



California State Parks

Video Transcript



Tears From the Sun: A Story of Gold

This bar is worth twenty-five thousand dollars. It weighs one thousand ounces and is composed of a very precious metal called gold.

Down through a good many centuries, man has regarded gold as a synonym for riches and wealth, as well as a standard of monetary value. For some mysterious reason, gold has always had a strange lure and sentimental fascination for most people. Then too, it's interesting that although gold coins are no longer used as money in our country, almost every civilization on earth has used its value as a basis for their monetary systems. For centuries gold has been used in works of art. These golden idols, for example, were found in prehistoric sepulchres on the border of Columbia and Ecuador in South America. Gold is also important as decoration. These jewelry pieces, simply but beautifully done, are admired by almost everyone. In industry as well, gold takes its place as an important metal. It resists corrosion and maintains its yellow luster.

Gold is one of nature's most permanent metals. No one can foretell where gold may or may not be found. It is sometimes found in quartz veins deep in the earth, or in surface outcroppings, in the stream beds of the earth's surface—and it might even be found in the garden of your own backyard.

No doubt the earliest gold mines were the beds of running streams where ancient people obtained their supply of the precious metal by panning. This type of mining is comparatively simple and it's not uncommon today in the California Sierras to see a lone prospector trying his luck along the banks of a mountain stream.

However, on March 15, 1848, *The Californian*, a San Francisco newspaper, announced an event which set into motion the most significant mass migration of all time. The first published announcement of this epoch-making discovery of flakes of gold in the tailrace at Sutter's sawmill was only a small item in *The Californian*. Just as it was first set into type, this is what it said: "Gold Mine Found – In the newly-made raceway of the sawmill erected by Captain Sutter on the American Fork, gold has been found in considerable quantities. One person brought thirty dollars worth to New Helvetia, gathered in a short time. California no doubt is rich in mineral wealth; great chances here for scientific capitalists. Gold has been found in almost every part of the country."

Six weeks after the item appeared in *The Californian*, the paper went out of business because both the subscribers and the employees had taken off for the gold fields. The last issue ever tacked to the bulletin board carried a story to the effect that the whole country, from San Francisco to Los Angeles, resounds with the sordid cry of "Gold! Gold! Gold!"

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The river and streambeds immediately drew the enthusiastic attention of thousands of these early prospectors. An ordinary pick, shovel and pan in many instances were the only requirements of these fortune hunters. However, many of them did strike it rich.

But panning gold proved to be a slow, tedious, and backbreaking method of separating the grains of gold from the gravel and earth. The ingenious prospectors soon learned that much more gravel and earth could be washed by mechanical means, and soon the device known as the cradle, or rocker, came into common use on the streams of the Mother Lode. The rocker or cradle was a small box-like affair into which the gold-bearing gravel was shoveled. Water was then poured over this gravel as the operator rocked the cradle back and forth. The action caused the water to wash out, or separate, the heavier gold from the lighter gravels. And this gold sifted through the mesh bottom of the box where it was caught, and the gravel and rock, cleaned of its gold, was then dumped out of the box and the process repeated. After a sufficient amount of gravel had been worked in the box, the miner would carefully wash down the canvas, or sacking, that had been used to collect the mineral from the gravel, and he would then pan this aggregate to further refine out the gold from the waste materials. It was backbreaking labor, but much wealth was recovered in this manner and with very little capital investment.

The next logical mechanical improvement to follow was a device known as the sluice box. If a small amount of gravel could be washed each day by panning, and if this amount could be greatly increased by using a rocker or a cradle, certainly much greater amounts of earth could be washed by merely increasing the size of these devices. The sluice box is nothing more than a long three-sided box with cleats or mesh nailed to the interior of the bottom side. When large amounts of earth, gravel and water are put into the top end of the sloping sluice box, the water quickly carries away the light earth and gravel, and the heavier gold is caught behind the board cleats. Often in the smaller sluices, a piece of sacking would be placed under the cleats to pick up and hold the very tiny grains of gold that would otherwise be washed through the box with the lighter waste. In the cleanup operation, the cleats would be removed and the sacking washed out in the gold pan to recover the fine gold. The larger nuggets would, of course, be caught behind the cleats.

The use of the sluice box was the forerunner of the great hydraulic mining industry in California that was to literally wash away mountains. When in 1853 Edward Mattson first turned a stream of water against the gravel bank of his claim near Nevada City, California, he conveyed the water to the site through a rawhide hose to which he had fastened a wooden nozzle. He played this stream much as a fire hose is used today. Torn by the water, the gravel was carried into a sluice and hand shoveling was thus avoided. Since water in the mountain streams was so abundant, miners were soon running it to their workings in iron pipes and then under great pressure, directing it against the sides of gravel deposits and washing great quantities of the gravel down through long sluices. This method proved very profitable because many yards of gravel containing small amounts of gold could be mined with a minimum of backbreaking labor.

The hydraulic method of mining, just as in other methods, depends on the fact that gold is a very heavy metal. A particle of gold of a certain size is so much heavier than a particle of rock of the same or even larger size, that a current of water washes away the particles of dirt or

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rock, leaving the gold behind. But, while millions in gold were recovered, these monstrous operations sent an avalanche of mining debris down the rivers. Naturally, the valley people rebelled at this, and in the late 1880s legislation brought an end to this type of mining, for the rich farmlands of many California valleys were being covered by the mining debris. The flow of the monitors ceased, and this type of mining slowly passed into history.

The Malakoff hydraulic diggings in Nevada County, California, is probably the West's most spectacular product of man's ingenuity in his lust for gold. Today, these diggings stand as a silent monument to probably the most awesome method ever devised to dig into nature's treasure stores.

Gold bearing quartz was discovered on Gold Hill at Grass Valley in June of 1850—yes, gold right in the quartz rock. These first discoveries were in surface outcroppings, and the first mining was nothing more than to crush the rock to release the gold. Then, the miners went down to the earth after this gold-bearing quartz. The first tunnels and shafts bored down to follow the quartz veins were driven by hard handwork. Holes for blasting were punched out by sledge and steel, and muscle and sweat.

Once out of the earth, the rock had to first be crushed in order to start recovering the gold. To do this, small hand mortars were used by many of the miners, and much wealth was recovered in this manner. However, the process was slow and tedious since the resulting finds still had to be panned out by hand.

Mexican placer miners next introduced to California the "arrastre," which was a device originally designed to grind grain. Animal power pulled a grinding stone around inside a grinding basin, breaking the rock into fine particles and releasing the gold. But, it too was slow and cumbersome and soon fell into disuse.

There were many, many disappointed miners, but goodly numbers saw their dreams of riches come true. However, this romantic era of the lone prospector equipped with a few simple tools has long since our own time slipped away into history.

Today, the quest for gold still goes on, although on a greatly reduced scale. In some places where the debris can be controlled, gold mining is still being done by the hydraulic method, and near Foresthill, California, such an operation is still being carried on.

Dredging is another method of recovering gold from deep gravel deposits. Huge barges, some costing millions of dollars to build, are set up on the gravel deposits. Endless belts studded with huge iron buckets dig more than a hundred feet down into the earth to lift the gold-bearing gravel up to the top of the barge where it is washed to recover the gold. Near Marysville, it is a strange sight to see these gigantic barges at work in the flatlands—their clanking buckets gouging and ripping into the surface depths, leaving after them mountains of washed gravel and clay.

Some of California's present underground mines are marvels of engineering. The Empire Star Mine at Grass Valley is one of the deepest in the United States. Its surface buildings are extensive; its shafts have been sunk to a depth of nearly two miles and are connected by many

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miles of tunnels and drifts. Here, deep underground are electric power stations that operate giant pumps. Laboring day and night, they keep the mine dry. And here, tiny railroad cars trundle along miles of track, hauling the rich ore to the hoisting equipment that will lift it thousands of feet up to the surface mills. At the top of the head frame, the cars automatically empty and the ore now goes through a small crushing plant where it is broken into uniformly coarse particles. After being crushed, the gold-bearing ore is loaded into railroad ore cars for the short trip to the mill. This rail line is only a few hundred feet in length, but over it has been hauled enough wealth to ransom a thousand kings.

Here at Willow Valley Mine near Nevada City, the crushed aggregate is fed to a battery of stamps, which break the coarse ore into very fine particles called pulp. From the stamping mill, the pulp is then carried to a ball mill where it is further broken down. These machines are called "ball mills" because iron balls about the size of baseballs are used inside rotating drums to break the rock into fine, flour-like particles. Carried by water, this fine paste-like substance is then treated chemically. The lighter waste material, containing no gold, is washed away in this stage of processing, and the residue is a heavy mineral concentrate.

Further refining takes place in these tightly sealed furnaces, which are heated by a forced draft to temperatures high enough to bring the gold to a molten state. This heating may require two or more hours, depending on the amount of concentrate. The metal, after it has reached its molten state, is next poured into iron crucibles. Since the operators must work so close to the white-hot furnaces, asbestos coats and face masks are necessary to protect the workmen.

Although the metal flowing from this furnace is a golden color, it also contains silver, copper, iron, lead, melted blasting caps and other impurities, but the gold, being heavier, goes to the bottom of the crucible in an almost pure state. After the metal is cooled, the mass is dumped out, and the gold, in the shape of a cone, is separated from the slag and other metal impurities. Although gold at this stage still contains silver, it is cleaned up, and it is now ready for shipment to the United States Mint.

In the milling process, the ore gives up some of its gold in an almost free state. This is caught in mercury baths, and later when the mercury is distilled off, a sort of gold sponge remains. These chunks of gold sponge are then weighed, put into crucibles, and fired in small furnaces at a very high temperature. When the gold reaches a liquid state, it is poured from the crucibles into molds of various sizes.

Although pure gold is a very valuable metal, in many respects it is absolutely useless. It is too soft to be worked into anything more useful than decorative pieces. Steel, copper, and tin find far more use in our everyday life, yet for ages men have slaved, battled, and died for it. It has been the cause of more suffering and inhumanity than any other one thing in the history of the world.

And yet, the yellow metal has been one of the greatest benefactors of the human race. Gold and the search for it have been the major reasons for exploration and discovery. Gold was the incentive that led Columbus on his daring voyage, and gold was the lure that drove the hordes of Spaniards to the conquest of the New World. Where gold has been found, civilizations have

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followed. Yes, it is a strange metal indeed, and yet, what is even more strange is that we should owe so much to the many things represented by this soft, precious metal—Gold.

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Produced by Stanley H. Halls, [no date]