in the spring of 1874. The mill tapped a resource of many square miles of scrubby forest which, during the winter, was out of reach due to deep snows.23

In 1870 an attempt by Belshaw to pipe water into Cerro Gordo only resulted in a lot of frozen and broken pipelines. Three years later Stephen Boushey's Cerro Gordo Water and Mining Company began construction of a pipeline and a steam pumping plant which brought water to Cerro Gordo from Miller Spring, 10½ miles northwest of town.[24]

From the summit, the water ran through 13½ miles of 4 inch pipe, falling 950 feet into town. The pipeline was 4½ miles longer than originally planned, as a certain section of the pipeline crossing a valley could not withstand the pressure. At that point, all the water leaked out of the joints. The engineer tried unsuccessfully to seal the joints with lead, then tore up the pipe and ran it around the mountain. This added $26,000 to the cost of the pipeline, making the cost of the whole venture in excess of $74,000. With the line completed in May, 1874, water that previously cost 7 to 10 cents per gallon sold for 1½ to 4 cents. It delivered to town only two-thirds of the water that passed through the pumping plant.[25]

The Union-San Felipe conflict

Mr. John Simpson was hired by Belshaw and Beaudry in 1874 to construct a 4,000 foot tunnel under the town of Cerro Gordo to tap the Union vein and provide easier access. While in their employ, Simpson refused to pay the high toll price of the Belshaw-controlled road up Yellow Grade. With public opinion in his favor, Simpson was successful in getting the Inyo County Board of Supervisors to reduce the toll charges. This action greatly favored the Owens Lake Silver-Lead Company who used the road to transport ore to their smelters in Swansea.[26]

The two biggest mines in the district during the 1870s were the Union, owned by Belshaw and Beaudry, and thee San Felipe, or Omega (located adjacent to the Union) owned by the Owens Lake Silver-Lead Company. This company brought suit in 1873 against the Union Mine and Belshaw's company to force a point. The Owens Lake Silver-Lead Company was driving a tunnel to intersect its silver vein when they struck lead. Belshaw, upon seeing galena on the San Felipe dump, accused the Owens Lake Silver-Lead Company of robbing his mine (vein) and boldly took over the San Felipe tunnel. The Owens Lake Silver-Lead Company was suing for damages and to regain control.

In a week-long trial in July of 1873, it was claimed by the Owens Lake Silver-Lead Company that the Union Mine was claim-jumped by its original locators, it being a part of the San Felipe vein. The Union group contended that the San Felipe was a silver vein mine cutting diagonally across a lead vein. The jury thought the San Felipe discovery shafts intersected the two veins, and the Owens Lake Silver-Lead Company won.[327]

While the verdict was being appealed, the Union group was "vigorously at work robbing the mine of the rich ores, leaving all ores assaying less than twenty- five percent lead in the mine or putting them over the dump as waste." In May, 1875 Belshaw obtained a new trial which dragged on for a year. The Union Consolidated Company was finally formed in 1876 as a compromise to both groups.[28]

When both furnaces in Cerro Gordo and the other furnace at Swansea were in full operation, Cerro Gordo boasted a population of 500 to 600 men working as miners, furnacemen, coal burners, and packers. In December 1876 the Belshaw furnace had shut down. By 1877 only 60 people were employed. The Union works burned down on August 14, 1877, causing $40,000 worth of damage.[29]

By October the Union was repaired, but Belshaw reported to his company directors

in San Francisco an indebtedness of $110,000. Beaudry resigned his position in the company and left for Darwin. Miners' wages were reduced to $3 a day in March, 1878, and half of them immediately left town. The next month the last stage pulled out of Cerro Gordo. The Union Mine was abandoned in October, 1879, and on November 20, 1879 Beaudry's furnace closed down. Remi Nadeau hauled the last load of 208 bars of bullion and a 420 pound mass of silver on November 21, 1879. In June, 1882,the Bessie Brady was destroyed by fire.[30]

In 1911 Louis P. Gordon discovered zinc in the Cerro Gordo properties and worked the mines again from 1911 to September 15, 1915. A six mile gravity-powered tram was built in 1911 at a cost of $250,000. The mines also saw intermittent production from various owners from 1923-1933. From June, 1929, to April, 1933,the American Smelting and Refining Company obtained 10,000 tons of ore worth more than $300,000. The Cerro Gordo properties were briefly worked during World War II by the Golden Queen Mining Company. With 30 miles of underground workings, Cerro Gordo produced an estimated $17,000,000.[31]

TECOPA

At approximately the same time Pablo Flores discovered Cerro Gordo, silver-lead ores were discovered at Tecopa. Little is known of the early history of this mine except that it enjoyed a production from 1865 to 1882 that eventually warranted the construction of a ten stamp mill and three furnaces in 1880. By 1881,40 men were involved in the various mining operations here. A 1,000 foot tunnel was dug to open a vein composed of galena at the surface and changing in depth to a carbonate ranging in value from $60 to $400 a ton, with an $80 average. Known as the Gunsight Mine, it is related to Turner's famous discovery in name only (Turner's discovery was supposedly much further north). Most of the Gunsight Mine's production occurred during the twentieth century.[32]

PANAMINT

Another product of the search for the Lost Gunsight Mine was Panamint, a boom camp whose mines were first discovered by bandits in 1873, developed by Senator Jones and Stewart in 1874, and on the decline by late 11875.

Surprise Canyon is a secluded steep and narrow canyon tucked between Telescope Peak and the Panamint Valley, some 200 miles from Los Angeles. Originally used as a hideaway, rumors of the Lost Gunsight Mine may haved caused the bandits to do a little prospecting while holing up in the canyon. William L. Kennedy, Robert L. Stewart, and Richard C. Jacobs discovered silver here in early 1873. Nadeau places the date as January; Wilson has the three miners organizing their district in February; and Chalfant says it was in April. By June,80 locations had been filed and ore was assaying at thousands of dollars per ton.[33]

E. P. Raines, after securing a bond on the biggest mines in the area, attempted to publicize Panamint and drum up business for the district. Unsuccessful at first, he later received newspaper publicity by displaying a half ton of ore at the Clarendon Hotel in Los Angeles. There he convinced a group of businessmen, including jewelers, bankers, and freighters, to undertake the building of a wagon road to Panamint. Meeting with success in Los Angeles, he left for San Francisco to meet Senator J. P. Jones, who loaned Raines $1,000, then $14,000 more when they met again in Washington, D.C.[34]

The Nevada senator was a former mine superintendent who became a hero during a fire in 1869 on the Comstock Lode. Jones and his colleague, the distinguished Senator William M. Stewart (also of Nevada) were known as the "Silver Senators" for their wide range of mining investments. The two soon organized the Panamint Mining Company with a capital stock of two million dollars. They spent at least $350,000 in buying up the better Panamint mines.[35]

One particular transaction involved men known to have robbed Wells Fargo on more than one occasion. The good Senator Stewart arranged amnesty for the mine owner, but only after making sure that the owner's profit, some $12,000 was paid to the famous express company to cover their losses. It is highly possible that Stewart's willingness to deal with the bandits persuaded Wells Fargo never to open up an express office in Panamint.[36]

By March, 1874,125 persons called Panamint their home. Panamint City didn't have a schoolhouse, church, jail, or hospital then, nor did it ever. The two senators, due to the lack of an express office, resorted to molding the bullion from their mines into 450 pound cannon balls. In this condition the precious freight could be hauled to Los Angeles unguarded.[37]

On November 28, 1874, the Idaho Panamint Silver Mining Company was organized with a capital stock of five million dollars. The next day the Maryland of Panamint was organized with three million dollars of capital stock. In December seven more Panamint corporations appeared with a capital of forty-two million dollars.[38]

On November 26, 1874, T. S. Harris inaugurated the *Panamint News*. On December 1, he denounced his editor, D. P. Carr, who left town with stolen advertising revenues. Like T. S. Harris and advertisers in the *Panamint News*, the public who bought shares in Panamint stock would soon wake up and find themselves holding an empty bag.[39]

Panamint had all the indications of being a second Comstock. The mineral belt was 2½ miles wide and 5 miles long. "There is scarcely a mining district where more continuous and bolder croppings are found than in Panamint," reported C. A. Stetefeldt in 1874. It was indeed true that veins were appearing all over Panamint wide enough to drive a wagon through. The veins could be traced for great lengths, running parallel to Surprise Canyon. Some of the veins were quite fractured, others appeared to be unbroken. The silver ore came in two forms. A rich, purer mineral near the surface, changing with depth to antimoniates of copper, lead, iron, and zinc, with sulphuret of silver and water. The rich ore assayed over $900 per ton from Stewart's Wonder, $350 dollars per ton from Jacob's Wonder, and $600 per ton from the Wyoming. The more common ore ranged in value from $12 to $85 a ton.

Stewart's Wonder, $350 dollars per ton from Jacob's Wonder, and $600 per ton from the Wyoming. The more common ore ranged in value from $12 to $85 a ton.[40]

A year and a half after the original discovery, the mines were still not developed in depth. Companies that were heavily financed bought and opened up mines with no regard as to which were better situated on the veins. There was the Jacob's Wonder, Stewart's Wonder, the Challenge, Wyoming, Little Chief, Hemlock, Harrison, Hudson River (which was bought by the Surprise Valley company for $25,000), Wonder, Marvel, War Eagle, and the Esperanza. Everyone was hoping that wealth to one would be wealth for all.

The winter of 1874 was Panamint's finest and biggest season. The Surprise Valley Mill and Mining Company was shipping it's ore all the way to the coast and then to Europe for final smelting at a profit! Two stage lines opened service to Panamint in November of 1874. ouis Felsenthal's Bank of Panamint was open for business. Lumber sold for $250 per 1,000 feet and 50 structures soon lined either side of Surprise Canyon. Mules and burros were used as transportation in town, the only vehicle in town being a meat market wagon that doubled as a hearse and parade platform. The Oriental saloon was billed as "the finest on the coast outside of San Francisco."[41]

By January, 1875, 1,500 to 2,000 people inhabited Panamint. One of them was George Zobelein, later to become the founder of the Los Angeles Brewing Company, who bought a $400 lot and opened up a general store. In April, two more Panamint corporations were offering stock worth eleven million dollars.[42]

On June 29, 1875 the Surprise Valley Mill and Water Company's twenty-stamp mill went into operation. Ore averaging $80 to $100 per ton from the Wyoming and Hemlock mines traveled down the mountain by means of a 2,600 foot wire tramway to the mill. Wood consumption in the mill's furnace amounted to three cords each day. Each cord cost $12, and miners and mill workers received from $4 to $5.50 a day. The crumbling smokestack of this mill stands in Surprise Canyon. Daniel P. Bell constructed this highly acclaimed mill, but committed suicide in Salt Lake City, Utah on July 26, 1875, being despondent over having contracted cancer.[43]

Panamint's Decline

William Ralston's Bank of California came tumbling down in August, 1875, days after Panamint's twenty-stamp mill began operation. The bank's fall brought down with it much of the Comstock's wealth. With the people's trust and confidence shattered, California hit hard times. People weren't about to speculate. T. S. Harris published his last issue of the *Panamint News* on October 21, 1875 and left for Darwin, as "the ores there are of a different character-being argentiferous while those here are milling-and consequently the same amount of capital is not required."[44]

In November, 1875, almost everybody had left Panamint for somewhere else. Rumors were circulating that the ore bodies were in danger of exhaustion. Those that were staying were hoping that Senator Jones would come to the rescue.

Panamint has always been waiting for the arrival of cheap rail transportation. Everyone knew the wagon road was only a temporary measure, and that the Panamint mines would exceed the Comstock.[45]

Senator Jones backed the development and creation of the Los Angeles and Independence Railroad. It was grading its right of way in Cajon Pass when on May 17, 1876, William Workman committed suicide. With brother-in-law Francis Temple (who was treasurer of the LA&I), Workman had owned the Workman and Temple Bank. This soon failed, spelling the end for the Los Angeles and Independence Railroad. It's assets soon fell into the hands of competitors and the company silently disappeared.

Less than two months later, on July 24, 1876, a cloudburst washed down Surprise Canyon, carrying a lot of Panamint City with it. The last to give up was Senator Jones himself. In May 1877, "the most serious panic that ever swept over the stock market" caused Jones to shut down his Panamint mill. Jones, like most of the public who poured money into Panamint, wanted to recover his investment at least, if not make a profit. Yet of the approximately two million dollars the "Silver Senators" poured into Panamint, it seems they received little, if anything in returrn.46

Later Revivals

Richard Decker reopened the Panamint Post Office on May 23, 1887, and kept it open until June 19, 1895. Decker and two companions filed a claim January 3, 1890, in Woodpecker Canyon. The mines at Panamint were worked off and on until 1926, and then briefly during 1946-1947. The American Silver Corporation leased 12 patented claims, 4 patented millsites and 42 unpatented claims in the Panamint City area in 1947-1948. Most of the work was concentrated on the Marvel and Hemlock claims. No ore was reported shipped by this company, who built a camp at Panamint and improved the Surprise Canyon road before filing for bankruptcy on March 22, 1948. Throughout the 1970s there has been an increase in activity at Panamint but the veins are elusive and faulting makes them hard to follow.[47]

DARWIN

The silver-lead ore bodies at Darwin (named after Dr. E. Darwin French) were discovered in late October or November, 1874, supposedly by a wandering prospector trying to find a lost mule. By December there were 200 men in the district, and Abner B. Elder, Belshaw's earlier partner, became recorder of the "New Coso Mining District."[48]

Another of Belshaw's partners was in on the ground floor of the development of this camp. Victor Beaudry's Darwin Water Works was a $45,000 venture to pipe water from springs located 7 miles south of Darwin near the old Josephine mill at Coso. Iron pipes 4 inches in diameter brought water to the summit, then 2 inch pipes were used in the 412 foot fall into Darwin. Tanks north of town holding 28,000 gallons were enclosed by a large public building. Fire hydrants and rubber hoses were at strategic points throughout town and used to either fight fires or to control the

street dust. The water sold in 1875 at one cent a gallon for domestic purposes and a half cent for mining. In 1937 Darwin still got its water from the spring at Coso, at one cent a gallon![49]

In May, 1875, the New Coso Mining Company, under the management of L. L. Robinson, bought the Christmas Gift and Lucky Jim prospects. The Cuervo Mining Company (J. D. Fry, president) was organized June 6, 1875, with ten million dollars capital stock. This company held a controlling interest in the Grand and Promentorio mines.50

Mr. L. L. Robinson on December 15, 1875, reported that his Lucky Jim Mine reached a depth of 137 feet, and the Christmas Gift 97 feet. He complained that Darwin was located in a section of the country where everything was extremely expensive. Running steadily, his mill spent $40,000 a year on water alone. In 1875, the New Coso Mining Company was operating their mines without horsepower, meaning four men were stationed on a windlass at each of the companies 5 mining shafts. When paid $4 a day, 20 miners required an expenditure of almost $2,500 a month. It was fully one third of the New Coso Mining Company's labor costs. Eight to ten ore sorters were busy separating the high grade ore from the low grade, ensuring the efficient transport of only the good ore to the furnace. One sorter worked at the furnace double checking shipments, as it was so costly to send valueless material through the furnace. 23 men worked at the New Coso furnace with a payroll of over $3,000 a month. The company spent another $3,000 monthly on coal and wood for the furnace.

By 1875 L. L. Robinson had produced some 6,000 bullion bars worth $100,000, from mines less than 100 feet deep. Each day the furnace could be fed 20 tons of ore, along with 1½ tons of iron ore, 4½ tons of slag and 3 tons of lime. This 29 ton mixture, if things went well and the ore was of high enough grade, would reduce to 6 or 7 tons of bullion (150 to 175 bars) worth $2,000 in silver alone.[51]

In August, 1875, the New Coso Mining Company's 60 ton furnace was fired up for the first time, followed that December by Pat Reddy's Defiance furnace of 100 tons. A third furnace, the Cuervo, with a capacity of 25 tons a day, was located at the north end of Main Street. It was under construction in the winter of 1875.

By year's end, Darwin had 3 smelters, 20 mines, 200 frame houses, 700 citizens, 9 general stores, a brewery, 2 hotels, and a Wells Fargo express office. Three more furnaces were built in 1876, and the population reached 1,000. In August, Darwin held its breath as Pat Reddy's Defiance mill temporarily shut down. It was quickly reopened, but its closure made people wonder about Darwin's future.[52]

In 1877 Colonel Sherman Stevens built 2 adobe kilns in a wash just north of Cottonwood Creek to produce charcoal for the Darwin furnaces. That summer, the Cuervo Mine produced $45,000 from 13 tons of exceptionally high grade ore. Nevertheless, the boom days were over for Darwin. On September 15, editor T. S. Harris offered the office of the *Coso Mining News* for sale, due to "impaired eyesight and poor health"[53]

While a business directory in the same issue listed some twenty businesses, including an attorney, doctor, brewery, stables, two saloons, a lumberyard, and butcher shop in Darwin, most of these would be gone in a few months. The 1878 gold rush to Bodie lured away many of Darwin's citizens, including Pat Reddy and T. S. Harris. Excessive freight costs and the depletion of high grade ores were two reasons for the smelters shutting down before completion of the Carson and Colorado railroad station at Keeler. Mining at Darwin during the 1880s and 1890s was "sporadic and at times practically dormant due to poor transportation, lack of modern facilities, and some litigation."[54]

The entire district became nearly dormant by 1888. The easily mined ore had given out, and until World War I the area was operated sporadically by lessees. Consolidation of the Lucky Jim, Columbia, Promontory and Lane mines was undertaken in 1915 by the Darwin Development Company. After several mergers, the Darwin Silver Corporation in 1917 consolidated these mines with the Defiance and Independence mines. Equipment, roads, and camps were built in hope of reestablishing Darwin as a silver producer. E. W. Wagner financed this development until his death by suicide (due to financial reverses) in 1921.

In 1925, after clearing legal entanglements with the Wagner estate, the American Metals Company leased the Darwin mines and shipped a considerable amount of ore for a one year period. When lead prices hit a new low in 1927, the camp was again shut down. A fire in 1928 burned the shaft and mine timbering of the Lucky Jim Mine, making the largest mine in the district inaccessible for twenty years. In 1948, the damage was repaired but no ore was mined from it then.[55]

In 1938, Vincent C. Kelley reported that Darwin had experienced two separate periods of production and was ready to be revived again. The early 1870s production was halted by depletion of high grade surface ore combined with high transportation costs. The World War I boom was only halted by an industry depression and was not due to any lack of ore.[56]

In 1940, Mr. Sam Mosher operated the property under a corporation known as Imperial Metals. In March, 1943, Darwin mines took over operations. The Anaconda Copper Mining Company bought the Darwin properties in August, 1945. Total production from the Darwin district mines between 1875 and 1952 has been twenty-nine million dollars. Over 80 percent of the total production occurred between 1940 and 1952.[57]

THE LOST GUNSIGHT LEGEND

Claiming with certainty that one mine was the Lost Gunsight would be an extremely difficult task, even today. The Lost Gunsight Mine became a legend at a very early stage and its location probably would have been cruelly disappointing to its discoverers and to future fortune seekers. As long as it remained undiscovered, there was hope of finding a second Comstock.

Prospectors have discovered dozens of silver mines in the Panamint and Argus

ranges, yet few have claimed to find the Lost Gunsight, and fewer still believed those who so claimed. If it was found at all, the most likely candidate for being the Lost Gunsight Mine would be one of the mines on Lookout Mountain.

John Colton, one of the emigrants who heard about Turner and Martin's discovery of silver ore, wrote, "The Georgia men were old silver miners. They told us upon arrival in camp that there was immense wealth of silver in sight where we camped. One of the boys showed me a chunk of black rock he held in his hands, and he told me it was half silver, and that nearly all the rock we were walking over was very rich in silver, and if we only had provisions and water and knew where we were, that there was all the wealth in sight that we could ask. "[58]

Colton's camp, according to historian Carl Wheat, was located just a few miles west of Towne's Pass. It was here that the Georgia boys met up with Colton and informed him of their find. Float from the Lemoigne, Kerdell and Big Four mines may have provided the rock "very rich in silver" over which the emigrants walked. Scouts searching for water and a trail would have gone west to explore a way over the Argus Range. Such a search pattern would of necessity have included Lookout Mountain.

LOOKOUT

Two years after the discovery of Panamint, on April 22, 1875, rich silver-lead deposits were discovered on the east slope of the Argus Range by B. E. Ball, J. E. Boardman, E. W. Burke and J. S. Childs while "looking for the Lost Gunsight".[60]

Shortly after discovery, these men sold their interest in the claims, later known as the Modoc Mine, to the Modock Consolidated Mining Company of San Francisco. Created August 9, 1875, one of the five corporate directors of this company was Senator George Hearst.[61]

In 1876 the Minnietta Belle Silver Mining Company was formed. Mr. James Dolan was superintendent of the Minnietta Mine. The mine's shaft was down 100 feet that year, and Dolan was calculating that the Minnietta contained at least 3,000 tons of ore worth at least $100 a ton. The silver content of the Modoc Mine ore ranged from 100 to 300 ounces of silver per ton. These ores were crushed and treated at the twenty-stamp mill in Panamint until October, 1876, when the first of two thirty-ton furnaces located at Lookout began operations. Each furnace could produce 160 bars of bullion, each weighing 80 to 85 pounds, every day. The smelting process required iron, which was obtained from the nearby Iron Cap Mine.[62]

By the end of November 1876, it was reported that $100,000 worth of bullion had been produced by the Lookout furnaces, which required 3,000 bushels of coal a day. This coal and other supplies were hauled in by a few hundred mules that kept a constant parade moving to and from the Argus Range.[63]

In early 1877, charcoal for the furnaces was being made in pits dug in the vicinity of a wood supply located on the mountain slopes adjacent to Wildrose Canyon.

Nadeau's wagon road was completed by May, 1877, connecting Lookout to the newly constructed charcoal kilns in Wildrose Canyon. The kilns, constructed by Mr. Morrison, were operating successfully and furnishing "clean hard coal, very much superior to that made in the ordinary pits. Lookout hit its peak in 1877. The small settlement included three saloons, two general stores, a slaughterhouse, and a post office (the official name of the town was Modock). That summer 40 men were operating the charcoal kilns in Wildrose Canyon for the Lookout Coal and Transportation Company. A triweekly stage operated between Darwin and Lookout. 140 voters were registered at Lookout, and 8 Lookout children belonged to the Darwin school district[64]

Lookout's future seemed bright until, in the fall of 1877, the furnaces broke down. Modock Consolidated changed managers, the price of lead fell, and the company reduced wages. The miners struck, causing another company reorganization. Hard times were over by May, 1878, when the *Coso Mining News* reported that both furnaces were again in operation, each supplying 200 bars of bullion per day, weighing 85 pounds each, from 38 tons of ore. The mines were by no means worked out by 1879, but clearly the high grade ore was. Wood cutting in the Wildrose Canyon area stopped that year. The furnaces continued working for a short time thereafter, but the Modock Consolidated leased the entire property to Frank Fitzgerald who ran the triweekly stage from Darwin to Lookout in 1881.[65] 1895, By 1890 the Modoc Mine had produced $1,900,000. Left on the slag and mine dumps of the Modoc were 40,000 tons of ore carrying 6 to 10 percent lead and 10 to 15 ounces of silver per ton. These values were not recovered due to the inefficiency of the furnaces. The Minnietta Mine had a rather low production until 1895, when Frank Fitzgerald worked the mine and recovered $65,000 in silver and $600 in gold. Also, Jack Gunn worked the mine for a time in the 1890s. Ten years later the Minnietta had produced over $350,000 in silver and $25,000 in gold. The total estimated production for the Minnietta from 1895-1955 is $600,000.[66]

In the 1890s a little to the south of the Minnietta, the Argus Gold Mining Company was operating their St. George gold mine. Farther to the south in 1918 the Sterling Silver Mine was developed by the Sterling Mining Company. Ore from the Sterling averaged 30 percent lead and 19 ounces of silver per ton. From 1924 to 1927, the Lead (Hughes) Mine produced ore averaging one ounce of gold, 11 ounces of silver per ton and 30 percent lead. Located north of the Minnietta, it had 600 feet of underground workings.[67]

The Minnietta was not worked from 1920 to 1944. After World War II, the slag and mine dumps were worked and the values that the original owners could not extract were recovered. The Modoc dumps were also worked after World War II. Wartime (1941-1944) production in the area amounted to 4,000 ounces of silver, 160,000 pounds of lead, and 20,000 pounds of zinc. Close to one-third of the lead and one-fourth of the district's silver mined during World War II came from the Defense Mine. The Minnietta Mine produced 3,000 ounces of silver and 50,000 pounds of lead in one year alone (1944). All of the zinc produced by this district came from the Big Four Mine, first located in 1907.[68]

The Bank panic of 1873 brought a depression to the West. In California it was first felt hard when the Bank of California closed it's doors August 26, 1875. Panamint, Darwin and Lookout lasted through this dark period, in spite of the world decline in the price of silver. The discovery of new ore bodies on the Comstock in early 1874 served to bolster these desert camps as well, each of which was considered a second Comstock.[69]

Gold, traditionally strong during depression periods, was being sought in Inyo County by the time the silver camps were reaching their peak production in 1877.

Beveridge

Probably the most inaccessible gold-producing district in Inyo County, and also its most productive, has been Beveridge. Wood was scarce, and no natural wide pathways existed to make it easy to haul the ore out and supplies in. Yet the gold was there, and miners beat a path to its door.

William L. Hunter, after having sold his lead mine in the Rose Springs (Ubehebe) district to M. W. Belshaw, prospected to the northwest and discovered the Big Horn gold mine in 1877. The Beveridge Mining District was organized on December 7, 1877, at Big Horn Spring in Hunter Canyon. Beveridge took its name from John Beveridge, noted Inyo County resident. Hunter's Big Horn Mine consisted of 8 claims and one millsite. In 1878, Hunter built three arrastres in Hunter Canyon to treat his ore. That same year the Keynote Mine went into operation. Its five-stamp mill was located in Beveridge Canyon. The Big Horn Mine was worked continuously until 1893, the Keynote until 1894. The Big Horn had a total production of some $10,000 while the Keynote produced $500,000. Both mines were worked shortly during the 1930s.[70]

In 1878, gold was discovered in Mono County and the rush to Bodie was on. Production on the Comstock fell to $20,000,000 (half it's 1876 production) while Darwin and Cerro Gordo were also declining rapidly. In spite of the re-introduction of a silver purchasing plan (the Bland-Allison Act of 1878) Inyo County silver mines could not recover. Their high grade ore bodies having been depleted, most fell into inactivity.[71]

The Bland-Allison Act was joined by the Sherman Silver Purchase Act in 1890. Both required the U. S. Treasury to purchase an increasing amount of silver bullion and coin it. Most of the European nations were on the gold standard and viewed the stockpiling of silver as an indication of our inability to stay on a gold standard. This and other economic conditions culiminated in a depression in 1893. People once again were soon looking for gold.[72]

Ballarat

Charles Anthony and John Lampier located the Panamint Valley Mine on July 27, 1893. This mine, also known as the Anthony, Gold Bug, and Knob Mine, is located

3½ miles east of the Post Office Spring in Post Office (now Pleasant) Canyon. A small camp sprang up around Anthony's 5 gold mining claims. Henry Ratcliff worked in Anthony's camp and discovered in May and July, 1896,6 claims east of town which became the Ratcliff (Radcliffe) Consolidated Gold Mines, Ltd. James F. Cooper staked a claim east of the Ratcliff group in 1896, near an old stone corral thought to be built by Indians.

The 80 acre townsite of Ballarat was laid out in 1897, and the buildings from the Ratcliff Mine were hauled down the canyon to help start the town. George Riggins is credited with suggesting the name Ballarat, after the famous mining town of his native Australia. John S. Stoker, a storekeeper, was appointed postmaster of Ballarat July 21, 1897. Richard Decker was appointed justice of the peace. The two-story Calloway Hotel was built in 1898. A school operated out of an adobe building at Ballarat for one year in 1899. That same year six saloons were opened for business. In 1900 the Porter brothers built a jail at Ballarat for the Inyo County Board of Supervisors at a cost of $300. The Teagle brothers opened a feed and supply yard in 1901.[73]

The total production for the Ratcliff mines have been estimated from $300,000 to $1,000,000. In 1903 a 3,800 foot tram transported ore from the mines to the mill. An assay office, engine room, blacksmith shop, and various other buildings formed a small camp at the base of the mountain. In 1951, remains at the Ratcliff Mine included a twenty-stamp mill, a 4 foot by 6 foot ball mill, and 4,000 feet of underground workings.

The World Beater, discovered by Shorty Harris, began real production shortly after the Ratcliff mines gave out in 1903. According to D. H. Claire, it produced $185,000 prior to 1930 and another $75,000 from 1936-1942. The Buster Brown, adjoining the World Beater, had a small five-stamp mill and its 1927-1942 production amounted to $250,000. The Lotus, and the Monte Cristo mines, 15 miles south of Ballarat, were developed probably after 1900 by two aerial trams and a 2,800 foot inclined rail tram. A 1,750 foot aerial tramway that serviced the Anthony, Gold Bug, and Knob mines was rebuilt in 1940.[74]

The Ballarat Post Office was closed on September 29, 1917. Since then Ballarat has been a favorite gathering place for many of the colorful prospectors and desert residents. Charles Ferge, better known as "Seldom Seen Slim" was one such character to permanently inhabit Ballarat, and there are residents today.[75]

RYAN

By 1900 the Pacific Coast Borax Company realized that their mine in Borate would soon be exhausted, and started looking for new ore bodies in the Death Valley region. In 1903 they began development of the Lila C. Mine, where they discovered three beds of colemanite 6 to 18 feet wide and at least 2500 feet long. Steam traction engines hauled ore to Manvel, 100 miles away, until 1907, when the Tonopah and Tidewater Railroad reached the borax area. A spur from the railroad connected the Lila C. Mine to the main line, allowing ore to be shipped that year

over the Tonopah and Tidewater. The opening of the Lila C. Mine caused the price of borax to drop 2 cents a pound to between 4½ and 5½ cents, causing a shutdown of the mine at Borate, and mines in Saline Valley and on Frazier Mountain. The Lila C. was worked until January 1915. The town of Ryan (Old Ryan) grew up around the Lila C. It had a small post office and 200 or so inhabitants.[76]

With the discovery in 1914 of bigger ore bodies northwest of the Lila C., a new $400,000 concentration mill was constructed at Death Valley Junction. In January, 1915, the Pacific Coast Borax Company switched operations to the Biddy McCarthy, Lower Biddy, and Grand View mines. Old Ryan was torn down and hauled to the Biddy McCarthy to become New Ryan. Ore was hauled from the various workings of the several mines by a twenty-four inch gauge railroad to ore bins in New Ryan, then over the narrow gauge Death Valley Railroad to Death Valley Junction. When the Kramer borax mines were discovered and developed in 1927, the Pacific Coast Borax Company transferred all operations to the new area, closing down New Ryan in June, 1927. At the time of the closure the ore was averaging 26 percent borax.[77]

GREENWATER

Early in 1904, Aurthur Kunze reportedly found copper float, and in December, 1904, Fred Birney and Phil Creasor discovered more of it, in a location southwest of Death Valley Junction. When Kunze sold his claims to Charles Schwab at Goldfield, Nevada in July, 1906, it triggered a rush. The stampede to Greenwater was on!

Greenwater was the name of the townsite Kunze established near his claims. It takes it's name from Greenwater Spring south of town. Harry Ramsey laid out the townsite of Copperfield two miles to the east of Greenwater townsite. A third townsite (Furnace) was laid out near Patsy Clark's Furnace Creek copper mine. In September, 1906, the Tonopah Lumber Company reported it had sold 150,000 feet of lumber to the Greenwater camps and mines, and a hundred men were in the area.[78]

Kunze moved his townsite into Copperfield and the two became known as Greenwater by December, 1906. In early 1907, the population reached 700. By April the telephone line from Rhyolite reached Greenwater. Water sold for high prices, $15 a barrel, or one dollar a gallon. In May 1907 Kunze traveled to Los Angeles to order a printing press and supplies for the *Death Valley Chuck-Walla* and the *Greenwater Miner*. In June, 1907, the press building at Greenwater burned to the ground. The new press was never shipped in. The Ash Meadows Water Company started laying a 27 mile, 6 inch pipeline from Ash Meadows Spring. After spending $200,000 the line was 10 miles long. It was never completed.[79]

Upwards of 30 companies were formed, with capitalizations from one to five million dollars each, allegedly to tap Greenwater's riches. The Furnace Creek Copper Company, capitalized with a million shares offered originally at 25 cents each, was soon selling at over $5 a share. The public, encouraged by the big names promoting Greenwater, bought any stock with Greenwater in its name. New stock promotions were sure to include the name Greenwater somewhere in their corporate title. The

South Greenwater Copper Company was typical of the many companies that solicited public support. Their advertising copy read, "We are reasonably sure that we have a mine at South Greenwater. We would not spend money there if we were not." Charles Schwab, Augustus Heinze, T. L. Oddie and F. M. (Borax) Smith were all "reasonably sure" they had a mine, too, for they were spending money on Greenwater. But no one had a paying mine at Greenwater. Over 2,500 claims blanketed the acreage. Greenwater had a telegraph and a telephone line, two newspapers, a $100,000 bank, a drug store, boardinghouse, and several saloons. But not for long.[80]

Pope Yeatman, a mining engineer hired by the Guggenheim interests, came to Greenwater to investigate the Furnace Creek copper mine, Greenwater's biggest. By then it was some 200 feet deep. The mine had opened up on a body of copper oxides, and some 20 tons had been shipped in early 1906 that yielded 20 percent copper. Yeatman took one look and immediately left camp. Making a long distance phone call to New York, his observations that day marked the beginning of the end for Greenwater. The ore body in the Furnace Creek copper mine went nowhere, and the shaft had hit what appeared to be volcanic ash. With this news the Greenwater copper market collapsed.[81]

On September 7, 1907, the *Beatty Bullfrog Miner* reported that the *Greenwater Miner* had stopped publication and that a hundred people were still at Greenwater. Buildings were brought down one by one, many of them being hauled to Zabriskie or Shoshone. The Greenwater Copper Company hung around until January 8, 1910, when it gave up on Greenwater after sinking a 1,400 foot shaft and finding only low grade ore.[82]

It is interesting to note that the Amalgamated Copper Company, in control of over 50 percent of the nation's copper production in the 1900s, began stockpiling copper in April 1907. This was when Greenwater was at its height. In September, when the myth of Greenwater was exposed, the copper was unloaded on the market, knocking down the price of copper and copper mining shares.. Augustus Heinze, who allegedly bought claims in Greenwater for $200,000, tried to keep the price of copper up by using funds from several banks he controlled. His efforts resulted in the bank panic of 1907. George Graham Rice estimated that $30,000,000 was invested in Greenwater in four short months.[83]

TECOPA (20TH CENTURY)

Due in part to the interest generated by Greenwater, the Tonopah and Tidewater had been pushing their railroad through the Amargosa River Canyon in an attempt to pick up on the developing copper camp's business. Although arriving in Tecopa just in time to see Greenwater's collapse, the railroad providently provided the Noonday and Gunsight Mines (owned by the Tecopa Consolidated Mining Company) an outlet for their silver ores. The company quickly shipped a 30 car train of ore worth $40 a ton. By 1910 a standard gauge railroad (The Tecopa Railroad) was hauling ore from the mines to Tecopa station, where high grade values were shipped over the Tonopah and Tidewater and on to smelters at Murray, Utah.[84]

From 1912 to 1928 the Tecopa Consolidated Mining Company produced $3,000,000 worth of silver and lead. After World War II these mines, inactive during the Depression, were purchased by the Anaconda Copper Mining Company, who operated them with a crew of 45 men until March, 1953, when the mine closed down. No high grade ore reserves were found after exploration by the Anaconda Company.[85]

GOLD IN THE TWENTIETH CENTURY

After the Ballarat boom, no new gold discoveries in Inyo County occurred until the worldwide depression of the 1930s and devaluation of the dollar brought back interest in gold. Unlike other counties, Inyo's gold producing areas did not experience a huge influx of prospectors during these years. New gold mines were developed, but they were small mining operations in isolated parts of the county far from any towns.

The Little Mack Mine in the Lookout District and the Marble Canyon placer mines in northern Inyo County were two such depression era mining activities.

Little Mack Mine

In Thompson Canyon, 400 feet east of the Minnietta Mine, lies the Little Mack Mine. Otto Siedentopf of Trona, California operated this gold mine from 1930 to 1937, producing $15,000. A 250 foot long tunnel develops a four foot wide vein of quartz which averaged $15 to $20 in gold per ton. Ore was transported by an aerial tram 325 feet long to a 20 ton ore bin. From there it was next crushed by one 800 pound stamp powered by a gasoline engine, and the gold was recovered with an amalgamation plate. A Rix air compressor powered his drills and the mine also had a small blacksmith shop on site.

In the midst of the rich silver and lead mines of the Lookout istrict, the Little Mack Mine operation stands out for two reasons. It was entirely a one man operation, and the only mine producing gold as the primary metal in the entire district.[86]

Marble Canyon

In 1934, a small mining rush occurred when J. C. Lewis discovered coarse gold in gulches in Marble Canyon. By 1938, approximately twenty men were working placer gold mines, recovering gold by dry washing. One gold nugget worth $300 was found at the Bedell group of mines, and all of the mines reported recovering nuggets ranging in value from $3 to $20. The gold fineness averaged about 920 for the whole area.[87]

The source of the placer gold values in this area is an old stream channel some 200 feet wide and 9 miles long. The miners dug down through this channel until they hit bedrock, usually 70 to 115 feet down. The gold itself was probably washed down from the Magpie or Blue Bell veins located in the Inyo National Forest, three miles south.[88]

BIG FOUR MINE

The last new metallic ore discovery in Inyo County, like the first, was silver. The Big Four Mine (known also as the War Eagle) is a lead-silver-zinc mine located seven miles northeast of Panamint Springs. Although possibly first discovered in 1907, it was never more than a prospect until William Reid restaked three claims in 1940. Development work began in 1942 and 370 tons of ore was extracted between 1944 and 1945. Leased from 1946 through 1949 by various persons, the ore averaged 16.6 percent lead, 12.5 percent zinc and 2.6 ounces of silver per ton. In 1952, production amounted to 136 tons of ore.[89]

NON-METALLIC MINERALS

Nineteenth century mining in the California Desert concerned itself mainly with the "big five" minerals (gold, silver, copper, lead and zinc) . In the twentieth century, non-metallic minerals play an increasingly important role, and became Inyo County's most plentiful mineral resource. In addition to the Searles Lake developments (actually in San Bernardino County but included here) and the borax discoveries at Ryan, salt, sulphur and talc were discovered in very large quantities in Inyo County.

SALINE VALLEY SALT

The presence of mineable salt in the Saline Valley was noticed as early as 1902, but due to its inaccessability, it was not until 1911 that anyone successfully and seriously developed the deposit. A 16 square mile deposit 30 feet thick, consisting of a salt (sodium chloride) 98.71 percent pure, was an attractive gem on the desert floor. In August, 1911, the Trenton Iron Works received a contract from William Smith's Saline Valley Salt Company to construct a 13 mile aerial wire-rope electric tramway. It was completed in 1913. Two hundred and sixty-eight buckets, each carrying 12 cubic feet of salt, would travel 7,600 feet from the valley floor to the top of the Inyo Mountains, and then another 5,100 feet down to Tramway, where a 70 ton mill and employee dwellings were located.[90]

The Owens Valley Salt Company operated the mine from 1915 to 1919 as a leasee. In 1920, G. W. Russell revived operations for a year, and after four years of inactivity, Russell formed a new company. The Sierra Salt Corporation repaired the tramway, which had fallen into disrepair after previous companies hauled the salt out by truck. In 1929 the tramway was reopened, but in the 1930s, Russell ceased operations. All three companies seemed to be plagued with difficulties in making the tramway pay for itself. Although the salt was exceptionally pure, it did not demand a high enough price to offset the tremendous investment poured into the construction and upkeep of the remarkable tramway.[91]

DARWIN (TALC, ZINC)

Talc mining in eastern California began during World War I. One-half of all known talc deposits of commercial interest lie in Inyo County. Until the 1940s, the Talc City Mine, six miles northwest of Darwin, provided nearly all the steatite grade talc in the United States.[92]

Originally known as the Simmonds Mine, it was operated before 1915 by the Groah Mineral Company of San Francisco. Other owners include the California Talc Company (1915-1917), the Inyo Talc Company (1917-1922), and Sierra Talc Company (1922-). The mine first provided talc for use in the manufacture of insulating cores for Hotpoint stoves. Later, in the mid-1930s, the talc was used in making high frequency electrical insulations. By 1950 the total production from the Talc City mine was a quarter of a million tons.[93]

The Zinc Hill mine, six miles northeast of Darwin, was one of the biggest zinc producers in Inyo County during 1918. During World War II, the mine produced some 2,500 tons of zinc ore. A mill site and ghost mining camp that once serviced the Zinc Hill Mine lies between Darwin and Panamint Springs on State Highway 190. A packtrail runs from the mill to the mine. Several shafts had inclined tramways and aerial tram lines connecting them to the pack trail. From 1917 to 1920, this mine was the major zinc producer in California.[94]

LAST CHANCE RANGE (SULPHUR)

California's largest sulphur deposits are located on the western edge of Last Chance Range in Inyo County. First discovered in 1917, the sulphur lies in a mineralized area three miles long by one mile wide. A bedded deposit 16 to 30 feet thick contains ore values ranging from 30 to 80 percent sulphur. Estimated reserves in 1938 showed over a million tons of ore containing at least 40 percent sulphur. Most of the development of this area occurred in the late 1930s.[95]

Six claims known as the Crater Group were developed in 1929-1930, with several shafts and a large open pit completed by the Pacific Sulphur Company of New York. This company produced approximately 12,000 tons of sulphur. In August of 1936 Sulphur Diggers Inc., obtained a lease on the Crater Group and operated them until September, 1937. Retorts were installed at the mine and 5,000 tons of 96 percent sulphur ore produced.[96]

The Western Mining Company took over operations in 1938, built a new 100 ton retort and concentrated on mining, by open pit methods, an exposure of 10,000 tons of sulphur on the Crater Number Six Claim. A 125 horsepower boiler provided steam for the retorts which consumed 3,250 gallons of water each day. 15 men were employed at the mine. An additional 15 worked at the refinery. In late 1941, an

explosion destroyed the refinery. World War II finally caused operations to cease in August of 1942.[97]

Adjoining the Crater Group on the south were the Fraction and Southwest Sulphur claims, comprising 18 acres which developed a 6 to 12 foot sulphur vein. Further south, the Gulch Group were 10 claims located originally by James Jacoby in 1918. Half of the 20 foot wide sulphur vein on this property consisted of massive crystalline sulphur 90 percent pure. The richness and extent of sulphur reserves in this area is well proven. Their isolation and distance from an adequate water supply for milling operations have discouraged extensive development.[98]

SHOSHONE (PERLITE)

A light to dark greenish gray color of perlite is found on the east side of the Dublin Hills, 2 miles west of Shoshone. Perlite is a vlocanic glass used as a filler for plaster, rubber and paint; as an abrasive in soaps and cleansers; in filters, as an insecticide carrier, and soil conditioner. Ed Grimshaw, A. W. Stalker and Walter Davis own 21 claims collectively known as the Shoshone Perlite Deposit. In 1948 the claims were leased to Perlite Industries, Inc. This deposit and the entire perlite industry has been developed after World War II.[99]

OWLSHEAD MOUNTAINS (EPSOM SALTS)

Thomas Wright, a Los Angeles florist, discovered magnesium salts 28 miles east of Searles Lake near the Owlshead Mountains in the early 1910s. The 63 mile journey from Randsburg to the deposit was described as *"an interminably long and punishing sentence of bumps and jolts, punctuated now and then by the brisk snap of breaking springs, truculent overtones in the clatter of the badly treated motor, and the sinister hissing of water frying in the radiator."*[100]

A railroad to the deposit seemed to be the only economical way to develop the find. The high cost of roadbed grading persuaded Wright to adopt a monorail system. Work began on the monorail in 1922 and the 28 mile line from Magnesia (two miles south of West End) through Layton Canyon and Wingate Pass to the Epsom salt works was completed in 1924.[101]

When an engineer made the trip shortly after the line opened in one hour, with a full load of ore, the Epsom Salts Line became known as the "fastest moving monorail in the world." For two years, Wright's American Magnesium Company produced a small tonnage of hydrated magnesium sulfate which was shipped over the monorail to Magnesia siding and on to Wilmington, California for refining.

By the summer of 1925 mining operations began to suffer. The Wilmington plant was receiving ore containing 50 percent waste rock and the monorail was suffering from track warpage, cloudbursts and poor locomotive design. In June, 1926, the mine shut down. The monorail stood intact for approximately 10 years. In the 1930s the single rail and timbers were pulled up for scrap. The Naval Weapons

Center, Mojave Range B now completely surrounds this deposit and most of the monorail line.[102]

SEARLES LAKE

Covering more than 40 square miles of northwestern San Bernardino County and a small part of Inyo County, Searles Lake contains half the natural elements known to man. This mineral treasure chest was not recognized as such by the emigrants who camped on its shore and tasted of its brackish waters while escaping from Death Valley in 1850. They had already found and left behind a rich silver deposit. Drinkable water to them was much more valuable than any silver or brine. Nevertheless, it was the emigrant's lost silver deposit, the famed Lost Gunsight Mine, that first lured Dennis Searles into this area and put him in a position to discover and develop the lake that now bears his name.

Dennis Searles was among those searching for the Lost Gunsight Mine with Dr. S. G. George in 1860. Two years later, Dennis and his brother John were mining gold in the Slate Range. While there, they noticed that a large dry lake nearby contained borax. They went back to mining their gold, as borax wasn't quite the money maker gold is, but by 1866 Indians had chased them all away from the Slate Range.[103]

In the 1870s the Searles brothers were in Nevada, where they saw F. M. Smith successfully mining borax from a marsh. Dennis and John ran back to their lake, staked claims, and formed the San Bernardino Borax Mining Company in 1873. That year they scraped together a million pounds of borax and sold it for $200,000.

Mining law regarding placer deposits limited the Searles brothers to 160 acres, but they were able to control the entire lake by discovering and monopolizing the closest source of water, some seven miles from their plant. Most of their competitors were required to sell out sooner or later and the Searles brothers' early profits were largely the results of harvesting the borax already gathered into piles by their competition. The San Bernardino Borax Mining Company operated until 1897 when John Searles died. In 1898 Francis Smith bought the 100 ton a month plant and closed it. The equipment was moved for use at Smith's richer Daggett and Borate deposits.[104]

Trona was discovered in Searles Lake in 1905, and that year the California Trona Company, with a $50,000 loan from Goldfields American Development, began buying up claims on Searles Lake. In 1913 the California Trona Company became the American Trona Corporation. Raymond Ashton began building a railroad from Searles Station to the lake, the line (the Trona Railroad) being completed in March of 1914. A huge, heavily financed refinery was completed in October, 1916.

Baron Alfred de Ropp since 1908 had managed to make the Searles Lake operations pay. As manager of the Goldfields American Development Company, de Ropp was the man responsible for investing a million dollars to erect a refinery capable of extracting potash at a profit. His vision had paid off, but when he resigned in 1920, a lack of leadership was felt. The American Trona Corpoaration was reorganized

later as the American Potash and Chemical Corporation, and this company operates the plant at Searles Lake today.[105]

Current production is 1800 tons each day of sodium, potash, boron, lithium, bromine, liquid bromine and boric acid. The American Potash and Chemical Company operations at Trona are the only source of potash currently being mined in California. The Trona plant is a 32 million dollar investment employing 1,500 people. Patented claims cover 2,560 acres of Searles Lake with 3,400 additional acres being leased from the federal government.

A rival plant to the American Potash and Chemical Company operated briefly for a four year period from 1916 until 1920. The Borosolvay Plant was operated by the Solvay Process Company of New York. Located 2½ miles south of Trona at Borosolvay, while in operation the plant produced 200 tons of potash a month.

In addition to the aforementioned minerals, sodium carbonate is also recovered from Searles Lake by the American Potash and Chemical Company and the West End Chemical Company. The West End Chemical Company originally mined borax with poor results when the company was organized by Francis Smith in 1920. Three years later the refinery was rebuilt to recover soda ash in addition to the borax, and it has been successful ever since. The process used to recover soda ash and borax involves injecting the lake brine with carbon dioxide gas, obtained by burning limestone from a nearby deposit. The bicarbonate produced is dried and heated in furnaces where it becomes a fluffy brown soda ash. In its coarse state this is used in the manufacture of glass.

Searles Lake's estimated mineral production potential is staggering. Thirty-two square miles of the lake are considered worth commercial interest. Each of these 32 square miles contain an estimated 100 million tons of alkali salts. This supply is expected to last for several generations.[106]

INYO COUNTY-Looking towards the future

From as far north as White Mountain City to as far south as Tecopa, prospectors have been searching in Inyo County for Lost Gunsight silver. The search goes on, and while silver continues to rise in price activity is stirring up once again at Darwin, Tecopa and in the Panamints. Silver ore that was sub-marginal at the turn of the century is now 30 times more profitable to mine!

Inyo County has led the state in silver-lead production, with over 98 percent of the lead produced in California having originated here. There is little reason not to expect Inyo County to be a major producer of silver, lead and zinc in the years ahead. Small mining operators will provide the bulk of this output, as they are the ones best able to adapt themselves to the California Desert.

While larger concerns are exploring the possibilities of reopening Darwin or Tecopa, the lead time they require to open a mine (from 5-8 years) and the large tonnages of low grade ore needed to make a profit restrict them from taking action quickly. The

small miner, much more adaptable to desert conditions and more able and willing to make the investment in desert mines, will be the ones who usher in the next Inyo County silver rush. Many are in the Panamints now.

Aside from silver, large reserves of talc exist near Darwin, salt in the Saline Valley, borax at Ryan and sulphur in Last Chance Canyon. Gold mining in the Pleasant Canyon area will increase side by side with silver mining in the Panamints. Although not open for relocation, claims within the China Lake Naval Test Station have modest reserves of gold, silver, tungsten, copper, zinc and mercury.

Inyo's silver mines were Los Angeles' Comstock. For years the relationship between the two counties was one of mutual support and growth. Los Angeles went on to become a metropolitan complex while many of the Inyo County boom towns died. After years of neglect, it seems that a few adventuresome individuals, who know that desert mining is not dead, may rediscover southern California's roots and win new fortunes for themselves in the hills and mountain ranges of Inyo County.

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[22]Nadeau, *City Makers*, pp. 65-66, 72.

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[25]Raymond, 1875, p. 28.

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THE FUTURE

Never before in the history of mining has the price of gold and silver been so high. With many signs indicating that we may be on the eve of another gold rush, we are frankly surprised that it has not occurred even earlier. Most of the mines were never depleted. Legislation and price fixing only made them temporarily unprofitable.

What, then, is holding back the gold rush from erupting all over the California desert? These are some observations:

1. L-208 prematurely shut down many gold mines even before their ore became submarginal. In so closing these mines, rich ore was left untouched. However, 40 years have elapsed. Mine timbers rot and shafts fill with water, making it an expensive process to dewater and retimber mines.

2. A generation has grown up without the benefit of an active small mines industry. The techniques, processes and skills involved in mines are dying out with the passing of each prospector. It is an "endangered" art. The family business has not been passed on from father to son, and enrollment at mining colleges has been low for years and only now is picking up.

3. The ecological movement may have caused people to shy away from and look down upon mining with disgust (i.e. "raping the earth"). Only now are we realizing how little mining affected the land (less than 3/10 of one percent of the total U.S. land area has been affected by mining). The 1872 Mining Laws (rules and procedures for locating, developing, maintaining and patenting mineral deposits), under massive attack for a myriad of ecological and economic reasons for over a decade have only recently been accepted by the non-mining public as a workable set of laws. The fight for their repeal by ecological groups and politicians seems to have died down. This recent accomplishment was the result of a large grass-roots effort among small miners and prospectors throughout the West to "Save the 1872 Mining Laws."

4. The high costs for equipment, legal consultation and complying with rules and regulations in the areas of labor, worker safety and the protection of the environment has hindered small mining concerns in making a profit in the past.

5. The high speculative conditions inherent in mining and the physical labor involved may be further hindrances. A large scale unemployment condition has not yet developed (like in gold rushes in the past) that would give incentive to perform hard physical labor.

Although no rush comparable to the 1930's has yet occurred, some new and renewed activity has taken place in the desert during these last ten years. American Smelting and Refining Company conducted exploratory work in the Calico Mountains during 1964, and as late as 1976 was reported as having renewed their interest in a planned

silver mining operation in the area. Activity is building in Kern County and in the Panamints. The Bagdad Chase Mine in San Bernardino County has been producing since 1971.

As prudent investors realize that hundreds of mines made a profit with $12 a ton ore, and today that same ore, still underground, is worth over $200 a ton, more desert mines will be reclaimed, and mining activity will increase.

Desert mining was and still is an exciting occupation, with an exciting future. As foreign supplies diminish or become unavailable to us, the California desert will provide a greater share of our nation's mineral needs. Imperial County will supply geothermal energy, gypsum, manganese, kyanite, marble and gold. Riverside County will provide iron, copper, and manganese. San Bernardino County will yield tungsten, silver, salines, rare-earth minerals, borax, copper, and gold. Kern County will supply gold, borax and uranium, in addition to its petroleum products. Inyo County will produce lead, silver, zinc, borax, talc, salt and sulphur, as well as tungsten.

Desert military reservations and state and national parks and monuments, although not open for location, contain known deposits of mercury, gold, silver, copper, lead, manganese, borax, geothermal energy and epsom salts. They are a veritable desert stockpile of precious and strategic minerals.

Behind the facts, figures and future predictions is a story of man's close association with himself and nature while in the pursuit of mineral wealth. Whether underground following a vein deeper and deeper into the earth, or at a camp after just having bedded down, one's contact with nature is intimate, and time for inward thoughts is abundant. Such feelings were vividly captured by one prospector in 1907:

" That first night, snug under my tarpaulin during drizzling rain, I felt I was a guest in God's own hotel, and that thought abided with me from night to night as I lay in my bed under the open sky gazing at the sight of sights--the stars I could almost touch. There I was, drinking it all in, flattering myself that I was an essential part of it, essential, else how could I see it? How was it that my eyes could light instantly on the farthest star, more than one hundred light-years from the earth? Was not that fact sufficient to dispel the illusions of time and space? I had to give up. It was truly a luxurious hotel without electric lights for reading, one in which there was no stale air, no noise of revelry, no bellboys, but just the distant tinkle of Jennie B's bell, the plaintive tweet of a night bird, and often the shrillllllllll yap-yap-yap of the lovesick coyote.." Quoted from Herman W. Albert, *Odyssey of a Desert Prospector* (Norman: University of Oklahoma Press, 1967), pp. 19-20.

Gold, freed from its matrix by erosion and deposited as nuggets, flakes, or fine "colors" in streambed gravel, provided the first non-native American mineral production in California. These placer deposits, in what would later be known as Jackson Gulch and the Potholes in Imperial County, were worked for a brief period in 1780-81 by Spanish prospectors.Gold also was discovered and worked at Placerita Canyon near Newhall in 1842, but neither discovery caused a worldwide rush like that of Marshall's find in January, 1848. The Mother Lode in northern California acted as a magnet drawing young and not-so-young men to the West Coast. Despite country-cousin comparison with the Mother Lode, the California desert soon had its share of visitors on their way to the northern goldfields.

Mining in Inyo and San Bernardino Counties began in the winter of 1849-50. In Inyo County it began with the discovery of silver by a man named Turner. He was one of at least a hundred immigrants who accidentally discovered and explored Death Valley while on the way to the goldfields in northern California. Having turned south from Salt Lake City, Utah, to avoid crossing the high Sierra in winter (an act that had cost some members of the Donner Party their lives just three winters before), these gold seekers were nonetheless anxious to arrive in Sacramento. When a Captain Smith appeared bearing a map depicting a shortcut to Sacramento that would save weeks on their trip, they chose to leave the main trail, going cross-country to the west. The shortcut brought them to Death Valley. Turner or one of his companions named Martin discovered a promising mineral deposit and carried some of the ore out of Death Valley. Because this ore was reportedly used later to fashion a gunsight, this has been known as the "Lost Gunsight Mine" ever since. Their discovery was made within sight of a campsite in the Panamint Valley they shared with John B. Colton and William B. Rood. The exact location of the ore deposit found by Turner is unknown, but is believed to be somewhere in the Panamint or Argus ranges. It could have been ore from what was later to become the Modoc Mine on Lookout Mountain.

In San Bernardino County, gold was discovered at Salt Springs near the Amargosa River in December, 1849. This discovery was made by a member of the Mormon caravan to San Bernardino lead by Jefferson Hunt. The mine was reworked on and off until about 1902.

Fueled by rumors of the Lost Gunsight, a stampede of prospectors scoured the California desert after the discovery of the Comstock silver deposits in 1858-1859. They went out in the attempt to pick up the vein which they believed extended from the Comstock Lode southward through the California desert to the silver mines of Mexico.

Two groups of explorers in the 1860s, one lead by Dr. Darwin French, the other by S. G. George, found and named mountain peaks, a waterfall, a live "volcano"

(actually Coso Hot Springs), a lead mine in Wildrose Canyon and gold and silver mines in the Coso and Slate ranges, with those over-promoted mines worked until the mid-1860s. Also, miners from Aurora, Nevada traveled south to discover the White Mountain City mines in 1861.

Other stimuli to mining in the California desert were discoveries in nearby Nevada and Arizona. The Potosi, Nevada silver deposits were discovered in 1856, yet not aggressively mined until the spring of 1861, when a smelter was erected. Gold was discovered at El Dorado Canyon in Nevada, on the Colorado River in the spring of 1861, and in January, 1862, the rich dry placers discovered at La Paz, Arizona sent hundreds of men trekking across present day Riverside and San Becounties to the Colorado River mines. As a result, prospectors discovered copper in the Whipple Mountains, Turtle Mountains and west of Needles. They also found gold in the Mule Mountains (and probably in the Orocopia and Chuckwalla mountains) and silver south of the Government Road in the Providence Mountains.

In 1865, the Cerro Gordo silver-lead ores were discovered, as well as the gold deposits of the Gunsight Mine east of Tecopa.

Cerro Gordo was the most significant discovery of the 1860s, and was to Los Angeles what the Comstock was to San Francisco. Mining engineer Mortimer Belshaw systematically developed the whole hill, conquering problems in linking Cerro Gordo to the outside world, smelting ore and bringing water to the area. Criticized as a ruthless businessman, Belshaw nevertheless furnished the technology and obtained the capital needed to extract a large percentage of the seventeen million dollars produced from the hill.

In 1866, the St. John Gold Mine in Kern County was found, followed by the Paymaster silver mine in Imperial County in 1867. Although the mines at Providence, Coso, Salt Springs and in the Slate Range were vacated in the late 1860s because of Indian troubles, by 1870, the threat of Indian attack had been removed, and prospectors began heading back to the abandoned portions of the desert. The Copper World was discovered by 1868 and silver at Ivanpah in 1869. Silver was mined at the Macedonia District in 1872 and in the New York Mountains during 1873. Gold was discovered near Twentynine Palms in 1873 and has been worked off and on until today.

Prosperity reigned after the Civil War and lasted until 1873. The bank panic that year and subsequent depression curtailed speculative capital for mining just at a moment when three significant discoveries were made at Panamint (discovered six months before the crash), Darwin, and Lookout. Of these three silver-lead districts Panamint is the most famous and least productive, receiving too much publicity and being over-promoted. Two years after its discovery, Panamint was already on the decline.

Darwin was developed by Abner Elder and Victor Beaudry, two of Belshaw's ex-partners, and Lookout received the attention of Senator George Hearst. From the mid 1870s to the early 1880s, Darwin and Lookout produced the same amount of wealth, approximately two million dollars each. Production figures for Darwin and Lookout continued to match each other like mirrors until World War I, when Darwin produced three and a half million pounds of lead and three hundred thousand ounces of silver, while Lookout produced barely two hundred and fifty pounds of lead and only thirty-four thousand ounces of silver. Although Darwin finally proved itself the richer area, supported a bigger town, and had its own newspaper, both should share the spotlight equally as the significant California desert mining districts of the 1870s.

The 1880s were years of general prosperity. The coming of the railroads, the A&P via Needles, and Southern Pacific building southward to Yuma, stimulated new mining, particularly in San Bernardino County. There, Ivanpah, worked since 1870 for silver, was essentially developed by two companies in 1880 and 1881. Also, two prospectors from Ivanpah discovered the Bonanza King silver mine in the Providence Mountains which flourished from January, 1883 to June, 1885. In 1885 and 1886 the Cambria Mine at Nantan was active, and late in 1889 silver and gold were discovered in the Old Woman Mountains. Further west in the county, the Oro Grande gold mines began development in late 1880, and in the spring of 1881, the Calico silver deposits were discovered and boomed for a decade. In Riverside County, the Palen copper mines were located in 1880, and gold was discovered in 1886 in the Chuckwalla Mountains.

Gold dominated the 1890s. The Panic of 1893 resulted in political decisions unfavorable to the silver interests, but these decisions inspired the discovery and working of the Goler, Rademacher, Mojave and Summit Dry Diggings in Kern County, the Radcliffe Mine in Inyo County, the Vanderbilt, Hidden Hill, Dale, Ibex and Old Woman Mountains in San Bernardino County, and Arica Mountain in Riverside County.

The highlight of the 1890s without a doubt was the discovery of the Olympus (Yellow Aster) gold mine in Kern County which brought Randsburg into existence in 1895. Randsburg was a well established gold-mining community by 1900. Four years later tungsten was discovered nearby, creating the area's second boom. In 1919, while the Atolia tungsten mines were experiencing a brief slump (due to the end of World War I) silver was discovered at Red Mountain, causing the third rush to the area. The price of silver was kept artificially high, allowing the California Rand silver mine to be operated during the 1920s at a profit. However, most of the other mines throughout the California desert were inactive during the inflationary period.

While gold mining at the Yellow Aster was drawing national attention in the 1890s, copper prices had risen enough to reopen the Copper World Mine in 1898. Also, Copper City near Randsburg shared the limelight for a year or two. In the Whipple

Mountains and Turtle Mountains of San Bernardino County, copper mines were also reopened around 1900. The rich gold mine of Bagdad Chase south of Ludlow in San Bernardino County was discovered about 1898. About this time the widespread use of cyanide for the treatment of gold ore sent many out reworking old dumps, and formerly unprofitable mines were reopened.

The fabulous discovery at Goldfield, Nevada was made nearby in 1903, and a stampede there began early in 1904. During the fall of 1904, this excitement extended south to Rhyolite, and soon spilled over to San Bernardino County, California, with the ephemeral towns of Greenwater, Crackerjack, Orange Blossom, Vontrigger Camp, Goldbend, Gold Valley, Gold Park, Dawson, Kewanee and Hart springing up. In 1916, Goldstone north of Barstow was perhaps the last camp to come in on the coattails of Goldfield.

Elsewhere in the California desert during the early 1900s, borax was discovered at Old Ryan in 1903. Its discovery was the direct result of the Pacific Coast Borax Company's search for a deposit to replace the diminishing ore reserves of their mine at Borate. Greenwater sprang up south of Old Ryan the next year. Its boom only lasted until 1907, the year the Shoshone silver mines were reopened. The biggest discovery of the decade was the Atolia District.

In 1911, the Saline Valley Salt deposit was being developed, and Cerro Gordo was reworked for its zinc values. Borax was discovered near Kramer in 1913 but was not developed until the late 1920s. In 1915, New Ryan replaced Old Ryan when the Biddy McCarthy Mine at New Ryan began operations, replacing the Lila C. Mine of Old Ryan. The highlight of the 1910s was the discovery of the California Rand Silver mine, which made Randsburg the center of mining attention for its third decade.

In the years immediately preceding and during the nation's involvement in World War I, mining in the California desert experienced a general revival as prospectors began searching the old dumps for overlooked fortunes in manganese, lead, zinc, talc and tungsten. Darwin, Atolia, and Cerro Gordo were "rediscovered" and had record productions during the war years.

The inflationary 1920s put a damper on new mineral discoveries in the California desert and many mines could not operate with the high prices then prevailing. The Kramer borax deposit, however, was developed, the California Rand silver mine had a strong production, and the Shoshone silver mines were providing a modest output.

In late 1924 or early 1925 gold was discovered north of Goffs on the south slope of Hackberry Mountain and another Vontrigger camp grew up. In 1926, gold was discovered at Kramer Hills, three miles south of Kramer.

The 1930s resulted in a gold rush, not unlike the rush of 1849. The Great Depression that struck this nation at that time resulted in massive unemployment, and a tight money situation existed. Millions needed to work and receive money for their labors

to buy the necessities of life. A steady job during the Depression also served to provide peace of mind and was very healthful. Prospecting seemed to be the perfect solution to the problem. Frank A. Crampton, in the *Los Angeles Times* of April 17, 1932 wrote, *"There is an actual gold rush on now, well identified by mining engineers. The operations are not as lavish as in the old days, but California's gold output has steadily grown in the last three years as men, out of work, turned to the old tailings dumps and prospected old placer streams in search of gold. In 1929 the state's gold production was valued at $8,506,703. In 1930 it jumped to $9,451,162. During 1931 it increased to $10,708,000: This gold is being gleaned in small amounts by a giant horde of men and logically, as they prospect, new lodes and development will follow."*

Crampton's prophecy came true a year later. A rich gold vein was discovered in the Mojave District, causing a rush back into that area. The Silver Queen Mine was the highlight of the 1930s. The combined output of this and adjacent mines all owned by the Golden Queen Mining Company amounted to more than six million dollars from 1936-1942. In the fall of 1934 the Cactus Queen Mine was also discovered in the Mojave District, and produced over four million dollars in eight years.

Older districts experienced revivals, such as Goldstone, Oro Grande, Vanderbilt, Dale, Chuckwalla, Arica, Riverside Mountains, Sageland, and the Cargo Muchachos. Prospect holes appeared everywhere gold was known to have been found, and some new discoveries such as the Marble Canyon placers in the Saline Valley area, were made as a result of this heightened interest. Silver districts did not experience any revival during the Depression.

The United States came out of the Depression largely as a result of the world-wide demand for products at the beginning of World War II. Atolia once again increased tungsten production for the war effort while Darwin provided lead. Miners at Mojave during the Depression were pouring out gold and silver, and the mill at Burton's Tropico Gold Mine was accepting ore from hundreds of small miners who worked the California desert. The Imperial County gold mines also experienced revivals.

After the Japanese attack on Pearl Harbor, things changed as the United States prepared to take a more active role in the war. Men were needed in the Armed Forces and the factories and industries that turned out war materials. Mines were also needed, to extract the minerals that Uncle Sam declared essential for war production, and the government paid a premium price for manganese, iron, copper, lead, and zinc. Purchase depots throughout the West bought tungsten, antimony, and lead-zinc ores from small miners. Mines producing these ores prospered immensely during the war, as did the Vulcan and Eagle Mountain iron mines. Darwin woke up during the war and went on to produce one hundred million pounds of lead and five million ounces of silver from 1941-1951. Sixty-five percent of the silver and eighty-five percent of the lead produced from the Darwin silver-lead district was extracted after 1941. Mining loans were freely given when it was deemed to be beneficial to the war effort.

At this moment, when there seemed to be such a growing future for the mines of the California desert, many of them were dealt a severe blow. The United States War Production Board, concerned that over 20,000 men were employed at 250 gold mines and 700 placer mines throughout the western United States, sought a method to transfer the men and machinery to operations that provided a more strategic and needed mineral than gold. On October 8, 1942, the War Production Board issued Limitation Order L-208, classifying gold mines as non-essential for the war and giving mine owners sixty days in which to cease operations. Although lode mines that produced less than 1,200 tons in 1941 were exempt from the order, this order meant a sudden disruption to almost all of the significant gold mining that was taking place.

Designed to free manpower and equipment for use in those mines more vital to the war effort, there is a great deal of doubt that this order effectively accomplished what it had set out to do. The whole gold mining industry was suffering from a slowdown due to the inflationary wartime economy. The price of gold was fixed, and labor was rapidly leaving the gold mines to work in factories and defense plants and industries that paid much higher wages. At the time the shutdown order took effect the California gold mining figures had been declining sixteen percent a month, and had been doing so since May, 1942. From January, 1941, to May, 1942, the production was declining at a rate of four percent a month. The Bureau of MinesMinerals Yearbook for 1942 states, "Economic forces were curtailing gold production o rapidly in 1942 that the exercise of Federal authority was not needed to accomplish a most drastic curtailment in gold mining in California."

Many of the mines closed by this drastic action on the part of the federal government suffered great damage through forced neglect and could not be opened after the war. Mineral values still present in these mines became inaccessable due to flooding and the rotting of the mine timber. Only those gold mines lucky enough to receive special permission to keep a small crew on the site for maintenance and upkeep were able to survive the war years. Tropic is one such mine, because it supplied rock from its glory hole for use in building airstrips in the Antelope Valley.

The inflationary post World War II years drove labor costs up, adding to the cost of dewatering and retimbering the mines. Gold mining in the California desert has never really recovered from the effects of L-208 and the fixing of the price of gold at thirty-five dollars an ounce in the 1930s.

In 1968 a free market was declared on private gold, while governments continued to honor the thirty-five dollar figure. In 1971 President Nixon declared that foreign governments could no longer demand gold for their paper dollars, and in December our dollar was devalued by 8.6 percent as gold became worth thirty-eight dollars an ounce officially. Gold doubled in price the next year, by 1978 had risen to $200 an ounce, by mid-1979 it rested at $400, then soared to $800 an ounce, before falling slightly to around $700 at the beginning of 1980.

In 1968, the Vanderbilt mine was reactivated and in the early 1970s, the Bagdad Chase mine south of Ludlow also was reopened. Extensive exploration for gold is underway now in the California desert, and with recent successful large scale gold mining operations in Nevada, notably the Carlin, Nevada mine, today's exploration has centered on looking for mines with millions of tons of ore reserves. Uranium fever, much like the gold fever of early days, swept the desert from about 1953 until about 1956, and with the price per pound of uranium now several times what it was in 1956, extensive exploration is once again taking place.

At present, independent miners and prospectors throughout the desert are attempting a comeback. The Blue Star Mining Company discovered gold in the Calico Mountains in 1966, and in August, 1978, coined three and a half ounces of gold into a doubloon as a publicity gesture to let people know that gold is still being mined in the California desert. The rise in the price of gold has been matched by an increased production and sale of metal detectors and dry washers throughout the 1970s. New mining supply companies and mining oriented publications appear at an amazing rate. Weekend prospectors are combining mining with recreation, and many prospecting clubs hold valid claims that their members work.

The need for preserving and interpreting the history of mining in the California desert is great. There is a serious lack of representation within the National Park System of sites and districts with mining themes. In spite of the important role mining played in the development of the American West, one has to look hard to find a place in the West where the story of mining is told. At the same time there is a great deal of public interest in this subject. In the California desert, what is left of mining sites is hardly enough to provide the desert visitor with a clear idea of what it was like and what went on. In many cases where buildings and structures at a site are preserved and in all cases where they are not, dynamic interpretive programs are needed and in some instances reconstructions will be required, in order to adequately present the story of mining.

In the California desert a marvelous opportunity exists for living history demonstrations, where the public can as much as possible "experience" history. If the public had a place or places to go where they would be able to "see" and "feel" history through meaningful experiences at visitors centers or demonstration areas, vandalism and relic hunting would be reduced. Relic hunting is nothing more than an attempt to "have a piece of history of your own." Having a place to go that allowed one to see and feel these relics or reproductions in use, and perhaps even be involved in prospecting,mining and milling activities, would serve to educate the public, preserve history and encourage conservation of historic resources.

In conjunction with experiences and demonstrations it is necessary to provide the visitor with the opportunity to take a piece of history home with him in the form of creative and dynamic booklets, books, cassette sound "tours," reproductions of relics, photographs, posters and emphera, etc. It is a healthy and common desire of the public to want to feel and heft history, get closer to it, rather than coldly and statically look at history through the glare of a glass case. The visitor should be encouraged to make history a part of his life.

Chronology

Most of the better preserved mining sites are located in isolated areas, while many of the lesser preserved sites are of equal significance and deserve to be a part of any management plan for the desert. In selecting sites for preservation/interpretation that represent the history of mining in the California desert, a chronological balance should be kept so that sites are not chosen merely because they are well preserved. The history of mining in the California desert can be roughly broken up into decades, as in the sample below.

DECADE	POSSIBLE THEMES	SAMPLE REPRESENTATIVE SITE
1780-1820	Early Spanish Mining	Potholes
1820-1850	Mexican period	Cargo Muchacho area
1850-1860	Anglo-American Beginnings	Cerro Gordo
1870s	Inyo silver mining	Lookout
1880s	San Bernardino silver	Calico
1890s	Kern County Gold	Randsburg
1900s	Shift to strategi	llics Atolia, Borate
1910s	World War I	Atolia
1920s	Roaring Twenties	Red Mountain
1930s	Depression Gold Rush	Mojave, Marble Canyon
1940s	World War II	Darwin, Tecopa
1950s	Uranium, exotics	Mountain Pass

Significance

Determining significance is the process by which administrators make subjective value judgments in the most objective way possible. Different types of significances exist in mining history. There is public significance of a site, or how important the site is for interpretive programming, and in educating the public; research significance, or the site's importance in yielding data that would increase our knowledge of mining history; and legal significance, which is used to determine whether or not the site qualifies for inclusion in the National Register of Historic Places.

In determining the legal significance of a mining site or area, we suggest that the following points be considered:

1.Production figures or the richness of ore.

2.Mining, milling processes used - including any outstanding adaptations, uniquenesses.

3.Personalities. To what extent did owners achieve notorierity or prominence through their mining activities?

4.Pioneerinng. How far reaching was the mine in influencing the first water, transportation, or commerce into the area?

5.Promotion. Extent of capitalization. If stock was issued, on what exchange?

6.Uniqueness. Firsts of their kind, outstanding examples of architecture, outstanding degrees of preservation.

Some quantative data exists in mining that makes significance a little less difficult to calculate. For example, production amounts could be used as a gauge for sites hoping to qualify for regional, statewide, or national significance. Care should be used so as not to exclude an obviously important site, i.e. Greenwater, simply because its production figure was low. Population figures, whether the town supported a newspaper or railroad, etc. would also help determine the extent of the site's influence and importance.

Specific Recommendations

What follows is a list of the more important mining camps and sites within the California desert. A survey of these historic mining structures and sites is badly needed. Any outstanding buildings, millsites, or ruins should be recorded as a part of either the HABS (Historic American Buildings Survey) or the HAER (Historic American Engineering Record). Some of the survey could be accomplished using already existing aerial photography. The photography shows structures not listed on maps and structures which were present at the time the photograph was taken but which are no longer standing. Video tape recorders, and photogrammetric recording of buildings are some other techniques which may be used. Field surveys would attempt to record and document the present condition of each site, photograph and map the location and condition of any foundations, trash dumps, abandoned machinery, headframes, etc.

From the data obtained in these field surveys, several sites should be chosen and developed as "living history" areas where prospecting, mining and milling techniques could be showcased for the public. Oral history and historical arcaeology methods should be used to extensivley research the history of the showcased areas for incorporation into the interpretive programs. Sites selected for showcasing should have museums, underground tours (similar to, but more extensive than, the ones conducted in the Tropico Mine at Rosamond) combined with experiential demonstrations of mining and milling techniques. In selecting such sites, primary considerations would be accessibility and interpretive value (those sites with a high public significance rating). Six sites that could be considered to meet this criteria would be the Anthony mill ruins, Cerro Gordo and Randsburg in the Bakersfield BLM District, and Providence (Bonanza King Mine), Amargosa (Salt Spring) gold mine, and Tumco in the Riverside BLM District. The historical interpretation of Randsburg, because of the sizeable number of privately owned structures meriting attention, probably could not be undertaken by the BLM alone. However, a

cooperative effort with federal, state, and private funding could make this possible, and Randsburg has exceptional interpretive value because of its central location, its accessibility, its relatively well-preserved state, and its historical importance.

Besides the selection of a few sites for showcasing, abandoned mines or camps that have exceptional interpretive value but are less accessible, or are of smaller regional impact, should be considered for less extensive, perhaps self-guided interpretive programs. There could be dozens of these sites scattered throughout the desert, with caretakers provided to guard against vandalism and provide information for visitors.

Whether the sites are showcased or less extensively developed, the present claimholders/owners of mining property adjacent to historic sites should be approached and involved in all phases of management decisions affecting the site. Whenever possible, owners, private organizations, and local or regional historical groups should first be encouraged to develop and implement their own interpretive programs and protection measures for nearby sites with historic value, in full cooperation with the Bureau of Land Management. Where such interest does not exist for a given site of importance, and the site in question is endangered, support for the protection and interpretation of that area should then be sought at the county, state, or federal level.

As most of the historic sites worthy of interpretation/preservation are old townsites, steps should be first taken to determine whether they were ever patented, and if not, governmental agencies should first attempt to preserve and interprete these sites while inviting the surrounding claimholders/owners of important historic mining properties to voluntarily become a part of an interpretive program with the town. Then, depending on the resources of the agency, abandoned millsites and land deeded to the state for unpaid taxes could be obtained for interpretive purposes and perhaps even outright purchase/donation of additional historic property would occur once the successful interpretation of the town was under way.

Where a historic mining camp is situated near a valuable mineral deposit, the camp should be interpreted while still allowing mining. New mining operations could help maintain existing buildings rather than degrade them. Since at present the BLM has difficulty protecting most historic sites found on the public domain, a mining company with employees or a watchman on site is a deterrent to vandals. Many camps currently are protected by watchmen, since owners obviously don't want valuable equipment stolen. As these owners feel they have a mineral property worth developing, history and mining can exist side by side. Since the site is honoring the history of mining, mining operations at or near the historical sites would be entirely appropriate, and would lend a sense of realism to the area.

On those sites not selected for interpretation, owners and mining companies should be encouraged to develop interpretive programs and/or protective measures for historic stuctures and areas under their ownership, and idealy should advise the BLM before conducting any operations that may seriously endanger the historical integrity of a site so that salvage archaelogical digs could be performed. Companies and owners should cooperate with historical societies in jointly conducting an historical archaeological survey and inventory of historical values on or within their

property. This can be achieved by pointing out that such actions would be good public relations for the owners, claimholders and companies involved. The BLM should grant the permits necessary to conduct such archaeological research on sites in the public domain.

The story of mining in the California desert could be a valuable historical experience for the American people. It is a story that needs to be interpreted and presented as part of any management program of the California desert.

POSSIBLE SHOWCASE AREAS

AMARGOSA (SALT SPRING) GOLD MINE (South of Dumont Sand Dunes, San Bernardino County)

Gold 1850s

Site of first gold production in northern desert (1850).

ANTHONY MILL (Inyo-San Bernardino County)

Obscure mine may have been worked in the 1870s.

BONANZA KING MINE (Providence Mountains, San Bernardino County)

Well-preserved town; beginnings date to 1880s when the mine was in operation.

CERRO GORDO (Inyo Mountains, Inyo County)

Silver-lead, zinc 1865-1880

California's largest silver-lead mine; and responsible for much of the growth and development of Los Angeles. The townsite is well-preserved, lending itself well toward interpretive programming.

RANDSBURG (YELLOW ASTER) (Rand Mountains, Kern County)

Gold 1895-1918

The 14th largest producing gold mine in all of California; the largest in the California desert.

RANDSBURG (ATOLIA) (Rand Mountains, Kern and San Bernardino Counties)

Tungsten 1904-1945

The largest high grade scheelite deposit in the world.

RANDSBURG (RED MOUNTAIN) (Red Mountain, San Bernardino County)

Silver 1919-1929

One of the few California desert mines to flourish in the 1920s, the California Rand Silver mine produced over thirteen million dollars. Its discovery gave Randsburg its third boom, over three decades of steady mineral production.

TUMCO (Cargo Muchacho Mountains, Imperial County)

Gold 1884-1947 Tumco was the second largest mine in the United States producing gold from low-grade ore. Tumco supported a small town and had a one hundred stamp mill.

OUTSTANDING MINING SITES IN THE CALIFORNIA DESERT

BEVERIDGE (Inyo Mountains, Inyo County)
Gold 1877-1890

Inyo County's biggest gold-producing district and also its most inaccessible.

BLACK METAL MINE AND LANDING (Chemehuevi Mountains, San Bernardino County)

Silver mine discovered in 1879. Some operations until 1890. The landing on the Colorado River in 1881 was a thriving little mining camp. Black Metal Landing is now a resort on Lake Havasu. Dos Palmas in the 1860s was an important stop on the road to La Paz, Arizona. An important camping spot for prospectors. Home of Frank Coffee, local prospector.

BURTON'S CUSTOM MILL (Tropico Hill, Kern County)

Custom mill that received ore from hundreds of miners in the California desert during the 1930s until closure in 1956.

CALICO (Calico Mountains, San Bernardino County)
Silver 1880s

Large silver producer, presently a county park.

COPPER WORLD MINE/VALLEY WELLS SMELTER (South of Clark Mountain, San Bernardino County)
Copper 1868, 1898-1918

Discovered in 1868. The largest copper mine in the California desert. Mining began in 1898 and was worked on and off until 1918. The smelter was erected in January of 1899. Mining is underway at present. Vast slag pile at site of smelter and occupied structures.

COSO (China Lake Naval Weapons Center, Inyo County)
Gold and Silver 1860

Early attempt to establish mining in the California desert. Discovered by Dr. E. Darwin French's 1860 exploration party while looking for the "Lost Gunsight Mine." Ruins possibly well-preserved due to location within Naval Weapons Center.

DALE, NEW DALE, VIRGINIA DALE (Between Dale Dry Lake and Pinto Mountains, San Bernardino County)
Gold 1880s-1890s

Three mining communities that started in the late 1880s. At the Virginia Dale mine ten years ago, the cyanide tanks and ore bin were well-preserved.

DARWIN (Darwin Hills, Inyo County)
Silver-lead 1874-1883, 1916-1918, 1941-1951

Darwin was once home for fifteen hundred people during its heyday. Three smelters worked high grade ore in the late 1870s, but Darwin's greatest contributions occurred during the war years; production over thirty-seven million dollars. Little of present-day Darwin dates back to the 1870s.

GOLDSTONE (Due south of Goldstone Tracking Station, San Bernardino County)
Gold 1916, 1930s

A 1916 boom town, probably never very large. Some structures, probably built in 1930s still stand.

GREENWATER (Black Mountains, Inyo County)
Copper 1904-1907

Stock speculation in this boom camp indirectly caused the panic of 1907 and was labeled "the monumental mining stock swindle of the century."

HART (Castle Mountains, San Bernardino County)
Gold 1908-1910

Boom town of 1908-1910. No remains left.

IRON CHIEF/EAGLE MOUNTAIN (Eagle Mountains, Riverside County)
Gold 1900s, Iron 1940-

Was an important producer of gold at the turn of the century. In the late 1940s it became the center of Eagle Mountain Iron Operations, the biggest West Coast iron mine.

IVANPAH (New York Mountains, San Bernardino County)
Silver 1870-1890

Rich silver camp that existed from 1870-1890, which peaked about 1880-1881. Reportedly no remaining structures.

KRAMER (BORON) (Boron, Kern County)
Borax 1927 to date

The largest and highest grade borax deposit in the world. Discovered in 1913 but no real production until 1927, when all operations were transferred here and new Ryan was closed.

KRAMER (Kramer Hills, San Bernardino County)
Gold 1885, 1899, 1926.

Site of three goldrushes, 1885, 1899, 1926. No remains.

LOOKOUT (Lookout Mountain, Inyo County)
Silver-lead 1875-1880

Best preserved of the silver-lead boom towns of the 1870s. Developed by Senator George Hearst, its charcoal kilns in Wildrose Canyon are a popular attraction in Death Valley. Lookout should be preserved and interpreted to compliment the story of the kilns.

MACEDONIA (COLUMBIA) MINE (Providence Mountains, San Bernardino County)
Silver 1860s, 1900s

Silver mine active in 1860s and early 1900s. Well-preserved ruins nearby.

MIDLAND (between Little and Big Maria Mountains, San Bernardino County)
Gypsum 1925-1973

A company town, 1925-1973, adjacent to operations of U.S. Gypsum Company. Peak employment of four hundred. Only a few foundations exist.

MOJAVE (Soledad Mountain, Middle Butte, Kern County)
Gold 1933-1943

Rich discoveries in the 1930s that produced millions. The Silver Queen Mine, discovered 1933 and yielded ten million dollars. The Cactus Queen Mine, discovered 1934 and yielded four million dollars.

MOUNTAIN PASS MINE (South Clark Mountain, San Bernardino County)
Rare earths 1950s to date

Mine owned by Molybdenum Corporation of America that is the largest known deposit of rare-earth minerals in the world.

NEW YORK/SAGAMORE MINE (New York Mountains, San Bernardino County)
Silver 1873-1890

Reportedly the site of the first milling works in the California desert, It started December 1873. Mined for silver on and off until 1890.

NILAND CO_2 FIELDS (Niland, Imperial County)
Carbon Dioxide 1927-1954

Carbon dioxide gas field located at the southeastern end of the Salton Sea. An important economic asset of Imperial County in the 1930s. Also, Section 10, Township 11S, Range 13E SBM is the site of the first drill hole to test the commercial potential of geothermal steam in Imperial County.

ORO GRANDE (North of Victorville, San Bernardino County)
Silver 1880-1892

Now site of extensive limestone mining and milling complex. Well-preserved cabins and a headframe exist on flanks of Silver Mountain.

PANAMINT (Surprise Canyon, Inyo County)
Silver-lead 1873-1877

A famous boom camp developed by "silver senators" Jones and Stewart. Ruins of a twenty-stamp mill and a number of foundations still stand.

POTHOLES AREA (Southeastern Chocolate Mountains, Imperial County)
JACKSON GULCH (Cargo Muchacho Mountains, Imperial County)
Placer gold 1780-1781

First gold production by the Spanish in California prior to the U.S. acquisition of the area.

PICACHO (Southeastern Chocolate Mountains, Inyo County)
Gold 1879-1910

Part of the oldest mining region in the California desert, a four hundred and fifty ton mill employed seven hundred men and was possibly the largest cyanide plant in America. Picacho mine produced approximately fifteen million dollars.

PLEASANT CANYON (Pleasant Canyon, Inyo County)
Gold 1890- 1920

Important gold producing area in the late 1890s to early 1900s and in the 1930s. The mining camp at the Radcliffe Mine (Clair's Camp) is well-preserved. An excellent ball mill and stamp mill are still standing. World Beater Mine also well-preserved.

RED CLOUD MINE (Chuckwalla Mountains, Riverside County)
Copper 1880s, 1899-1902, 1910s

This mine may have been discovered in the 1860s. Worked in late 1880s, 1899-1902 and prior to World War II. Extensive remains exist of smelter that was probably never completed.

RYAN (NEW) (Greenwater Range, Inyo County)
Borax 1915-1927

Low grade borax deposits developed and mined until the Kramer discoveries went into production. Once served by a narrow-gauge railroad, it has a remarkably well-preserved townsite and mines.

SALINE VALLEY (SALT) DEPOSIT (Saline Valley, Inyo County)
Salt 1911-1930s

An exceptionally pure grade of salt developed by one of the steepest tramways in the United States. (The tramway is already on the National Register.)

STEDMAN (South of Ludlow, San Bernardino County)
Gold 1902-1910

Sizeable mining community flourished from 1902-1910. No buildings were standing in 1970. Mining has been under way on and off since 1972 at the Bagdad-Chase Mine.

TECOPA (Northern Kingston Range, Inyo County)
Silver 1865-1890s, 1940s- 1954

Silver mines first located in 1865 that have produced over three million dollars. Operated later by the Anaconda Mining Company, this district with Darwin was among the top silver-lead producers in the state.

VANDERBILT (New York Mountains, San Bernardino County)
Gold 1891-1893

A sizeable mining community existed here for about two years from 1891-1893. No remains are reported to exist. Mining has been under way on and off since 1968.

SITES LISTED BY CHRONOLOGY

1780-1820	Potholes Area/Jackson Gulch, Picacho.
1820-1850	Cargo Muchacho Mountains area.
1850-1860	Coso, Macedonia, Cerro Gordo, Tecopa, Amargosa, Copper World.
1870s	Anthony Mill, Beveridge, Darwin, Ivanpah, Loolout, New York, Panamint.
1880s	Calico, Bonanza King, Tumco, Black Metal, Dale, Kramer, Picacho, Red Cloud, Oro Grande.
1890s	Randsburg, Dale, Mojave, Pleasant Canyon, Vanderbilt.
1900s	Atolia, Greenwater, Hart, Eagle Mountain, Stedman.
1910s	Goldstone, Ryan, Saline Valley Salt.
1920s	Red Mountain, Boron, Kramer, Midland, Niland.
1930s	Burton's Custom Mill, Mojave.
1940s	Eagle Mountain, Tecopa, Darwin.
1950s	Mountain Pass, Boron.

SITES BY COUNTY

Imperial	Riverside	San Bernardino	Inyo
Tumco	Eagle Mountain	Red Mountain	Cerro Gordo
Potholes	Midland	Atolia	Beveridge
Jackson Gulch	Red Cloud	Bonanza King	Coso
Picacho		Amargosa	Darwin
Niland CO_2		Anthony Mill	Greenwater
		Black Metal	Lookout

	San Bernardino	*Inyo*
	Calico	Panamint
	Dale, New Dale	Pleasant Canyon
Kern	Hart	Ryan
Randsburg-YA	Ivanpah	Saline Valley
Burton's Mill	Kramer	
Boron	Macedonia	
Jolliver	Mountain Pass	
Mojave	New York Mine	
	Oro Grande	
	Stedman	
	Vanderbilt	

RESEARCH POTENTIAL OF SITES

The following is a rating of the probability of finding needed important new information about the site's history through an historical archaeologic investigation of the site. The ratings are: H= High, M= Medium, or L= Low.

Sites with high ratings:

Amargosa	Anthony Mill	Beveridge	Coso
Hart	Ivanpah	Jolliver	Lookout
Macedonia	New York	Oro Grande	Potholes/Jackson Gulch
Picacho	Stedman	Vanderbilt	

Sites with medium to high ratings:

Cerro Gordo	Greenwater	Pleasant Canyon	Tecopa

Sites with medium ratings:

Bonanza King	Tumco	Black Metal	Copper World
Kramer	Niland CO_2	Panamint	Red Cloud
Saline Valley Salt			

Sites with a low to medium rating:

Yellow Aster	Atolia	Red Mountain	Dale, New Dale
Darwin	Eagle Mountain	Mojave	

Sites with a low rating:

Burton's Mill	Calico	Goldstone	Boron
Midland	Mountain Pass	Ryan	

RANKING OF SITES ACCORDING TO PUBLIC SIGNIFICANCE

Public significance is the adaptability and desirability of a site for interpretive programming as showcases and the site's importance in portraying a part of the history of mining in the California desert. Each site was rated according to its accessability, uniqueness (how representative it was of its period) and to a lesser extent, the amount of preserved structures on the site. The site rating was done on a 1 to 5 scale, 5 being the rating for a site with a high degree of adaptability, 3 for a medium degree, and 1 for a low degree. These same figures can be used to assess whether a site is of local (1-2), regional (2-3), statewide (3-4), or national (4-5) public importance.

Site	Rating	Site	Rating
Burton's Custom Mill	5	Coso	3.2
Calico	5	Saline Valley	3.2
Red Mountain	4.8	Anthony Mill	3
Yellow Aster	4.8	Black Metal	3
Atolia	4.2	Darwin	3
Cerro Gordo	4.2	Greenwater	3
Ivanpah	4.2	Panamint	3
Lookout	4.2	Picacho	3
Macedonia	4.2	Pleasant Canyon	3
Ryan	4.2	Tecopa	3
Amargosa	4.1	Jolliver	2.8
Copper World	4	New York/Sagamore	2.8

Mojave	4	Dale, New Dale	2.6
Tumco	3.8	Hart	2.6
Niland CO_2	3.8	Vanderbilt	2.6
Potholes/Jackson Gulch	3.8	Goldstone	2.4
Bonanza King	3.5	Beveridge	1.8
Eagle Mountain	3.4	Midland	1.8
Boron	3.4	Red Cloud Mine	1.5
Kramer	3.4		

SITE RANK ACCORDING TO LEGAL SIGNIFICANCE

Legal significance is the relative importance of the site (local, regional, statewide, or national). It is also a gauge of the relative ease with which the site could be nominated to the National Register of Historic Places.

Using each of the six points (production, mining and milling processes, personalities, pioneering, promotion and uniqueness) the sites were rated on a 1 to 5 scale. The average of all six areas is the legal significance rating. On a 1 to 5 scale, 1 represents an area of local significance only, and probably could not be nominated to the National Register. A rating of 2 through 3 represents a site of regional significance and probably could not be nominated to the Register. A rating of 3 through 4 represents a site of possible statewide significance, and some sites in this range could be nominated to the National Register. A rating of 4 through 5 represents sites of possible national significance and probably should be nominated to the National Register.

Site	Rating	Site	Rating
Cerro Gordo	4.3	Amargosa	3
Tumco	4.25	Anthony Mill	3
Bonanza King	4	Atolia	3
Lookout	4	Red Mountain	3
Macedonia	4	Dale	3
New York/Sagamore	4	Eagle Mountain	3
Oro Grande	4	Jolliver	3
Panamint	4	Boron	3
Saline Valley	4	Mountain Pass	3
Stedman	4	Niland CO_2	3
Greenwater	3.7	Vanderbilt	3
Yellow Aster	3.7	Radcliffe	2.7
Coso	3.7	Mojave	2.7
Burton's Mill	3.5	Beveridge	2.3
Copper World	3.5	Kramer	2
Ivanpah	3.5	Black Metal	1
Darwin	3.4	Goldstone	1
Picacho	3.3	Hart	1
Ryan	3.1	Midland	1
Tecopa	3.1	Red Cloud	1

GLOSSARY OF MINING TERMS

ADIT. The "entrance" to a mine. A horizontal or nearly horizontal passage driven from the surface for the working of a mine. If driven through the hill or mountain to the surface of the opposite side it would be called a tunnel.

AMALGAM. (a) An alloy of mercury with one or more metals. (b) The pasty amalgam of gold and mercury, about 1/3 gold by weight, obtained from the plates in a mill treating gold ores.

ARRASTRE, ARRASTRA. A circular rock-lined pit in which broken ore is pulverized by stones attached to horizontal poles fastened in the central pillar and dragged around the pit.

ASSAY. The chemical testing of ores or minerals for their percentage and worth of valuable elements.

ASSAY FURNACE. Usually situated near the opening of mines for assay of ore.

BALL MILL. A rotating horizontal cylinder with a diameter almost equal to the length, supported by a frame or shaft in which ore is ground. Cast or forged iron or steel balls are used to finely grind ore previously crushed in a primary crusher (eg. a jaw crusher).

BULL QUARTZ. A worthless iron-stained quartz that gives the appearance of containing mineral values.

BULLION. (a) A semi-refined alloy containing sufficient precious metal to make recovery profitable. (b) Uncoined gold or silver in the shape of bars, ingots or comparable masses.

CHILEAN MILL. A mill having vertical rollers running in a circular enclosure with a stone or iron base.

CHLORIDING. A method of extracting gold from its ore by injecting chlorine gas after milling and roasting.

CRUCIBLE. A refractory vessel for melting or calcining metals, ores.

CUPEL. A small shallow cup about ½ inch wide and ½ inch high made of bone ash used in gold or silver assaying with lead in a furnace. After intense heat is applied, the bone ash absorbs the liquid lead, leaving a "button" of gold or silver.

CYANIDING. The process of treating finely ground gold and silver ores with a weak solution of sodium or potassium cyanide, which readily dissolves these metals. The precious metals are obtained by precipitation from solution with zinc. Came into general use about 1900.

CYANIDATION VAT. A large tank with a filter bottomin which sands are treated with sodium cyanide solution to dissolve out gold.

DRIFT. An underground working.

DRY WASHER. A machine for extracting gold from dry gravel. Consists of a frame in which there is a rectangular bellows made of canvas; the upper part of the bellows is set at an angle upon which are riffles. Gravel is screened and as it falls on the riffles, bellows blow the dust from gravel passing over the riffles. The gold is caught behind the riffles.

DUMP. (a) A pile or heap of waste rock material or other non-ore refuse near a mine. (b) A place where ore considered too low grade to ship is stored.

FAULT. A break in the continuity of a body of rock accompanied by a movement on one or both sides of the break, so that veins or stratum in the rock are no longer continuous.

FLOAT. Pieces of rock which have broken off from a vein outcrop and have been deposited in gullies, usually downhill from the parent vein.

FISSURE. A cleft or crack in the earth's crust that has been filled with mineral bearing gasses and liquids from deep within the earth that have since solidified.

FREE-MILLING. Applied to desribe ore containing gold that can be recovered from the gangue by simple crushing and recovery, or gold ore that does not need roasting or chemical processes to free it.

GRUBSTAKE. A financial "loan" in the form of supplies, food or money to a prospector with the understanding that the creditor will receive a share in any mines the prospector may locate.

GANGUE. The non-commercial values present in ore.

GLORY HOLE. A large open pit containing high concentrations of ore; or extensively mined out workings of an underground mine that have become an open pit due to caving.

HEADFRAME. The steel or timber frame at the top of a shaft, which carries the pulley for the hoisting cable.

HIGH GRADE. Ore of exceptional richness.

HIGH GRADING. The act of stealing from the mine an exceptionally rich piece of ore for monetary gain.

HYDRAULIC MINING. The process by which a bank of gold-bearing earth and rock is excavated by a jet of water, discharged through the converging nozzle of a pipe, under a great pressure, the earth or debis being carried away by the same water through sluices. The only place in the California Desert where this type of mining probably would have been possible is Picacho.

JAW CRUSHER. A primary crusher designed to reduce large rocks or ores to sizes capable of being handled by a secondary crusher. Consists of a moving jaw hinged at one end which swings toward and away from a stationary jaw.

LANE MILL. A slow-speed roller mill of the chilean type. A horizontal spider carrying six or more rollers revolves slowly in a pan ten feet or more in diameter making about eight revolutions per minute.

LEACHING. The washing, dissolving or draining by percolation of minerals from ores by chemical solutions or water.

LODE MINING. The mining of a tabular deposit of valuable mineral between definite boundaries, usually in a vein or fissure.

ORE. A natural mineral compound of the elements of which one at least is a metal. Applied more loosely to all metalliferous rock, and occasionally to the compounds of non metalic substances, as sulphur ore.

ORE BIN. A well constructed steel, wooden or concrete receptacle for ore awaiting treatment or shipment.

ORE CAR. A cart for carrying ore or waste rock.

ORE CHUTE. An inclined passage, from 3 to 4 feet square, for the transfer of ore to a lower level.

OUTCROP. The point of surface exposure of a vein.

OVERBURDEN. Non-commercial ore material, country rock, covering a vein.

PLACER DEPOSIT. A mass of gravel, sand, or alluvium containing valuable minerals deposited in gullies and ancient stream beds by the erosion of veins located upstream or upwind.

PLACER MINING. The extraction of a heavy mineral usually gold or platinum, from a placer deposit by concentration in running water, utilizing a gold pan, sluice box, cradle or other device.

PLATE AMALGAMATION. Use of copper or copper-alloy plates coated with enough mercury to form a soft adherent film, in order to trap gold from crushed ore pulp as it flows over the plates. The resulting amalgam, containing up to some 40 percent of metallic gold is periodically scraped off and more mercury is added to the film.

PROSPECT. A claim upon which tests are being conducted or shafts sunk in hopes of finding a mineral bearing vein.

RETORT. The vessel where mercury is distilled off from gold or silver amalgam.

RIFFLES. Transverse bars in a cradle or sluice to trap heavy minerals. Riffles are also fixed on concentrating tables to catch coarse gold, tin or other heavy mineral.

SHAKER TABLE. (concentration table) In concentration of finely crushed ores by gravity, a rectangular deck with longitudal riffles. This is shaken rapidly in such a way to move sands along, while they are exposed to the sweeping action of a stream of water flowing across the deck, which is tilted about its long axis.

SHAFT. A vertical or steeply inclined excavation or opening.

SHOOT. An enlongated body of ore, usually richer than the rest of the vein.

STAMP MILL. A machine consisting of a crushing member which is dropped on a die, the ore being crushed in water between shoe and die. The crushing space is surrounded by a mortar box which is equipped with a screen to regulate the size of discharge. Amalgamation is usually combined with crushing when gold or silver is the metal sought.

STOPE. The excavation left after mining an ore shoot.

TAILINGS. (a) Those portions of washed ore that are regarded as too poor to be treated further; used especially on the debris from stamp mills or other ore-dressing as distinguished from material (concentrates) that is to be smeltered. (b) Also applies to sectional residue, for example, table tailings, which is the residue from shaking screens and tables.

VEIN. (a) A zone or belt of mineralized rock lying within boundaries clearly separating it from neighboring rock. (b) A fault, fissure, or crack in neighboring rock which was filled by minerals in a gaseous state rising from deep within the earth, then cooling.

WINZE. An underground shaft (vertical or horizontal) having no outlet to the surface, but usually connecting one or more levels.

WHIM. A large capstan or vertical drum turned by horsepower or steampower for raising ore from a mine.

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