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COLORADO'S MINERAL WEALTH

Prepared by

GENERAL FRANK HALL

Edition 1909

ISSUED BY
THE COLORADO & SOUTHERN RAILWAY
T. E. FISHER, General Passenger Agent
Denver, Colorado

A TYPICAL MINE SCENE IN CLEAR CREEK COUNTY.

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To. 44

Colorado's Mineral Wealth

Historical Epitome

16,910

FROM 1859 to 1907, inclusive, the gold and silver mines of Colorado have produced over eleven hundred and forty-seven millions of dollars, as shown by the official reports of the United States Mint and the State Bureau of Mines. This includes gold, silver, lead and copper, the associated metals.

Eighteen months prior to the election of Abraham Lincoln to the presidency of the United States, gold in paying quantities was discovered in the Rocky Mountains.

The birthplace and cradle of the State of Colorado was the Gregory vein, or lode, situated about midway between the present towns of Black Hawk and Central City, in Gilpin County. This county was named for William Gilpin, the first governor of Colorado Territory, appointed by President Lincoln soon after his inauguration, March 4, 1861, a territorial form of government having been meanwhile provided by Congress.

When the discovery of gold in the Rocky Mountains was first spread broadcast over the land, in 1859, the national treasury, and largely the commercial and industrial interests of the United States, had been practically rendered bankrupt by the great financial panic of 1857, the most destructive in our national history.

When the glad tidings appeared that a mere handful of enterprising pioneers had disclosed great treasures of gold in the Far West, it became a matter of supreme importance to the nation and all its people, because, with the exception of a few mines in the States of Georgia, North Carolina and California, we possessed no metallic treasure for coinage. The greater part of the circulation medium, based upon the issues of state banks, had perished with the panic. There was not a silver mine in the republic, all our silver being obtained from Mexico.

Again, when the report went forth that abundant supplies of yellow metal had been found in the West, seven hundred miles from the Missouri river, there were but two organized

Unknown 259

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states between that river and the Pacific Ocean—Oregon and California. Neither Kansas nor Nebraska had been admitted into the Union. Utah, with its population of Mormons, was under the sole domination of Brigham Young and the Church of Latter Day Saints—a menace, rather than a blessing, to the land. Out of this vast stretch of country, comprising more than half the territory of the American republic, nine states and three territories have been organized since the birthplace and the cradle of Colorado came into the problem.

Within two years after the pioneers found gold in Gregory Gulch the Civil War began. When it ceased the indebtedness of the United States amounted to something over three thousand millions, the greater part of which has since been paid.

Since the outbreak of the Civil War just mentioned, an event that shook all Christendom, the mineral bearing states and territories subsequently organized by acts of Congress have produced over four thousand millions of dollars in gold, silver, lead and copper. That is how the enormous national debt came to be so quickly paid. Of this amount, Colorado has yielded a larger proportion than any of its contemporaries. Again, the principal sources of its precious metal production lie along the lines of the Colorado and Southern System of railways.

A MINER'S CABIN

The Birthplace of Colorado

The Gilpin Gold Region

THE Colorado and Southern narrow-gauge trains leave Denver soon after 8 o'clock in the morning for the gold mines of Gilpin, and the silver and gold belts of Idaho Springs, Dumont, Lawson, Empire and Georgetown, passing through the beautiful, highly-cultivated agricultural valley lying between Denver and Golden, and thence striking directly into the deep gorges and wild, stupendous rocky canons along the course of a plunging stream, that has its source in the eternal snows, bedded at the apexes of lofty ranges and peaks that form a part of the great Continental Divide. This is the first mountain railway ever built for general freight and passenger traffic. As already related, it was the first railway line surveyed and platted west of the Missouri River, and was originally designed for the use of the Union Pacific Transcontinental Railway to Salt Lake City, Utah. But the railway builders of that distant era rejected it as impracticable, because of the heavy grades and frequent short curves necessitated by following the sinuosities of the stream through the canons, but more than all because of the numerous tunnels that would be required to admit the passage of trains through the crests of the higher mountains. In the years that have elapsed since the Union Pacific was constructed, the feats accomplished by a later generation of engineers have demonstrated that railways can be built wherever it is necessary to build them.

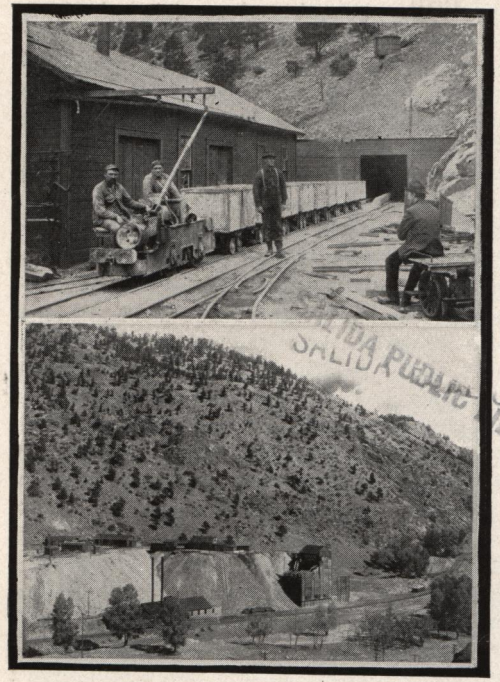
In the winter of 1859 John H. Gregory, a Georgian miner and prospector, poor to the verge of destitution, uneducated and inexperienced in everything save his knowledge of how to prospect for gold, having been attracted by the stories of remarkable finds made along certain streams traversing the plains near the base of the Rocky Mountains, by a fellow Georgian named W. Green Russell, who had preceded him to this country, but had confined his explorations to the plains below the mountains, procured a small grubstake from a party of immigrants encamped near the present town of Golden, and struck out alone into the wilderness on the course now followed by the Colorado and

Southern Railway. The creek was then known as Vasquez Fork, named for an old hunter and trapper in the employ of the American Fur Company of St. Louis.

At the place hereinbefore mentioned as Gregory Point he found traces of gold. A little digging convinced him that rich placers existed there. Returning to his friends in the valley, he told them of his discovery. A small party was formed, provisions and mining tools were collected, and, with Gregory as a guide, they made their way to the place he had described. Excavation in the gulches and along the outcrop of a large vein of decomposed quartz upon the hillside brought astonishing results. The news was quickly conveyed back over the long stretch of plain to the Missouri River, whence the telegraph carried it over the Union. Immediately thereafter Horace Greeley, the venerable editor of the New York *Tribune*, realizing the importance to the entire nation of this discovery, provided the accounts received were true, left his desk, and hastened across the country for the express purpose of ascertaining the exact situation here, with the view of publishing it to the people of the United States through his paper. Without dwelling upon the details, what he found in Gregory Gulch verified the reports. His articles in the *Tribune* sent a mighty procession of emigrants to the Rocky Mountains that continued for two years, when it was checked by the outbreak of the Rebellion.

In less than ninety days after this intelligence passed over the country there were from 15,000 to 20,000 people, largely young men, assembled in Gregory and tributary gulches. Out of this multitude of men, eager to find fortunes for themselves, sprung many prospecting expeditions. Other rich placers were opened. The tide of exploration spread over the mountains into the beautiful valley of the Vasquez Fork (now Clear Creek), where still further valuable deposits were uncovered; thence across the lofty Divide into the South Park (now called Park County), where new camps were located, and great quantities of gold washed from the banks and beds of the streams. Millions of money were taken from the various gravel beds; hundreds of millions have since been extracted from the quartz veins that ribbed the mountain sides, from which the gold originally found in the valleys was eroded by the storms and tempests of the ages. Millions more await extraction.

Such was the inception, rudely and hastily sketched, of American civilization in the Rocky Mountains. There is no space in this pamphlet for more than a brief outline of these momentous events. But one fact of striking importance may be set down before we pass to later developments, and that is that most of the prodigious mineral wealth, amounting to thousands of millions, that has been produced from the great West sprang, in great measure, from the brief chapter of history just narrated, for the trail-blazers and pioneers of the Pike's Peak region took a prominent part in the discovery and development of all the mining states to the west and northwest.



NEWHOUSE TUNNEL AND ELECTRIC TRAM AT PORTAL.

The first extraction of gold in this, as in all other, mining regions, was by the panning process. The next step was the sluice-box, the rocker, cradle and the long tom, primitive appliances which the miner could make for himself. For grinding auriferous quartz, the Mexican arastra —slow and tedious, but effective —was employed, followed by the stamp mill, which is still in use. From these successive stages evolution engendered by experience, aided by learned scientists, has grown through more than forty years of gradual progression, gaining each year small advances, the more perfect methods of the present.

In the treatment of ores from the lodes and other deposits carrying precious metals, during the first decade the loss of values, owing to the ignorance of proper means, nearly equaled the amount recovered. Then came smelting, which proved a

striking benefit. This we borrowed from the English and the Germans. But even this process, which had been used for centuries in other lands, failed to meet all the requirements. Like all other elements in our industrial economy, it has been pushed forward by the genius of men through repeated trials and many failures to the high stage of perfection now witnessed. To the eleven hundred and forty-seven millions of dollars which stand upon the record as the gross production of our mines in forty-eight years should be added from twenty to thirty per cent. that has been wasted while our miners, mill men and smelters have been forging their way to final success. This enormous loss is represented in the dumps of the mines, the tailings from mills spread along the streams for miles, and in the slag piles of the smelters. The present generation is now regaining a portion of these losses by working over the dumps, the channels of the streams below the mills and the slag dumps of the furnaces. In many cases fair profits have been realized.

The first division of the old Colorado Central Railway was completed to Golden from Denver, and opened to traffic September 23, 1870. For its extension into the mountains beyond Golden, space for much of the grade had to be literally blasted from the solid rock, owing to the narrowness of the various gorges. In places the grade is from four to five per cent. This line, built under great difficulties, was completed to Black Hawk in 1872, but was not extended to its present terminus at Central City until May 21, 1878.

In the series of narrow gulches that constitute the habitable area of Gilpin County began the permanent history of Colorado. Here, in an unattractive region, where there is neither tree, shrub, flower, garden nor grass plot to relieve the monotony of brown rocks and verdureless soil, where the hillsides ribbed with veins of gold-bearing ore are pitted by thousands of prospect holes, is the spot that represents the chief corner of the splendid commonwealth of to-day.

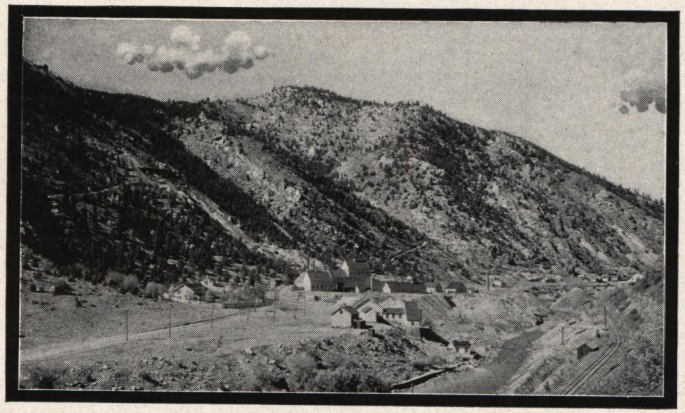
The incorporated City of Black Hawk derives its name from one of the earliest mining companies, which, being organized in Illinois, adopted the cognomen of the famous old Indian warrior, Black Hawk, and applied it to the settlement where their quartz mill was established.

Central City, the county seat and commercial center, a mile further up the gulch, was so christened because of its central position between Black Hawk and Nevada or Quartz Hill, where terminates the line of inhabited territory in that direction.

It has an area of about 125 square miles, and the one industry is precious metal mining. Although the smallest county in the state, it has been one of its most important producers of those metals. The geological structure is principally metamorphic granite, or granite-gneiss, much contorted and disturbed. The veins or lodes are of the class known as "true fissures," considered practically inexhaustible. The deepest vertical shaft is 2,220 feet deep, on the California mine, situated on Quartz Hill. There are hundreds of shafts in the region varying from 100 to 1,600 feet in depth. The ores are composed, in the main, of iron, copper, lead and zinc sulphides, in conjunction with a granular quartz, calcite and other minerals common to fissure veins in granite-gneiss areas. Near the surface, or to a depth varying from 50 to 200 feet, the ores are highly oxidized, and the gold contents free, or amenable to treatment, and almost complete recovery by amalgamation. In the sulphide ores the gold present is minutely blended or associated with the base metals.

The bulk of the material taken from the mines is reduced in stamp mills, the free gold being amalgamated and the residue of the pulp concentrated for smelting. The various mills contain something over 700 stamps.

In the course of their long and prosperous career the mines of Gilpin County have produced, in round numbers, about one hundred and twenty-five millions in gold, silver, lead and copper. Up to this writing, not a mine has been exhausted. The entire population does not exceed 4,000. When the State of Colorado



STANLEY MINES

was admitted into the Union, August 1, 1876, two senators and one representative elected to Congress were residents of this little county, although one of the senators-elect, Hon. Jerome B. Chaffee, claimed to be a resident of Denver. During the first ten years of history-making in this country Central City was the most prominent point in the state.

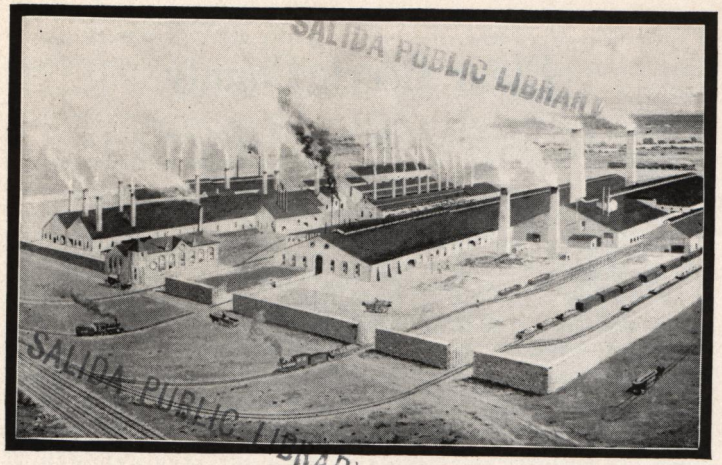
Black Hawk is the natural milling center, because it has the advantage of the only available stream of any magnitude within the county. Prior to 1886 all the ores from the mines were hauled there in wagons for treatment. In 1886-87 a corporation, known as the Gilpin County Tramway, was formed, which built a railway of two-foot gauge, comprising about twenty-five miles of sinuous track, and equipped it with locomotives and mine cars for the purpose of delivering ores from all the principal shafts to the mills on North Clear Creek and to the station of the Colorado and Southern at Black Hawk. This has not only cheapened the cost of transportation, but is of very great convenience to the producing mines. This is the only railway of its kind in the Rocky Mountains.

In 1867 Nathaniel P Hill, professor of chemistry in Brown University, Rhode Island, established the first well ordered smelting works for the proper reduction of ores, at a point half a mile below the city of Black Hawk. This was the beginning of the smelting industry in Colorado. Ten years later the necessities of the situation and the expansion of the mining field impelled the removal of these works to a place named Argo, near Denver, where they were rebuilt and placed upon a much broader plane of usefulness.

It may be interesting to learn that, except during a short interval, necessitated by the removal to Denver, the fires first lighted under the furnaces in 1868 have been burning night and day for forty-one years. During that period they have produced a great many millions in gold, silver and copper, each of these metals being refined on the ground for the use of the mints and metal markets.

As to the future of gold mining in this region, the extract subjoined from a late report of the State Bureau of Mines will convey to the reader a well-digested impression:

"The deeper mines have demonstrated the ore values and ore deposition to be persistent; of better grade, perhaps, at some horizons, than others in each mine, but, as a whole, unusually even in grade and value per ton. Under such conditions the future of the section in mining is obvious."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ARGO SMELTER.

To this may be added the well-demonstrated fact that one shaft on Quartz Hill (on the California mine) has reached a depth of 2,220 feet. The record shows that the ores from the surface to the lowest point reached have maintained a fine general and profitable average throughout all the workings. The same is true of all the shafts thus far opened to great depths. It may be assumed, therefore, that the values will endure to all depths where it is practicable to work them. The main obstruction, and one of the principal hindrances to rapid development of these mines, is water. This branch of the subject will be taken up and considered in treating of operations in the neighboring county, just over the divide, on South Clear Creek.

As a last word, it may be said that a district which has produced $125,000,000 without exhausting any of its mines must necessarily have an important future. That its future will be infinitely greater than its past will be made manifest as our story proceeds. In one of its divisions, called Leavenworth Gulch, have been discovered a number of lodes that contain large quantities of the now exceedingly valuable mineral, pitchblende, from which radium is extracted. As far as known, this is the richest belt of pitchblende mines on this continent, and is now attracting much attention from scientists engaged in endeavoring to extend the production of radium.

Clear Creek County

THOUSANDS of tourists and hundreds who come to Colorado on flying business trips, desiring to see something of the interior mountain conditions before returning to their homes, take what is known as the "Loop Excursion" to Georgetown and Silver Plume, the heart of silver mining in the Rocky Mountains. At a point seven miles below Black Hawk, North and South Clear Creek are merged, flowing thence to the plains in unison. This station is called Forks of the Creek. The train made up at Denver in the morning, for both Gilpin and Clear Creek, is separated here, one part proceeding to the "Loop," and the other to Central City. What is called the Floyd Hill branch was completed to Georgetown, passing through the beautiful town of Idaho Springs, and thence up the valley, accommodating en route the mining towns of Dumont, Lawson and Empire, August 14, 1877. The loop extending from Georgetown to Silver Plume was finished in 1881-82. It was constructed to overcome the necessity of hauling ores from, and supplies to, the mining camps perched upon the lofty slopes, over a steep and rugged wagon road of about one mile in length. By the various loops and curves the railway is some four miles in length, and is one of the finest examples of engineering in the world, and also one of the most interesting excursions in the West.

The first discovery of gold in the valley of Clear Creek, originally known as Vasquez Fork, was made in January, 1859, by a hunter, trapper and Indian trader named George A. Jackson, a native of Missouri. The exact spot may be seen from Idaho Springs. From this event, which attracted profound attention at the time, came other discoveries of rich placer diggings in the vicinity of Idaho Springs and along Lyon Gulch at Empire, in 1860 and 1861.

On the ridge known as Seaton Mountain, which stands as a gigantic wedge, forming the boundary line between Gilpin and Clear Creek Counties, have been developed some of the greatest mines of gold, silver, lead and copper in the Rocky Mountains.

Upon the broad gravel bar, at the foot of which runs Clear Creek, a beautiful stream having its source in the eternal snows of the higher ranges, stands the always attractive and inviting town of Idaho Springs, so named from the medicinal and curative waters of many springs along a small affluent of Clear Creek, known as Soda Creek. The town was built rather for a health resort than a mining camp, but in its later history has admirably served both purposes. This is unquestionably the most charming settlement (of about 4,000 people) to be found in any of the mountain divisions of the Colorado and Southern System.

Owing to the abundance of water for the milling of ores, and its easy accessibility from the great number of mines surrounding the town, a greater number of crushing and concentrating establishments have been erected and are now in operation here than at any other point in Colorado.

As all trains pass near the portal of the great Newhouse tunnel, it is deemed advisable to present a brief epitome of this highly important enterprise, in view of its influence upon the present and future of the district. This tunnel was projected to run entirely through Seaton Mountain, where a great number of mineral veins have been exposed by surface workings, through Russell Gulch to Quartz Hill and Central City, in Gilpin County, for the dual purpose of draining the mountain to a depth of 2,000 feet, exposing at this depth the mineral-bearing lodes or veins, so that they might be worked from below by the method known as overhand stoping, and for the rapid conveyance of

GEORGETOWN.

ores from all the mines thus intersected to the Colorado and Southern Railway, and to the reduction mills on Clear Creek.

It has been driven a distance of about three and one-half miles, and when finished will have a length of five to six miles. All the veins which traverse Seaton Mountain from the west to east have been intersected, but a vastly larger number remain to be penetrated. It will be understood that this is a cross-cut tunnel, driven at right angles to the lodes. It has been thoroughly constructed; broad enough for double tracks of steel, underneath which a large covered flume carries all the drainage water to its outlet near the town of Idaho Springs. The ore and supply trains used in the tunnel are operated by electric motors; the bore itself, as well as the various mines, being worked along its course are lighted by electric incandescent lamps.

Most of the mines were worked by shafts prior to the introduction of this tunnel—a much slower and more expensive method than the present system. The largest group of mines on Seaton Mountain is the Gem Consolidated series, comprising a number of claims and parallel veins assembled by consolidation under one management, and which are now being operated on a very extensive scale.

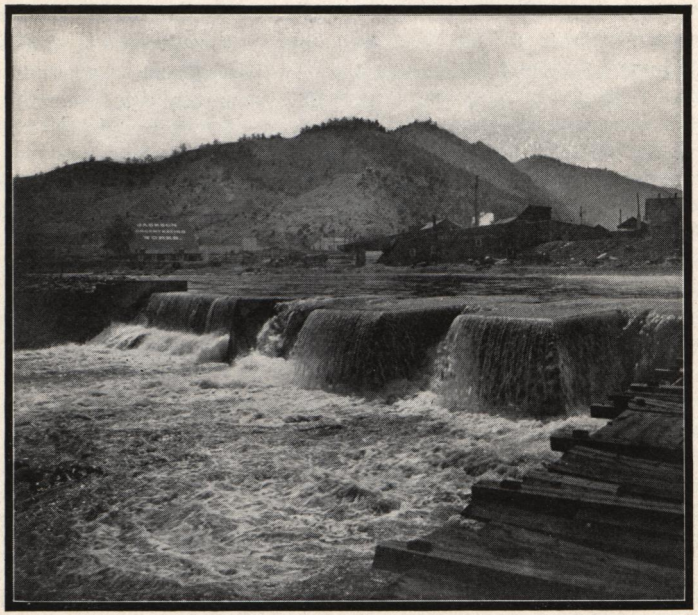
After the Gem vein had been cut by the Newhouse tunnel, by an arrangement with the owners, the managers of those properties began what is called a "raise;" in other words, miners were employed to cut their way upward through the quartz a distance of about 1,100 feet to a connection with the shaft which had been sunk about 700 feet. This remarkable achievement was successfully accomplished early in December, 1903, and wholly without any serious accident. This, as will be seen, opened the vein in the Gem property to a vertical depth of about 2,000 feet, the shaft having been meanwhile deepened two hundred feet to hasten the connection.

SILVER PLUME.

The amount of excellent mining ground thus prepared for speedy development and the extraction of ore is prodigious. The company owns two or three reducing mills on Clear Creek, and is now preparing to erect a mill large enough to crush 1,000 tons of ore daily, near the portal of the tunnel.

The Sun and Moon Mining Company also owns a large amount of mining territory along the course of this tunnel, which has been cut by it, and from which a "raise" similar to that on the Gem was completed in 1908. These people have a deep shaft on their property, and the raise has been made to a connection with it, as in the case of the Gem, just recited. And this method will be followed with each vein, or lode, as it is penetrated by the tunnel. Even the neophyte in mining affairs will readily comprehend the almost incalculable advantage this method will afford over the system formerly employed. It will very rapidly increase the volume of mineral extracted, and place the industry upon a permanently profitable basis.

Five miles above Idaho Springs stands the mining town of Dumont, originally named "Mill City." Here many groups of mineral veins are being developed. Just below the town the traveler will observe the machinery, buildings and the portal of the Monarch Tunnel, Transportation and Mining Company. This tunnel is projected to run 5,000 feet, for the purpose of intersecting, at right angles, a very large group of mines, known as the Freeland Group, located in Freeland district, all of which, opened at the surface many years ago, are known to possess great value. The tunnel has been driven a distance of nearly 8,000 feet. A drift extended laterally from it will cut under the principal vein, whence, by upraising to the old workings, enormous quantities of valuable ore will be rendered available for extraction. This accomplished, a suitable reduction mill will be placed on the border of Clear Creek, whence the concentrated product may be conveyed by chutes to the cars of the Colorado & Southern Railway, for conveyance to the smelters.



CONCENTRATING WORKS NEAR IDAHO SPRINGS MARKS SPOT WHERE JACKSON FIRST DISCOVERED GOLD.

A few miles beyond is the mining town of Lawson, where, upon a ridge just back of the little hamlet called Red Elephant Mountain, have been developed some of the richest mines in the state. A tunnel is now being driven from the town into this mountain, for the purpose of penetrating the veins at great depth, and is now nearing them.

A few miles beyond we come to Empire Station. The mining town of Empire is situated in the valley of Bard Creek, one and a fourth miles distant. Gold mining has been carried on there since 1860. Near this station two great tunnels are being driven to pierce the thickly vein-ribbed slopes along their respective courses. Here mills will be erected to treat the products brought out of the tunnel.

Proceeding to Georgetown, the traveler will find himself in the richest silver mining section of the state, although, at present, not the most productive. Mining for silver and gold has been prosecuted here since 1867, when the first workable lodes were found. In the early days some rude smelting works

were built in the town, and many mills employing various processes for the recovery of precious metals were operated.

The mountain sides are literally seamed with veins, hundreds of which have been exploited to varying depths. The records of Clear Creek County (Georgetown being the county seat) show that nearly 23,000 lode and placer claims, mill and tunnel sites have been recorded. Of these about 1,300 have procured United States patents. The average number of mines and prospects at work during the past year was about 247; the average number of men employed in mining, 2,010.

Within the city limits of Georgetown, a three compartment shaft is being sunk to develop known veins under the town. The principal value of these mines is gold.

From Georgetown the train begins its spectacular ascent to the town of Silver Plume, over the justly celebrated "Loop." Near Silver Plume the Dives-Pelican, Bismarck and Seven-Thirty mines are operated. This group aggregates between twenty and thirty miles of underground workings. There are almost innumerable mines in this stretch of lofty mountains. In the East Argentine district, just beyond, the Vidler Tunnel is boring its way entirely through the range into the adjoining county of Summit. It will intersect a very large number of veins en route, which will be mined as fast as they are encountered.

From Silver Plume the Argentine Central railway, built in 1906, runs along the mountain side 16 miles to the great mines of the Waldorf Mining and Milling Company, which have for the past seven years been under systematic development, and thence to the summit of McClellan Mountain, at an altitude of over 14,000 feet above sea level. This railway, built by Edward J. Wilcox, president and manager of the Waldorf mines, is about sixteen miles in length and was previously designed to transport supplies to and ores from the mines. But the grandeur of the scenic views along its course has made it highly attractive to tourists; hence, traffic arrangements with the Colorado & Southern railway have been made whereby the famous "Loop" trip may be extended from Silver Plume to the apex of McClellan Mountain during the tourist season.

The Colorado and Southern Railway enters Clear Creek County from the east, and extends practically through the center to the western boundary, traversing all the mining camps and one of the most rugged canons in the state. Between Georgetown and Silver Plume the ascent is made by a complete

circle in the track. At the steel bridge, where the track crosses over itself, the most sublime mountain views may be enjoyed.

The highest average grade of ores, counted by the ounces of silver contained, are produced about Georgetown, Silver Plume and Argentine. No other district compares with it in this respect. Finds of ores that contain from 100 to 3,000 ounces of silver per ton are frequent. It is a fact worthy of note that as the mines deepen the percentages of gold increase, and in some cases the gold has become the predominating value. The veins are true fissures in all parts of the county, therefore considered inexhaustible. The placer mines opened near Idaho Springs, in the first years of discovery, were soon exhausted, when the numberless veins of quartz became the main dependence. Except at Georgetown, no great progress was made in this class of mining until about ten years ago, although the Clear Creek Valley has been occupied since 1860. It may be predicted that in the next decade this will be one of the most productive sections of the state.

THE VIDLER AND WALDORF MINES.

South Park

Breckenridge and Leadville Districts

WHAT is known as the South Park Division of the Colorado and Southern System penetrates parts of Jefferson County, traverses the great South Park, passes into Summit County, thence to Lake County, where its present terminus is Leadville, the county seat. A branch line extends from Como, in the Park, to Fairplay and Alma. Gold, in placer form, was discovered on Tarryall Creek, near Como, and at Fairplay, in the summer of 1859, where large amounts of gold were obtained. When these deposits were exhausted, a few years later, the prospectors went into the hills and discovered many quartz lodes. The plateau or basin of the South Park is a scene of surpassing grandeur, occupying the geographical center of the state, and is supposed to have been the bed of a primeval sea or lake. It is comparatively level, surrounded on all sides by rugged mountains. The park has an average altitude of about 9,000 feet above sea level, is about forty miles long by thirty miles in width, and has an area of 1,200 square miles in the park proper. The Mosquito Range includes Mount Lincoln, named for the martyred president, with an elevation of 14,297 feet above tide water, and in a spur of the range, to the northward, are Mounts Evans and Rosalie, 14,330 and 14,340 feet, respectively.

PANNING FOR GOLD.

This region is rich in gold and silver. The placers have yielded largely and are still operated in the summer seasons. Up to the discovery of silver, in 1871, the gold lodes and placers

combined had produced about $2,500,000. But the silver deposits are of vastly greater value and extent. Up to 1879, inclusive, the gross production was placed at $6,114,852.78.

The first silver mine that attracted attention was the Moose, opened in 1871. This was followed by many other discoveries on Mounts Bross and Lincoln. These led to the founding of smelting works at Alma, which were kept in operation until about 1879, when, the railway having been constructed across the park, they were discontinued and the ore shipped to Denver for treatment.

The Dolly Varden ranked next to the Moose in production and size of deposits. The ores from both mines were very rich and soon made fortunes for their owners. Park County, taken as a whole, has been the least productive of the mining counties. Within the past year, however, it has assumed much greater importance, by reason of some remarkable disclosures in the vicinity of Alma, the principal town, and for the future will be very much more progressive.

The Colorado and Southern Railway follows up the South Platte River from Denver to the North Fork, and thence along this stream through the canon to Webster; thence in a southwesterly course, via Jefferson and Como, entering Breckenridge via Boreas Pass; thence to Dillon in Summit County; thence up the Ten Mile Creek through Frisco, Kokomo and Robinson mining camps, and to the headwaters of the Arkansas River; thence down that stream to Leadville.

The park area, in addition to the coal, clay and other mineral deposits, is now being exploited for oil. Some few salt springs were discovered many years ago, but have never been utilized to any extent.

Along the Platte River and some of its affluents a great deal of placer mining is carried on each summer season, but with what results it is impossible to ascertain, as no reports of clean-ups are at any time available to the public. The best intelligence vouchsafed by the operators is that they are satisfactory. The principal revenue is obtained from vast crops of superior hay, and stock-raising.

The richest and most productive mine in Park County is known as the London. It is situated on the Eastern Slope of the Mosquito range about 6 miles from Alma.

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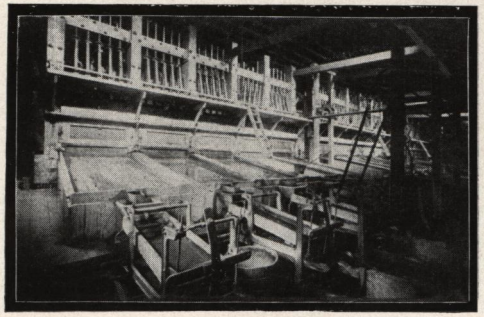
Summit County

THIS county has an area of 690 square miles, and its only industry of consequence is mining. In the neighborhood of Breckenridge, the county seat, and tributary gulches, some of the finest placer mines in the Rocky Mountains were found in the summer of 1859, and have been operated with more or less regularity from that time to the present. The amount of gold produced is problematical, owing to the absence of authentic records. The early miners left no accounts of their gains, and those that succeeded them gave nothing to the public whereby their recoveries of precious metal could be approximated.

The territory now occupied lies wholly on the Pacific slope, at a lofty altitude, and embraces the valleys of the Blue, Swan, Snake and Ten-Mile rivers, with the drainage basins of their tributaries, all of which unite with the Blue and form one of the large tributaries of Grand River, which it joins near the north county boundary.

The placer beds on the Blue and its affluents are credited with a production of many millions, to which may be added the later production of the lode or quartz mines, which have been constant producers since 1879.

Quoting from a late report of the State Bureau of Mines, the placer deposits in this section are, in most respects, common to those of other mountainous sections of the State. They occur in low flats and bars along the stream beds, or in ridges or benches above the level, but adjacent to the stream. The latter, generally designated as "bench diggings," have been those most operated until within the last few years. The gold in these beds is generally bright and clean, ranging from 800 to 900 in fineness. It generally oc-



A STAMP MILL.

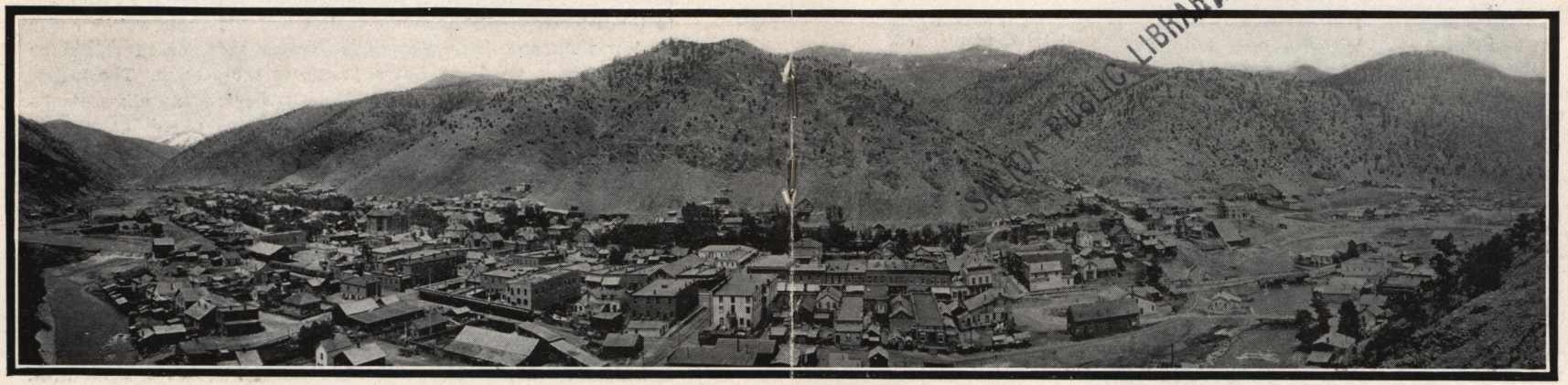
CENTRAL CITY.

curs in the form of nuggets and coarse grains, or "shot gold" and is comparatively easy to recover. These conditions caused Gold Run, Georgia, American, Humbug, Galena, Nigger, French, Illinois and Mayo Gulches, and Yuba Dam, Delaware and Buffalo Flats to be well-known districts early in the history of the state.

Breckenridge is beautifully situated, in the valley of the Blue, at an altitude of about 9,100 feet. The surrounding mountain ridges culminate in a number of peaks, varying from 12,000 to 14,000 feet above the sea.

The larger part of the placer ground in this region is owned by capitalized corporations, which are operating them upon a large scale with dredge boats. Their steel pipe lines, for the conveyance of water long distances, are among the largest in the West.

What is known as the Ten-Mile mining district occupies the southwest part of the county, where a large amount of development has been done, and the towns of Robinson and Kokomo have been located. On the Snake River is the mining town of Montezuma, where there are many productive mines. Near the town of Frisco some extraordinary discoveries were made last year.



IDAHO SPRINGS.

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The Famous Cripple Creek District

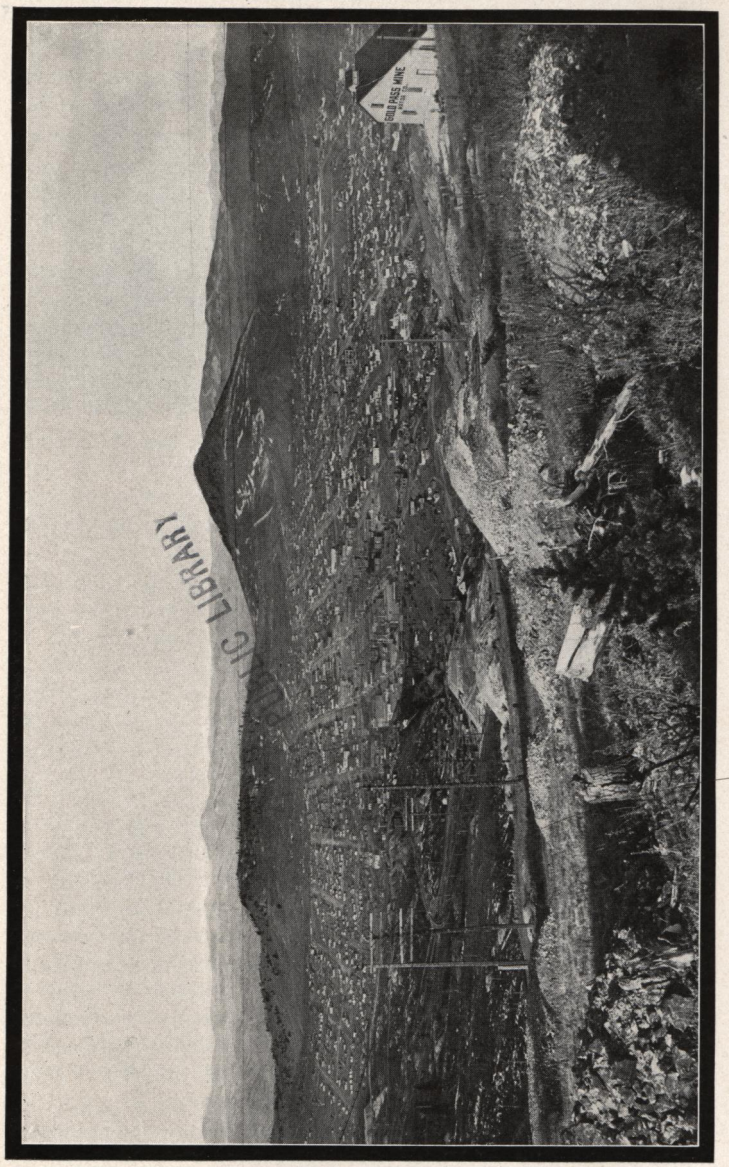
From a Cattle Ranch to One of the Richest Mining Sections of the World

LET us consider the districts in detail, beginning with Cripple Creek. This is the greatest producer of gold in the known world save one—the Witwatersrand, near Johannesburg, in South Africa. Nothing to compare with its productiveness has ever been discovered on this continent, save the marvelous placer mines of California in 1849 and subsequent years, and the enormous output of the silver mines along the celebrated Comstock lode in Nevada that was discovered some time after Colorado was occupied. But long prior to the finding of gold in Cripple Creek the placers of California and the great silver mines of Nevada had been practically exhausted. The newer phenomenon stands, therefore, distinctly by itself in the matter of remarkable yields of precious metals.

The first line of rapid transit to penetrate Cripple Creek is a connection of the Colorado and Southern System of railways, leading, as do all the rest, from the City of Denver. The first surveyed railway route ever established west of the Missouri River, then designated the Colorado Central and Pacific, is now a part of the Colorado and Southern System.

Prior to the discovery of gold in the district mentioned the entire area had been occupied as a cattle ranch. The first mine regularly opened was the Gold King, located upon a tract adjoining the City of Cripple Creek, called Poverty Gulch, which may be seen from the doors of the principal hotel. This event occurred in 1890. So much has been written of the early history of this district, its rapid development, its era of extravagant speculation, the sudden enrichment of men who were fortunate enough to strike bonanzas, it is needless to repeat it here.

From a gross production of $200,000 in 1891, the yield has augmented rapidly year by year, until at the close of 1908 it amounted to nearly $200,000,000. In August, 1903, by order of the Western Federation of Miners, with which a very large majority of the miners were affiliated through their local unions, over 4,000 men ceased work, and all the mines and reduction



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CRIPPLE CREEK.

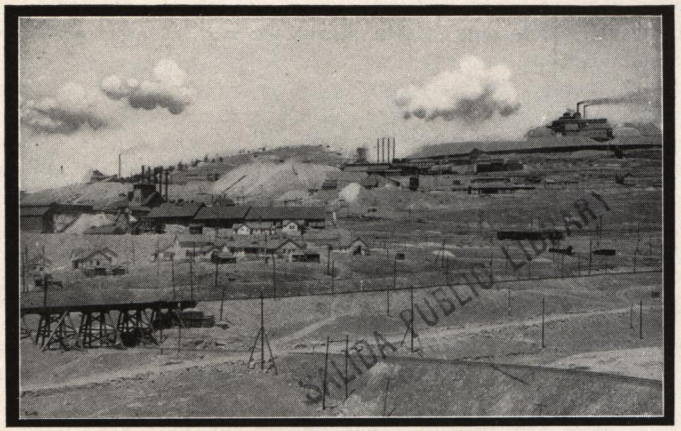
mills were closed. Late in the fall the Governor of the state sent a regiment of troops into the field. Gradually thereafter the mines were manned and the mills reopened under protection of the military, largely by operatives brought from outside sources. In December the yield again approximated the normal.

Since January, 1904, there have been no conflicts between Capital and Labor in Cripple Creek district. Peace and harmony prevailing, the mines have been made continuously productive and profitable. During the last two years a number of mills using the cyanide process for extracting gold from the lower grades of ore, which owing to the cost of transportation can not be shipped to the great milling plants at Florence and Colorado City, have been erected near the mines. By this means vast quantities of material containing from three to ten dollars gold per ton, hitherto cast into the waste piles or left in the mines, has been utilized with profit to the operators.

Strikes of ore containing phenomenal value are of frequent occurrence, usually in narrow seams carrying telluride of gold in the form of Sylvanite and Calaverite. The major part of the mine products, however, such as are transported to the great mills and smelters, run from $15 to $65 per ton.

The water level in the operated portions of the district is encountered at depths ranging between 800 and 1,100 feet. It having been found that the lower workings could not well be drained by pumping, save at very great expense, in 1903 a temporary drainage tunnel about one mile in length was driven from the level of the small stream known as Cripple Creek, to a point several hundred feet beyond the El Paso mine on Beacon hill. This temporary makeshift served the purpose of its construction for about three years, when it became necessary to plan the cutting of a much deeper bore. Competent engineers were employed, who in due time reported their findings. Money was raised by subscription and in March, 1907, the work of excavating for the approaches and the erection of needed buildings was commenced. This tunnel will, if carried to its surveyed objective—the Vindicator mine—be three miles in length, and will drain the entire territory penetrated at depths of 1,500 to 2,000 feet. It will according to present estimations be completed in 1910. It will be large enough to serve the dual purpose of drainage and transportation, besides affording property owners the privilege of mining upward from that level.

The Portland mine, on Battle Mountain, within the corporate limits of the City of Victor, five miles from Cripple Creek, is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THE PORTLAND AND INDEPENDENCE MINES.

probably the most valuable gold mine in the world, measured by the amount it has produced, the average value of its ore, and the dividends it has paid in the last ten years. This mine was discovered in 1892 by three poor mechanics, all of whom are now millionaires.

From April 1st, 1894, to December 31st, 1908, the Portland mine has paid $8,107,080 in dividends on a total capitalization of $3,000,000, and at the close of 1908 the underground workings measured over forty-one miles. It has a large reduction mill near Colorado Springs, having a capacity of treating from 9,000 to 10,000 tons of ore per month.

There are many other mines in the district which have corresponding development, but none that have been so prolific in yield and the distribution of dividends.

What is known as the Stratton Independence adjoins the Portland on Battle Mountain. It was discovered by the late Winfield Scott Stratton, July 4, 1890, who, after developing, sold it to an English company for $10,000,000. It is now operated by lease and is still one of the productive mines in the district. A large cyanide plant to treat the low grade ores in the mine and dump was completed in 1908.

There is no mining district on this continent where better machinery is employed, or superior mine engineering practiced. The geological conditions and the vein system of this section

differ in many respects from those of any other mining field in the world. It is only within recent years that they have been reasonably well understood by even the most skillful geologists and engineers. Much remaining to be comprehended by local operators, the services of the United States Geological Survey were enlisted in 1903. A corps of experts was sent out from Washington, and spent a great part of 1903 in making exhaustive investigations of every mine in the district. Their report, recently published by the government, will serve as a guide to future exploitation at depths below the points that have thus far been attained. The deepest shaft in Cripple Creek is about 1,500 feet. All the rest range between 100 and 1,400 feet.

Now a word as to the future. These questions are asked:

1. Are the mines permanent, and for how long will they continue to produce payable ore

2. Will the present ore-producing territory be enlarged, and, if so, in what direction?

3. Will the treatment facilities continue in the present state, improve, or deteriorate

4. Will the transportation facilities continue, improve, or lessen?

Answering these queries, Charles J. Moore, a prominent mining engineer who has spent many years in the district in the practice of his profession, writes as follows:

"It would seem that the consideration of the first two questions includes an answer to the last two—if, for instance, the district will enlarge, the transportation and treatment facilities will be enlarged at an equal rate, and the charges for both decrease as the supply becomes larger.

"From the numerous developments that have been made in the territory outside a circle, say, six miles in diameter, having the summit of Ironclad Hill for its center, it would appear that no further extension of the ore-bearing district can be expected beyond the limits we now have.

"This does not mean that all the mines are already opened, for very large tracts of territory within this circle remain undeveloped, in some of which, certainly, new mines will be opened up. We have certainly not reached the end of new discoveries within the district. A large impetus in this direction will be given by opening the properties of the Stratton Mining and Development Company by the granting of the ground to industrious and experienced miners, which is now in progress.

"The main question remaining is that of the permanency of the mines, and of this, during the past year, we have received very promising evidence."

After enumerating the list of principal shafts ranging between 800 and 1,500 feet in depth (there is only one that has penetrated to 1,500 feet—the American Eagles, belonging to the Stratton estate), Mr. Moore says: "All but one of these shafts have good bodies of ore and excellent indications for the future at the lowest levels to which they have thus far attained. In two or three of them some of the richest ore ever mined in the district has been found at their lowest levels.

"A special feature of these rich bodies at 1,200 and 1,300 feet below surface is the presence of copper, which is entirely absent from the upper or oxidized portion of the Cripple Creek vein. Another change in the mineral contents of the veins at the greatest depth thus far attained is the presence of lead, zinc and antimony in sulphide form, and increase in the iron sulphide generally called 'pyrites.' None of these changes coming in the veins at depth indicate any decrease of gold or silver values, but, on the contrary, in the immediate future, a great increase from a plane, about 9,100 feet above sea level, downward.

MINERS AT WORK UNDERGROUND.

"In view of all the conditions now presented, it would appear that successful future of the district is certain, and that the average grade of the ore produced during the next two years will, in all probability, be higher than at any time during the past, except the years 1894 to 1897."

Finally, one fact is definitely established, that there is no mining district in the world where so many strikes of extraordinary value have occurred. And notwithstanding that remarkable revelations have appeared from time to time in the past ten years, the opening months of the present year (1907)

have witnessed a greater number of such disclosures of mineral running into the thousands, per ton, than have been presented in any former period.

It may, therefore, be said, in all candor, that the situation at Cripple Creek at this writing is even more favorable than at any time in its history, and that the mines will continue to output large quantities of gold for an indefinite period.

The ride from Denver to Cripple Creek is one of rare scenic attractiveness to the tourist. If, after arriving upon the ground, the visitor is fortunate enough to secure permission from the manager of some one of the noted mines, a descent to the depths, when the miners are working, will furnish an impressive object lesson in the details of the cost in labor, machinery and engineering skill required to raise the precious ore to the surface. Then, if they will follow the ore to the places where the gold is extracted, and witness further evidences of the amount of capital, scientific effort, manual labor and machinery requisite to the proper extraction of its values, they will be imbued with higher respect for every ten or twenty dollar gold piece met with in the financial affairs of life, because they will have seen something of what it cost to bring it into commercial use.

Leadville

THIS, next to Cripple Creek, is the largest and most productive mining camp in Colorado. It is the county seat of Lake County, and one of the leading commercial centers of the State, situated on the west flank of the Mosquito range, near the head or north end of the Arkansas Valley, and has a mean elevation

BIRDSEYE VIEW CITY OF LEADVILLE.

of 10,200 feet. The basin is drained by the Arkansas River, which flows in a southerly course, and a number of tributaries that rise in the mountain ranges upon the east and west sides.

In order that the reader may obtain an impression of the rise and progress of this remarkable settlement, a rapid digest of its romantic history is presented.

To begin with, in the course of its spectacular career of twenty-nine years, this district has produced three hundred and forty-five millions of dollars—a much larger amount than any other one district in the entire Rocky Mountain chain. In the matter of ore tonnage, its output to-day is much greater than any of its contemporaries, but as a rule the grade is much lower.

Late in the spring of 1860 a small band of Gilpin County gold hunters crossed the Park range of mountains and entered a heavily timbered ravine which they called California Gulch. They panned the surface dirt for gold, and finding it rich beyond their expectations, settled there and immediately began preparations for extensive work by sluicing. In a few days reports of what they had discovered spread over the land, bringing a continuous stream of prospectors. The original discoverers claimed 200 feet up and down the stream, and those who came after were allowed 100 feet until the gulch was preempted for 33,000 feet, or nearly its entire length. The town or camp was christened El Oro. Many log cabins were built and occupied; trading stores followed. Parts of the gulch were fabulously rich, but the water supply was limited. Some of the claims are said to have yielded $1,000 per day. It was reported at the time that one firm of miners took out $100,000 in 60 days' sluicing. Before the summer ended there were more than 5,000 people assembled in this narrow ravine. Then came the usual accessories of gambling houses, dance halls, saloons and the like.

HYDRAULIC PLACER MINING NEAR BRECKENRIDGE.

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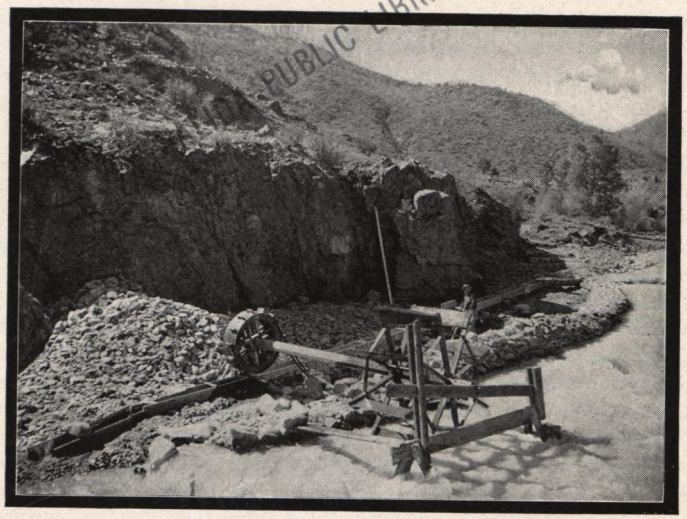


SLUICE PLACER MINING.

Matters ran on in this manner for several years. The yield from these mines in any one year, or in the period of their greatest productive capacity, can not be accurately known, but those who have taken pains to find a fair approximate of the total place it at about five millions. Later day apochryphal reports double that amount.

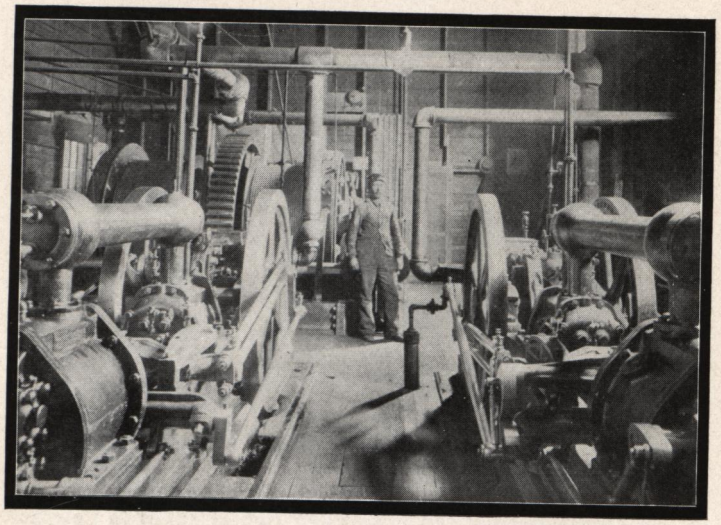
This, hastily epitomized, was the initial period, which lasted from eight to ten years, with a steadily diminishing output. People moved away, and in due course the once prolific gulch fell into innocuous desuetude.

Second Period.—In 1874, William H. Stevens, a wealthy miner, went over from Park County, in company with A. B. Wood, and began constructing a twelve-mile ditch for the California Gulch claims he had purchased, under the well formed impression that large quantities of gold remained which the earlier operators had failed to recover. The head waters of the Arkansas River were tapped for a sufficient supply. When Stevens and Wood began operating their sluices under hydraulic pressure, they were subjected to much inconvenience by reason of the great weight of the boulders and fragments of rock that tumbled in upon them. Mr. Stevens, taking some of these fragments to an assayer, was informed that they were carbonate of

lead, carrying high values in lead and silver. Investigating their source, he discovered that they came from very extensive deposits of mineral upon the mountain sides. Prospecting led to the location of many claims, and out of this sprang the Leadville of which the world has heard so much. Space will not permit of anything more than a hurried outline of the consequences. It may be briefly epitomized by saying that tidings of these important discoveries were flashed over the world by telegraph, and in due time attracted vast multitudes of people. The town of Leadville was built, and soon become a very populous city.

Meanwhile the South Park division of the present Colorado and Southern Railway, which had been built from Denver to the base of the mountains some time prior to the events just narrated, was rushed through the canon of the Platte River and across the South Park to the phenomenal camp, near the head waters of the Arkansas River. The excitement raged without intermission from 1878-9 until 1880-81, when it began to subside. In the interim some of the largest and richest mines in Colorado had been opened and were pouring forth millions of treasure.

The high line division of the Colorado and Southern Railway passes to the very head of the Arkansas River, and swings along the mountain sides high above the valley, until it reaches the city—a splendidly picturesque and wonderfully interesting journey, that compels warm admiration of the road and its builders. From the city branch lines or spurs have been built to all of the principal mines of the district, for the conveyance of supplies, and to bring down the ores for transference to the smelters. Immense bodies of sulphide ores have replaced the deposits of carbonate lead-silver bearing mineral originally found and operated, carrying gold, silver and lead sufficient to yield large returns above charges incident to mining, transportation and smelting. The ore deposits of this section have been made the subject of careful research and study by some of the world's greatest geologists. One of the largest plants of the American Smelting and Refining Company is located at the base of the city, where the bulk of the ores are treated and their valuable contents extracted in the form of lead bullion. The production of the district is from 85,000 to 90,000 tons of ore per month. The area is being enlarged each year by the development of mines in the neighboring territory. The great Yak tunnel has been driven into Breece Hill a distance of over three miles, and from it vast quantities of mineral are mined. The famous Ibex



INTERIOR OF MODERN SHAFT HOUSE.

Mines at the head of Breece Hill have about 40 miles of underground workings and have produced many millions. The ores of Leadville are used in all the smelters of the Arkansas Valley, and thousands of tons are brought to the smelters in Denver, to be used as fluxes for the great variety of other ores sent them for treatment. The population of Leadville is about 12,000, the greater part engaged in mining, which pursuit will probably be carried on for a great many years with profitable results. During the last five years it has become the largest producer of zinc ores in the State. This district has produced to the close of 1908 about $369,774,085 in gold, silver, lead, copper and zinc.

Chaffee County

THIS county occupies a central position in the State, and has an area of about 1,150 square miles. Lake adjoins it on the north, and Gunnison on the west.

A branch of the Colorado and Southern Railway extends from Como across the South Park via Garo, over Trout Creek Pass, through the Arkansas Valley via Buena Vista in Chaffee County; thence up Chalk Creek Canon, through Alpine

tunnel, one of the highest railway passes on the North American continent; thence down Quartz Creek Valley in Gunnison County to Pitkin and the City of Gunnison. From Garo there is a branch line to Fairplay and Alma in Park County.

The precious metal mines of Chaffee County have not attained the prominence that has been developed at Leadville or Gunnison. Great activity prevailed until 1862, but not until the past year or two has any very important work been accomplished. There was one smelter at Buena Vista engaged in working the valuable ores of the Mary Murphy group of mines, at Romley, above St. Elmo, which has been very extensively developed and has yielded about $14,000,000 in gold and silver, but the works were some years ago destroyed by fire and have not been rebuilt. Near Granite the placer mines have been operated on a more or less extended scale since 1861. The placer season usually opens about April 1, and lasts until about November 1.

Lode mining in the Dewey and Granite districts, embracing the northeast portion of the county, has been more active during the past two years than formerly, several new companies having entered the field. One of the more productive and promising sections is that adjacent to Turret, Whitehorn, Manoa and Calumet, where some important discoveries have been made.

In the Chalk Creek district, in the vicinity of Romley, Alpine and St. Elmo, some really great mines have been developed, the Mary Murphy being the most conspicuous.

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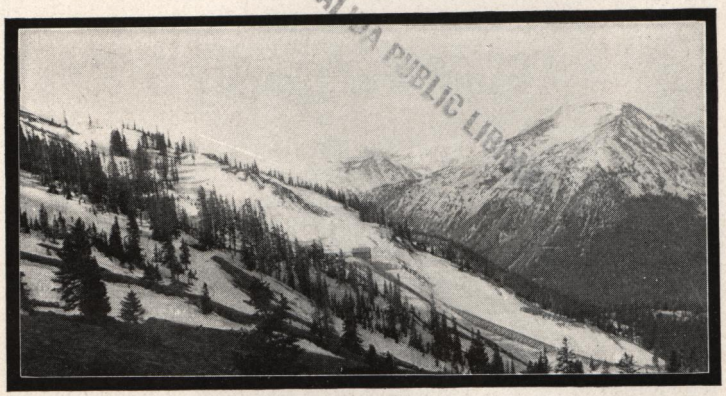


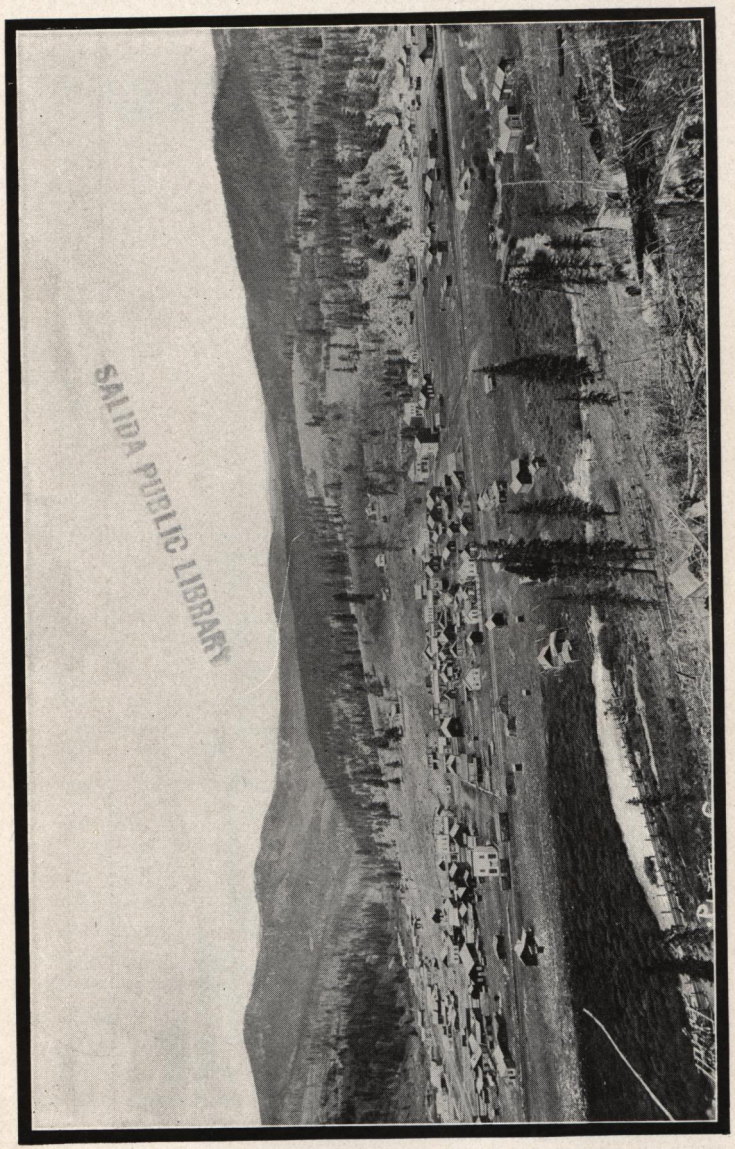
MARY MURPHY MINE, NEAR ALPINE PASS.

OPERATING AIR DRILL 900 FEET UNDER GROUND.

In Monarch district much very valuable ore is being extracted from the Madonna, Lilly and a few other mines. A short distance above Salida are the extensive smelting works of the Ohio and Colorado Smelting Company, which produce about $4,000,000 annually. Much of the ore supply comes from Leadville, where the Company owns and is extensively operating the New Monarch properties. Many consignments are drawn from other points in the State, as also from neighboring mining States and territories. This is the only large lead smelting plant in Colorado that has not been absorbed or controlled by the American Smelting and Refining Company, known as the Smelter Trust. One of the largest copper mines in the State is operated at Sedalia, a short distance above Salida.

Gunnison County

PASSING out of Chaffee County, the Colorado and Southern Road enters Gunnison County by a tunnel under Alpine Pass, thence down Quartz Creek to Pitkin, and on to the City of Gunnison, whence a branch line extends up Ohio Creek, to the coal fields. The mineral resources of this region embrace about every variety of ores known in the State, and, in addition, vast beds of superior coal, including anthracite, from which all our supplies of that class are drawn. It is the only anthracite mined west of Pennsylvania, save the Perry mine in Routt county, whose products have recently been shipped to Denver. There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PITKIN, GUNNISON COUNTY.

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are great beds of superior iron ore and immense quarries of splendid granite. The State capitol, in Denver, which was built of Gunnison granite, is a striking example of its beauty and strength. The Dakota sandstone is likewise quarried extensively at several points. Mineral springs, both hot and cold, occur in various localities, and, during the past year, there has been considerable prospecting for oil.

Many mining camps were established in the county following the excitement at Leadville, in 1879-80, but only a few of them have been thoroughly developed. Events of the past year have led to the reclamation of a great many mines that were virtually abandoned after the final demonetization of silver, in 1893.

In the vicinity of Pitkin, twelve miles below Alpine Pass, some of the largest consolidations in the State have been effected, and some large developments prosecuted.

From Tin Cup north to Italian Peak, or the section tributary to the headwaters of the Taylor River, there has been a great increase in mining and prospecting. In the White Pine district the Akron Mining Company has driven a tunnel about 2,500 feet for the purpose of intersecting its mines, at great depth, for drainage, and more convenient working of its mines. This tunnel was completed in 1903. White Pine is known as one of the best gold and silver mining sections of the county. Here, as at Pitkin, the veins carrying gold and silver are both fissure and "contact." At Tin Cup the values in gold and silver are about equal, while north of Tin Cup the value is mainly gold. At White Pine there is a series of large veins of magnetite.

Here about mid-summer of 1903 some remarkable new discoveries of gold occurred in the Box Canon district, four or five miles south of Pitkin, the nearest and most convenient railway station, which subsequently took the name of Bowerman from the original discoverer. A large vein of hard quartz, carrying great quantities of gold, was opened. The news was quickly carried to all parts of the State, and hundreds rushed in. Prospecting followed, and, by the close of the year, a strong town had been established. Subsequent development uncovered a considerable belt of valuable lodes, which are now being opened and ore extracted for shipment to markets. About the same time a new camp on Cochetopa Creek in the southern part of the county,

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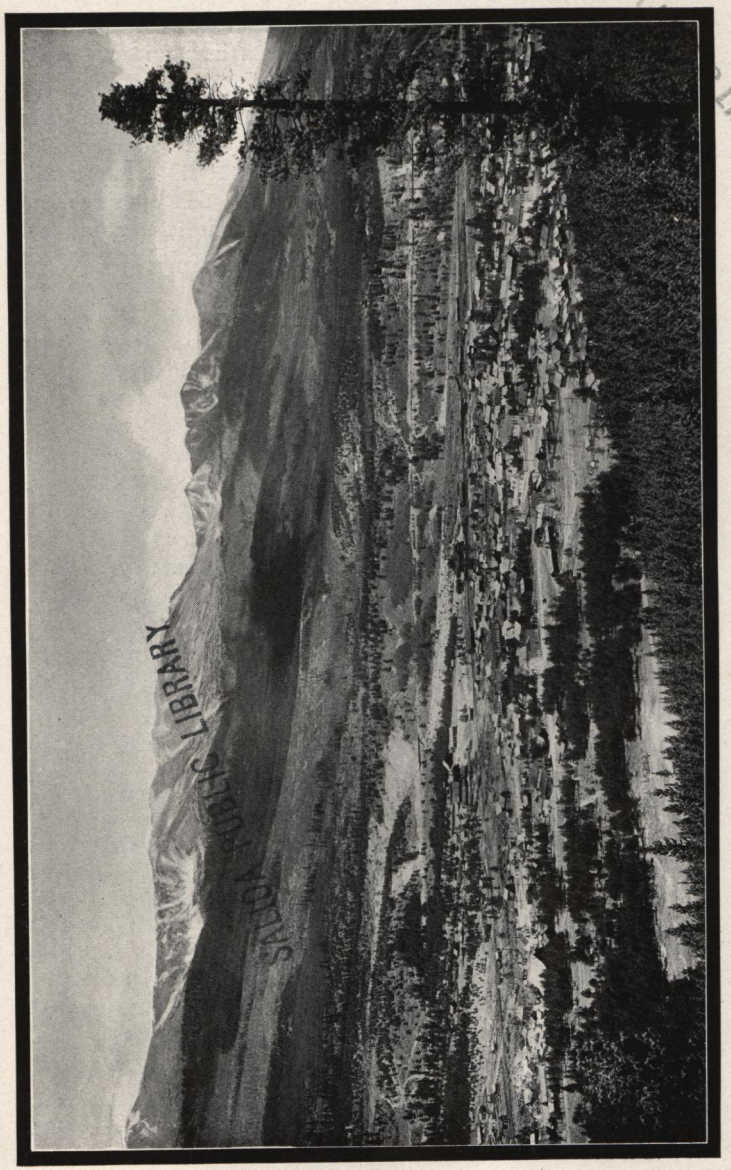
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BRECKENRIDGE AND THE TEN-MILE RANGE.

called Sillsville, was founded upon the discovery of many gold-bearing veins. Companies were formed to operate them, and the output has been very favorable for a new undertaking of this character.

The scenes of greatest activity for the past two or three years are around the Pitkin and Ohio City Gold belt. The Raymond tunnel, about 2,500 feet in length, driven to intersect at great depth a belt of gold-bearing veins that had been exploited at the surface and found to contain large quantities of valuable material, accomplished that purpose, thereby draining them and opening the way for their more economical exploitation. Laterals have been extended along these veins from the tunnel, and very large reserves of excellent mineral exposed. At the portal of the tunnel was built a superior amalgamating and concentration mill, containing the latest modern improvements for value saving. As a result, having an abundance of ore, the property is extremely profitable. Under capable management the Raymond has risen to be the most important mining and milling enterprise in Gunnison county. The Carter tunnel in the near vicinity, designed to cut the same belt of veins, has a length of over 3,000 feet, but has not yet reached its objectives.

Probably the longest, and one of the most important tunnels in this district is the Gold Links, being driven by A. E. Reynolds of Denver. Its present length is over 3,000 feet, and it is being rapidly extended. A very large mill to treat the ores exposed along its course is now under construction. The Belzora Bassick is another enterprise of great magnitude. The Grand Prize is producing liberally of high grade ores, as are the Napoleon and others.

The anthracite and bituminous coal mining districts in the northwestern part of the county are very productive. During 1906 the Colorado Fuel and Iron Company shipped to various markets 1,450,000 tons of coal and coke from these mines, the value of which was $4,970,000. In the vicinity of Crested Butte this company is producing the only anthracite coal mined west of Pennsylvania. In addition to its vast mineral resources, the agricultural and stock growing industries are prominent.

On Gule and Crystal Creeks, in the northwestern part of the county, vast deposits of white statuary and colored marbles have been opened up by the Colorado-Gule Marble Company. The first is pure white of uniform texture and can be obtained in

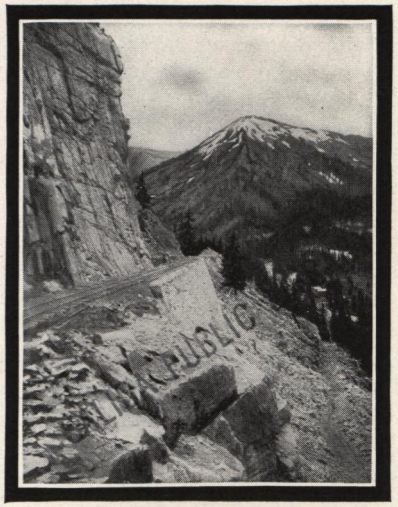
blocks of any size desired. Among the recent contracts of this company was one for the interior of a court house in Cleveland, Ohio, amounting to $500,000, said to be the largest contract for interior white marble ever recorded. So great are the demands for Colorado marble from these now thoroughly opened quarries the company employs a constant force of 350 men exclusive of office and other employes. It has installed a complete equipment for quarrying and dressing the product at a cost of over $1,000.-000. The mill will be able to turn out fluted columns 18 feet in length by 3 feet in diameter. A finishing plant has been added at a cost of $50,000, exclusively for finishing work.

Boulder County

THE Fort Collins division of the Colorado and Southern Road, starting north from Denver, traverses the agricultural garden of the West. At a distance of thirty miles from Denver stands the beautiful university town of Boulder, from which point the Denver, Boulder & Western R. R., connecting with the Colorado and Southern, serves the mining districts of Salina, Crisman, Wall Street, Ward, Eldora, Sunshine, Magnolia, Gold Hill, Caribou, Nederland and Sugar Loaf, in most of which mining has been carried on for the past thirty years with varying success.

This, like Gilpin and Clear Creek, is one of the pioneer counties of the state. The metal mines are located in the metamorphic rocks of the mountain division. The fissures containing the precious metal veins form a network over almost the entire area, and strike at all points of the compass. All carry values in gold and silver, the gold predominating. The so-called telluride belt, extending from Magnolia to Ballarat, produces the high-grade gold and silver telluride ores. In the later seventies ores of wonderful richness were taken from the American mine at Sunshine, the Melvina and several other properties, that gave prodigious yields in gold. Selected samples assayed from $5,000 to $200,000 per ton. They became the marvels of the time, and many of the famous mineralogists of the world came to visit them. The Crown Mineralogist of Russia was among the number. Nothing like these revelations had ever been known in the

history of the world. The manager of the American mine stated that for eighteen months the ore shipped from that property to the smelters averaged $5,000 per ton. Unfortunately, these extraordinary values were not enduring. The rich tellurides occurred in streaks, which, when exhausted, were followed by ordinary sulphides of varying, but still profitable, value. At times, even at this day, ore is found in many mines that is worth from $500 to $5,000 per ton, but this does not continue with the regular course of development.



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Taken as a whole, Boulder County mining is upon a higher plane of progressiveness at the present writing than ever before. Many important enterprises have been inaugurated there during the past two years, which augur well for the future general development. The discovery, among other things, of considerable quantities of wolframite or tungsten ores, about Caribou, Nederland and Sugar Loaf, three small mining camps, has created a lucrative branch of industry, since the demand for this metal in steel manufacture is increasing. This district is now the largest producer of tungsten in the United States, statistics showing that of the total production of the United States, fully 75 per cent. is produced in Boulder County.

Notwithstanding the very large area now given up to mining in Colorado, there are almost limitless fields open to exploration, in which, as the years go round, equal, and perhaps even more productive, industries will be established. There are numberless opportunities in these comparatively unexplored regions for the acquisition of fortune. No one claims that the limit of discovery has been reached. Every year brings to light something new along the trails of the tireless prospector. It is felt

by the oldest residents that no section of the world presents so many inviting propositions to men who are willing to seek earnestly that they may find. Out of these now waste places will eventually be gathered more millions of money than the State records show to have rewarded the diligence of the past forty years.

In conclusion, let it not be forgotten that the Colorado and Southern System of railways, standard and narrow gauge, extends to and affords admirable transport facilities for all the really great mining districts of the State, save the far distant San Juan country, bordering on New Mexico. The points accommodated comprehend the larger part of the mining population, and are yielding the preponderance of ores and bullion. The beneficent policy of the management, to afford every possible facility to these productive quarters, has evoked universal appreciation.

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