

Chapter Eight

A History of Placer Mining in Arizona

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A Few Observations

The technology for mining placer gold has been in use since civilization rooted itself over 3,500 years ago. The tools are simple; a stick is used for digging and a scraper is used to transfer material to a calabash where it is washed and the gold recovered. These primitive methods are still in use in some of the third world countries, unchanged by technological advancements.

Recently, in West Africa, depression and a sharp drought, brought about a revival of placer gold mining.

The combination of depression and placer mining are bringing major economic and political reforms to West Africa. This same combination has led to socio-economic reform throughout history.

It is not the discovery of gold that sets off a gold rush but the conditions which make gold valuable. The gold of West Africa has been mined for centuries. The 1849 gold discovery in California was no secret to the Spanish and Mexicans, they had been mining gold in California for over a century¹³. The gold deposits in Arizona and New Mexico were also known or taken for granted. Gold mining is started during times of economic distress and it remains profitable so long as credit is unavailable or overpriced.

Since the value of paper money is based on faith, it can be said that gold mining is based on fact. The fact is that simple technology and low capital requirements make placer mining the poor man's way to produce gold for survival when nothing else holds its value.

Spanish Explorations

Coronado's exploration of Arizona in the 1540's was a search for gold. This would have been placer gold since it was fairly well established that the native North Americans had no tradition of advanced mining technology.

The Coronado exploration was a typical gold fever promotion. It was started with a wild tale of large amounts of gold in an area that no one had seen. It was promoted by people who were provided great hospitality in exchange for a golden story. The story was perfected with numerous tellings until it was fit for a king. The clergy was used to corroborate the information. The prime originators were dropped from the program because they had designs on a share of the fortunes. The monies appropriated for the expedition were carefully guarded by accountants and

technical expertise was carefully avoided. Staffing for the expedition consisted almost entirely of unlanded gentlemen, family members of political friends, a few green soldiers and clergy.

The expedition failed to find even the first nugget. Coronado was never paid for his efforts in the "Glory of God and the King of Spain". He was never given another expedition and died a failure in the eyes of all Mexico.

Had his expedition been staffed with prospectors, miners and technical types, who can say how many deposits he would have discovered as he passed through these mineralized lands.

His failure discouraged further exploration of the Pimeria Alta for two centuries and this was probably one of the reasons why it was so poorly colonized before the Mexican-American War.

There were, no doubt, a few clandestine exploration efforts during the Period 1550 to 1700, but these were undocumented. If these efforts existed, they were without the approval of Spanish rule. They would also have been untaxed, unprotected and directed primarily at placer mining because of the ease of operations and the adaptation of local labor and materials.

Working in remote regions is an exercise in logistics. Although the trails into the area were well established as trade routes by the Indians, they were not sufficient for the transport of heavy mining equipment. Buying or otherwise acquiring the equipment for a major mining operation would attract the attention of the Spanish military intelligence and this would certainly bring about the much dreaded taxation.

Prospecting was necessarily limited to those areas where the Indians were friendly and water was available. With these limitations, it is doubtful if early Spanish activity ever accounted for more than a few ounces of production.

Kino and the Jesuits

Father Kino is said to have brought peace and development to southern Arizona in 1700. His goals were directed toward agricultural development rather than mineral interests. The entire Jesuit campaign in Pimeria Alta did not document any great amount of mineral activity, either placer or hard rock. In all, the Jesuit influence was limited geographically. Most of the remaining "Spanish Missions"

in the southwest are Franciscan, the Jesuit missions having been built over or having failed. Where the Jesuit missions have been excavated they reveal the stark rigidity of Jesuit architecture which reflected their Spartan preachings and strict adherence to the doctrine of poverty.

The Franciscans

When the Jesuits left Arizona in the 1760's they were replaced by the more worldly Franciscans. From about 1772 to 1822 a lasting peace was brought about by strict regimental accord from the king of Spain. The Royal Regulations¹ of 1772 established a system of presidios along the northern frontier. These presidios provided some protection for mining operations. With the first successful Mexican Revolution in 1822 the military support was suspended and the mining industry dropped back behind the settled areas.

There are few reports of mining activity from that era. A 1777 report was translated and reprinted in the Yuma Sentinel of April 13, 1878, according to one of Bancroft's prolific footnotes².

The article describes the rich veins in the area of Aribac, and the placers of the Babocomori valley which were evaluated by Jose de Toro. This was probably the Baboquivari and the Quijotoa Placers.

The Quijotoa Placers^{3,4} still have a high potential for gold production. They cover an area of about 100 square miles, extending into Mexico. They were being worked in 1774 and produced some gold from dry washing operations. The placers are perched high and dry above the valley floor. The only water available in the district is from a few small springs and wells. The gravels, which are quite deep and somewhat cemented, require considerable scrubbing to achieve liberation. They have never been scientifically explored or worked by modern methods. They are totally within the Papago Indian Reservation, but are partially covered by claims which were staked before the reservation was closed. Some of these claims have never been invalidated by the BLM or the BIA. The Indians and the claim holders are fighting over every drop of water in the district. Here is the potential for millions of cubic yards of gold bearing gravels, but, until the land and water problems can be resolved these placers will remain a tease to the placer explorationist.

The footnote also cites de Anza of 1774 as saying nuggets of considerable size had been found at Aribac. These were apparently the Arivaca Placers described by Wilson⁵. The deposits here consist of a few inches of rich gravel covered by several feet of barren conglomerate. They were worked by sinking pits to bedrock and working the gravels through dry washers. The total placer production of the district for the Spanish period was probably quite large, but Tenney's conservative estimate of 50,000 ounces is all that can be made.

During this time of peace, exploration covered a vast area. The first American explorers into the area gave reports of "antiguas"⁶ in the Oro Blanco, Sierritas, Tucson, Patagonia, Santa Rita and Catalina Mountains. Most of these operations were described as small placer mines and hard rock silver mines⁷.

The American Pioneers

Beginning with the Gadsden Purchase in 1854 Americans (mostly from San Francisco) began to open mines in Arizona. The phrase "Eastern capital was enlisted"⁸ aptly describes the activities of Poston and Mowry in forming companies, building mills and putting mines into operation. Until 1861 mining in Arizona was promoted and developed with considerable success.

These prospects were sharply interrupted by the civil war. The Arizona troops were withdrawn and given the order "to destroy everything within one hundred miles of their route which might support an army". This retreat was taken as a triumph by the Apaches and they immediately launched a campaign of death and destruction upon the remaining white settlers. Mining properties were plundered and destroyed, miners were killed, and work in the area was almost totally suspended¹⁰.

During this period, however, the placers on the lower Gila were worked. They were discovered by Jacob Snively in September of 1858 and during the next four years they were worked by over 1,000 miners. They were never entirely abandoned and there still is some activity in the district at the present time. As the area became more populated and started attracting the attention of the recruiting officers from both North and South, several parties of prospectors struck out on their own.

In January of 1862, the La Paz, Olive City, and Ehrenberg placers were discovered and attracted a crowd of Californians. They avoided conscription at these diggings for several years and produced a substantial amount of coarse gold.

The principal methodology used at these locations was dry washing followed by hauling the concentrates to water or the water to the concentrates. This proved to be too tedious for the Americans, and under the leadership of Pauline Weaver, a party pushed their prospecting efforts north and east to discover the Weaver and Rich Hill Placers in 1863.

According to Wilson⁹, the Weaver party camped at the base of Rich Hill. There is seasonal water in Antelope Creek and several areas with good grass and fuel. A member of the party, while looking for a stray animal discovered loose nuggets near the top of Rich Hill. Since Rich Hill is a near solid rock outcrop, it is an unlikely placer prospect. The burro had obviously drawn the party to the top of the hill to share his instinctual discovery with his masters. The ability of the burro as an adept prospector is well documented. There are any number of recitations where a donkey is credited with a valuable discovery, among these are Tonopah, Nevada and the Coeur d' Alene. The point of this discussion is that any "stupid ass" should be able to find a gold deposit.

The amazing thing about the Weaver discovery is that a placer deposit and a large one was found on the top of a mountain. Rich Hill is a coarse grained granite; its well scrubbed surface has little gravel. The discovery of gold in this unlikely place originated the expression that "Gold is where you find it" and this discovery voided all previous attempts to turn placer geology into a science.

This discovery was expanded to include Weaver and

Antelope Creek. During the first five years about 25,000 ounces of fine gold were scratched from under boulders and crevices of this rocky monolith. By 1883 the yield of the district was estimated at 50,000 ounces and the total yield to date is probably in excess of 100,000 ounces.

The gravels of the Weaver District are notorious for their boulders. Most of these boulders could not be handled by the old timers without blasting. The cost of blasting could not be supported and much of the area was not well worked.

Recently I reviewed the Rich Hill deposits. I believe the deposits to be a residual placer with gold weathered out of the many small lenticular quartz veinlets.

Currently there are several operators in the Weaver District applying modern equipment to the boulder problem. LaPaz Mining has had an ongoing operation in the district which has made our local Caterpillar dealer very happy.

Weaver's discovery at Rich Hill was simultaneous with the Walker⁴ party's discoveries in the upper Hassayampa area. The Walker expedition began when Walker and eighteen companions left Keyesville, California in 1861 on one of the most incredible adventures in American history.

Joseph R. Walker, a mountain man, trapper, military guide, gold miner and obvious promoter, convinced his following to suddenly leave the comforts of Keyesville with little more than the clothes on their backs. The reasons for this ill prepared and hasty departure was to avoid the recruiting officers of the South and the soldiers of the North.

On their journey they traveled a route not easily followed. They crossed Death Valley without water, went up the Colorado River, and after prospecting in Colorado, traveled south on the Santa Fe Trail through New Mexico. They finally crossed hostile Apache lands and escaped into central Arizona. Through a deliberate effort on their part they increased hostilities with most of the Indian nations that they contacted. Eventually, they participated in the betrayal and murder of Mangas Coloradas. After prospecting the Gila, Salt, Santa Maria and Hassayampa Rivers they discovered the placers of Lynx, Humbug, Big Bug and Turkey creeks south of present day Prescott. The Walker mining district was established on May 10, 1863, only two years after their California departure.

During the next few years the Walker party extended their discoveries to include the rich gold and silver veins of the district.

These efforts by the Walker Party gave Arizona the promise of a permanent mining industry. When the territory of Arizona was organized in 1864 and 1865, Prescott in the Walker district was made the first territorial capital.

In the years following 1865, the district made several attempts at major placer production. Most of the placer dredging and hydraulic activity in Arizona was concentrated around the Walker-Big Bug districts. Most ended in financial failure. A few were successfully worked for a number of years and left dredge tailings for several miles. Most of the gravels in the district have been worked at least once. During the 1930's, when gold sold for \$35.00 per ounce and a day's pay was \$2.00, placer mining was again the means of survival and most of the district was reworked.

In recent years the district has seen renewed placer activity. Several new starts and reworking operations have been conducted in the district and at the present time nearly every placer property in the district is either being worked or promoted. There is a continuing battle with the environmental forces in the district. It is a running battle to see if an old tailings pile can be preserved as a historical site or primitive area before it can be mined.

The Frontier

During the Apache wars, the Civil War and for several years thereafter, mining and prospecting in Arizona was perilous. Capital formation was difficult but many men made a living by working placers and small veins in the most primitive manner. Every military expedition during this time was also a prospecting trip. The general attitude of the investor was to wait for the defeat of the Apache and the return to peace.

Peace came, in pieces, but capital in Arizona was still limited. There was no money for expanding operations and the cost of bringing equipment to Arizona was prohibitive. The general attitude of the investor changed to one of waiting for the railroad.

The railroad crossed Arizona in 1878 and 1880, but did not put an end to the high freight rates. As Myrick⁵ so aptly puts it "The protectionists . . . who sought to preserve the economic integrity of the . . . Railroad", kept rates high and unaffordable. The investment attitude changed to one of lets see what everyone else does.

After many years of little interest, the Bland-Allison Act of 1878 remonetized silver and made it respectable. The smart money of that time was invested in silver mining and since silver will not form placer deposits, gold placer operations were largely ignored. During the financial panic of 1893 silver was again demonetized and gold mining became a legitimate enterprise although it was being overpowered by the copper boom.

The Gold Mine Promotion Era

The depression which held the U.S. at the turn of the century provided a major opportunity for gold mining. Dunning⁶ describes the period as "the Gold Mine Promotion Era". It was one of those wild and crazy times when the federal government let business roll without restraint. There was no Securities and Exchange Commission and a public stock could be floated on any issue.

With fixed gold prices and the prices falling for most other commodities, an investor can shift his money into gold and it will hold its value (so the theory goes). Some of the golden opportunity money of the time went into placer gold mining.

Greaterville in the Santa Rita mountains south of Tucson is an example of the excitement in placer mining during this period.

The deposits were discovered³ in 1874 and a small rush started. With streams that run only during the rainy season and little ground water, only the richest gravels could be mined. These rich gravels were exhausted by 1890 and by 1896 the district was all but deserted.

In 1905 the Santa Rita Water and Mining Company started a large hydraulic mine on its 2,000-acre property.

The water delivery system consisted of several miles of ditch and pipe lines connecting the area to the system of dams in Gardner and South Canyons. These operations were successful and the company was eventually acquired by Gadsden Purchase, Inc. The capital required for this scheme could not have been formed at an earlier time.

Other hydraulicing efforts in the area included an operation at the junction of Kentucky and Boston gulches. The operation was said³ to have been sluiced with water having 125 feet of head and delivered to the property through an eight mile pipeline. The water was obtained from the "first canyon south of Gardner Canyon". Other efforts in the district included a one-ton steam shovel and a conical concentrating plant. Although, none of these efforts were successful for long the investment and technology represent a period of dynamic growth.

During the depression the district was again worked but on a smaller scale. In 1948 the Pima Placers Company worked in the district with a dragline and a portable washing plant. For 90,000 cubic yards, this material averaged \$7.13 at today's price of \$450 per ounce. The inflationary period following WWII ended most of the gold placer mining efforts in North America. With the gold prices fixed and rapidly raising inflation, the operations soon became unprofitable.

There is still potential for placer production from this district which is credited with 50,000 ounces, which is probably a gross under estimation.

The Great Depression

During the depression of 1928 to 1942 gold mining activity in Arizona started on an upswing that was unparalleled by any other industry. At a time when there were no jobs and \$2.00 was considered a good day's pay, a miner who could produce $\frac{1}{10}$ of ounce per day from a creek bed could buy beans for his family. A good healthy miner can shovel about 10 cubic yards of gravel per day through a conventional sluice. Two dollars at the \$20 gold price would require gravel carrying 0.01 ounces or \$0.20 per yard. The U.S. government saw the value of putting thousands of people to work in this manner and raised the gold price to \$35.00 per ounce. This nearly cut the required placer grade in half. The government also started making low interest loans to companies and individuals who were planning to start a gold mine.

Although most of the Arizona placers were reworked during the depression, the deposits around Quartzite deserve special mention. They include the Oro Fino, Middle Camp and Plomosa Placers and represent the high and dry placers of the western deserts.

In these deposits there is a rich seam of gravel lying on bedrock or on a false bedrock of well cemented gravels. This pay streak is five to 20 feet wide, zero to three feet thick and covered with five to 50 feet of cemented gravels. The gravels are extremely competent.

In the thirties, teams of miners consisting of less than five men would mine these deposits in the following manner¹²

Starting at the top of the stream where the pay streak could be found they would mine down stream until the streak ran under the overlying caliche. They would con-

tinue mining down stream under the caliche until the haul to the surface was too far. At that point they would sink a three foot diameter shaft from the surface and install a whim for hoisting.

One partner would stay on top during the mining to hoist ore and process it through a small dry washer. His partner or partners would mine the pay streak underground and take only as much of the pay streak as was suspected of having high values. Usually this underground opening was only three to five feet high, twenty feet wide and shaped as near the original channel as was practical for mining. As the workings progress down the channel, new shafts would be sunk and the old ones abandoned.

The washing operations consisted of careful screening of material to about $\frac{3}{8}$ inch by hand and carefully hand breaking of all clay balls or agglomerated gravels. Once screened, the gravels were spread out on an iron turn sheet for further drying before dry washing. Many of the dry washers used in the area are still available for inspection. The original design has been copied and is still made today.

The type described here should more properly be called a dry jig. The most popular design consisted of a screened hopper in a feed box over a steeply inclined cloth bottomed tray with cross riffles. Below the cloth bottom, bellows made from canvas or goat skins provided an intermittent or jiggling flow of air up through the cloth.

The screened and dried materials were shoveled into the feed hopper while the bellows pumped an intermittent flow of air through the cloth. The lighter materials were blown away while the heavier gold and black sand stayed trapped behind the riffles. When the riffles were loaded the tray was removed and cleaned into a tub for final washing. With this equipment two to three cubic yards of screened gravel can be washed in an eight hour day.

Once the gravels had been dry washed, the partners would take the concentrates back to town for a final clean-up with water before splitting and trading the gold. After careful panning in dirty water, the gold and some of the black sand would be dried in a clean cast iron skillet over a small fire, then poured into a small pan, bit by bit, where the black sand would be carefully blown away. A magnet would be used to pull out the last bit of magnetic sands and any remaining grains would be cleared by hand.

This weekly cycle would involve living at the mine site using only as much water as could be carried to the camp.

Through these entrepreneurial efforts in and around Quartzite and elsewhere in Arizona, several families survived the depression and even prospered.

This district still has a great potential for additional placer development. All of the gravels above the pay streaks carry some gold and not all of the pay streaks have been found or mined. Many of the old miners continued working in the district after the war. To my knowledge, there has not been one serious effort to explore the placer area with modern methods. The area lacks water although several wells in the valley have a high yield.

WWII and L-208

With the bombing of Pearl Harbor, the United States was startled into a war effort for which it had not planned. An immediate need for war materials required that all

miners in non-essential industries immediately join the service or find work in an essential industry. Public Law L-208 was passed reversing the governments previous position on gold mine incentive programs and closed all gold mines which did not provide an essential war material.

Many Arizona gold mines, both hard rock and placer, were raided for scrap iron or anything else that might be used for the war effort. This hit the mechanized placer miners particularly hard as their equipment was hauled off for scrap or recruited for mining copper, lead or some other base metal.

After the war, L-208 was repealed but the damage had already been done. While prices were inflated, gold had been fixed at \$35.00 per ounce and American gold miners had to sell their production to the U.S. Mint for this price. New or replacement equipment could not be had at any price, and without new equipment efficiency could not be improved. Few new operations were started and many more closed because they were not profitable. By 1960, essentially all gold placer mines in the U.S. were closed.

The Last Great Gold Rush

With the 1975 release of the gold price and US citizens allowed to buy, hold and sell gold as they pleased, a new gold rush was started. To show their belief that this barbaric relic had nothing to do with the value of the American dollar, the government also sold off much of its gold reserves. This sale had the effect of artificially suppressing the gold price for an additional three years. Then, amid predictions that the price of the barbaric relic would sink to \$5.00 per ounce the price suddenly climbed to over \$700 per ounce. The same congress who had OK'd the sale of gold reserves at less than \$100 per ounce three years earlier had no explanation for the increase. The result was a wild and turbulent time for the mining industry.

Gold mine tax shelter promoters suddenly appeared from nowhere. Experts claiming to hold exciting degrees in business administration from Harvard, Stanford and Yale raised millions of dollars to mine reserves which had never been sampled. Beautiful, glossy publications in color were prepared for properties that were not even mineralized. Processing plants were built for ores that did not exist or even had a process! Money was spent wildly and foolishly without producing even the first ounce of any metal.

Placer properties caught more than their fair share of this kind of promotion. In my rogues gallery, I have a collection of no less than 10 tax shelter promotions based on placer properties which have no gold, no gravel and no work!

Summary

Arizona's placer gold production is paled by that of California, Idaho and Montana, but it was the search for placer gold that resulted in some of Arizona's first established towns and some of its most colorful characters.

The total product of Arizona's placer mines up to 1900 is estimated at only 500,000 ounces. Since 1900, record keeping has been more accurate and the total placer gold from 1900 to the present is probably less than 100,000 ounces.

Estimated Production of Arizona Gold Placers Prior to 1900

Field	Production Oz.	Source
LaPaz	100,000	J. Ross Browne
Gila City	25,000	J.B. Tenney
Laguna	10,000	
Kofa	2,000	E.L. Jones, Jr.
Castle Dome	5,000	J.B. Tenney
Quartzite	25,000	
Weaver Walker	200,000	J.B. Tenney
Greaterville	35,000	J.B. Tenney
Quijota	12,500	J.B. Tenney
Total	414,500	After Wilson²

Annual Gold Production from Arizona Placers 1902 TO 1950

Year	Ounces
1902-1907	8,075
1908-1915	11,914
1916-1927	4,791
1928-1942	66,322
1943-1950	3,358
Total	94,460

This poor production record is not necessarily from poor placer deposits. Placer mining in Arizona has not been given an even chance. The water required for large scale placer operation has not been available and for this reason they have been ignored by the larger placer mining companies.

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"Gold is where you find it." Top of Rich Hill where abundant, residual gold was discovered in the intensely jointed, granite outcrops by the Weaver Party in 1863. *Courtesy of the Arizona Geological Survey.*



Early hydraulic placer operation on Lynx Creek. *Courtesy of the Sharlot Hall Museum, Prescott.*



Tunneling on bedrock at the Sandy Harris placer, above the Colorado River at Willow beach, c. 1933. Ancient stream bar contains poorly sorted aggregate. *Courtesy of the Arizona Geological Survey.*



Dry-land dredge of the Gold Gulch Mining Co., Teviston district, 1933. Rated capacity was 50 cubic yards per hour. Courtesy of the Arizona Geological Survey.



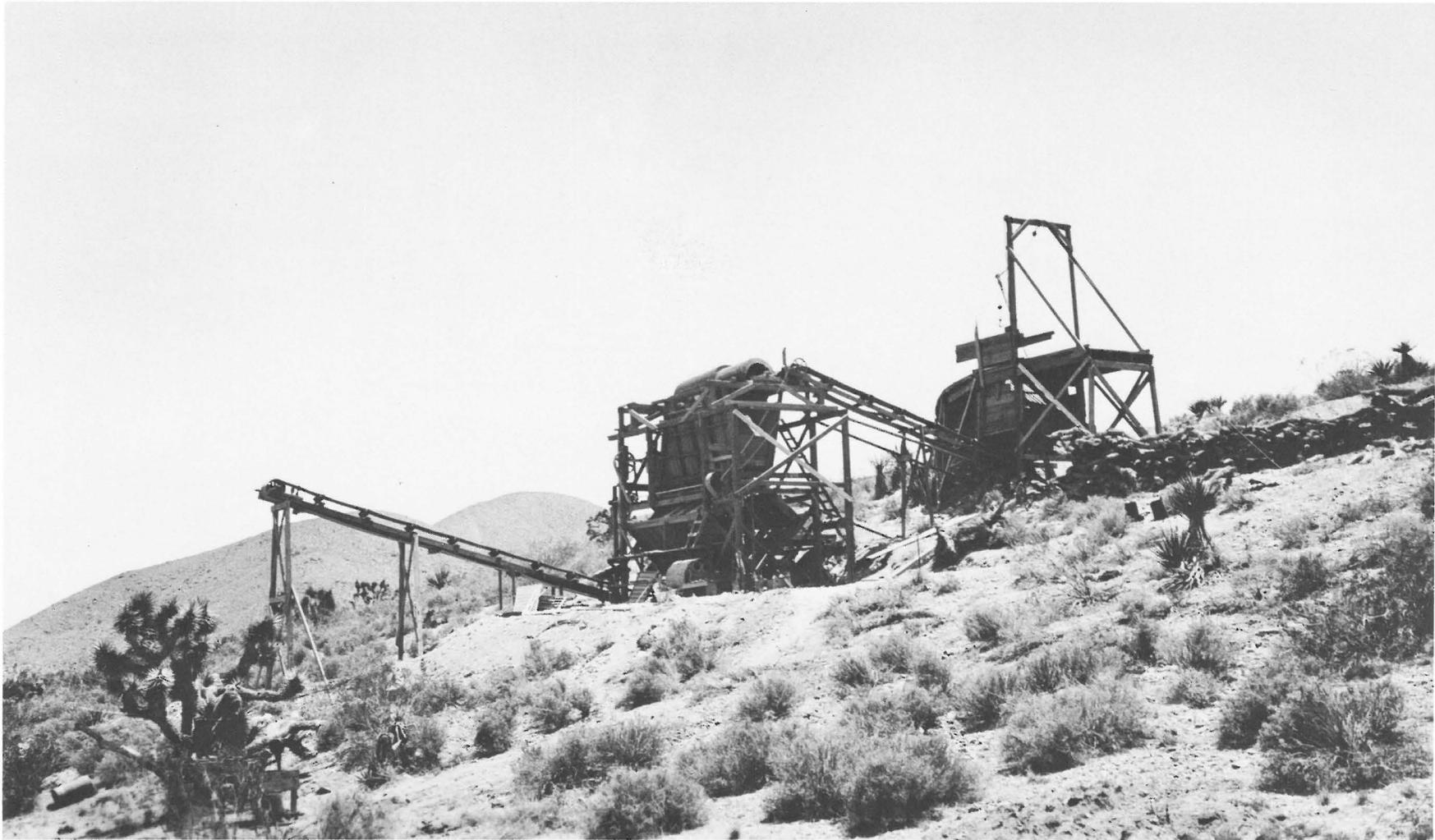
Construction of the Pantle Brothers' concentrating plant near Big Bug Creek, 1933. Requiring about 300 gallons of water per minute, the operation had a capacity of about 60 cubic yards per hour. The first 40 days produced about 45 ounces of gold. *Courtesy of the Arizona Geological Survey.*



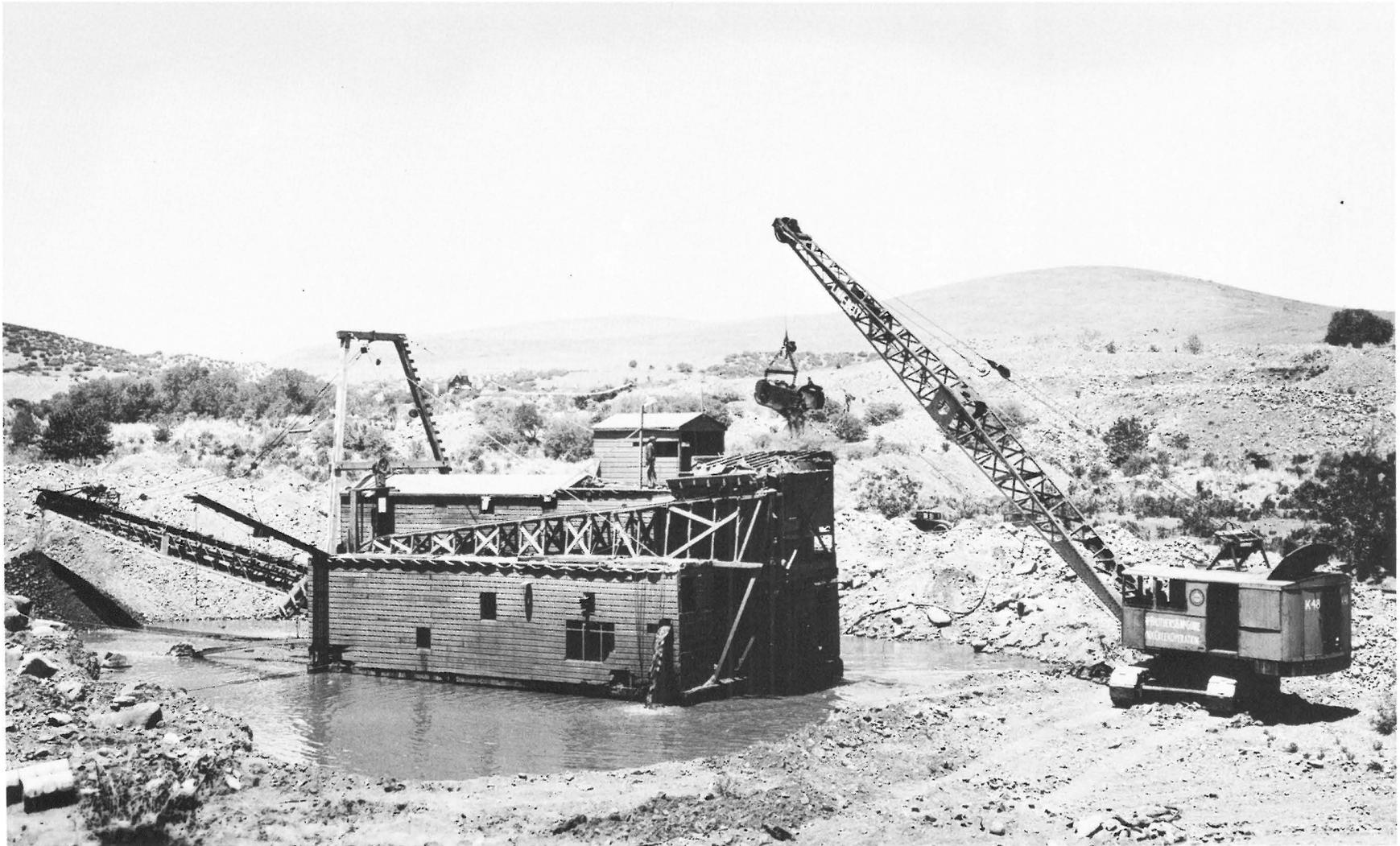
Placer miner operating a rocker in Copper Basin Wash. Fifty to sixty individuals operated rockers and small sluices in the drainage during the Depression. *Courtesy of the Arizona Geological Survey.*



A small sluice in operation on Chase Creek, Greenlee County, 1933. Courtesy of the Arizona Geological Survey.



The Searles dry-washing operation on the Gold Basin placers of Mohave County, 1933. This plant, equipped with 12 dry washers, had a rated capacity of 20 cubic yards of gravel per hour. *Courtesy of the Arizona Geological Survey.*



Dredge operated in Lynx Creek by the Calari Dredging Co., 1933. Capacity was 100 cubic yards per hour. Courtesy of the Arizona Geological Survey.

HISTORY OF MINING IN ARIZONA

EDITORS

J. MICHAEL CANTY
MICHAEL N. GREELEY

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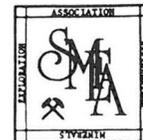


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