COLORADO MINERS – WORK & TOOLS

Placer

What do these photos tell you about how early gold miners did their work?

Placer Miner Panning Gold

The man in this photo is using a pan to find gold in a stream.

Miner panning gold

Photo: Colorado Historical Society

More About This Topic

The first miners in Colorado looked for "free gold." These were flakes of gold lying in stream beds. It could be recovered by swirling water around in a pan full of sand and gravel taken from a stream. As the sand and gravel were washed out, the heavier gold settled to the bottom of the pan. Washing gold out of stream beds and the banks of creeks was called placer mining.

Their Own Words

"Our medium of exchange in those days was mostly gold dust, carried in a buckskin sack and weighed out on gold scales. The smallest amount that was ever weighed out was 25 cents worth."

"That gathers all the Gold from among the Sand. Then we have to retort [heat] the Gold in order to Separate it from the quicksilver which takes from 10 to 12 o'clock every night. No small job rest assured. . . ."

Source: Recollections of S. M. Buzzard, Colorado Springs Telegraph*, July 31, 1921.*

Source: "The Letters of David F. Spain," (letter to wife, April 30, 1859), in John D. Morrison, Colorado Magazine *35 (April 1958): 105-106.*

Placer Miners At Work

This photo shows two men mining for gold using a shovel and pan. Two miners mining for gold

Two miners mining for gold

Photo: Colorado Historical Society

More About This Topic

Tiny bits of gold also settled in the dirt along the banks of creeks. Miners recovered this gold by shoveling the dirt into pans and washing it with water from the creek. This kind of placer mining worked best with two men. One man shoveled while the other used the pan, like the men in the photo.

Their Own Words

". . .I'll tell you what we have done in the last week in the way of mining. Have taken out since one week ago today Ten hundred and ninety (1091) Dollars. . . . We have crowds of New Comers around us from

morning till night watching, and wishing it were them. . . . We have sold one of our Claims to George Simmons (the Chicago man) for Three Thousand give hundred dollars to be paid as fast as he takes it out. And on Saturday last we sold half of the claim we are now working for Five Thousand two hundred and fifty Dollars. That also to be paid as fast as taken out."

Source: "The Letters of David F. Spain," (letter to wife, April 30, 1859), in John D. Morrison, Colorado Magazine 35 (April 1958): 105-106.

Drawing Of Gregory's Diggings

The men in this drawing are at Gregory's Diggings near present-day Central City. They are looking for gold with various tools used in placer mining.

A drawing of Gregory's Diggings

Photo: Colorado Historical Society

More About This Topic

Placer miners also used sluice boxes or "long toms" to take gold from the streams. Sluice boxes were long, wooden troughs with slats nailed to the bottom. Miners shoveled dirt into the box as water ran through it. The water carried the dirt away, leaving the heavier flakes of gold to settle to the bottom, where it was caught in the slats. The miners periodically stopped the flow of water and removed the gold from the slats. This was done every few days or weeks in small sluice boxes. In some large sluices that extended for a mile or more, the "cleanup" was done only a few times each year.

Their Own Words

"Work usually started at the placer mines about the first of April and ended during the latter part of September or early part of October, depending on the water and weather conditions. The old system of placer mining was employed. The flume, or sluice box, was about two miles in length and about two feet in width; the riffles were made of poles, originally five inches in diameter, but they were worn down rapidly. Excepting a small amount of 'light' gold, the first half mile of flume usually caught it all."

"The 'cleanup' was made but twice a year. First the riffles were washed, to save the gold clinging to them, and removed from the flume. Then a small stream of water was turned in to wash away the dirt and all black sand possible. The water was then reduced to a mere trickle and quicksilver poured into the flume and gradually worked to the lower end. One hundred and twenty-five pounds of quicksilver was required for the cleanup which usually netted about 50 pounds of course, 'shot' gold."

Source: Joe F. Maro [as told to Richard Carrol], "Reminiscences of the Granite Mining District," Colorado Magazine*, 13 (July 1936): 137-138.*

Source: Joe Maro, quoted in Richard Carrol, "Reminiscences of the Granite Mining District," Colorado Magazine *13 (July 1936): 138-139.*

Placers Miners Near Central City

This photo shows men using shovels and a sluice box to mine for gold. The photo was taken in 1877 at Russell Gulch near Central City.

Miners in Central City

Photo: Denver Public Library, Western History Collection

More About This Topic

The amount of dirt that could be washed in a sluice box depended on the number of men operating it. The photo shows at least seven men working at this sluice box. Longer sluice boxes had even larger work crews.

Their Own Words

“We have found this gold in nearly every place we have prospected from the mouth of the canyon, for a distance of twenty-five miles in a north-westerly direction, and I know, by actual experiment, that a man can make with a rocker $5 per day.”

Source: A. A. Brookfield to Friend Norton, Gold Hill, March 5, 1859; Phyllis Smith, A Look at Boulder From Settlement to City (Boulder, 1981): 14.

Placer Miners Using a Sluice

The miners in this photo are shoveling dirt into a sluice.

Miners using a Sluice

Photo: Denver Public Library, Western History Collection

More About This Topic

The men in this photo are using a long sluice box built in the middle of a stream. They are washing out the dirt from the banks of the stream, leaving only bare rocks and boulders behind. Mining changed the landscape of the Colorado mountains.

Their Own Words

"Agriculture restores and beautifies, mining destroys and devastates, turning the earth inside out, making it hideous, and blighting every green thing…. There was mining everywhere along that grand road, with all its destruction and devastation, its digging, burrowing, gulching, and sluicing."

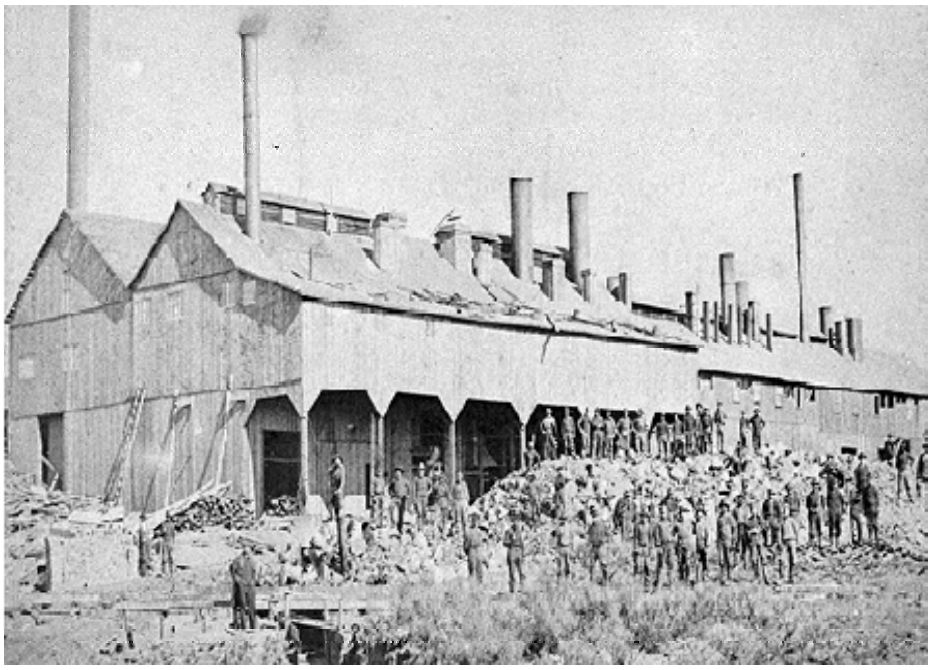
Source: Isabella Bird, A Lady's Life in the Rocky Mountains *(London, 1879): 224.*

Smelters

What do these photos tell you about how ores were smelted?

Grant Smelter At Leadville

The building is this photo is the Grant Smelter at Leadville. Smelters separated the gold and silver from the quartz rock hauled in from the mines.



Grant Smelter at Leadville

Photo: Colorado Historical Society

More About This Topic

Miners had difficulty separating gold and silver from the quartz rock found deep inside a mountain. This ore contained sulfur and other minerals that also had to be removed. The process used to recover gold and silver from this ore was called smelting. Smelters like the one in this photo used hot blast furnaces to remove the gold or silver from the ore by melting it from crushed rock.

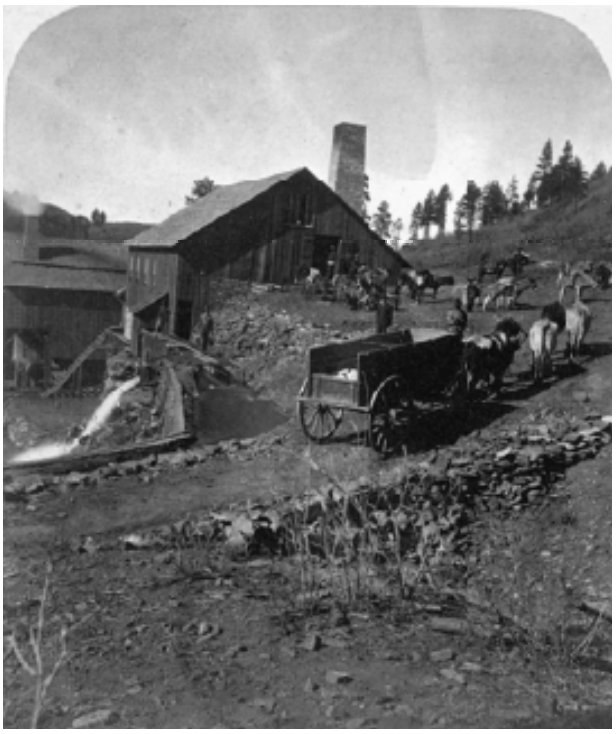
Their Own Words

"The smelter lies between the Rio Grande and Fort Worth [railroad] tracks, in the outskirts of the city [of Pueblo]. . . . The ore as it comes from the mines. . .is ground in powerful mills, which reduce it almost to powder. The only unusual noise in the place comes from these thundering crushers. . . . The [crushed] ore is kept in bins, from which it is taken to the roasting department. It is placed in furnaces here, sixty feet long and twenty wide, and is subjected to a low heat to rid it of sulphur. . .that may be in it. . . . Ore trucks, lifted in place by hydraulic elevators, next convey the roasted ore to the bedding floors, where it is fluxed for the smelters proper." "Bedding is, briefly, the mixing of ores and fluxes [limestone and other minerals]. . . .The mixing or bedding is accomplished by dumping the ores from the cars overhead, upon the bedding floors, where they are spread in thin layers, one above another until, maybe, the mass will be seven or eight feet deep. . . .
"The mixed ore, coke and limestone is thrown into the furnaces. . .from platforms above them. The openings for this purpose afford no view of the raging fires within, but they are there nevertheless, and the natural heat is intensified by a blast blown into them by one of two great engines. . . ." " On one side of them are the lead wells from which the workmen draw the molten metal in ladles, and pour it into moulds that hold about a hundred pounds each. The slag, or refuse, is run off on the other side. . . and pitched over the 'dump.'. . .When the moulds have cooled, bars having something of the sheen of silver, are taken from them, but it is not silver, at least not all of it. It is the "base bullion," in this instance more lead than anything else. It has yet to be refined, and for that purpose, in the case of this company, is sent to Philadelphia."

*Source: Andrew Morrison, T*he City of Pueblo and State of Colorado *(St. Louis: George Englehardt & Co. 1890): 117-118.*

Silver Smelter At Windham

The building in this photo was a silver smelter at Windham, Colorado in Ouray County. The photo was taken about 1875. The burros and wagon are hauling ore to the smelter.



Silver Smelter at Windham

Photo: Denver Public Library, Western History Collection

More About This Topic

Every mining district had its smelters where miners brought their ore. The smelter in this photo must have served many small mines. Some of the miners brought their ore to the smelter by pack trains of burros.

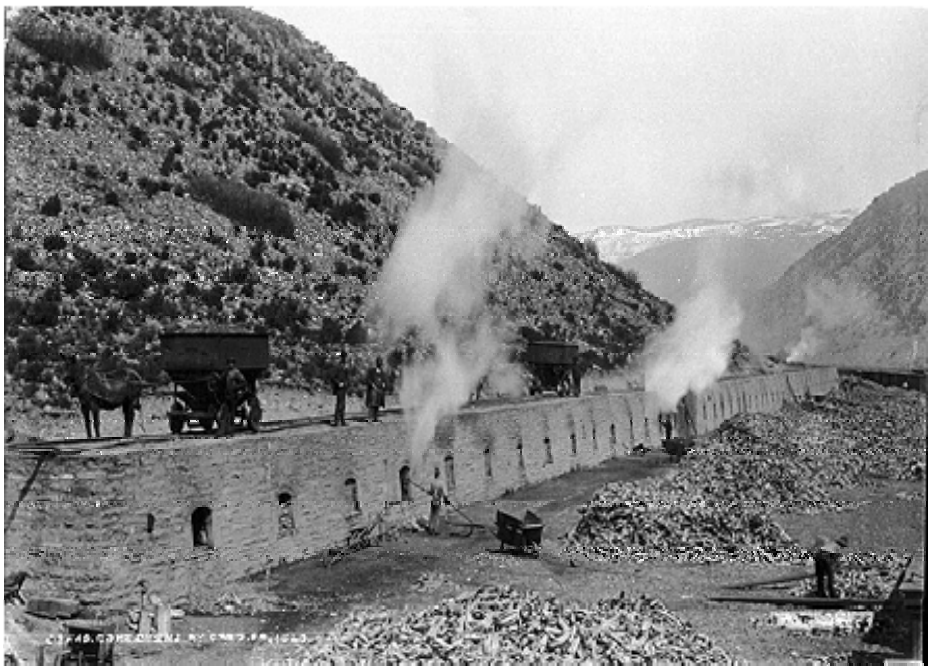
Their Own Words

"Out in the smeltering works I saw long rows of vats, pans, covered by bubbling – boiling water, and filled with pure silver, four or five inches thick, many thousand dollars worth in a pan. The foreman who was showing me shoveled it carelessly up with a little wooden shovel, as one might toss beans."

Source: Description by Walt Whitman in Colorado: A Guide to the Highest State, (1940): 91.

Cake Ovens At Cardiff

This is a photo of the coke ovens at Cardiff, a town near Glenwood Springs. Coke is partly-burned coal used to heat the blast furnaces of smelters and steel mills. The men on the ground are putting wood into the ovens to burn the coal.



Cake Ovens at Cardiff

Photo: Colorado Historical Society

More About This Topic

The ore smelting business helped develop coal mining in Colorado. The smelters needed fuel for their blast furnaces. After cutting down the nearby forests for wood, the smelter owners began using coke. Coke is coal that is partly burned to remove impurities. The remaining coke burns much hotter than ordinary coal. The demand for coke made coal mining more profitable in Colorado.

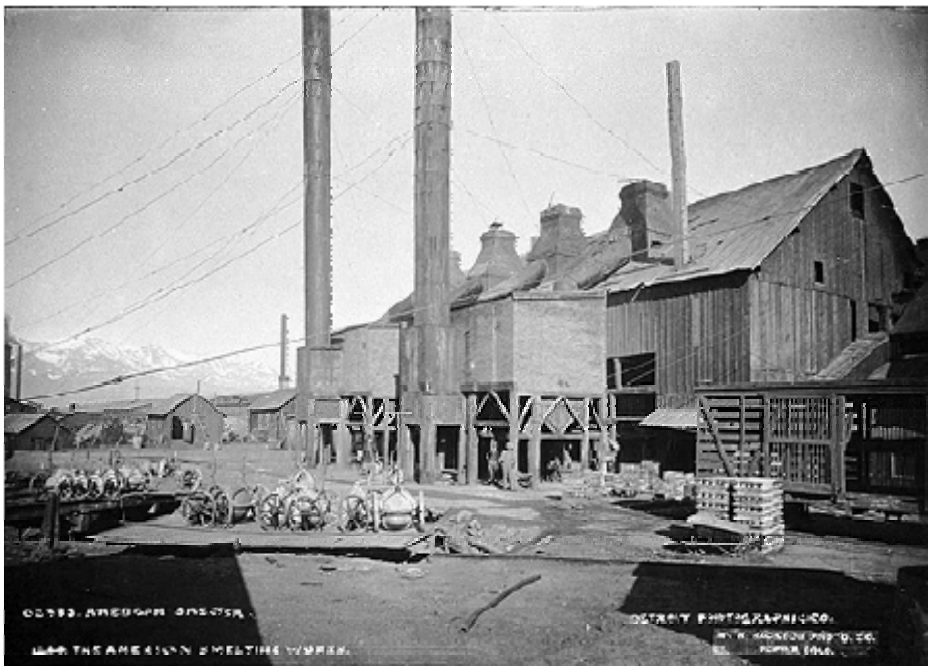
Their Own Words

““El Moro . . . consists of four stores, one hotel . . . and about 300 population, most of whom are engaged in coal mining. . . . About six miles southeast of the town are located extensive coal mines, and about two miles in the same direction are 400 coking ovens. The coke produced here is . . . better than the celebrated ‘Connelsville’ [coking coal] of Pennsylvania, and is of a superior quality for use in the smelting furnaces, for which purpose it is shipped all over the state.”

George A. Crofutt, Crofutt’s Grip-Sack Guide of Colorado, (Omaha, Nebraska: Overland Publishing Company, Volume II, 1885): 89.

The American Smelter

The smelter in this photo was owned by the American Smelting and Refining Company. By 1900, it was the largest smelting company in Colorado.



American Smelting and Refining Company

Photo: Colorado Historical Society

More About This Topic

The buckets on wheels in this photo are called ladles. They were used to remove the melted silver from the blast furnaces. The metal was then poured into mold. In the molds the metal cooled and hardened into silver bullion. There is a stack of silver bars on the right side of this photo. Each bar weighed about 100 pounds.

Their Own Words

“The Argo smeltering furnaces are a group of building on the eastern outskirts of the city. Arriving at the works you take a short walk around a high broad fence, cross a track on which are freight cars laden with gold and silver ore and last arrive at the office door. Here you are likely to be challenged by a burly watch man who wants to know your business. If you are fortunate enough to know someone in the office you can gain admittance and a polite young man offers to take you over the works. First of all is the room where the ore is being ground into powder. This is necessary before the smelting and waiting process begin.”

“Here and there are heaps of powdered ore each pile market with the name of the mine from which it has been taken. This ore is gray or brown or red in color and looks like any common powdered stone. Of course these mounds contain a great deal of precious metal. Seeing one which looked unusually rich, I asked our guide how much money he supped was in ‘that.’ He looked queer for a minute and answered, ‘That’s mostly brick dust.’ Little half buckets carried off ores attached to a leather band which is constantly revolving over wheels carries the powdered ore to the furnace where the smelting process beings.”

"All of the slag sinks to the bottom of the furnace and at the end of a certain time is drawn off leaving only the metal, not yet, however, in the pure state…." Still another smelting and wasting process follows this when the metal is ready for the tank. Here the almost purified metal is placed in huge tanks through which boiling water passes. The metal here is in its most beautiful form in quantities…. Not being yet in a convenient form the metal is removed from the tanks and melted. It is last of all poured into brick molds which contain about $1,000 worth of silver and which weigh when turned out about 85 lbs."

Source: Henrietta Hitchcock Manuscripts, MSS#1344 Colorado Historical Society.

Coal

What do these photos tell you about what coal mines were like?

Miners In A Coal Mine

These men are miners working inside a coalmine.

Miners working in a coalmine

Photo: Colorado Historical Society

More About This Topic

Mining coal became an important business in Colorado during the 1880s. The smelters and steel mills needed coke made from coal. Factories and mills with machines run by steam engines used coal for fuel. As wood became more difficult to find, families began using coal to heat their houses. Colorado quickly became the largest coal mining state west of the Mississippi River.

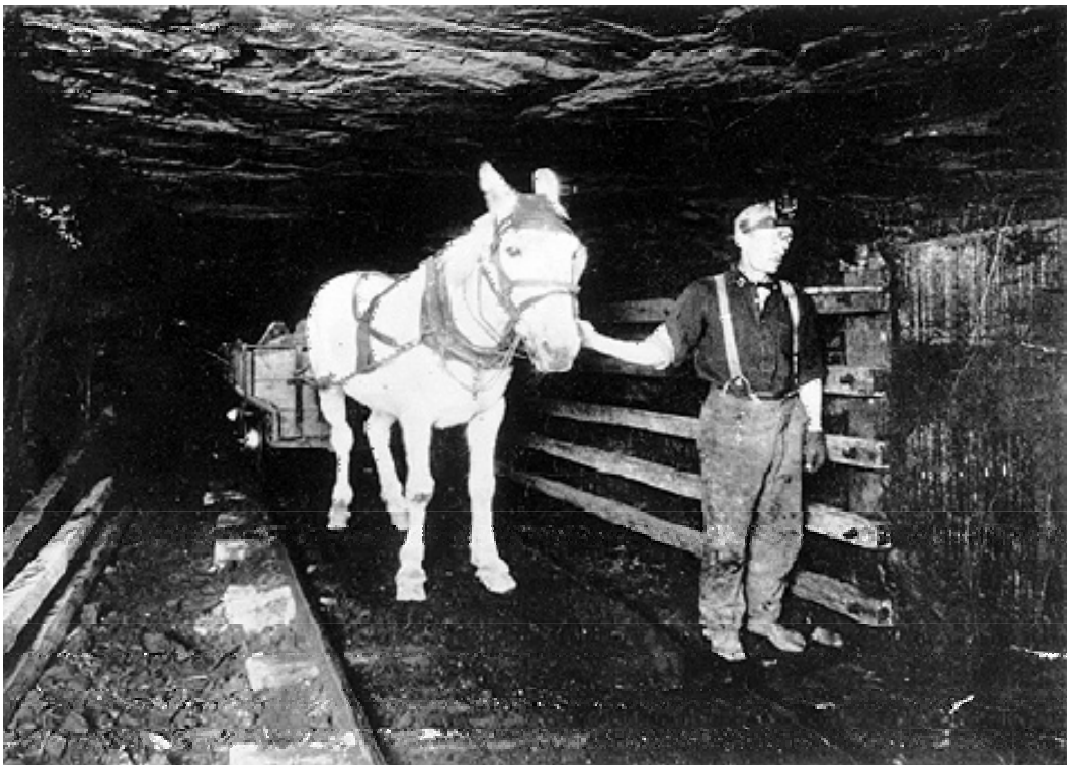
Their Own Words

"November 19, 1886, came to Colorado, to Rockvale. Started in coal mining December 1886…. Coal was struck August 1881 at a depth of 325 feet, the bottom vein 3 feet 6 inches of coal…. The town was peopled by Scotch, Welsh and English miners. In 1886 some North Italians and Austrians came…. About 1925-26 the mine closed. Worked out."

Source: Henry Johns (1934), CWA Interview Doc. 7/366, Colorado Historical Society.

Coal Miner With A Horse

This photo was taken inside a coalmine. The miner is leading a horse that is pulling a cart filled with coal.



Coal Miner with a horse

Photo: Colorado Historical Society

More About This Topic

The coalmines of Colorado created thousands of jobs. Many of the men who worked in the coalmines were immigrants. They came from Great Britain, Italy and other European countries.

Their Own Words

"Usually [you were paid] twice a month. . . . At the Columbine we got forty-four and a half cent a ton for loadin' coal. If you got sixteen tons you was a good loader. . . . You had to have ideal conditions to load that [much] coal. . . . Your pay didn't start till you started loadin' coal. You loaded coal by the ton. You wasn't workin' by the hour. You was workin' by the ton. . . . You had a snap on the end of the car. You hung your check with your number on that snap. When it went up the shaft, the weighman up there took the check off and credited it to your account."

Source: Richard Brown quoted in Maria M. Rogers, ed., In Other Words: Oral Histories of the Colorado Frontier (Golden, CO: Fulcrum Publishing, 1996): 33.

Coal Miner In Kubler Coal Mine

Coal Miner in Kubler Coal Mine

Photo: Denver Public Library, Western History Collection

More About This Topic

Coal mining was more dangerous work than hard-rock mining. Coal fell on miners and coal dust caused explosions. The worst mining tragedy in Colorado happened on January 24, 1884 at a coalmine at Crested Butte. Fifty-nine men were killed there in a coalmine explosion.

Their Own Words

"Tragedy struck again. Father was a loader--he shoveled coal from the chute into the railroad cars. Often coal would get hung up and he'd have to step in the chute and dig at the jammed coal to loosen it. This is what happened this day. He was picking at the coal when it broke loose before he could clear the chute; coal caved in and his foot and leg were crushed. . . . Gangrene set in the foot, and a doctor from Boulder came to Lafayette--said the foot must come off at once. Aunt Jane came, Mary came, and they shooed me out of the house. The doctor cut father's foot and lower leg off--right there in the bedroom. The ether was so strong in the house that it nearly knocked everyone out!!"

Source: Mary Ruth Kauffman, Sarah, Her 100 Years [the Life of Sarah Savage Brillhart]*. (Boulder: Gambrill Properties, Publisher, 1982): 20.*

Coal Miners Near Harris

This photo was taken in a coalmine at Harris, a coal town west of Trinidad. The miners are working at a seam of coal deep underground.

Coal Miners near Harris

Photo: Denver Public Library, Western History Collection

More About This Topic

Coal Miners in Colorado tried to improve working conditions in the mines. They held meetings to protest unsafe conditions. They joined unions and went on strike for better pay and shorter hours of work. Nevertheless, mining remained a dangerous and low-paid occupation.

Their Own Words

“You remember hearing about town criers years ago! Well, we had town criers in Lafayette after the turn of the century. The miners always feared strikes, and every time they held a mass meeting they sent criers out in the streets to call the miners to the gathering. Workers were in constant insecurity about their jobs and conditions in the mines—the high accident rate, poor pay, all the poor working conditions—kept a nervous aura about the community.

Source: Mary Ruth Kauffman, Sarah, Her 100 Years [the Life of Sarah Savage Brillhard]. (Boulder: Gambrill Properties, Publisher, 1982): 21.

Quartz

What do these photos tell you about what tools miners used?

Mine Near Hahn’s Peak

The man in this photo is Pete Pourtalis. He is pushing a wheel- barrow loaded with ore from a mine. The photo was taken in 1906 at a mine near Hahn's Peak north of Steamboat Springs.

Pete Pourtalis near Hahn’s Peak

Photo: Denver Public Library, Western History Collection

More About This Topic

Placer mining in a newly discovered gold region usually lasted only a few weeks. The gold in the stream beds and creek banks was quickly taken out. The miners then searched for the veins of gold higher in the mountains from which the flakes of gold had come. The veins were embedded in quartz rock. Mining the quartz rock was much more difficult than placer mining. The men had to blast the rock out of the mountain and crush it before they could remove the gold.

Their Own Words

"The present condition of the Gregory Diggings is somewhat different from what it was some four or five weeks ago. Then hundreds of claims located on leads of decomposed quartz of a gold bearing character yielded regularly, handsomely and in some few instances, marvelously. But since then the decomposed quartz had given out in many of them and nothing remains but the solid rock, which cannot be possibly worked without the use of blasting and crushing apparatus."

Source: Letter from Denver City, August 12, 1959; Missouri Republican*, August 26, 1859.*

Mine Near Idaho Springs

The horse in this photo is pulling carts filled with silver ore out of a mine near Idaho Springs.

Horse pulling cars near Idaho Springs

Photo: Denver Public Library, Western History Collection

More About This Topic

The silver one in this photo came from deep inside the mountain. The mine owners used horse-drawn or mule-drawn carts that ran on rails to remove the heavy ore. Removing gold or silver from the quartz rock inside a mountain took more men and equipment than placer mining in streams.

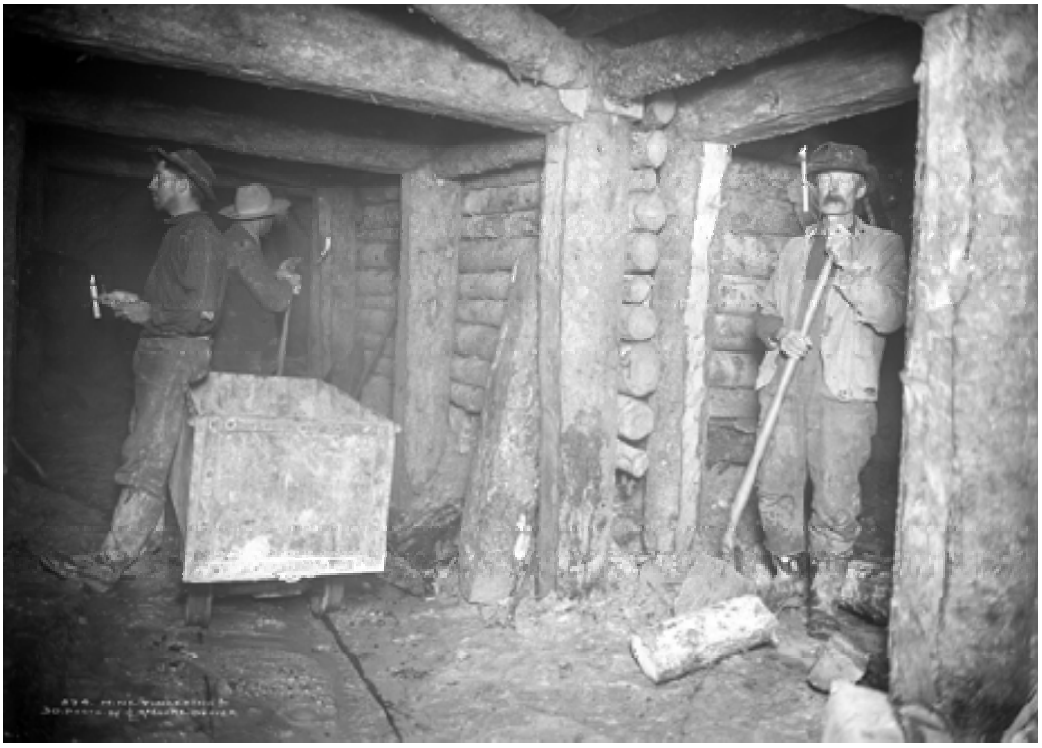
Their Own Words

"A short distance below the Gregory [mine in Black Hawk] on the left as you approach Central [City] is the Bobtail [mine] tunnel. . . . One of our favorite Saturday amusements was to tramp in and out of the tunnel as far as the shaft, dodging the numerous mule-drawn ore trains. The ore cars were . . . built of sheet steel, built in two sections which were hinged at the top. . . ."

Source: C. H. Hanington, "Early Days of Central City," Colorado Magazine, 19 (January 1942): 5.

Inside A Colorado Mine

The miners in this photo are standing beside an ore cart inside a mine. They are working by candle light.



Coal Miners inside a Colorado Mine

Photo: Colorado Historical Society

More About This Topic

Miners dug tunnels called adits deep into the mountains to find gold-bearing rock. They used logs and heavy timbers to keep the walls and roof of the tunnels from falling in on them. Hard rock mining was very dangerous.

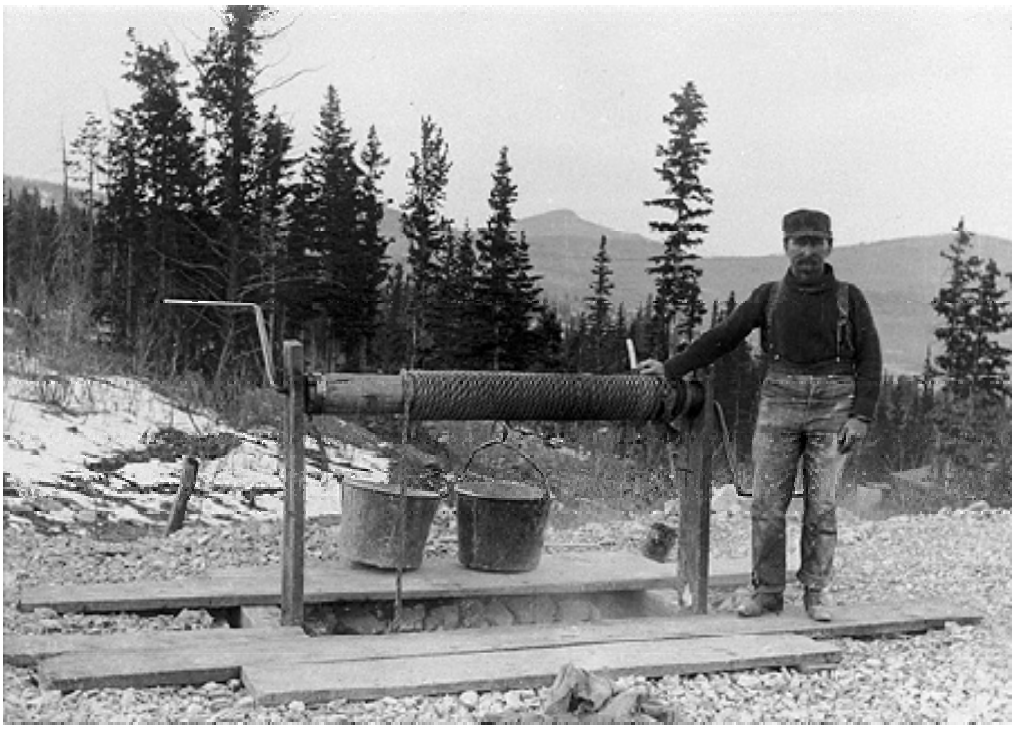
Their Own Words

"So there is the economic picture as far as a single man earning the basic wage was concerned. Wages per month, $90.00; Food, $20.00, Lodging $10.00; balance of wages after payment of food and lodging, $60.00; twice as much as he would have received in his pay envelope for a month, for rough work in the East, on the basis of a seven day week."

Source: Leo J. Keena, "Cripple Creek in 1900," The Colorado Magazine*, 30 (1953): 271.*

Mine Shaft Near Cripple Creek

This photo shows a miner standing beside a vertical mine shaft. He is resting his hand on a windlass or lifting device. The photo was taken near Cripple Creek, where gold was discovered in 1891.



Miner next to mineshaft at Cripple Creek

Photo: Colorado Historical Society

More About This Topic

Gold and silver ore also was removed by digging mine shafts into the ground. These mines needed machines to lift the ore to the surface. The machine in this photo was a simple windlass turned with a crank by hand. The windlass lifted buckets filled with ore.

Their Own Words

"These quartz veins run in various directions through the mountains. . . . After a crevice is discovered, the miner proceeds to open the claim by sinking a shaft or hold into it, which is effected [done] by blasting and the pick and shovel; and, as soon as needed, a windlass is erected over the shaft, in order to draw up the pay dirt and quartz. Or the miner may commence his work by tunneling into the base of the mountain, thus reaching the vein, and working it from beneath."

Source: C. M. Clark, A Trip to Pike's Peak and Notes by the Way, (San Jose: The Talisman Press, 1958 [originally 1861]): 97.

Saratoga Mine Near Central City

This photo was taken in the shaft house at the Saratoga Mine near Central City. The shaft house was built over the opening of the shaft that extended down into the mine. The men in the photo are standing in the cage that carried miners and ore carts up and down the shaft. This photo was taken about 1890.

Miners at a Shaft House at Saratoga Mine

Photo: Denver Public Library, Western History Collection

More About This Topic

Large mines used iron cages to lift ore carts out of the mine. The cages were like elevators driven by a steam engine. The man on the left in this photo was the lift operator or "topman."

Their Own Words

"In 1900 only the big mines in the [Cripple Creek] District had cages. In the smaller mines men going on and coming off shift rode the bale of the bucket, that is stood on the rim of a one-ton bucket and steadied themselves by holding to the hoisting cable. Three hundred feet or so of that, when the hoist was working jerkily with an occasional back slip, engraves itself on one's memory."

Source: Leo J. Keena, "Cripple Creek in 1900," The Colorado Magazine*, 30 (1953): 271.*