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COLORADO:

A

HISTORICAL, DESCRIPTIVE AND STATISTICAL WORK

ON THE

ROCKY MOUNTAIN

GOLD AND SILVER MINING REGION,

BY

FRANK FOSSETT.

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PREFACE.

THIS book, as its name implies, is devoted to Colorado. Its contents are historical, descriptive and statistical. The resources, productions, and natural advantages of the new State, are set forth at length. The Mines and Mining Regions receive considerable space and attention. The collection of facts, and figures, although not as complete as could be wished, are the most accurate and extensive ever compiled on Colorado Mines, and is the result of no little care and labor. A record of events from the first settlements, with some account of the struggles, reverses, progress and successes of Mining and Milling for Gold and Silver in the Rocky Mountains, will also be found in these pages. The climatic virtues, physical beauties, and general attractions of this part of the far West, receive due attention, with plain unvarnished statements regarding Mining, Farming and Stock growing in Colorado, and the opportunities awaiting capital and labor. Although necessarily imperfect in many respects, the author trusts that much will be found in this volume to interest Colorado as well as eastern readers.

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THE CENTENNIAL STATE

CHAPTER I.

GEOGRAPHICAL FEATURES.

The Mountains and Plains—Elevation of Snowy Range—Rivers and Parks—Length of Rivers—Something of the great Parks.

Colorado occupies the centre of the Rocky Mountain region, together with the western portion of the great plains, being located in the heart of that part of the United States lying between the Mississippi River and the Pacific Ocean. It extends from the thirty-seventh to the forty-first parallel of North latitude and from the one hundred-and-second to the one hundred-and-ninth meridian of longitude West from Greenwich, and is about midway between British America on the North and Mexico on the South. It is nearly square, or rather rectangular in shape, having a length of about three hundred-and-seventy miles from East to West, and of 280 miles from North to South. It comprises an area of 104,500 square miles or more than any other State excepting Texas and California. It is larger than Great Britain, one-half the size of France, and embraces nearly as much territory as New York and New England, or the four Middle States combined. To the North are Wyoming and

Nebraska, on the East, Nebraska and Kansas, with New Mexico on the South, and Utah on the West.

The centre of Colorado is traversed by the Rocky Mountains,—Sierra Madre—in a North and South direction. The spurs and offshoots of this grand mountain system occupy the western portion, while to the East are the great plains.

The plains occupy over one third of the State, ascending gradually to the base of the Mountains, where they attain an elevation of a little over a mile above sea level. They are destitute of timber excepting along the river bottoms, but over all this district grow tall nutritious grasses, affording splendid grazing grounds for stock. Immense herds of Buffalo roam over this treeless territory, usually keeping at a safe distance from settlements. Wherever irrigation is practicable, as along the valleys of the Arkansas, the South Platte and their tributaries and chiefly near the mountains, the soil has been found to possess remarkable fertility and to be capable of yielding most bountiful crops.

From the western limit of the plains rises what are known as the "foot hills," which form the beginning of the mountain system. They are often sharply defined, with the barren rock jutting out boldly toward the plains, and again smooth and rolling. Beyond them are still higher elevations, hill upon hill and mountain upon mountain, all more or less heavily timbered and extending on and up until the dividing ridge of the continent is reached some forty or fifty miles west of

the foot hills. This region is traversed by innumerable ravines and cañons, some of which are sharp and deeply cut, worn by the waters and snow slides of ages. The crest of this mountain system, familiarly termed the "Snowy Range," attains an elevation of from 13,000 to 15,000 feet above tide water, and several thousand feet above "timber line," and every species of vegetation. Its course although irregular, has mainly a North and South direction, and many spurs of equal elevation extend East and West. It forms the backbone of the American continent, the region of eternal snows, with crystal lakes and sparkling rivulets, which uniting form streams from which great rivers flow to either ocean. From the eastern slope the Platte starts on its winding course of 1,500 miles to the Missouri river. Further South, the Arkansas dashes through mighty cañons, and fertile plains, on to the lower Mississippi, 1,800 miles from its mountain source. In southwestern Colorado where the range takes a southwesterly direction into the San Juan region the waters of the Rio Grande Del Norte take their rise and begin their long journey of 1,800 miles to the Gulf of Mexico. On the western slope the Grand and Green unite to form the Grand Colorado of the West, 2,000 miles in length, and emptying into the Gulf of California.

To the West, the mountains slope off gradually, but a series of lofty ranges and rugged hills divided by well watered parks and valleys occupy this almost unsettled portion of the State.

The parks of Colorado are a distinct and remarkable feature of this mountain system, being probably the basins of former lakes at an early period of the world's history. They were evidently deprived of their water by volcanic agency, retaining their original outlines. Their lowest parts are from 6,000 to 9,000 feet above sea level. These parks are firmly walled about with mountains grand and high, and are watered by the purest streams. They are covered by rank luxuriant grasses with here and there groves and patches of timber. They form some of the choicest grazing lands in the world and in some instances are admirably adapted to agriculture. The largest of these in the order of their size are San Luis, South, Middle and North parks. The last two more especially with several smaller adjacent ones, have always been famed for their plentiful supplies of wild game of almost every description, which have made them a famous resort for sportsmen. The mountains are covered with pine, fir, aspen, and other varieties, the finest timber being found at elevations of from 8,500 to 10,500 feet. Above those points the trees grow smaller and more sparse until they dwindle to shrubs and bushes bent by the mountain storms. These disappear altogether at elevations of from 11,200 to 11,600 feet above sea level, or at the point known as "timber line." Above all this is a bleak and barren waste of rock and "slide" varied with the occasional presence of stunted grass and flowers.

The gold and silver regions are confined to these

mountain chains and down to points near the foot hills. Most of the gold districts are located at elevations of from 7,000 to 9,000 feet above sea level, or from 1,500 to 3,500 feet above the plains. The silver veins have a general tendency to higher altitudes, and many of them are in the main range proper, crossing and recrossing it. The coal lands extend from the foot hills out on to the plains for a considerable distance and are also found in the less explored mountain regions of the West.

CHAPTER II.

EARLY HISTORY OF COLORADO.

First White Visitors—Explorations of Lieut. Pike—Col. Long's, and other Expeditions—Indian Traders—Discovery of Gold—Early Settlements.

ACCORDING to the best authorities the first white men who ever penetrated to the wilds of Colorado, were some eight hundred Spaniards and Mexicans with Indian allies, under Caronado, who were sent northward from Mexico by the Spanish Viceroy in the year 1540, to explore the country for gold. The expedition failed to discover the wealth of these mountains that has since added so largely to the world's production of gold and silver, and, after enduring great hardships, returned from whence they came. And so Colorado was left for ages in the undisputed possession of the buffalo and the red man.

France once claimed this entire region, as far west as the Pacific, as a part of the great province of Louisiana. In the same indefinite manner, Spain asserted ownership as far North as the northern portion of what is now Colorado. Spanish settlements and military posts were established on the Rio Grande and the tributaries of the Arkansas, in the early part of the present century. The larger part of Colorado was ceded to the United States by Mexico, at the close of the war of 1846-48.

After the purchase of Louisiana from France, in 1803, the United States government began to take steps to explore and ascertain the wealth and resources of the purchase—a region larger than all of the States at that time, and greater than all Europe combined, with the exception of Russia. An expedition of twenty-three men was sent out, under command of Lieut. Pike, of the regular army, which reached the western Arkansas in October of 1806, and came within sight of the Rocky Mountains, November 15th, of that year, when the most prominent peak was named after the commander.

After passing a winter of great severity among the mountains, and discovering the head waters of most of the leading rivers of Colorado, Pike and his command were taken prisoners by the Spaniards, who had a military post somewhere in the San Luis Park or the San Juan country. They were the first white visitors in most of the territory over which they traveled.

In the year 1819 a second expedition was sent to these mountains, by the government. This was commanded by Colonel S. H. Long, of the United States army. Early in the summer of 1820 the party struck the South Platte, and followed westward until they came in full view of the mountains. The most prominent peak, and the first one seen was named Long's Peak. A careful examination was then made of the country. In 1832 the American Fur Company fitted out an expedition which was commanded by Capt. Bonneville, of the army.

The most complete and effective expeditions were those sent out by the government under command of Fremont, in 1842-44. His books and reports were of great value.

At the close of the Mexican war, a vast tract of country extending from the Rocky Mountains to the Pacific, and embracing nearly 500,000 square miles, was added to the national domain. From this have been carved the golden state of California, Nevada, with its inexhaustible silver deposits, several territories and the greater portion of Colorado, than which no brighter star has been added to the flag of our Union. Soon after gold was found in California, and thousands made their way over the dreary waste of plain and mountains just north of the region, which, ten years later, caused a similar excitement, but which was then passed by as worthless.

For a decade or two previous to the discovery of gold, a few Indian and fur traders had established themselves on the plains, near the mountains, where they built small forts for protection against the savages. Among them were Lieut. Lupton and Vigil St. Vrain, in the North, and Colonels Bent and Boone, on the Arkansas. A Mexican population had gradually worked its way up from the land of the Montezumas, and was engaged in stock raising just north of the New Mexican line. The mass of this population is of mixed Spanish and Indian blood, speaking the Spanish language only, or a corruption thereof.

From the trading posts and camps of the early

times, the hunters and trappers of these western wilds were accustomed to gather (to pass the winter) at the junction of the Fontaine qui Bouille with the Arkansas, where the City of Pueblo now stands. Among them were such celebrities as Kit Carson, Dick Wooten and others. A trading post was finally established there, and several small Mexican settlements were started in neighboring sections. In 1854 the Ute Indians wiped out the Pueblo post, and in one night killed all who had assembled there.

The Fairplay *Sentinel's* history of Park county, has the following:

"In 1848, a trapper by the name of Williams, claims to have penetrated into the South Park and to have discovered gold. During the winter and spring of 1851, John Orbert, now residing in the town of Walzenburg, in this State, employed himself in trapping in the vicinity of Hamilton, and the ruins of log huts, which were found on the Breckenridge Pass, are said to have been built by his party. During the year 1856 a party of Texan rangers entered the South Park via the Arkansas river. The troops skirted along the Mosquito range and camped nearly opposite the town site of Fairplay."

Early in 1858, W. Green Russell and nine companions left Georgia for the purpose of searching for gold along the eastern slope of the Rocky Mountains and after a long and toilsome trip across the plains, arrived at the head of Cherry Creek on the first day of June. Parties were organized in Missouri and Kansas, after

they passed through, to follow them or reach the reported gold fields first. One of these left Lawrence in May and camped near where Pueblo now stands, about the fourth day of July.

Russell's party prospected on nearly all of the streams in northern Colorado as far north as the Cache a la Poudre, and returned, considerably disheartened, about the close of September, to the Platte. They camped at Dry Creek, and took therefrom several hundred dollars in gold dust. Some of the party then returned to the states to carry the news of the discovery.

In the months of October and November, the Lawrence (Kansas) party, settled and built twenty or thirty log cabins on what is now known as Younker's ranch on the Platte river, some distance above Denver. This they called Montana city. This was the year succeeding the great financial crisis of 1857 when so many time honored mercantile houses went down in the storm, and men were ready for any venture that promised to better their fortunes. The effect of so many failures had been to throw thousands out of employment, and these looked anxiously for some means of improving their condition. The opportunity was offered by the discovery of Gold in Colorado. The reports that Russell's men carried back, spread like wild fire; several parties were organized in the Missouri river towns, and arrived in Colorado before the close of the season.

In October 1858, a small settlement was formed on

or near the present site of Boulder. The first permanent arrivals at Denver, were in September. In November, a large number of adventurers from all quarters, settled on both sides of Cherry Creek, and from that time this locality became the great point of arrival and departure for the multitudes who followed in the wake of the early pioneers. It will be seen that no discovery of gold in any considerable quantities was made during this entire season. The Cherry Creek villages were first known as Auraria and St. Charles.

We quote the following from Hon. W. F. Stone's very interesting historical sketch of Pueblo county.

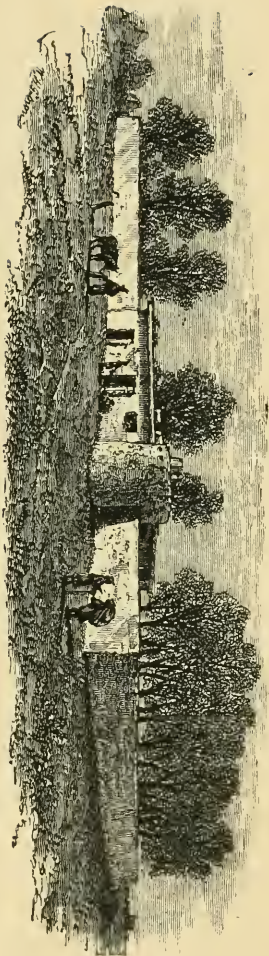
"In 1848 the children of Wm. Bent while camped on Crow Creek, on the way from Fort Bridger to Bent's Fort are said to have gathered small nuggets of gold. In 1858, a St. Louis party arrived on the Arkansas. These pioneers were Josiah T. Smith, Otto Wenneka, Frank Doris and George Lebaum, and they were soon reinforced by others including a brother of senator McDougal of California, a talented but eccentric and dissipated genius, who had left California and the world in disgust and spent several years with Charley Autobeas and other old trappers in the wilderness, self exiled and a wanderer. These parties joined together and laid out a town, just East of Fontaine, where the present road runs, and named it Fountain City. Two men named Cooper and Wing, came about this time, from Missouri with a little stock of goods, and with them were two men named Shaffer and Browne who made a survey and plat of the town

site. Cooper and Wing built a large cattle corral and opened a store. Most of the adobe houses were built from the old walls of the fort at Pueblo, portions of which remained standing. Bob Middleton brought with him his wife, who was the first white woman of the settlement. About eighty lodges of Arapahœ Indians camped alongside of the settlers for nearly three months during the winter, trading in furs, dressed skins and other commodities.

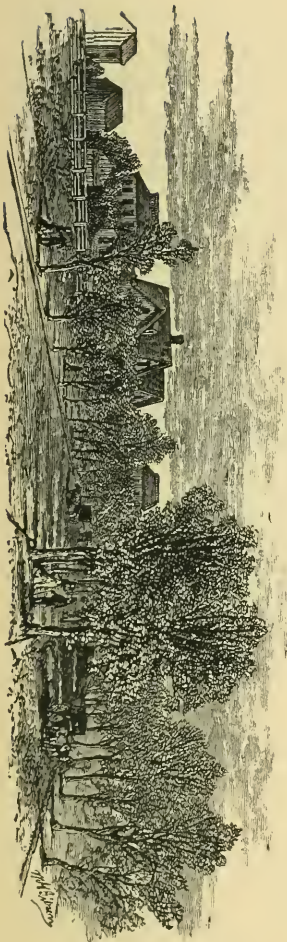
The most lively event of the winter was that of a raid which was made one day by the wily Utes, who got away with a hundred head of Arapahœ ponies. An Arapahœ chief with a few braves, including Si Smith, followed a few miles up the river to try to recover the stock, but when the chief was ambushed and shot near the Rock cañon, Si and the other Arapahœs got suddenly discouraged and retreated. Game was plenty, and the settlers frequently indulged in it during the winter, both for food and pastime. It consisted chiefly of deer, antelope, jack rabbits, *monte* and *seven-up*.

In January a man coming down from the diggings, got caught in the snow on the divide, and perished with cold and exhaustion, dying just as he reached Fountain City afoot; and thus the settlers were providentially enabled to start a grave yard and thus plant civilization in these western wilds. The next spring—1859—an acequia was dug and water taken out of the Fontaine for irrigation."

The territory of Kansas at the time of the gold



OLD TIMES ON THE BORDER - RICE'S RANCH.



NEW TIMES ON THE BORDER—SOUTH PUEBLO.

discoveries extended as far West as the crest of the Rocky Mountain Range. Consequently the Pike's Peak region was within the limits of that territory. The enterprising spirit of the American people was shown by the political move that took place here in 1858. At this time, there were not over 200 men in this broad expanse of country, and most of them had been here but a few weeks; yet a county had been defined called Arapahœ and an election was held on the 6th day of November, at which H. J. Graham was elected Delegate to Congress and A. J. Smith, Representative to the Kansas Legislature. Two days afterwards the newly chosen Delegate was on his way to Washington to induce Congress to organize a territory, but failed in his object. Smith met with better success, and the county of Arapahœ was authorized to be established by the Kansas Legislature. This county was intended to include this entire region as far West as the territory of Kansas extended.

CHAPTER III.

THE MARCH TO THE LAND OF GOLD.

First Discoveries in the Mountains—Narrative of Events in '59—The Gregory Diggings—Gregory's Discovery—The Jackson Gulch Mines—Stampede for the Mountains—Further Explorations.

DURING the winter of 1858-9, extravagant reports had circulated among the states regarding the Pike's Peak Gold Region—for this name had been applied to the entire country, after the peak that first greeted the eye of the immigrant, although no gold was found within fifty miles of it—and the result was a grand rush for the land of promise, as soon as spring opened. The stampede across the plains at that time has never been equalled before or since, except in the case of California. Over the broad expanse from the Missouri westward for a distance of six hundred miles, came an almost continuous stream of humanity. The magic word "gold" had created a fever and enthusiasm that no distance nor hardship could repress, no danger or difficulty dispel. And so the routes over this ocean of dust and solitude, wherever water is obtainable, were lined with caravans, and with pilgrims weary and footsore, but ever hopeful of the land and future before them. They came in wagons, with ox teams, on horseback, and on foot. Some trudged along with their packs upon their backs, and a few

with a wheel-barrow before them—any way to reach the new El Dorado, and return in a few short months rich and independent. That many were doomed to bitter disappointment, will be told in the unwritten history of this and all other new mining regions.

The roving adventurous spirits who formed the vanguard in the settlement of Colorado, were largely made up from the better and more enterprising classes of the peoples from which they came, together with a smattering of good, bad and indifferent characters—all equally determined and desirous of bettering their condition, which in some cases could not be worse. It is estimated that over 50,000 men aided in this eventful year to enlarge "That western trail of immigration which bursts into States and Empires as it moves." The broken-down merchant, the illiterate hod carrier, the wide-awake speculator, the unsophisticated plow boy, the gambler and the wanderer from foreign lands, all combined to swell the human tide that was setting in so strongly to this new land of gold. A very large proportion were admirably adapted to settling and reclaiming a wilderness, and some were there who had "pioneered it" in California and elsewhere. But nineteen-twentieths of them were as ignorant of the business of gold mining as they well could be, and had but a faint idea of the hardships that must be endured in this wild rush for wealth. Thousands on arriving at Denver, and finding no gold and seeing no confirmation of the vague rumors that had reached the "states," retraced their steps over the

long weary way, cursing the country and their own folly in visiting it. But their stories could not discourage the oncoming, and almost continuous caravan they met, for nearly everyone was bound to see the elephant, trusting that he would prove more fortunate than his disconsolate predecessors. Two courses were followed from the Missouri river to the Mountains, known as the Kansas, or Smoky Hill, and the Platte and South Platte, or Nebraska routes. With the exception of a few military posts on the latter, the plains constituted one vast wilderness, uninhabited, save by wandering tribes of Indians. Terrible hardships were often endured on these journeys. Men fell by the wayside, and the bones of mules and cattle, served as road guides to those who followed the pioneers. The desperation and determination of many may be duly appreciated when such a watchword as "Pike's Peak or bust," was adopted.

With the approach of warm weather in 1859, the pioneers began to move out from their winter quarters in quest of gold, which was found in paying quantities on several streams. A small town was started on Clear Creek, near the base of the mountains, and called Arapahoe, after the tribe of Indians that occupied this portion of the plains country. These diggings paid for one season and then were abandoned for sixteen years, but, strange to say, have been worked profitably during the past year—probably enriched by the waste from Gilpin county's stamp mills during the past decade. Diggings were also struck on Ralston Creek.

In January gold was first discovered in the mountains. One party from the Boulder settlement penetrated the mountains as far as Gold Run, and B. F. Langley found gold on South Boulder creek, which he called Deadwood diggings, and which had yielded quite a quantity of gold before the coming of spring.

Near the close of April, George Jackson, an old California miner, while hunting for game in the mountains, came upon a tributary of South Clear Creek, near the town site of Idaho Springs, which looked so promising for gold that he stopped to prospect. Taking his sheath-knife he dug enough dirt to fill a small tin cup, that he carried with him, took it to the stream and obtained therefrom about one dollar's worth of gold. This was enough to convince him that rich gold diggings existed there. He returned to Denver with his gold, but met with considerable difficulty in finding believers of his story. There were some, however, who returned with or followed him, and among them Wm. N. Byers, of the *Denver News*, W. W. Whipple, and a company of men from Chicago. From the latter the stream took the name of Chicago Creek. Mr. Whipple went down to Denver in two weeks with about four ounces of gold, worth \$75, and returned about June 1st with a supply of provisions. This was the first gulch gold taken out that amounted to anything, although some gold was received from the Gregory Diggings about the same time. This showed there was gold in the country in paying quantities, and it revived the despondent arrivals on the plains, who had begun to think the

country was one grand fraud. Water was then brought in by ditches along Chicago Creek and work began in earnest. Hundreds were now at work along South Clear Creek, and at Spanish Bar and Payne's Bar.

The grand discovery, and that which fully confirmed the reputed wealth of the country, was made in May. In 1857 John H. Gregory left his home in the mining district of Georgia, bound for the Frazer river gold mines of British Columbia. He had proceeded as far as Fort Laramie, in 1858, where by some means he was detained until the following spring. When about ready to resume his course to the Pacific he was induced, by reports from the Pike's Peak country to turn southward to try his luck in that direction. He followed Clear Creek from the town of Golden up into the mountains as far as where the city of Black Hawk now stands. Indications of gold caused him to strike up a gulch tributary to this fork of Clear Creek. Says Hollister: "He was alone, and before he could fairly test the value of the gulch he was overtaken by a snow storm and nearly perished. When the storm ceased he was obliged to return to the valley or country at the base of the mountains, for provisions. He then induced Wilkes Defrees to return with him to the mountains and they reached the spot after a tedious journey of three days. It was the 6th day of May, 1859. He climbed the hill where he believed the wash, or gold dirt, would naturally come from, scraped away the grass and leaves, and filled his gold-pan with dirt and took it down to the gulch. Upon panning (washing) it down, there was

about four dollars' worth of gold in it! He dropped his pan and immediately summoned all the gods of the universe to witness his astounding triumph. That night he could not sleep. At three o'clock Defrees fell asleep and left Gregory talking, and awoke at day-break to find him still talking. That day they washed out forty dollars' worth of gold and then left for Auraria to get their friends. The discovery was made on what was afterwards known as claim No. 5, on the Gregory lode."

The "rich find" of Gregory set the people of the plains towns, then filled with new arrivals from the East, wild with excitement and caused a stampede for the Gregory Diggings, as they were afterwards called. As the cañon of Clear Creek was impassable for most of the way, other routes were found necessary to reach the desired locality. These lay over almost impassable mountains covered with timber, and down into ravines, which necessitated the crossing of other and still higher mountains. Teams were taken though with the utmost difficulty over the rude highways of those days and the construction of toll roads by individuals or companies, became a necessity, as there were no local governments nor authorities of any kind to act for the public benefit.

When Gregory returned, he employed five men from the new arrivals and by means of a sluice took out \$972 in one week. He soon after sold his claims and began to prospect for new lodes. Other rich strikes were made almost daily, and large amounts of gold

were taken out in a short time. The Bates, Bobtail, Mammoth, Gunnell, Burroughs, Illinois, and hundreds of other lodes were found, and thousands of claims were taken up.

W. Green Russell and his brothers "Doc" and Oliver Russell with a party of Georgians were among the early arrivals at the Gregory Diggings. Some of them had paid a visit to their former homes during the winter and had returned with a large force of men. These attracted thousands of others from the states through which they passed, so that all parts of the union were represented among these mountain mines.

What was first called Gregory district, was soon subdivided, and new mining camps were formed at intervals, for miles around. Parties started from Denver, Colorado, and Cañon cities, for all parts of the mountains, some of them even crossing the snowy range and into the unknown country beyond. Rich gulch diggings were found on the head waters of the Platte, Arkansas, and Blue rivers, and on the creeks to the north of the Gregory Diggings. Many lodes were recorded, and lode mining began in earnest; but details of what followed in these mountain camps will appear in succeeding pages.

CHAPTER IV.

GREGORY DIGGINGS IN 1859.

The Miners' Laws—Lack of Water—Building the Consolidated Ditch—A Chapter on Placer or Gulch and Lode Mining—The Pioneers and the New Comers—Extracting the Gold—First Arastras and Stamp Mills.

As the summer of 1859 advanced the wealth of Colorado's gold veins and gulches became more and more apparent. Over fifteen thousand men were congregated in Gregory, Russell, and tributary gulches, and many of them were accumulating wealth rapidly; but everything valuable was soon preempted and large numbers were forced to hunt their fortunes elsewhere.

The first Miners' Laws framed by Gregory and his early followers allowed two hundred feet on a vein to the discoverer and one hundred feet to any person who secured a portion of the same lode. The horde of gold seekers who followed, began to think they would be unable to obtain their share of the prizes under such an arrangement, and consequently a meeting was called to alter the laws then in force. The pioneers were few in numbers and perceived at once that they were liable to lose the greater part of their possessions at one fell swoop. They accordingly set about concocting some scheme to avert such a disaster. Fortune favored them by the timely arrival of W. Green Russell and his party of one hundred and

seventy Georgians. There is a sympathy among the pioneers that they alone can appreciate, and Russell readily brought his men to the support of the "early comers." Even with this reinforcement they comprised but a small fraction of the vast assemblage. However, by tact and skillful engineering, they overcame the heavy odds against them. They secured control of the meeting by the election of Wilkes Defrees, chairman, and James D. Wood, secretary, by creating dissensions among their opponents, and by making and voting upon motions with great promptness and no little noise, until they had carried all of their points.

The following are the laws adopted by the miners of Gregory District:

"No miner shall hold more than one claim except by purchase or discovery; and in any case of purchase, the same shall be attested by at least two disinterested witnesses, and shall be recorded by the Secretary, who shall receive in compensation a fee of one dollar.

Each miner shall be entitled to hold one mountain claim, one gulch claim, and one creek claim for the purpose of washing: the first to be one hundred feet long by fifty feet wide; the second, one hundred feet up and down the river or gulch, and extending from bank to bank.

For the settlement of difficulties and the purpose of preventing disputes, the miners of this district hereby enact: That there shall be elected in this district, by ballot, a President, a Recorder of Claims,

and a Sheriff for the term of one year from this date. That the President, Secretary, and one assistant, to be chosen by the people, be tellers of said election, and that it take place immediately.

It shall be the duty of the Recorder to take charge of and safely keep all records heretofore made by the Secretary, and all records made necessary by law shall hereafter be made by him.

All claims may be recorded if the owners see fit, but no claim that is being worked shall be obliged to be recorded.

When a miner has a lode claim which it is impossible to work to advantage this season, either from want of water or machinery, he may hold the same until the first of June next, by filing a statement of the reasons with the Recorder.

All water claims not used shall be recorded within ten days of claim date, or they shall be considered forfeited.

All bills of sale or conveyances of claims shall be witnessed by at least two disinterested witnesses and recorded.

The books of the Recorder shall be always open to the inspection of the public, and shall never be taken from the Recorder's hands; but any person shall be entitled to copy any record at any reasonable time.

All laws relating to trials of disputed claims are hereby repealed.

When any person is aggrieved with regard to a claim, he shall file with any commissioned Justice of

the Peace, or in his absence, with the President of the Miners' Association, a statement of his grounds of complaint, which shall also have the names of the parties complained of, and a prayer that they be summoned to appear and answer. Thereupon the Justice (or President,) shall issue a summons to the adverse party to appear and answer within three days. If he fail to do so, the complaint shall be taken as true and execution issue. If he appear and answer, the Justice (or President,) shall summons a *venire* of nine persons from which each party shall strike off one until there remain but three, who shall proceed to hear the evidence of the parties with or without council, and try their case. Any juror may be challenged for cause shown either by his own evidence or that of others. Should the party loosing feel aggrieved by the decision, he may appeal to a jury of twelve men, by paying cost already accrued, which jury shall be selected by the Justice (or President,) and their decision shall be final.

The Sheriff shall have power to serve notices and excutions, and he shall have power to summon parties, put parties in possession of property decided to be theirs by law, summon juries and do such service as a Sheriff in any other place may do, and shall be entitled to receive double the legal fees provided by the Statutes of Kansas.

The fee of the Recorder shall be one dollar for each claim recorded.

The Justice (or President,) shall be entitled to five

dollars for presiding at each trial and making out the papers.

The jury shall be entitled to one dollar each, per day.

The defeated party in each suit shall be liable for all costs of the suit, and the Justice (or President,) shall issue execution for the same, which shall be collected from any property the party so liable may have, excepting tools, bedding, clothing, and necessary provisions for three months.

In any case either party may call upon the other to give security for costs; the suit shall be dismissed if plaintiff, or defeated if defendant shall fail to give such security.

Any person may take up by recording, forty feet front and one hundred deep, for a building lot, but shall not secure the same against being used for mining if found rich. Should any person work out the ground on which a house stands, he shall secure the house against damages.

Any person or company intending to erect a quartz mill, may select or locate two hundred and fifty feet square, which shall be recorded. He may also claim a right to cut a race from any river to bring water to the same and shall hold the water, not interfering with any vested rights.

The pre-emption laws established by the citizens of this county shall be recognized in the mines but shall not conflict with miners' rights.

Gulch claims shall be one hundred feet up and down

and fifty wide, following the meandering of the stream, and shall be worked within ten days if water can be obtained; if water is wanting, they may be recorded and held until water can be obtained. Any time after the 1st of September, any miner may record his gulch claim and hold it till the first of June.

When any miner holds both a gulch and lode claim, if one be worked the other may be held without working by recording the same.

When water companies are engaged in bringing water into any portion of the mines, they shall have the right of way secured to them and may pass over any claim, road, or ditch; but shall so guard themselves in passing as not to injure the party over whose ground they pass.

When any company is formed for the purpose of discovery [by tunneling], the parties engaged may stake off, record, and place notices on ground two hundred and fifty feet each way from the tunnel and running as the tunnel is intended to run. After that, all new lodes discovered by the company in tunneling belong to the company to that extent; claims already taken are to be respected, but claims cannot be taken within the limits staked off, if work be progressing on the tunnel. If work on the tunnel be stopped for one week at any one time, the original claim shall be forfeited and shall be open to claimants."

Time has since proved that the claims were none too large for surface work, and entirely too small for deep mining.

W. Green Russell and his party crossed over to the southern portion of the county and located in the gulch which still bears the name of the leader. Hundreds of Georgians and Missourians followed. Russell being perfectly satisfied with the yield of these gulch or placer diggings, remained in that locality for three or four years. But he became convinced in May, 1859, that there was not sufficient water to mine with profit for more than one or two months in the spring of the year. The miners generally had become alarmed at the scarcity of water, knowing that gulch diggings were comparatively worthless without it. Russell, and a few others, began, therefore, to explore the country with a view to find a stream of water that could be brought to these mines by means of a ditch he having previously had some experience in ditches and in placer mining in California. The head of Fall river was found a practicable point from which to obtain the desired water supply by means of a twelve-mile ditch and a flume, constructed around the mountain sides. A claim for the water-power and right of way was accordingly made. But another party, becoming aware of the necessity of a water supply, had surveyed a ditch route and laid claim to the same water right. Two companies were formed at about the same time, both claiming right of possession by priority of location, a title always recognized by miners, and so there was a dead lock between them. Russell's company was known as the Fall River Company, and the other, of which R. W.

Steele, afterwards provisional governor, was president, was called the Rocky Mountain Company. Nothing was done towards obtaining water until July, when both organizations were united under the name of the Consolidated Ditch Company, with W. Green Russell as President, A. H. Owens, Secretary, and J. M. Wood, Superintendent. The work of construction was then begun—an undertaking of no little moment at that day, when the District was almost destitute of capital, and the whole country regarded as a humbug. Provisions and material were very dear—the lumber supply being very limited and that held at high figures. Powder, which was necessary in blasting, was \$18 per keg, and steel \$1 per pound. There was much difficulty in getting lumber along the line of the ditch. Lumber was whip-sawed and carried by hand to the places demanding it. But owing to the vast influx of people, labor was cheap and this helped the enterprise amazingly. The ditch was completed July 16, 1860, and soon after a thousand men were gulch-mining in Russell and its immediate vicinity. A lively and flourishing town was located on the divide between that locality and Spring gulch, and was called Missouri City. The provisional governor and secretary, Messrs. Steele and Bliss, wanted the Central express and post office moved up there, saying it was the only town in the country that would amount to anything. At that time populous villages were located at Central, Mountain City and Black Hawk, and at other localities.

The ditch company's right to this water was acquired by preemption under the miners' laws of Gregory District, when that included what is now Gilpin and Clear Creek counties, and the record bears date June 15th, 1859. Congress afterwards confirmed these laws. Previous to such confirmation, however, soon after the regular organization of the Territory, late in 1861, the first legislature of Colorado recognized the rights of said company and granted them a charter for ten years.

The surface dirt and "slide" from the veins were at first washed for gold by means of small iron hand pans and by rockers, and then by sluices. Arastras—machines very much like the Freiberg and other large pans now used in stamp mills—were useful in grinding up the dirt and surface quartz, and answered very well until the contents of the veins became so hard as to require stamps.

The first water power arastra was brought into Gregory Diggings July 5th, 1859, by J. D. Peregrine, and set up at or near where the Norton mill now stands, in Black Hawk. An arastra, run by ox-power, had arrived a week earlier. Peregrine's arastra was a very large one, being seven and one half feet in diameter, with a bottom of four pieces of wood twenty inches thick, drags weighing one ton each, and the whole run by a water wheel sixteen feet in diameter. Its cost was \$2,000, one half of which was paid for cutting the stone. It began work August 5th, and could handle, in twenty-four hours, one and one half cords of Bates

quartz, one and one fourth cords of Gregory and three fourths of a cord from either the Bobtail or Fiske. Other arastras followed. Previous to this time many miners had left these diggings for the head waters of the Platte, Arkansas and Blue, partly owing to the fact that the vein matter became too hard for successful sluicing. It will be seen that for a time an arastra of this size did the work of a ten or twelve stamp mill of to-day. Henderson, in treating one lot of ore from the Gregory, lost twenty-five pounds of quicksilver. After that he had his ore roasted in heaps, something after the method of roasting at smelting works, and was then able to save \$200 in gold per cord of rock. Peregrine's arastra for a time crushed nearly all the "headings" and "tailings" from the Gregory lode.

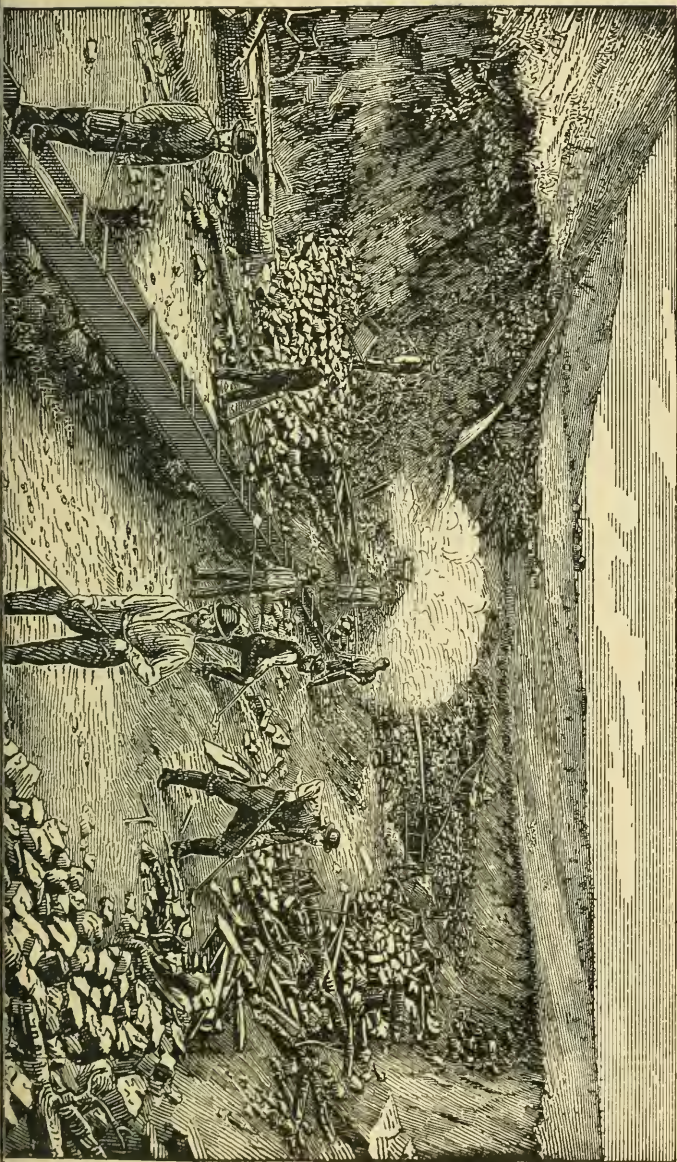
The first stamp mill that operated in the mountains contained three stamps and was brought in by J. Prosser, October 15th, 1859. It was set up on claim No. 1, of the Gregory lode, and was run on the headings from the sluices. Before the close of the same month Coleman & Lefevre set up a six stamp mill in Eureka gulch. One Clark brought in the third mill. It contained nine stamps, was located in the gulch between Main and Spring streets, where the Welch block now stands, and began work in December 1859. In 1860 stamp mills began to arrive by the score. At first they were rude, imperfect affairs and destitute of copper-plated tables—hence they were not very effective in saving gold in Colorado. After the surface quartz was exhausted, and the miners had sunk down

in the veins to the iron pyrites, they saved but little gold, and the mill men in 1861-2 were often unable to obtain the gold even on copper-plated tables. The ores of one mining country are usually different from those of another, and time is required to adapt a process to ores so as to ensure the highest measure of success. This was particularly the case in Colorado. Of the thousands and tens of thousands who came here and sooner or later left for their homes in the states, or for the next gold or silver region that was heralded abroad, not one in fifty were miners or had the slightest idea about mining or milling. It was like a plow boy attempting to manufacture an intricate piece of machinery without having served a day as a mechanic. This was more especially the case in lode mining, which requires far more experience than the working of gulch or placer mines—the latter being a much simpler avocation.

A series of long boxes over-lapping one another one or two feet in height and breadth, with riffles to catch the gold on the bottom, together with hose or hydraulics for washing down the gravel banks, constitute the most of the requisite machinery for gulch or placer mining. An ample supply of water is necessary of which a heavy stream is kept running through the sluice boxes at the same time that the dirt or gravel is shoveled into them. The gold being heavier than the stones or dirt, sinks to the bottom of the boxes, where a supply of quicksilver has been previously distributed to retain it. At intervals the water

is turned off, and the gold is taken out. This is what is called a "clean up." In surface or creek diggings of this character the gold is free and is easily separated from the dirt. Bar, or creek diggings, are operated in a similar manner, except that the course of the stream is turned, the boulders or heavier stones removed, and shafts run down until the "bed rock" or permanent granite of the country, is reached. These drifts are run from six to eight feet wide and supported by solid timbers to keep the gravelly bed of the stream, often from fifteen to fifty feet thick, from caving in. The immense quantity of water that continually leaks down from above, is taken out by means of powerful pumps of peculiar character. In past ages the gold has found its way by continued washings from lodes on the mountains or hill sides, into the streams, where it has gradually worked itself down through the loose gravel on to the hard bed rock—and that is where the richest pay is found. In fact it is usually necessary to "go down to bed rock" in order to obtain large quantities of gold. The gold is usually as fine as powder, but is often found in much coarser particles and in nuggets. The nuggets are from the size of a pea to that of a hen's egg, although those of the latter description are rarely obtained.

Lode mining is very differently conducted. Although free gold is often seen in the quartz, the precious metal is usually disseminated through it so as to be invisible to the naked eye. After the vein matter, near the surface, has been exhausted, the



quartz, or rock, is so hard as to require the aid of ponderous stamps driven by water or machine power, to crush it. Even then the crushing does not always pulverize the ore sufficiently to save much of the gold, even with the aid of quicksilver. Other appliances are often needed, as will be seen in the chapter on stamp mills. Lode mining itself is also quite different from bar or placer mining. With the former the work is carried down into the bowels of the earth following the course of the vein between the solid granite and country rock. Such entrances into the domains of mother earth can only be made by an extensive use of powder and a system of hand or machine drilling. Then solid timbering in shafts, levels and excavations are necessary to keep the walls from falling in or scaling off on to the miners and works below. As depth is gained, the windlass, which answers every purpose for the first fifty or seventy-five feet, gives way to the whim (or to horse power). This cannot be used to any advantage beyond a depth of much over two hundred feet. Then the steam engine is necessary for raising the ore, as well as for the water that prevails in nearly all mines. Powerful hoisting works and huge pumps are finally required for the increased development of the mine and for drainage. Finally iron tracks are laid in the levels so that the ore may be conveyed in cars from distant parts of the mine to the point of hoisting; and there are a number of requisites in lode mining and in the treatment of the ore after it has left the mine, both in

stamp mills and smelting works, that have not been mentioned above, showing difficult and intricate processes before the "pay" is obtained, while the gulch miner has his gold every night without awaiting the tedious process of milling or smelting.

But the Colorado placers and bars were never as numerous and extensive as they were in California and several of the northwestern territories, and the main portion of them were worked out, or nearly so, during the earlier years of mining in this region. Lode mining is Colorado's chief support and she possesses more distinct gold and silver bearing veins with a higher average value per ton of contents, than the entire west or the whole country beside. Time and development, and a moderate expenditure of capital, is all that is required to force them to produce more largely than all other states and territories outside of Nevada. One great advantage Colorado has over other regions is in her multitude of lodes, thus offering better opportunities to the many than any other section.

CHAPTER V.

HISTORICAL REVIEW OF EARLY SETTLEMENT.

Denver and Auraria—The rival Cities of Cherry Creek—Early History of Park County—Its Golden Placers and Gulches—Hamillon, Tarryall, Fairplay—Lively and Prosperous Times.

WHILE the mountains were receiving constant accessions to their population from the on-moving tide that made Denver its halting place, the Cherry Creek settlement was fast becoming a city of considerable importance. The abortive attempt at establishing a town there in September, 1858, under the name of St. Charles, had been followed by more permanent locations in the months of October and November. Some Georgians and Kansans from the Montana settlement then founded the town of Auraria on the west side of Cherry Creek. From Goldrick's history of Denver we obtain much interesting information, from which we quote at intervals.

"R. C. Hutchins, John Smith and A. H. Barker built log cabins on the "West side," which they called Indian Row. Soon after Blake and Williams, and Kinna and Nye, brought in stocks of goods, and on Christmas day Dick Wooton arrived with a quantity of flour; groceries, and dry goods, from New Mexico. A town survey was made of Auraria on November 8th, and as its prospects daily grew more

brilliant, those of Montana and St. Charles grew more discouraging. On the 17th day of November, a party of Kansas men headed by Gen. Wm. Larimer and Richard E. Whitsitt, arrived on the then deserted site of St. Charles, (East Denver) and took possession thereof. A town company was organized and the place was called Denver, after the then acting Governor of Kansas. The officers of the company were as follows :

President, E. P. Stout ; Treasurer, Wm. Larimer Jr. ; Secretary, H. P. H. Smith ; Recorder, P. F. Bassett ; with Messrs Stout, Larimer, Bassett, R. E. Whitsett, W. McGaa, C. A. Lawrence, Hickory Rogers and Wm. Clancy, as directors. Each of the forty-one shareholders were obliged to erect a buiding within the next ninety days, and Gen. Larimer, is said to have put up the first log cabin in the place.

The first officers of the Auraria town company, were W. A. McFadden, President ; and Dr. L. J. Russell, Secretary. Those of the Highlad town company, were Henry Allen, President, and Wm. M. Slaughter, Secretary.

Auraria was the leading town until 1861, although the Pike's Peak Express Company, had made their headquarters in Denver, in 1859, having received 1,460 town lots for so doing. Denver, Auraria, and Highland, were consolidated April 3d, 1860.

“At the beginning of 1859 only three white women had arrived in this then cheerless locality. Everything was uncertain and unstable. With winter ahead

of them, and with plenty of nothing but poverty and privation, these pioneer people had to make hope the main anchor of their souls. Lumber sold for one hundred dollars a thousand in 1859, flour at from twenty to forty dollars a hundred pounds, while sugar, coffee and tobacco were at times almost worth their weight in gold dust.

The first child was born here on the third of March, 1859. It was a half-breed son of Wm. McGaa, alias Jack Jones, the mountaineer, and they christened the boy "Denver." The first white child, a girl, born here, was to Henry Hubbell, in the fall of 1859, on the corner of 10th and Larimer streets, formerly the Eldorado Hotel. The mother and child were donated several corner lots for their "enterprise," in helping to populate Auraria, but she considered them worthless and forsook Colorado for Oregon in 1863. The first hanging scrape was that of young Stofel for shooting his brother-in-law, Biencroff. He was strung on a cottonwood, corner of 11th and Holladay streets, on April 8th, 1859. The first election of county officers for Arapahœ county, Territory of Kansas, took place March 29th, 1859. There were five or six hundred votes polled in the county at large, two hundred and thirty-one of which were in Auraria, and one hundred and forty-four in Denver. At this time Charlie M. Steinberger was elected "coroner," brother of the Steinberger who recently became "King of the Samoan Islands." The first preaching was done in December, 1858, by the Rev. G. W. Fisher, a Methodist, and Rev. L. Hamilton, a Presbyterian, preached

his first sermon in Denver in the following June. Of the thousands who arrived at Cherry Creek in April and May, the majority became disgusted because they did not find chunks of gold lying around loose for them in the streets of Denver, and stampeded back home cursing the country and all in it. The Fourth of July 1859, was duly celebrated in the grove near the mouth of Cherry Creek. The Declaration of Independence was read by Dr. Fox, James R. Shaffer orated, and music was furnished by a Council Bluffs band.

At the beginning of 1860, there were about one thousand people in the two towns bordering Cherry Creek. John C. Moore was the first Mayor of Denver, and was elected December 19th, 1859.

With the advance guard of the immigration of 1859 came the printing press. The *Rocky Mountain News*—then a weekly—was the first newspaper issued under the shadow of the Sierras and Wm. N. Byers and Thomas Gibson were its founders. The first number appeared April 23d 1859. The next newspaper venture in Colorado and the first in the mountains was the *Rocky Mountain Gold Reporter* and *Mountain City Herald*, which made its appearance at the Gregory Diggings August 6th 1859, published by Thomas Gibson. This paper did not survive the early snows of autumn, but appeared again in the form of the *Denver Commonwealth*, early in 1860, and in 1864 was united with the *News*. The *Daily Rocky Mountain Herald* and the *Mountainer*, made their first appearance in Denver in 1860.

Richard Allen of the Fairplay *Sentinel*, has given such an excellent history of the early times and settlement of Park county that the writer gives the following lengthy extract therefrom :

In the year 1859, the entire country from North to South and from East to West, was electrified with the reported discovery of rich gold fields, at, or in the near videnage of Pike's Peak.

The gold hunters of '59 were composed of the very best material the States could furnish. With scarcely an exception, they were men of education, enterprise and energy; they belonged to a class of men distinct of themselves, and whose fate, was to pioneer, and develop the mineral and agricultural resources of the Centennial State; to create the Plains Empire, was their mission; that they have accomplished the work assigned them our present prosperity attests.

About the first of July, 1859, twenty restless and adventurous spirits, determined to prospect the country of the South Park. At the instance of W. T. Holman a party organized and proceeded southward through Virginia Cañon to the valley of Clear Creek. Here the party halted and prospected the hills southwest of Chicago creek and Spanish bar, four or five days. The party then became disorganized and about eight of the twenty determined to follow out the original programme. Their route was in a southerly direction and followed Chicago creek to its source, the scene of Bierstadt's picture, "A storm in the Rocky Mountains." Crossing the rugged ridges, the party ascended Mt. Rosalia, and for the first time beheld the South

Park, radiant and beautiful in its summer garb. Descending into the valley they pursued a southerly course, and the second days journey they encamped on Tarryall creek, half a mile below Hamilton. Curtis, Chambers, and Holman at once set to prospecting, and their labors were rewarded by a very good "color." The next mining camp was struck two miles above the site of the first discovery, and the richest gold placers in the State were opened up to the civilized world. The diggings were named Tarryall. The discovery was made on the 19th day of July, 1859, and the original preemptors at once formed a district code of mining laws, which in the absence of civil law should govern the people. This code defined the length and breadth of claims, and gave to the owners a title in fee simple, until such time as they could secure a patent from the United States Government. In cases of dispute or in cases of trespass and jumping of their property, the matter was referred to a miners meeting. A judge was elected and each disputant had the right to select counsel from the members present. The verdict was reached by a vote of the meeting. Occasionally, disputes of all kinds were settled by arbitration, from which there was no appeal.

The original code gave the miners one hundred and fifty feet in length, from bank to bank along the gulch. Two weeks after the discovery, it has been estimated that there were 3,000 people on the ground. The present site of Hamilton very much resembled

a large military encampment and for weeks the scene presented was one of joy and mirth. It has been compared to the general muster day "way daoun east." Everybody was happy. Brass bands of music could be heard at all hours of the day or night, and the knights of the green cloth plied their vocation with a nonchalance, that to the uneducated eye, seemed as if the gamblers had reached a spot where they were free from laws and free from restraints of society. Gold dust was currency and the claims that produced the largest portion of it were the indirect means of fostering and giving birth to communistic ideas.

The late comers determined that one hundred and fifty foot claims, were too large, and that the owners should be compelled to give up fifty feet, that the general community might be benefitted thereby.

The mine owners along the stream, and particularly those discovering the diggings proper, at the junction of the streams, determined that the mining laws as adopted should remain in force. When the communists heard the expression of the meeting, they muttered "Grab-all." Hence the name of Graball, as applied to the Tarryall diggings, and the name of Fairplay as applied to the Platte diggings. The latter or Fairplay diggings were discovered August 19th.

The mining settlements extended along the stream a distance of two miles. During the winter of '59 and '60, the city of Hamilton was staked off, and the following summer the population numbered 500 souls.

Following this, on the south bank of the stream, Tarryall city was laid out. Tarryall city and Hamilton were rivals of each other and they in turn were rivals of Jefferson city near Georgia Pass, six miles north. All were competing for the immense trade of the region, at that time, and each had settled down into the belief that it was to be the city of the Territory. To-day, ruins alone remain to mark the sites of once popular towns, and villages, and there's the same interest attached to these as to those of a pre-historic date. The evidences of civilized life are readily recognized in the almost imperishable canteen, tin cup, and the once popular, but now alas! discarded "Billy Barlow" jack knife. In the coming decades or centuries, the antiquarian will find much that will interest them, in exploring the grass grown mounds of the dead cities of the Park.

CHAPTER VI.

ANNALS OF THE FIFTY-NINERS.

District Organizations—Rich Strikes in the Mountain Gulches—Settlement of Boulder—The Pioneers—Gold Hill, Left Hand, Ward, Etc.—Founding of Pueblo—Park County—Buckskin Joe and its History.

Large quantities of gold were obtained from the surface dirt and quartz of the various lodes of Gilpin as well as from the gulches. Rude tramways were constructed down the steep hill sides to the ravines over which the rich "pay dirt" was sent down in sacks attached to beeves' hides. Details of the workings and yields of these veins in earlier, as well as later years, will be found in chapters relating to the "mines of Gilpin county," in the latter portion of this book.

In July a mass meeting was held in Gregory Diggings, and Richard Sopris was elected President of the District, C. A. Roberts, Recorder of Claims, and Charles Peck, Sheriff, to serve one year.

Several mining districts were afterwards set off from Gregory, such as Eureka, Central City and Lake, while many new ones were formed in the surrounding country. Each was governed by a president, judge, constable, and secretary, who was ex officio recorder. The latter were elected for each of the twenty-six districts, of which the writer is able to give the names of only the more important ones, viz: Gregory—

J. W. Roberts; Central City—Bela S. Buell; Enterprise—Guy M. Hulett and H. P. Cowenhoven; Bay State—Mr. — Haynes; Eureka—Dr. Casto, and then D. Tom Smith; Nevada—Sam. Link, afterwards R. D. Darlington and J. W. Remine; Illinois Central—Ed. James and then Charles H. Utter; Russell—Chas. S. Fassett; Quartz Valley—S. G. Trine; Independent—Mr. — Hurlbut.

The records were often kept in a very careless manner, but answered the purpose for the time being. Nearly all of these districts finally adopted the code of miners' laws prevailing in Gregory.

In September, 1859, there was a very heavy fall of snow, and a large portion of the miners, believing winter had set in, left the mountains in hot haste. Most of them returned when they learned that the snow had disappeared in a single day. From that time until New Year's day, the ground was free from snow and the weather warm and pleasant. Sam. Link, Recorder of Nevada District, had been informed that Nevada gulch filled with snow during the winter as high as the summits of Quartz and Gunnell hills, and when the September storm came he left the district and did not stop until he reached Illinois. Some difficulty was experienced on account of his taking the book of records with him, but it was finally returned and R. D. Darlington was chosen as his successor.

Early in June, 1859, Horace Greeley, A. D. Richardson, and Mr. Villard, three prominent journalists, while crossing the continent, stopped at Denver and

paid a visit to Gregory Diggings. A hearty welcome was everywhere accorded them. The story of Horace panning out "a color" is still told by old residents.

The Boulder *News'* historical sketch, furnishes the following facts in regard to the early history of Boulder county:

"The first white permanent residents of the county came in search of gold, arriving the 17th day of October, 1858, a little pilgrim band, a division of the advance guard of gold seekers, forerunners of the rush of the following year, 1859. Of these pioneers were Captain Thomas Aikins, and two sons, A. A. Brookfield, Captain Yount, Dickson and Moore, Dan. Gordon, and brothers, John Hall, Theodore Squires, W. W. Jones, Thad. Hamilton, L. Davenport, John Rothrock, Albert Atcheson, Wheelock Brothers, Thomas Lorton, H. Childs, J. Machesney, John Brown, Charley Clouser, Silas D. Burns, and a few others whose names are not recalled. Capt. Aikins, and sons are now residents of the county, the Captain living on the land chosen for its living springs, near Valmont. Mr. Brookfield returned to Nebraska City early in '59, and the same season came back, bringing Mrs. Brookfield and they have since continued among the best-known residents of the county. Most of the party were from Nebraska City,

The "pilgrims" followed the South Platte river towards the mountains to the junction of the St. Vrain, where they were so pleased and impressed with the view of the Boulder foot-hills, that they were stayed

by a common impulse, and decided to strike directly for the mountains. Capt. Aikins, in giving the graphic account, says: 'I mounted the walls of old Fort St. Vrain, and with my field glass could see that the mountains looked right for gold; could see bands of Indian ponies and bands of deer and antelope grazing close up to the high foot-hills; could see that the valley of the south fork of the St. Vrain—called the Boulder, because of its boulders—was the loveliest of all the valleys in the scope of vision—a landscape exceedingly beautiful. Those mountains are so high and so steep, the boys said, that it will not be safe to venture up till spring, on account of snow slides. But the following morning was so fair, and the love of adventure and the hope of gold so inviting, that we forded the Platte and traveled up, with the bold mountains all before us, till we pitched our tents under the red rock cliff, near where the Red Rock flouring mill now is, at the mouth of Boulder cañon.'

The Old Chief, Left Hand, of the Arapahoes, then with his band encamped north, on the St. Vrain, was quickly notified of the arrival of the intruders, and hastened to the red-cliff camp, full of apprehension of the impending fate of his tribe, but assuming an air of unconcern and authority, he commanded, "Go away; you come to eat our grass, burn our timber, kill our game, and get our gold." The old chief intended to drive off the whites, but was caught by guile. The crafty little company of gold seekers received him with a show of doing him honor, and

made obeisance to the presence of "Big Indian." While being fed and flattered, in a gush of gratitude, he pledged eternal friendship, declaring that the country was big enough and rich enough for all, and that red and white man would live in peace together forever."

In January, 1859, the first pick was struck in Gold Run, and \$100,000 was taken therefrom the following summer, when a large number of men were engaged in gulch mining. Hand rockers were extensively used, and many men took out from \$70 to \$80 per day, each. The mountain above this gulch was named Gold Hill. J. D. Scott made the first discovery of a gold vein here, in the spring of 1859, which he named after himself. About the same time David Horsfal discovered the Horsfal lode, afterwards so famous for its gold yield. Hundreds of other discoveries followed.

In the summer of 1859, a Mr. Banker was shot by Indians, supposed to be Utes. A company of miners immediately started in pursuit of the murderers, but the band escaped over the snowy range. In 1860 a vast amount of timber land was burned over. So rapid was the advance of the flames that many escaped only by diving into shafts and prospect holes.

Thos. J. Graham brought a three-stamp mill from Leavenworth in 1859, arriving at Boulder in October of that year. It was put up and began work on Left Hand, in the spring of 1860, on Horsfal ore. During the same season Becker and Oppele put up a mill.

Wm. Greene, Steele & Britton, the Chicago Company, Holt & Holly, Charley Pencost, J. W. Smith (now of Denver), and D. D. White also brought in mills.

The *News* says further of the days of '59: "The crudeness of the art of saving gold in those days, is well set out in the story yet told of D. D. White's experience. When he came in from the Missouri river, according to the custom of those days, he loaded with a stamp mill and bacon, and to economize space filled the batteries of the mill with the fat bacon sides, utterly ignorant that grease and amalgamation of gold do not agree. He started the mill with the batteries full of the fat, and after a run on rich ore, the clean-up, of course, showed not a trace of gold!

Besides these stamp mills, the Left Hand, opposite the mill, was lined with arastras. Among the first to put up and operate them was our townsman, Austin Smith.

In 1860 Gold Hill was a camp of about 1,500 people. When it was found that the crude process in use did not save the gold, the place declined. Of the pioneers whose names have not been mentioned above, many yet remain in the county, among its foremost citizens. Of those whose names are given us, are W. A. Corson, Esq., one of the best known citizens of the county, its first Sheriff, and since holding many important positions of trust; Charley Dabney, a leading citizen of Boulder; P. M. Housel, the first County Judge; George W. Chambers, now a resident of Gold Hill, and the first County Treasurer, and one of the first

Board of County Commissioners; Wm. Bryant, now of Nederland; George Zweck, a wealthy farmer on the St. Vrain; John DeBacker, and family; Capt. J. A. Graham, of the National Hotel, Boulder; Mr. McCaslin, a wealthy St. Vrain farmer; W. R. Blore, a leading stockman on the Little Thompson; Henry Green, afterwards Sheriff of the county, and now manager at the Corning Tunnel, cutting under Gold Hill; Henry Hager, a thrifty St. Vrain farmer; Perkins Allen; Peter Iverson; Wm. Sellers; Wm. Stretch; J. A. Hitchings; Jos. Rhodes; E. C. Dubois; the negro, Bowman; Jacob Purdy; Charles F. Holly, the first Representative from Boulder county, afterwards a Territorial Judge; James A. Carr, one of the best citizens of Boulder; Hiram Buck, a farmer of Lower Boulder, and E. H. N. Patterson, at the present time editor of the *Georgetown Miner*.

In 1859-60, gold mining was carried on in various localities in these mountains, chiefly in the vicinity of the tellurium belt now mined so successfully. Gulch and lode mining was conducted quite successfully. Gold Hill developed some very rich lodes, such as the Horsfal, while not far away was the Hoosier, the Columbia in Ward District, and others. The mines on Gold Dirt hill were in some cases surprisingly rich, but eventually "pinched up," and were abandoned. For several years prior to 1870, mining affairs were at a low ebb in Boulder county. That year silver mining for the first time, became a source of industry and excitement, and caused the establishment of a

lively mining camp. In 1873, that rare mineral, tellurium, found only in two other localities in the world, was found to exist at Gold Hill, and the Red Cloud revived the waning fortunes and reputation of the district, until newer and better mines were found near by, and at Sunshine, Magnolia and elsewhere. Now the gold and silver interests rival each other in magnitude.

Pueblo was founded in the winter of 1859-60, and at once became a rival of Fontaine City, and soon absorbed it. Its first settlers were Doctors Belt and Catterson, W. Catterson, C. Warren, Ed. Cozzens, J. Wright, and Albert Bercaw, who came from Missouri and Denver. Hon. Geo. M. Chilcott was also one of the early settlers.

The following in regard to Buckskin, or Laurette, Park county, is obtained from one of the pioneer miners of the place:

"In August, 1859, a party of prospectors, consisting of Joseph Higginbottom (alias Buckskin Joe), W. H. K. Smith, M. Phillips, A. Fairchilds, D. Berger, David Greist, and others, discovered gold in the banks of the creek and in the gulch near the site of the old town of Buckskin. On the discovery of the precious metal a meeting was held and a code of mining laws was adopted. The district was called Buckskin Joe Mining District, in honor of Mr. Higginbottom, who was at the head of the band. The stream was named Fairchild's creek, in honor of one of the party. In September, 1859, the Phillips lode, which has played

such a conspicuous part in the history of Park county and Colorado, and which has yielded over \$300,000, was discovered. But little mining was done until the following year, 1860. The miners were mainly engaged in prospecting, staking leads and securing their claims from trespass and jumping. The district was reorganized, and a new code of laws adopted in the early part of the season of 1860. J. W. Hibbard was chosen President of the district, and Jacob B. Stansell, Recorder. By September a large number of lodes was recorded, and every crevice in the rocks on each side of the gulch, wherever crevice matter of any kind was found, was claimed, staked and recorded. Among the lodes claimed to have been discovered, were the Phillips, Mammoth, Bates, Buckskin Joe, and the Union lodes, nine in number, but none were opened and worked until the spring of 1861.

October, 1860, the town of Buckskin Joe was staked out by a company consisting of Messrs. Hibbard, Stansell and Miles Dodge, who gave to the new town the name of Laurette. About the first of June, 1861 the district was reorganized and a new code of laws adopted—N. J. Bond was elected President and Judge of the district, and George Dealby, Recorder.

Some rich developments were made which created a very great excitement, and people from all parts of the territory flocked to the place, living in houses, tents, wagons and under trees, until the town and gulch numbered over two thousand people. In September of this year, Charles M. Farrand erected the

first quartz mill in the district, and the first in the Southern mines, and commenced crushing quartz from the Phillips mine, for Bond & Stansell, from No. 6, which was the big claim, and yielded more gold than all of the others. By the first of November, there were in operation, and running day and night, one steam quartz mill of ten stamps, and water mills, of eight, and six stamps, and twelve arastras, besides four sluices run during the day. By April 1862, there were erected and in operation nine stamp mills, in all seventy-eight stamps, employing in their workings and that of the mines about three hundred men. On January 1862, the first number of the *Western Mountaineer*, was issued, by Matt. Riddlebarger, W. L. McMath, editor. It was a spicy little sheet, but had a brief existence, and suspended immediately after the election in November.

The county seat of Park county was first established by proclamation of Governor Gilpin, at Tarryall, which was a dead letter, as the officers refused to obey it, and established the offices at Laurette. The first election for county officers was held in December, 1861. W. L. McMath, was elected Probate Judge, J. L. Lewis, Sheriff; George Wing, Recorder; L. W. Dorsett, A. Slaght and L. L. Robinson, County Commissioners. The first term of the District Court was held in the Hall of Stansell, Bond & Harris, and was presided over by judge Chas. Lee Armor. Laurette at this time was well supplied with stores, hotels and business houses of every kind, not lacking a town

hall, in which Jack Langrishe and Mike Dougherty held their theatre. The town was not without its gambling saloons, and in one of these the first and only murder was committed, in February 1862. The murdered man was a gambler by the name of Pete Conitan. The town remained a prosperous mining centre until the fall of 1863, when it began to die, and by 1865 was almost deserted. In 1866, the county seat was removed from Laurette to Fairplay, and the Post Office, which was established in 1862, changed from Laurette to Buckskin.

In 1866, among the grand swindles perpetrated in Colorado, was the sale of the Excelsior lode, to the Colorado Mining Company, who began operations under the supervision of Prof. Dubois, and after the expenditure of about four hundred and fifty thousand dollars in the mines and machinery, they succeeded in realizing from their principal run, about five penny-weights of retort gold, four dollars and fifty cents coin value. The operations of this company and their expenditures, for a time made business lively, but, when they suspended, it was a terrible blow and the town died. At the present writing Buckskin numbers about twenty persons, all voters. Thirteen houses only, remain standing, but her mines are being constantly and steadily developed. The Phillips lode, is now owned and controlled by J. Q. Hart, of St. Louis, J. Q. A. Rollins, the estate of J. H. Morrison, N. J. Bond, the Stark Bros., and J. B. Stansell. Work is being vigorously prosecuted by N. J. Bond and the

Stark Bros. and the lode bids fair to eclipse its former greatness. The gulch and bars are being worked profitably and new and valuable discoveries are being made, and the day is not far distant when Buckskin will take her place among the leading mining towns of the Centennial State.

The altitude of Buckskin is about 10,000 feet above the level of the sea. It has a fine water power, and is situated in the edge of South Park and immediately at the foot of the snowy range, in sight of perpetual snow, making its location one of the grandest and most romantic in Colorado.

Evidences have been discovered to show that Buckskin has been inhabited in the dim past by a people superior to the Indians of the plains, probably by that class who at an early day, built their cities in the cliffs of the mountains of Mexico.

CHAPTER VII.

COLORADO IN 1860. EXPLORATIONS.

A season of Exploration and discovery—General advancement and prosperity—Incidents in the early History of Park County—Among the Gulch Mines—A Fatal Duel A sister's honor avenged—Life in the Mining Camps—Mosquito District.

WITH the spring of 1860, came another wave of immigration, and the season opened most promisingly throughout the whole extent of the Pike's Peak mining region. Mining was continued with redoubled vigor from Boulder county on the north to Lake and Park on the south. The Consolidated Ditch in Gilpin county was completed this season and the result was paying ground for more than 1,500 men with an average yield of five dollars per day, where no work was possible before. The yields of that district, of parts of Boulder and of the diggings in the South Park, and on the Blue and Arkansas, were very large. Fortunes were made in a single season. California gulch on the head waters of the Arkansas, was enormously rich and many an oyster can was filled with gold dust and nuggets in a remarkably short space of time. It is said nearly three millions of dollars came from this gulch in the years ending with the season of 1863.

A grand rush for the San Juan country took place this year but nothing of value was found and sev-

eral barrels of whiskey were lost by reason of the prospectors having been driven from that section by the snow and the Ute Indians. For twelve or thirteen years, this region of colossal mountains was believed to be destitute of mineral wealth. Since 1872, however, some of the richest gold and silver veins in the world have been discovered there, causing the latest mining excitement in Colorado, and one that promises permanent results and enormous wealth.

Of the rich returns that rewarded the bar miner in the vicinity of Idaho, and of the still richer "finds" of Empire, further mention will be made in the historical sketch of Clear Creek county.

Denver grew rapidly in the year 1860. George W. Brown founded the first Bank. Clark. Gruber & Co., built a banking, coining, and assay establishment which was purchased by the government, in April, 1862. It has since been used as a government assay office connected with the United States Mint. Two military companies were organized this summer in Denver. Several brick buildings were erected and a large number of frames. Turner & Hobbs established a banking house, with rates of interest at from ten to twenty-five per cent a month.

The rates of freight across the plains by ox or mule trains were from ten to twenty cents per pound or from five to ten times what they now are.

A band of desperadoes had congregated in Denver in the summer of 1860, and several atrocious murders were committed by them. The *Denver News*

office was fired into and its proprietor placed in daily peril of his life for daring to condemn their lawless acts. The result was, the citizens armed themselves, shot and hung a few of the ruffians, while one was pursued by the Sheriff through the Indian Territory and Kansas, brought back and duly executed. This settled the business, and lawlessness was a thing of the past, from that time forward.

An immense number of miners were at work this season in the Platte diggings at or near Fairplay. Allen's account of affairs in Park county this season contains the following :

"At night, after the boxes had been cleaned, the expressions of satisfaction and disappointment at the result, would challenge the greed of the miser and the disgust of the spendthrift.

July of this year witnessed the terrible duel between Pemly and Sanford, both of whom were Texans, playmates in their boyhood and college mates in after years. The immediate cause that led to the fatal duel, was the seduction of Pemly's only sister, by Sanford. Sanford at once left his home and was followed by Pemly through California, Australia, New Zealand, Frazier River, and finally, to Fairplay, Colorado. Sanford was at work in a pit when Pemly appeared on the scene. The salutation was short, "At last." Pemly was in the act of raising his rifle, when Sanford cried out, "Give me a chance;" to which Pemly replied "Come up and we'll arrange preliminaries." The weapons chosen were rifles, the distance thirty paces,

and the signal was to fire while one, two and three, were being counted. It was understood that if both missed, the contest was to be finished with the pistol. Scarcely a second of time intervened between the discharge of the rifles. Both fell, Sanford, shot through the heart, and Pemley with a crease of a bullet through his hair. The verdict of the miners was, that a sister's honor had been justly avenged.

The richest gravel paid from five to fifteen dollars per day to the man. The entire gulch was worked to great disadvantage. The reason is self evident, that none of the miners of that day were possessed of sufficient means to run a bed rock flume, and if they had been, the enterprise, to have been successful, would have required the consolidation of the almost numberless claims into which the gulch had been divided.

The rough and unhewn characters, of both sexes took an active part in the every day scenes of a busy frontier life, and to the abandoned and fallen women, who followed the army of prospectors, like a swarm of locusts, some credit is due. Wretched and degraded, ignored by the christian, and spat upon by the so-called moralist, victims of a jeering world, they forgot "Mans' inhumanity to man," and were the direct means of saving many valuable lives from that dreaded disease, mountain fever. The roughs were in force, and a few were troublesome. Invitations to leave were regarded with lamblike meekness."

Gold in plentiful quantities was found near the

base of Mount Lincoln. A district was organized named Independant. Within a few weeks a town called Montgomery, had a population of eight hundred, a theatre and six quartz mills in full blast. The decay of this place is attributed to the bonding of mines and consequent abandonment of work. Beaver creek, during those early times, received the name of "pound diggings," the explanation of which, is that each man could obtain a pound of gold, or two hundred and twenty dollars per day. The first owners were a party of Scotchmen and then Truman & Pease, who sold to Geo. A. Sidel in 1875; the latter, after a considerable outlay, is likely to realize largely. Later years have demonstrated the fact, that in Mosquito mining district are located some most valuable gold and silver mines. Recent discoveries would indicate that the vein system in this famed locality may be classed as true fissures. Large and wealthy companies are preparing to erect works on a large scale, notably, Puskas & Ford—to treat the ores of the London mine.

Mosquito Gulch district was organized in June, 1861, the Sterling lode, discovered by Dr. Pollock, bearing the oldest record. This gulch lies parallel with and one mile south of Buckskin Joe, from which it is separated by Buckskin mountain. The name was given from a large mosquito alighting on the Recorder's book while the question of naming the district was being discussed. A small pocket of gold ore found on the Lulu lode caused an influx

of prospectors, though some claimed that the ore was brought there from the Phillips. The third discovery was the Orphan Boy lode, made in July, 1861, by S. Sheppard, who started out with H. W. Dorsett and Webber, to discover the extension of the Phillips and with this result. This lode is still thought to be a portion of the same great vein as the Phillips. In 1862, when the property had mainly fallen into the hands of Dorsett and of John W. Smith of Denver, it was worked with great success and in a few years yielded \$200,000. A tunnel is now being driven to strike it at a great depth.

The town of Sterling was laid out in 1862, and at one time contained five active quartz mills. To-day but one of them remain and the population is limited to twelve people. Among the early discoveries were the War Eagle, Columbus, Jenny, Platte, Demory, Elephant, and Evening Star lodes; all paying well for a time and then abandoned. Most of them have since been relocated under different names.

The first silver was discovered in Mosquito soon after the Ten-Forty lode was found in Buckskin and prior to the silver discoveries on mounts Lincoln and Bross. Prominent among the silver veins, are the London, Mono, Lone Star, Keystone, and Joe Chaffee, all good paying mines, and the district bids fair to be one of the richest in Colorado.

CHAPTER VIII.

EARLY HISTORY OF GILPIN COUNTY.

The days of "Fifty Nine, Sixty and Sixty one"—Mail Facilities—Mining Districts—Holding Court under difficulties—Vigilantes.

THE first Sheriff in the Gregory Diggings, was named Reece, and he was succeeded by Jack Keeler. In the fall of 1859, Keeler was Sheriff of Arapahoe county, which included the entire Pike's Peak region, and Wm. Z. Cozzens was his deputy. There were many hard cases in the country at that time; among them was a desperado called Pensyltuck. He was taken out and hung one night—it is thought with Keeler's permission or connivance—by an impromptu organization of vigilantes. One man was hung in Lake gulch in 1860, for shooting an unoffending German. Several men who had violated the laws, were stripped and whipped and then banished from the mountains with the penalty of death awaiting them if they returned. Severe punishment was meted out to any one known to steal or appropriate mining tools in a prospect hole or wherever found. After the earlier years, the entire mountains were remarkably free from crime. Doors of sleeping apartments and dwellings, were often left unlocked at night for months, and cases of theft were unusually rare, until a year or two after the great railroads reached Denver and Golden from

the east. Only two executions under legal authority ever took place in the mountains, and not one since the olden times. One execution came off in February, 1870, when a negro was hung at Central for participating in the murder of a white man in Quartz Valley. Van Horn was hung in Jan. 1864, for killing Copeland. Mike Storms succeed Keeler, and Tom VanTrees was his deputy.

Nevada district was set off from Gregory August 1st, 1859, Russell, August 15th, and Central City, in the summer of 1860. It is said that 15,000 men had congregated within the limits of Gilpin county, in June, 1860, but most of these were transient visitors and soon started out for other localities.

Spring gulch yielded two ounces of gold to the man per day, or about thirty-five dollars, in 1860. Among the fortunate ones were Moon & Co., Pleas, Byers & Co. and others. In the fall of 1860, H. P. Morgan a partner of James Cavanaugh, was elected to the Kansas Legislature.

The fall of 1859, Madam Wakely, with the Haidee girls and family, who formed a part of Thorn's troupe, which broke up at Denver, opened a Theatre in a large log building at Mountain City. They played to crowded houses, and the fair Haidees won the heart of many a miner and mountaineer. In 1861, Langrishe started his troupe at Central, at the People's Theatre on Main street. It was made up of parties who came with him and several actors who were then living here. Mike Dougherty who had been mining

at Idaho, and had made some money, became a partner of Langrishe. At that time George Harrison was conducting the large theatre in the building, put up by Barnes & Jones, and afterwards partly owned by Langrishe. From the balcony of this building, Harrison shot Charles Switz, (a rough character,) in the street below. A woman, M'dlle Marietta who played for Harrison was the cause and it was understood to be a "shoot on sight" affair. Harrison was cleared at a considerable outlay of money. Both theatres did a good business on an admission price of one dollar and fifty cents. From this time forward Langrishe conducted the theatrical business at all of the leading towns and mining camps of the territory, tarrying in each as long as he drew good houses. He maintained this circuit (except when visiting Montana,) until 1870. His troupe was usually better than the "stock" employed at DeBar's theatre in St. Louis, and he often secured the services of "stars" of considerable merit.

Some queer judicial characters figured in the days of "fifty-nine and sixty." There was a Judge in Nevada district who was once called upon to try a case involving mining property of some value. H. B. Morse was retained in the case and after bringing an armful of legal books and authorities and stating his client's case, he began to cite from the book to sustain his eloquent plea. The Judge (Jones) who was from the uneducated backwoods of Missouri, finally grew impatient and said: "The court don't go a cent on them air leather kivered books, and decides the case for the other side."

In the same district in 1861 W. Train Mewir was the Judge. Although not a man inclined to hunt a quarrel, he was what was called "right square on the fight." The case before the court was one for slander of a widow, and it seems it had gone on until a good deal of ill feeling had arisen among the lawyers and between some of them and the Judge. The court room was a saloon engaged for the occasion. Each lawyer had a big navy or a horse pistol on the table before him. The Judge had one of huge dimensions, perhaps two feet long, which he used to enforce order. There was no jail or prison, so it was useless to attempt to fine a man for contempt of court, and the way the judge brought an attorney to order was by bringing down his shooting iron and taking "a bead," on the offender, at the same time that he commanded him to "sit down." This had the desired effect of temporarily quieting the obstreperous scions of the law and also, of clearing the room for a few moments, of all who stood within range. On the third day of the trial, Rankin, one of the lawyers for the defense, attempted to read a letter from some person in Illinois, reflecting on the lady's character, but the court would not receive it as evidence. In summing up the case another attempt was made to submit the letter and Rankin swore it should be admitted if his side must kill every one opposing, and drew his revolver. Then there was a general drawing of revolvers by some half a dozen men on each side, who ranged themselves in line of battle while the spectators hastily withdrew.

The opinion of the court was sustained however, without bloodshed. This was one of Henry M. Teller's first experiences before the bar in Colorado, but he did not participate in the warlike operations of his comrades. The slanderer was eventually heavily fined, while the widow's good name was generally considered retrieved.

Among the lawyers at Mountain city in 1859, some of whom had their offices in their hats, were H. P. A. Smith, Sam McLane, Richard Johnson, Judge Mayhew, C. C. Post, Geo. W. Brazee, C. C. Clements and Geo. Ainslee and Charles R. Bissell. At Central, in 1860, were L. L. Weld, Judge Purkins, James M. Cavanagh, H. B. Morse and Bristol, H. A. Johnson, and Swift. At Nevada, were W. T. Miller, John W. Remine, Judge Morgan, and Al. Thomson. Some of the above were also located at Missouri city, at times. It will be seen that the bar in those days was represented by no little ability.

C. B. Clements was Probate Judge in 1861 and when leaving for a two months visit to the states, left Bela S. Buell, who was then holding other responsible offices, to act in his place. Buell filled the bill admirably, and neither knew until sometime after that the proceedings were entirely illegal.

In 1859, Dr. Casto and a Mr. Shepherd ran expresses from Denver up the almost impassable mountain roads to Central. They continued this until the spring of 1860. Hinkley & Co., started a mail and express line to the mountains and sold to the C. O. C. and

P. P. Express of W. H. Russell & Co. The Western Stage Co., also started lines running into the mountains.

In 1859-60, the express offices, which, in the absence of U. S. mail facilities, also constituted the post offices, were the most interesting localities in any mining district. The office of Hinkley's express and afterwards of the Pike's Peak express for Gilpin county (Gregory Diggings) was situated at Central city, and Bela S. Buell was the agent. On the site of the First National Bank, corner of Main and Eureka streets, stood a log building forming a single room, whose dimensions were thirty-two feet by sixteen. This contained the express office and its mail department. The courts of Eureka district were held there; and in the same apartment were the offices of D. Tom Smith, district recorder, and of Dr. Smith. Waill's jewelry store and the law office of Purkins and Weld also found snug corners in this beehive. This shows that desirable locations were duly economized in those days. The Express office occupied a space nine feet by six, enclosed by a picket fence. Here was packed and piled the large amount of express matter, and the immense quantity of letters and the distributing boxes they required. The office was open from 7 o'clock a. m. to 9 p. m., and had two delivery windows and a man at each. For a long time it was the only mail distributing office in the mountains. During the summer months and often in winter, two long lines of men, numbering from 100 to 300, were always awaiting the opening of the windows in the morning, and there

was seldom much diminution of the crowd, (except from 2 to 6 p. m.) until closing time at night. Men who had trudged many a weary mile over mountain and ravine to hear from the dear ones in some far eastern home, after keeping their places in the lines for an hour, were doomed to the disappointment of seeing the windows close just before they reached them. Delivering letters was then a slow business, owing to the charge of twenty-five cents per letter by the express company, and as gold dust was the currency of the country, time was required to weigh out the payment in gold dust from the pouch of each man receiving a letter. For this purpose scales were used inside of the office window as at all points of trade in those days. Men experienced much difficulty in hearing from home, as letters were usually directed simply to Pike's Peak, with no town or other locality written upon them. The thousands on thousands of missives from wives, sweethearts, parents or friends, first came to Denver and were then sent to whatever part of the mountains a man was thought to be, and for a long time to Central only. One man, Noah Smith, mining in Park county, who had received no tidings from his wife for many months, was told by a friend from Gregory that four letters were awaiting him in the Central office. There was no way to get them except to walk over the mountains to that place, and he accordingly tramped the entire distance of ninety-four miles, only to find that some other man of the same name had taken them from the office. This

shows the eagerness of those brave pioneers and exiles to hear from the loved ones at home, as well as the difficulties in so doing, previous to the establishment of United States mails and of the necessary post offices. These troubles were enhanced by the transitory character of the population, which would be here to-day, and there to-morrow, one half of the people having no permanent abiding place. California and many other gulches beyond the mountains and far to the southward, attracted multitudes from the older camps and a rich strike in McNulty gulch drew five hundred men in a single day. Hollister says of this non-receipt of mails:

“The delay was wearing, how terribly so, none can know but those who have felt it. The heart of the wanderer in the west ever goes back to the home of his childhood. Thence the winds bear him the perfumes of the days that are no more—all the fond memories of a young life. It is he who prizes letters from home.”

States newspapers were seldom received in Colorado and but little was known of what was going on in the great world, save what could be gleaned from the few weekly papers of this region. There was no telegraphic facilities until near the close of 1863, and eastern news was a little stale if received at all. In August, 1860, the first United States mail service was extended into the mountains. In May, of the same year the *Herald*, of Denver, began to publish a daily edition and the *News* did likewise in August.

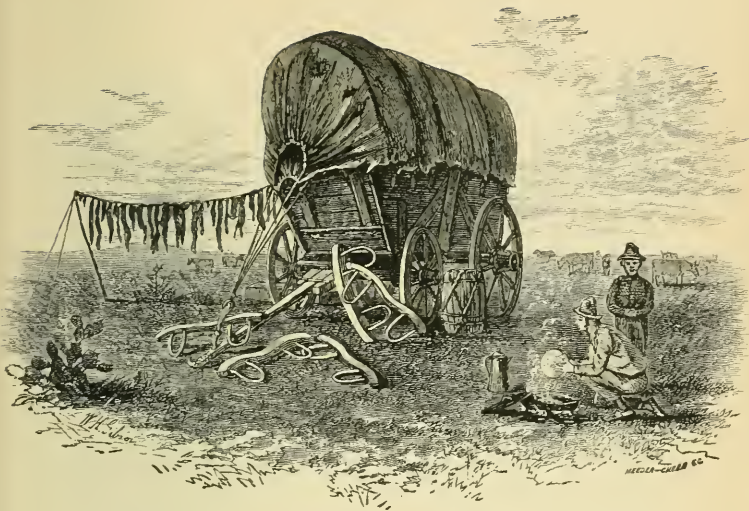
That summer there were sixty stamp mills in Gilpin county and these usually failed to save the gold in paying quantities. There were also thirty arastras, but the quartz, as depth was gained, became too hard for that treatment. A writer of that day says: "Too many are trying to make money without digging or working for it. They will find to their sorrow that the gold must be dug from the ground before it can get into their pockets."

CHAPTER IX.

TRANSPORTING GOVERNMENT SUPPLIES.

Early Locomotion on the Plains—Perils of the Border—The Mormon Expedition—The Pike's Peak Stage Line—How a Fortune was Won and Lost—The Story of the Pony Express—How Billy Russell secured an Overland Mail, and what it led to—The Pacific Railway and its Results—Russell's operations in and for Colorado.

As far back as 1845 the hazardous business of transporting government supplies for the scattered military posts of the far west, as well as merchandise for the distant New Mexican region, was entirely monopolized by a few men in western Missouri—then the extreme border of civilization. Everything destined for these points north, south or west, save the American Fur Company's supplies, which went up the Missouri at high water time, was taken from the boats at Blue Mills Landing, and conveyed six miles, inland, to Independence. From that place the long wagon trains took their departure for New Mexico and the boundless and almost unknown country towards the setting sun—one voyage a year being the extent of the operations of these "prairie schooners." In the decade before the Pike's Peak gold discovery, the sub-contractors and wagon masters of these trains were mostly men who had crossed the plains and the Cordilleras, and fought the battles of their country in



PRAIRIE SCHOONER, OR SHIP OF THE PLAINS, AT ANCHOR.



SHIP OF THE PLAINS, IN DOCK.

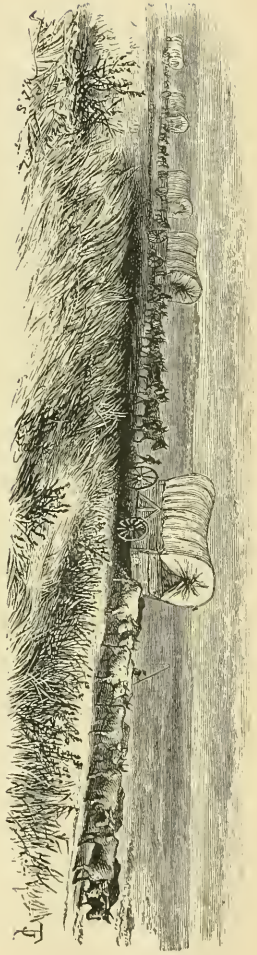


Mexico in the daring and romantic expedition commanded by the gallant Doniphan. They were inured to hardships and dangers, many of the train having absolutely fought their way through the hostile bands of Indians that infested the road from Independence to Santa Fe. No less than two large trains loaded with valuable merchandise were captured by the savages between the years 1847 and '50.

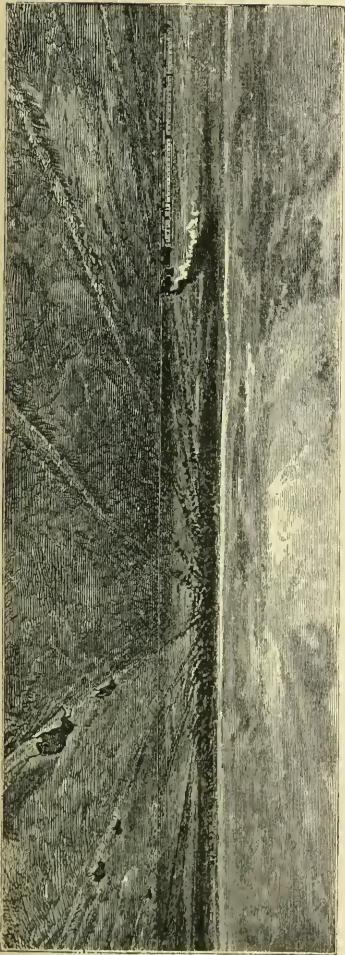
The largest fortunes in Clay, Jackson, Lafayette and Platte counties, had their origin in six yokes of oxen and a prairie wagon. When the California gold excitement broke out, long trains from the western states left the Missouri river bound for the Pacific coast. The distance was 2,000 miles, and was made in five months with ox teams—then the only available means of heavy transportation. The protection of these immigrants, and the annexation of California and New Mexico, caused the establishment of several new military posts, and before the Mormon war broke out in 1857, the governmental transportation business had assumed very extensive proportions.

At this time Wm. H. Russell, of the leading trading and shipping firm of Russell, Majors & Waddell, received a contract to transport the supplies for the entire army destined for Salt Lake, as well as for intermediate posts. This required 60,000 head of cattle, 8,000 wagons and about 1,000 mules, which were sub-divided into trains and let to Missouri farmers and freighters. Each of these trains consisted of twenty-six wagons, three mules and about thirty men,

with six yokes of cattle to each wagon. It is said by old army officers that this enormous contract was more satisfactorily performed in those unwarlike times than any made before or since. The hardships endured on this expedition are still vividly remembered by members thereof. The progress was necessarily slow and the rear columns often occupied the camping ground held by the vanguard on the previous night. As no subsistence was obtainable on the route, large herds of beef cattle were driven along. Winter came on with the expedition in the mountains of Wyoming, and it was no unusual thing for several hundreds of cattle to perish in a single night from the effects of cold and snow. It has always been asserted that had Gen. Harney been allowed to proceed and carry out his plans he would have encamped in Salt Lake that winter and not have been exposed to its inclemencies as was his successor Gen. Albert Sidney Johnston. Then as now, there appears to have been too much hesitation and peace policy in western measures. Governor Cummings of Utah was accused of sympathising with the Mormons, and of controlling or retarding Johnston's movements. The succeeding year the army occupied the Mormon country. In 1860, one herd of 4,800 cattle belonging to Russell & Co., were frozen to death in three days in what is now known as Skull Valley, Utah. When informed of the loss through Hockaday's express, Russell made no other remark than, "send the hides and horns east by return (wagon) trains." These facts are given to show



CROSSING THE PLAINS IN THE OLDEN TIME.



CROSSING THE PLAINS TO-DAY.



the character of the man and the magnitude of his operations.

In the spring of 1859, when the Pike's Peak immigration had fairly set in, Russell, Majors & Waddel, and John S. Jones, under the firm name of Russell, Jones & Co., organized the Pike's Peak Express Company. They bought the Hockaday line of coaches running from the Missouri river to Salt Lake, and the main line to Colorado diverged south from Fort Kearney, Nebraska. The line was stocked with fine new coaches and the best lot of mules from Missouri, Kentucky and Tennessee ever owned by any company. The financial history of this great enterprise, was not a success. Costly stations and supplies in a wild and barren country were necessary, an express messenger accompanied the driver, and for a time an outrider or a mounted man rode along to urge the mules to greater speed. The stage stations were usually from twelve to fifteen miles apart, where the mules were changed. It has been stated that the late John S. Jones and W. H. Russell gave away more tickets to disappointed men returning or to parties "going out" to seek lost relations than were sold at Leavenworth. The distance from that point to Denver by this route was about seven hundred miles, and the fare was one hundred dollars, and one dollar was charged for meals at the stations owned by the company. There were no government postal facilities until 1860, prior to which time the company received all mails destined for Colorado, at Leavenworth. Amos Steck, had

charge of the postal distributing office of the company at Denver, and twenty-five cents was the charge for each letter.

In 1862, when the company had the mail contract, the United States Government was in arrears to it for nine month's postal service, amounting to \$60,000. Ben. Holaday, often called the pioneer overland coachman, who had made a large amount of money through Russell in the famous government flour and mule contracts, became identified with the line, and in a short time through the valuable assistance of Senator and General Jim Lane, of Kansas, became its owner. Just previous to this, agents had passed over the line to appraise its value, and its stock, stations and supplies, were found to be worth together \$700,000. A previous advance of \$40,000 was the means by which Holiday obtained all of this property, and he reimbursed himself for even that, when the government settled the back mail dues. He resold the line to Wells, Fargo & Co., in 1863-4, for \$1,500,000 in stock, which he promised to keep, but sold instead.

To go back to earlier times again, the great California and Pacific coast mails had been conveyed by the Pacific Mail steamship line via the Isthmus, since the first years of the Pacific gold excitement. Early in 1860, representatives of Wells, Fargo & Co., and of the Butterfield or Southern Overland Company, with other prominent stage men had resolved to secure a four years contract from Congress at one million dollars per annum, to carry the mails overland, and

thus get them away from the steamship company. Russell's new Pike's Peak or Northern line, sometimes derisively called the "Ox Mail Express," was not counted in on this scheme. That line had none but the old Hockaday mail contract, requiring them to deliver only six mails to and from Utah in the summer months, and three in the winter, and none to Colorado or other points, and from these occasional mails arose the term, "Ox mail." During the winter a trial trip for speed was made by the steamship company and Butterfield stage line. The course of the latter lay through Texas, Arizona and California. The Stages made the trip so that the New York mails reached San Francisco in twenty-one and one-half days, beating the Steamship line a day and a half. So matters stood at the time of which we write and the Pacific Mail still held possession of the coveted prize.

Much to the surprise of these great companies, in February 1860, the following advertisement appeared in the New York *Herald*, and in the Washington *Star*, the latter paper being owned by Russell.

"I will start an express across the continent from St. Joseph Mo., to Sacramento, Cal., April 9th, 1860, the schedule time of which will be nine days. Letters weighing two ounces or less, five dollars. Other mail matter specially contracted for at the office, corner of Fulton Street and Broadway, New York City.
W. H. RUSSELL."

At this time there was no telegraph across the continent and none extending further west than St. Joseph,

Mo. Beyond a narrow tier of counties in eastern Nebraska and Kansas the country was one dreary waste from river almost to ocean, save the Mormon settlement in Utah, and the new Pike's Peak country, and such an undertaking was considered foolhardy and preposterous in the extreme.

Russell's announcement fell like a bombshell in the camps of the huge corporations. A proposition of so novel a character was never expected and was laughed at. At the time the advertisement appeared no one in California or the eastern states knew anything of the scheme save a few trusty agents, whom Mr. Russell had set quietly at work placing horses upon the route, unknown even to his partners. When one of the latter, Alexander Majors, among the shrewdest of western contractors, heard of it, he advised Russell's children in Missouri to go to Washington and bring him home. To use the old man's expression, he had long doubted Billy's sanity and "this time he has done gone crazy sure enough."

On the morning of the 9th day of April 1860, ten thousand people were assembled at Saint Joseph, speeches were made, cannons were fired and a special train arrived over the Hannibal and St. Joe. Railroad, with a messenger from New York and a "Pony Express Extra," together with extras of other newspapers with full accounts of the enterprise. A beautiful black pony was led forth and a pony rider placed thereon awaiting the signal to go. The mail bag was kept open to the last moment for dispatches and letters from the east, and then amid the shouts of the

multitude the pony and his rider started. Many of the people then believed that the same animal was going clear through to California. On the same morning a milk white steed was placed on the steamer Senator at San Francisco and, with an escort of not less than a thousand people, was taken up the river to Sacramento, one hundred and twenty-seven miles inland. The same scenes were there enacted as at St. Joe. and the pony and rider started. Telegrams from New York and the east were delivered on this first trip in eight days and four hours, and letters from San Francisco arrived at St. Joseph in eight days and nine hours! Here was a saving of fifteen days over the usual Pacific Mail Steamship time of twenty-three days, and was of course of vast importance to, and was duly appreciated by, business men east and west.

This settled the question of the quickest and most direct route to the Pacific and "Little Billy" got the United States mail contract to the exclusion of the steamships and stage companies, and the Butterfield line soon sold its stock to him. He extended his line to Salt lake, where it connected with the Chorpensing Co., and mail contract. Time from the Missouri river to San Francisco ten days, and from New York fourteen; This went by the name of the Central Overland California and Pike's Peak Express Company.

The management of the Pony Express was entrusted to Ben Finklin, then superintendent of the Pike's Peak Express Company. The stock for that part of the line west of Salt Lake was bought in California.

From that city to Fort Bridger, horses were used that were bought from the Mormons and officers at Camp Floyd, often costing three hundred dollars each, as none but the best and fleetest animals would answer. The remaining stock came from Missouri. The stations were from nine to thirteen and sometimes twenty miles apart. The ponies were swift, strong, and enduring, and were usually spurred to their greatest speed, although schedule time was adopted. A fresh pony awaited the couriers arrival at each station, station keepers being forewarned at night by the blowing of the horn. A moments time was sufficient to change the saddle from one pony to another and the messenger was again on his long and lonely route. The ponies were never let out to feed, but always stood in readiness for the road. The best of riders were chosen, generally from among scouts and plains men, fearless and brave and familiar with the route. They were very often exposed to attacks from Indians and highwayman, and for their valuable services they received but sixty dollars per month and board. They usually rode from fifty to seventy-five miles before laying off, when another man stood ready to proceed, and thus for eight days the express bag, with its ten or twelve pounds of contents, was kept moving. The drivers rode day and night and were not allowed to stop to eat. The average rate of speed for the entire route was over nine miles per hour, but at intervals it was increased to twelve or thirteen—this for 2,000 miles day after day and month after month. The news of

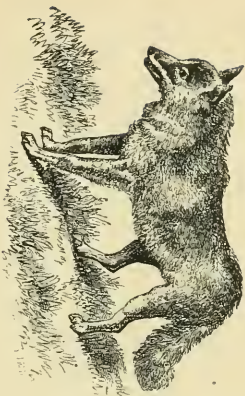
Lincoln's election was carried from St. Joseph to Denver, nearly 700 miles, in sixty-nine hours, the last ten miles having been made in thirty-one minutes.

It was a grand sight, while sitting in a coach on this treeless uninhabited waste, to see a small object on the far off horizon rapidly approach, dash by like a flash of lightning with a word of news or welcome, and as rapidly disappear in the opposite direction; all seemingly done in a moments time; and this occurred twice a day, one coming from each direction. Thus the avaut courier of the telegraph and iron horse, never slackening his speed by night or day, maintained his adventurous and dangerous way, beating a path for the civilization of the east to follow. The Pony Express was a losing concern, and gave way to the Overland Telegraph in 1862.

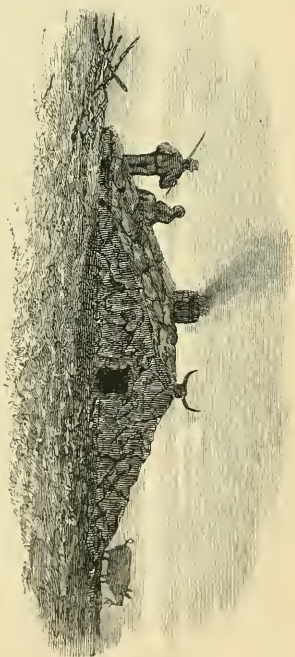
This exploit however decided the selection of routes for the projected Pacific Railway. An informal meeting of two or three prominent men from each leading northern and western state took place at Chicago in 1862, and articles of incorporation were filed for what is now known as the Union Pacific Railway Company. At this meeting Holiday represented Russell. To the latter and to Thos. J. Durant, more than to any other men, the public are indebted for this great national highway. Russell demonstrated the practicability and superior advantages of the route and strongly advocated its selection, and Durant and his associates secured the government's aid and built it. Both these men are now dead and rapidly becoming forgotten.

But their deeds and achievements are lasting monuments to their memories.

In sixteen years prior to the laying of the first rail of the Union Pacific (which occurred late in 1865,) the population of the great empire of the west, scattered over two thirds of the area of the country, had increased from a mere handful to over 700,000 people. Three states and numerous territories rich in mineral wealth had been organized from this grand public domain. This region's development, traffic and travel, its better protection from foreign foes or Indian raids and the government's increasing army and Indian agency transportation demanded cheaper and quicker locomotion and connection. The history of the construction of this railroad enterprise is too well known to require repetition here. How the two great companies beginning at the Missouri and the Pacific moved steadily forward to their point of union; how the world looked on in wonder as month after month the daily rate of construction increased from one to two and even four miles, and finally culminated in seven, seven and a half and ten; how the excitement grew as the great work approached the end, until these rival representatives of the Orient and Occident completed on the 10th day of May 1869, this wonder of the age; how nearly 2,000 miles of railway were constructed in three and one-half years, or in seven years less than the required time, are well known facts, parts of the history of the day and country, with which all are familiar. But the drawbacks attending the inception, con-



THE COYOTE.



DUG-OUT—AN OLD-TIME MILITARY AND STAGE STATION.



THE FIRST TOWN SITE SPECULATORS—PRAIRIE DOGS.



struction and completion of the work few appreciate and many have forgotten. There were difficulties of crossing and penetrating lofty mountains compared with which all eastern elevations are but mounds; from snows, from desert plains devoid of water and gorges and morasses where there was an excess; of cold and heat, of long intervals without timber, and in supplying a long line of laborers and stations; of protecting the same from Indians through half a continent of unsettled country, and with scarcely a white inhabitant on the entire route. The building of the Central Pacific presents the grandest exhibition of financial intrepidity, faith and enterprise, of intense energy and magnificent engineering the world has yet afforded. After the long struggles to interest capital and congress in the enterprise had succeeded, every kind of supplies had to be shipped by water, a distance of 15,000 miles from New York, via Cape Horn, to San Francisco. Progress on the western end of the road was slow for five years or until the road crossed California and crept up the cañons and steepes of the Sierras, and it was not until 1868-9 that those grand bursts of speed in railroad building were made that won the admiration of the whole world.

Princely governmental subsidies were received, and a royal monopoly and corporations sufficiently powerful to defeat all competing enterprises have been the result. Yet rapid advancement, great prosperity and enormous advantages have resulted from the building of this grand highway. A region embracing nearly 1,500,000,

square miles and until recently almost uninhabited, has been placed in direct communication with the world. Its population has been increased to 1,500,000 who are already favored with 4,500 miles of railway and 15,000 miles of telegraph; and now instead of a long weary pilgrimage of five months, the entire distance of 3,500 miles from ocean to ocean is traversed in six days, and has been accomplished in eighty-three hours and thirty-nine minutes! This subject has been noticed at length as it was partly the means of furnishing Colorado with its three great eastern outlets on the iron rail.

As Russell was closely identified with Colorado and its progress, something in regard to his mining and business operations here will not be out of place. In 1860-61 he and John S. Jones transported over thirty stamp mills and other heavy machinery across the plains and up into the mountains for other parties for which they received no pay. The banking house of Turner & Hobbs and the immense outfitting stores known as R. W. Bradford & Co., Miller & Co., and others in Denver, were all in reality employees of Russell. The government was still owing him over \$2,000,000 for transporting the army to Utah in 1857-8. He had received therefor the celebrated Floyd acceptances. The Treasury had no money to pay these with, and some politicians in Washington who had access to the Indian funds substituted those bonds (over which there was such a scandal) for the acceptances. The lack of this money and some of his heavy enterprises caused him to fail in business.

Previous to this time he had sent John Scudder to Central with the Lexington Stamp Mill and in connection with important mining enterprises. Through him he disbursed large sums of money in Gilpin county in various operations. Among other generous acts was the sending of a train from Salt Lake loaded with 1,500 sacks of flour to Scudder, who had stated that the article was extremely scarce and sold at from eleven to thirteen dollars per hundred pounds. He ordered this flour sold at seven dollars per sack, or about cost price, and given to those unable to buy. It was stored in Scudder's large ware house built where the Montana mill building now stands. There are men still in the country who walked off free of charge with one sack for their cabin and another to trade off at the stores for coffee, sugar and bacon. Russell bought and paid for every claim to the Hot Sulphur Springs of Middle Park, and began to build the famous Berthoud Pass road leading thereto.

In 1862 he came to Colorado on a mere visit of pleasure and relaxation, and after being entertained by Governor Gilpin, Amos Steck and others, drove up the Mount Vernon road to Grass Valley Bar, where he had purchased bar claims of Garvin, Sisty, Shinn and others on a previous trip. Men are still living in Idaho Springs who remember seeing the "old gentleman," tugging up a steep hill on one end of a sluice box, with John Scudder at the other, and hurrying the construction of the hydraulic works whose ruins are still to be seen in lower Idaho. They were completed

that same evening and a "clean up" from an hour's run gave twenty dollars worth of gold, which Russell took and always kept, prizing it more than thousands made in mercantile speculations.

Clear Creek county was then almost deserted. He kept on as far as Empire. His restless spirit could not brook inactivity, and he at once formed and began to carry out plans which eventually caused the employment of from six hundred to a thousand men during the next year. He set men at work on Silver Mountain on the Rosecrans, Tenth Legion and other lodes, and they were soon producing largely. He removed the Tennessee twenty stamp mill from Nevadaville to Empire in mid winter and had it running in six weeks. He may be said to have been the father of Clear Creek county. While mining there and in Gilpin, he was steadily shipping his gold retorts to New York where it would be seen by capitalists with whom he had had dealings when his operations to the tune of millions extended from New York to California. This was in furtherance of his plan of getting eastern capital largely interested in Colorado.

In 1863-4, the results of his enterprise began to be manifest. He organized the Star and Fulton companies, on the Crystal lode above Idaho Springs, which in one year expended \$500,000. He formed the Empire, Bay State, Knickerbocker and other companies on mines at Empire, each started with a large working capital. The miners owning these properties were paid through Russell large prices therefor. Over forty

parties received from one to twenty thousand dollars each, and there is scarcely an old resident of that county who could not testify to his liberality and noble disposition. During the time of heavy sales in Gilpin county in 1863-4 Russell took a leading part in the organization of such famous companies as the Fisk, Gunnell, Gunnell Gold and Central, the Burroughs, the New York and many others where his magic name was used to influence prominent men to become interested.

Russell died in August 1872 or '73 at the home of his son John W. Russell, a banker of Palmyra, Mo., and prominent men from all parts of the State attended his funeral. He was a man of wonderful executive ability, of large heart, great charity, and unbounded confidence in the entire human family. He was a warm supporter of Douglas, and spent large sums of money to aid in his election to the presidency. Jefferson Davis tendered him the position of Secretary of the Treasury for the Confederacy, just before the beginning of the war, but he declined, as he had ever opposed secession.

He had perfected plans, which had he lived, would have benefitted certain Colorado mining districts to a greater degree in five years than will now be the result in a much longer period. He was engaged in reorganizing the companies that he formed long ago, for the purpose of reopening a large number of idle mines. The consummation of one part of the scheme would have consolidated the eleven corporations owning on the Gunnell, so that the entire lode would now have been in full operation.

CHAPTER X.

HISTORY OF CLEAR CREEK COUNTY.

Placer and Bar Mining—Idaho and Empire—Russell's Operations in and for the County—Gold Lode Mining—How Silver was Discovered in the Richest Silver District in the World—Coley's Solitary Tramps—McLelland—Vigorous Prospecting—Sales of Property—Successes and Failures in Reducing Ores—Present Prosperity—\$2,000,000 per Annum.

The first discoveries of gold within the limits of Clear Creek county, have already been noted. This narrative of succeeding events is largely condensed from T. J. Campbell's historical sketch of Clear Creek county.

In 1860 some three or four hundred people were congregated at, or near, Idaho Springs and Spanish and Payne's Bars, engaged in gulch and bar mining. The chief work was done not far from where the Whale mill now stands. There was only one log cabin in Idaho, where Sam. Hunter sold flour, bacon, whiskey, and other luxuries. The currency, as elsewhere, was gold dust, usually carried in a buckskin sack or small glass bottle, and the price of each purchase was weighed out at the rate of one dollar for each pennyweight of gold. The gold in this district was unusually good, having a coin value of from \$18 to \$19 per ounce.

The town of Idaho Springs was laid out by Messrs. Sam. D. Hunter, Wm. E. Sisty, Wm. L. Campbell, and Wm. Spruance. The original Beebee house was built in the winter of 1860-61. For a time Mike Dougherty and Sam. Hunter were the most successful miners. Afterwards new mining districts were formed, governed by the usual miners' laws, until they were thirty in number. Very rich claims were worked on Spanish Bar, and at intervals for several miles below Idaho Springs. On the latter were J. G. Mahany, S. C. Bennett, and the Charles and Whitford brothers.

In the meantime gold had been discovered at Empire some thirteen miles above Idaho Springs and a few miles below Berthoud's Pass over the Snowy Range. The Patch Diggings for a time were the richest in the country. George Merrill was the first man there, arriving in June, 1860. But little gold was obtained however, until 1862, when Dr. Carlton, Charles Martin & Co., worked a large force, obtaining fifty dollars per day to the man and took out \$75,000 during the season. Times were lively then.

The first coach arrived at Empire in 1861, Russell having extended his plains stage lines into the mountains. Wm. Gilpin, the newly appointed governor of Colorado, and B. D. Williams, Delegate to Congress, under the Provisional Government, were among the passengers and everywhere received a cordial welcome. Mr. Charles R. Fish, now of the Miners National Bank, of Georgetown, was the first preacher and the first Methodist, at Empire.

J. S. Jones mined here quite extensively, and afterwards realized \$110,000 from the sale of his property in New York, which was effected through Russell. Like most other Colorado men who sold mines, he did not keep his money long. Wm. H. Russell, the leader of the firm of Russell, Jones & Co., and of many great enterprises, conducted extensive mining operations at Empire, and had a stamp mill there. He took out \$66,000 from Silver Mountain, in 1863. He and John Scudder were bar mining extensively below Idaho Springs, at Grass Valley, in 1862-63. John T. Harris, John M. Dumont, S. F. Nuckolls, afterwards Congressman from Wyoming, and Nichols and Hill, anchored at the site of Georgetown, when trout were plenty. They put up a quartz mill and actually took out \$2,500 from the Burrell and other lodes. But it was not a gold district, and as they were not looking for silver, and did not dream of its existence there, they escaped being millionaires for the time being.

During those years the richest portion of the gulches had been "worked out" and this section was not considered a promising one. In the meantime William H. Russell was quietly maturing a plan for interesting eastern capitalists in the development of the lode mines. He shipped his gold dust and retort regularly to New York City. He induced a leading man of the Philadelphia Mint to come out and examine the gold bearing quartz and copper pyrites, of the Empire mountains. The report that followed was such as to

induce eastern people, who had more greenbacks than they knew what to do with, to invest, and ten high toned mining companies were organized on Empire property. Some of them paid salaries alone, amounting to \$35,000 per annum, and of course this eventually broke them up in business. This was in the years 1863-4-5. Georgetown also secured five companies which put up extensive mills before the greenback supply gave out. But the latter not being a gold region, of course returned them but little. Clear Creek county had thus experienced two seasons of mining prosperity, one of gulch mining followed by a period of activity in lode mining, when another interim of dullness ensued.

A sample of the processes which pretentious professors gull eastern capitalists and Colorado mining investors with, is afforded in that of a scientific gent who operated for a company at Empire until he succeeded in breaking it up. "He had a concern something like a big ice cream freezer. The ore, after being pulverized, was forced by hydraulic pressure up through a syphon at the bottom of the machine and passed out at the top. It worked first rate but did not save any gold and required a tank of quicksilver (worth \$200) every fifteen minutes." Ed. Guibar and other Empire miners afterwards made big wages panning out quicksilver in the gulch below that mill. The members of the company attributed their losses to Colorado mines; when it was no fault of the mines, but their own foolishness and extrava-

gance and their pet process that used up their greenbacks.

It is now a well-known fact that the silver deposits of Colorado are far more extensive and therefore combine more wealth than those of gold. There are ten silver veins where there is one of gold, and although silver mining did not fairly begin until 1870 and is still in its infancy, sixty per cent. of Colorado's bullion product in the years 1874--5 was silver. In fact there appears to be no limit to the argentiferous wealth of this region. Year after year new districts of untold wealth are discovered, and, notwithstanding the almost inaccessible localities of many of them, they are being rapidly developed. And yet for many years the prospector, or hunter, ignorant of the character of the riches they were so carelessly passing over, crossed and re-crossed the veins which have since added so largely to the world's and the nation's wealth, without knowing their true value.

This was the case at Georgetown and vicinity, and for years the district that ranks in production second only to that of Washoe (with its great Comstock vein), was given the cold shoulder by the eager hunters after gold. The Whale mine, at Spanish Bar, was worked for gold, when seventy-five per cent. of its valuable contents was silver, that was washed down the stream and to irretrievable waste. The stamp mill process would not save silver. The company that purchased this mine built an enormous building of brick, three hundred feet in length and filled it with

the costly machinery necessary for some pet process of which a multitude of Bartola pans formed a part. This was in the costly times of 1864-5, and the outlay was \$225,000. The Whale mill was an utter failure and stood a monument of folly until its owners displaced its machinery in 1872, for the Swansea Smelting process. The first business representatives of this company, not content with the eastern agent's usual accompaniments, of a fast horse, high topped boots, etc., wore knee breeches, and were wont to astonish and disgust the miner and prospector with the gorgeous and unique character of their apparel. The Seaton, and other mines were also worked for gold at first, and paid for a time, and were then abandoned until the dawn of the silver era.

At the close of 1860 the free gold in the rich and famous Georgia Gulch, a tributary of the Blue, on the the Pacific slope of the "Rockies," was nearly exhausted. Soon after, the war of the Rebellion opened. These causes induced the gulch miners to scatter to other localities. Some went to their Southern homes and entered the Rebel army, and others joined the Union regiments recruited in Colorado. Those who cared more for gold than glory betook themselves to the western wilderness (then almost unbroken from Colorado to British Columbia), or drifted about the Rocky Mountains wherever the cry of good diggings was sounded.

About this time two miners while hunting for bear and other game near the site of Saint Johns, in Sum-

mit county, found themselves short of lead. When about to return to the settlements they camped upon the out croppings of a strong galena vein, and from the flinty ore made bullets by burning it on a log heap. They soon, however, found that these bullets were spoiling their rifles. Soon after they went out to the state of Nevada, and after seeing the silver veins of that section, concluded that their bullets, made in the mountains of Colorado, had come from a silver lode. They wrote to a friend of theirs at Empire, named Coly, describing the locality and advising him to go there and look for silver lodes.

Coly did not go until the summer of 1863, but kept the secret in the meantime. At last he slipped away, and went and returned by an indirect route. The Comstock lode, out in Nevada, was then becoming the wonder of the world, and Coly saw no reason why another Comstock might not be found in his own section. He made several of these solitary trips and his neighbors began to wonder what was the matter with the old man. The spot was twenty-five miles distant and beyond ragged and lofty ranges of mountains that were impassable from snow six months of the year. He became satisfied that he had a silver vein but had the mournful consolation of knowing that if the ore was one half silver, it could not be made to return a revenue in that mountain waste until immigration and capital should establish costly mills for extracting the precious metal.

Silver, or even gold, lodes do not yield up their

riches as readily as creeks or placers. Before the advent of mills or ore buyers, and the construction of roads or trails, the prospector's only chance for immediate wealth is in a sale. Without that his fortune lies entirely in the future or in his own imagination.

In the fall of 1864. Gov. Steele, J. Hough and Mr. Pine, having some faith in the existence of silver, and perhaps, wanting to find out where Coly was going, left Empire, and after camping at Georgetown started up the south fork of the creek. After killing an elk, and seeing a dozen more far up the mountain side, Hough started after them alone. He did not get a shot, but he found the Belmont lode. He carried a pocket full of ore to his companions and they returned with him to the spot. A coffee pot full of the rock was taken to Prof. Frank Dibbin, at Central, and he pronounced it silver ore containing from 300 to 500 ounces of silver per ton, or worth from four hundred to six hundred dollars. They had indeed found silver.

The few who happened to know of the affair, asserted that our pioneers had obtained the ore from the Comstock, and were attempting to organize a "big hoax," with the claim that silver had been found in Colorado. It will be remembered that at this time a great many worthless pieces of Colorado property, said to be gold bearing, had been palmed off on an unsuspecting set of speculators at the east, and that dodge having played out, some men thought the next scheme might be in silver.

In 1865 when it became generally known that gen-

uine silver ore had been found near Georgetown, men started there from all quarters, and eight or nine hundred people were soon collected at Georgetown—for the prospector is always ready to leave a good thing for an uncertainty in some remote locality. 'Tis distance lends enchantment to the view." The new town was built of bark and brush shanties, the only log cabin serving as a grocery. The place could be reached only with pack animals, no roads having yet been built. John Turck, Caleb S. Stowell, E. S. Streeter, and the Charles and Whitford brothers, were there. On the crest of McClelland mountain, which is bare of vegetation, the veins are exposed so that a good climber could have discovered about all there was to be found, in a few days.

This so disgusted the old regular gold prospectors, who had not been very fortunate here, that they left in disgust. Dick Irwin, Jack Baker, and Fletch. Kelso, three famous prospectors, passed over the McClelland mountain down into the depths of a cañon and on to the giant peaks beyond. They named these and the streams near them, after themselves. Before them was a smooth round mountain of immense size and this has since been known as Baker, or Kelso. Further on, two snow-capped peaks (in reality one mountain), seemed to pierce the very clouds. The sharp conical one, which appeared from their standpoint to be the highest, was called Irwin's. It still bears that name among Coloradans, notwithstanding the recent attempt of a Harvard professor to appro-





priate the honor. Gray's Peaks, however, is a title often applied to both points of this grand old mountain.

These men found a silver vein of great size which they named the Baker. It was afterwards sold to a party of Philadelphia Quakers for a large sum of money, and the mill and town of Bakerville was the result. Frank F. Brune, Dr. A. M. Noxon and R. Davis received money from this sale, the pile being divided among the six, in sums of from ten to twenty-five thousand dollars each, and the operators of the sale also came in for a share.

Anderson Orr left Argentine and went over on to Sherman mountain, and discovered the Elijah Hise, Ben. Harden, James Guthrie, and other lodes. M. P. Parker and John Cree located the Henry Ward Beecher, New Boston, and other veins, on Democrat mountain. By September, 1865, this was known to be a great silver district, but how to extract the silver from the ore was the mystery. There were no silver miners there. Consequently no money was realized that season. J. Oscar Stewart put up a small old fashioned lead furnace in December, and obtained a small quantity of silver-lead bullion.

In 1867, T. J. Campbell and Dr. Darnell found the Anglo Saxon lode, and evidently "struck it" in the right place, for an enormously rich pocket was shown from the beginning. The ore assayed over \$28,000 per ton, some of it being composed of seventy per cent. of the precious metal. Lumps were found so

rich that the pure silver could be cut therefrom with a knife. It created a great excitement and was pronounced the "biggest thing in the mountains." It was sold, and each of the discoverers received a pile of greenbacks containing \$10,000, and John T. Harris, who had handled the property, received a good round sum beside. This, and the Baker, constituted the first important sales. In 1870, Clark and Crow sold the Terrible mine, in England, for £100,000. Its ore was unusually rich. Other investments were made afterwards.

From 1866 to 1873, many attempts were made to treat these silver ores, and with varying success. Garrott, Martine & Co., put up a cylinder in 1866, which was very successful. That fall Joseph Watson started a Pennsylvania reverberatory furnace to test the ores of the Baker mine. G. W. Hall built a sampling mill in 1867. Caleb S. Stowell had a small lead furnace. The Washington Company changed their gold mill into one intended for silver ores, but it failed. This company, in 1870, successfully used the Krom Separator. John T. Harris also had a small furnace. J. O. Stewart put up a small reverberatory smelting furnace in 1867, afterwards changed to a chlorodizing and amalgamating concern. In eighteen months he turned out silver to the value of \$108,000. These works finally grew into those of the Stewart Silver Reducing Company, which produced over \$400,000 in 1874. This company's great mill was burned in January, 1872, with a loss of \$100,000, and its suc-

cessor in December, 1875, with a loss of \$60,000 above the insurance. Another mill has since replaced it.

In the summer of 1867, Joseph Watson built the Bruckner Cylinder mill, at Bakerville, at an outlay of \$150,000. The company afterwards failed and the mill was destroyed by fire. Watson also built a large smelting mill at Brownville and made many large silver buttons therein, one of which weighed seven hundred pounds, worth \$11,000. A Missouri blast furnace was started by Prof. Bowman, a colored man, and a good prospector, who owned several lodes. He organized a company among people of his own race, and a son of Fred. Douglas was in the party. Several other ore treating enterprises failed, and as with all new silver districts progress and advancement were slow. Roasting and amalgamating were successful, but too expensive, costing \$100 per ton of ore, instead of one half or one third that sum, as at the present time.

In 1872 Charles A. Martine and Gen. F. J. Marshall conceived the idea of organizing an ore market, and having perfected arrangements with eastern capitalists and works, they began to purchase ores. This was the beginning of legitimate business in this silver district. It brought the mill man in direct contact with intelligent competition. It caused a reduction in the price of treating ore, and placed the miner in an independent position. It aided to secure the confidence of people abroad, and gave a permanent character to silver mining in Colorado. Other reducing works at

the east and in Colorado afterwards established ore buying agencies and sampling works at Georgetown, and now ore is sold to eastern and to Colorado works outside the county to the amount of \$1,500,000 per annum. The home silver reducing works have also been vastly improved, and larger and better ones have been constructed—and the most skillful and best educated labor is employed.

In this same year (1872), George Teal and Edward Eddy, introduced the wet system of concentration and dressing on ores from the Terrible mine. Here was another grand stride forward in the right direction for successful mining. This process and that of dry concentration, are now two of the most important elements of success at Georgetown, for they render the immense quantities of low grade ore available. The extension of the Colorado Central Railway, soon after, to the lower end of the county, reduced the price of freights and increased the speed and convenience of travel. The steady development, vast number and richness of the lodes, aided by improved and cheaper milling, and a high priced ore market and reduced expenses, brought about a yield of over \$2,000,000 in each of the years 1874-5. This was done, notwithstanding the fact that most of the larger and richer mines were partially closed by bitter contests and litigation. With the consolidation of contested properties and further development the yield of the Georgetown silver mines can be increased many fold.

CHAPTER XI.

POLITICAL AND GENERAL HISTORY.

Attempt to secure Territorial and State Governments—Success of the former—Provisional Government—The Territory of Colorado—Early Elections—First Federal Officials—Arrival of Governor Gilpin—Colorado's War Quota—The Gold Mining excitement at the East—The era of ready sales—Causes of Mining losses—The Indian War—Territorial Officers and Legislators.

POLITICAL matters attracted the attention of the people of Colorado from the beginning, and from that day to this, there has never been any lack of patriotic devotion shown in serving the public in official positions. Among the pioneers were a large number of men from Nebraska, where politicians were said to have had their eye-teeth cut sooner than elsewhere. These men certainly equaled, if they did not better their instruction, for they have managed to keep top of the political heap, or somewhere near it, during much of their residence in Colorado. However, there were numerous representatives of other states that have shown remarkable brilliancy in the wire pulling line.

The pioneers in this unknown region, six hundred miles from anywhere, were determined to have a government of their own instead of remaining vassals of far away and indifferent rulers. Accordingly steps were taken to form a Territory and State, to which the names Jefferson, Cibola—the Spanish for buffalo—and Colorado were all proposed.

A convention was called to meet at Auraria on the 15th day of April, 1859, for the purpose of forming a state government. The object of this call was so far carried out as to secure the attendance of fifty delegates, when an adjournment was effected, after providing for a fuller convention in August of that year. At that time one hundred and sixty-seven delegates assembled and framed a state constitution. In case this constitution was rejected by the people, it was provided that an election should be held in October to choose a Delegate to Congress. The latter move was to secure a separation from Kansas and the establishment of a territory under the name of Jefferson. The state constitution was defeated, the vote standing 2,007 against, to 649 for.

At the election for Delegate to Congress, at which B. D. Williams triumphed over all competitors, there was said to have been terrible ballot box stuffing. Wilbur F. Stone, gives the following in regard to the manner of conducting this election in the would-be territory of Jefferson:

“As Fountain City was the only settlement south of “the divide,” it must needs be looked after, and so Hickory Rogers was sent down from Denver to see that the right of suffrage was properly exercised. Si Smith had been previously appointed by the governor of Kansas a justice of the peace, being therefore the first jurist that sat on the bench in the Arkansas valley, and he administered some of his oaths to the election judges, who proceeded to open the polls and

receive the votes of the settlement, amounting to about seventy-five, all for the Jefferson government. The returns were duly certified and sworn to and delivered to Hickory to take to Denver, which at that early day assumed to "hog in" the capitol. The first night out, old Hickory sat down and deliberately added 1,150 names to the poll book. As the returns were properly sworn to there was no going back by the canvassing board on the population of Fountain City, and thus early in the history of the now proud Centennial State, did the honest American voter of the Arkansas valley vindicate the glorious boon of the ballot box."

On the same day members for another state convention and officers for the county established by Kansas were chosen. Eighty-seven delegates composed this convention which framed an organic act, and appointed legislative districts and nominated a full state ticket which was elected the same month. R. W. Steele, was chosen Governor and L. W. Bliss, Secretary, and the legislature officered by James A. Gray as Speaker, and Eli Carter as President of the Council, was convened November 7th. After organizing nine counties, passing some general laws and appointing probate or county judges, the legislature adjourned till January 23d, 1860. Previous to November 1859, the people had governed themselves by laws and courts of their own making, in the various individual settlements and mining districts.

Williams was successful in securing the passage of

a bill through Congress establishing a territory of the same dimensions as that of the present state, and the name of Colorado was substituted for Jefferson. Portions of Kansas, Nebraska and Utah, went to make up the new domain—large enough for an empire. Kansas politicians were opposed to including the gold region in their state, and the latter did not care about forming a part of a commonwealth whose industries were of so diverse a character.

The first Federal officers of Colorado, appointed immediately after the establishment of the territory, February 26th, 1861, were as follows:

Wm. Gilpin, Governor; L. L. Weld, Secretary; B. F. Hall, Chief Justice; Charles L. Armor and S. N. Pettis, Associate Justices of Supreme court; C. Townsend, Marshal; W. L. Stoughton, Attorney General; F. M. Case, Surveyor General.

Governor Gilpin, arrived at Denver May 29th, 1861, and had a census taken of the territory during the following summer. It showed a population of 25,329, including 20,798 white males, 4,484 white females, and 89 negroes.

In 1861, H. P. Bennet was elected Delegate to Congress, being the first Coloradan allowed a seat in that body.

At the opening of the war of the rebellion a few men went south, but the population was almost entirely loyal to the Union. In 1861, Colorado furnished a regiment of infantry, commanded by Col. John P. Slauch. It was eventually transformed into cavalry.

It did good service in New Mexico in driving back the Texan invasion of that territory early in 1862, and was a most effective body of men. In 1862, a second regiment of volunteers was organized, commanded by Col. James H. Ford, and another was raised in the following year which was consolidated with the Second. This force was mounted and did some excellent fighting in Missouri in 1864.

In May, 1862, a change was made in the federal territorial officers, the new appointees being as follows: Governor, John Evans; Secretary, Samuel H. Elbert; U. S. Marshal, A. C. Hunt; Samuel E. Browne, succeeded Attorney General Dalliba, and John Pierce, soon afterwards became Surveyor General.

In September, 1862, another election was held for Delegate to Congress, which resulted in the re-election of Bennet. The vote stood as follows: H. P. Bennet, conservative, 3,655; Wm Gilpin, republican, 2,312; J. M. Francisco, democrat, 2,754.

From this time forward the record of the mines and mining districts will be given briefly; but extended details of the same, and of individual successes and reverses, will be found in succeeding chapters, devoted more especially to the mines.

Early in 1862 large numbers of miners from the failing gulches or refractory gold veins, sought new scenes and localities. Many went to the new diggings comprised in what is now Idaho and Montana territories. Columbus Nuckolls led a large expedition from Central and Denver, to the far away district

of Bannock, near the head waters of the south fork of the Columbia. This party endured great sufferings, and came near perishing from hostile Indians and want of food and water. The expedition was unsuccessful and but few of its members found their way back to Colorado.

The large quantities of Colorado gold that had been received at the east gradually created an interest among eastern men in regard to the mines of this region. The war had finally inaugurated a speculative era. Men became rich with a rapidity and ease they had never dreamed of, and this increased the fever of speculation. In 1863, eastern men began to invest in Colorado mines. About this time a number of brilliant operators had congregated about the New York Mining Stock Board. Some of them had the money and all had the nerve to carry forward undertakings of any magnitude. Their like was never seen before and is not likely to be witnessed again on the Atlantic sea board as far as mining operations are concerned. They had their brokers and they interested their moneyed friends. Wm. H. Russell and others put some really valuable pieces of property on the market. The bait was taken most readily. Warren Hussey and his associates then began to dispose of large numbers of mines. Everybody wanted some stock, or was crazy to possess a gold mine, and some properties were sold at the rate of a thousand dollars a foot. It was the age of greenbacks.

The year 1864, was the darkest of the rebellion and

gold ranged from two hundred to two-ninety. Many were afraid greenbacks would become worthless and were anxious to invest them in anything that gave evidence of greater permanency or of good profits. The mines of Colorado had in many cases been yielding enormously, and here seemed the golden opportunity for everyone to get rich. Our band of Wall Street operators, formed stock companies until nearly two hundred had been organized. Many excellent, as well as poor mines were sold. In a manner known to themselves, the operators gave to these stocks fictitious values, and then palmed them off upon an unsuspecting public on a fearfully inflated scale.

Capitalists of great cities of the east should not universally condemn Colorado mines or miners. They were swindled, in most cases, by their eastern operators, by the men who managed the companies, by their agents, or by sending fools to waste money in buying property where there were no mines, and in building worthless mills and reducing works from which no gold could be saved. Mining investments and mining operations must be conducted like those of any other business. As carried on by those eastern parties in 1863-5, they proved what most railroad investments do to the mass of stockholders—a losing venture in two cases out of three, if not nine out of ten. At last the bubble burst, the stocks in many cases became worthless, and the losers have considered Colorado a fraud ever since. And yet the same men may have lost many times as much in

other speculations, or in mercantile transactions, without condemning those lines of business as irredeemably worthless.

So many of those eastern investors seemed bent on squandering their money in the most useless manner possible, and in every way except in legitimate mining (in case their own company officers in New York did not swindle them), that they should certainly blame no one but themselves. In many cases, if they had kept their worthless relatives, or friends, at home, and had entrusted operations to competent miners, the results would have been large profits instead of heavy losses. There were a dozen bogus processes introduced in this country at one time and another, each entailing a loss of from ten thousand to two hundred thousand dollars on the men who "backed" the enterprises. And so the mining camps came to wear a discouraging appearance in the years 1865-6.

In the spring of 1864 a grand Indian war broke out upon the plains, and for a time communication was almost stopped between Colorado and the states. Coaches were captured, and the passengers killed and horribly mutilated. Other coaches were obliged to fight their way through or back from whence they came. It was the same with wagon trains, of which an immense number were engaged in conveying supplies and machinery to the mines for the newly organized companies. These were often abandoned on account of the risk and danger (and impossibility) of proceeding. Scattering farm houses and numerous

stage stations were burned by the Indians and the inmates slaughtered. Troops were ordered west to protect the routes of travel, and a regiment of twelve hundred men was raised in Colorado, commanded by Col. J. M. Chivington. This command attacked and nearly exterminated a band of some seven hundred Cheyennes, which had a salutary effect on that tribe and averted the death of many a white family. There is but one way to deal with unfriendly savages and the western man only fully appreciates that fact.

The Indian difficulties continued at intervals until the completion of the Kansas Pacific Railway, in 1870, although the building of the Union Pacific had a depressing effect upon their leading industry—the collection of scalps. Like the buffalo, the Indian cannot do otherwise than retire before the advance of the iron rail, the telegraphic wire and the general accompaniments of civilization.

Traveling across the plains, especially to members of the gentler sex, was anything but pleasant in the days of staging. Every one was obliged to carry arms, and was expected to fight to the death, knowing a worse fate awaited them in case of capture. Six days and nights were required to cross this seven hundred miles of plain and desert, with no stoppages, save at solitary stations for meals or changing horses. Escorts of soldiers were finally furnished the coaches when a half dozen or a dozen men were expected to do battle with many hundred Indians, with certain destruction before them in case of the death or disabling of the horses.

The first territorial legislature was elected August 19th, 1861, and assembled at Denver, September 9th, when Chief Justice B. F. Hall administered the oath of office. The records of some of these earlier legislatures were kept so badly that it is impossible to ascertain the entire list of those who were elected, but the names of all who appeared on the books, either on a vote or in any other manner, will be found here.

E. A. Arnold was chosen President of the Council, or upper House, and the Councilmen were as follows:

H. J. Graham, Amos Steck, C. W. Mather, H. F. Parker, A. N. Colby, S. M. Robbins, E. A. Arnold, J. M. Francisco, R. B. Willis.

The House included the following members:

C. F. Holly, Speaker; E. S. Wilhite, E. Scudder, W. A. Rankin, George M. Chilcott, J. B. Chaffee, J. H. Noteware, Daniel Witter, George F. Crocker, D. Steele, — Barcla, V. Garcia, — Hall.

O. A. Whittemore contested Hall's seat, and N. J. Bond, Witter's.

The territory was divided into nine counties with the same official positions that are held to-day. A list of the members of the various legislatures of Colorado, will be found at the close of this volume.

CHAPTER XI.

HISTORICAL AND COMMONPLACE NOTES.

Early Times on the Border—The Pioneers—A word about those who helped to make History—The early comers and first Officials—The era of good feeling—Disasters of Fire and Flood—Progress and Prosperity.

·Of those who came to Colorado in 1859 in search of gold, but few remain to-day. Their comrades are scattered from one end of the land to the other, and a majority have found their last resting place in that undiscovered country where gold hunting is unknown. These pioneers very naturally take especial pride in having formed the vanguard in the settlement of the Rocky Mountain region, and the title "Fifty-niner," is regarded by them as a most honorable one. Of those who arrived in 1860, a large number are still to be found in all parts of the state. They, as well as their predecessors, comprise a considerable proportion of the prominent and wealthy men of the state. To perpetuate the pleasant memories of the olden times—of those days of adventure, hardship, peril and good fortune—the "Society of Pioneers" has recently been organized in Denver, composed of men who came here in 1858-59 and '60.

A majority of those who were in Colorado in the earlier days, remained but a few weeks or months, or at most, one or two years. Some returned to their

homes, while others still continue their wanderings. Thousands drifted to the golden placers of Montana and Idaho. Others, who made fortunes in Colorado mines, or by sales of mining property in 1863-4-5, returned to the east to reside. Most of them lost all they had made, in subsequent mining or speculative operations, or in business at the east. Old residents who left us ten or fifteen years ago, have been returning, one after another, satisfied that Colorado is the best country in the world for rich or poor.

Of those who acquired fortunes suddenly in the earlier years, either by mining or selling mines, but few are wealthy to-day. Their money has slipped through their fingers almost as rapidly as it slipped into them. But few localities in the world have seen such sudden changes of fortune as this. A man may be poor to-day and rich to-morrow. It is the excitement and the hope of winning the smiles of the fickle goddess that gives a Coloradan almost unbounded confidence in his destiny. There is an abiding faith in the prospector and miner that the royal road to fortune lies open to every man if he will but find it.

The following list embraces most of the fifty-niners now in or near Gilpin county: E. W. Henderson, A. H. Owens, James D. Wood, L. C. Miley, L. M. Freas, B. O. Russell, D. G. Wilson, Wm. Z. Cozzens, Chase Withrow, O. T. Sparks, John W. Ratliff, Henry P. Cowenhoven, J. M. Wood, Thos. F. Hardesty, and C. C. Post. D. C. Collier and John Scudder, arrived in Denver in 1858.

Among those who came in 1860 are Bela S. Buell, J. M. Marshall, Frank Hall, the Briggs brothers, J. E. Scobey, L. W. Chase, Joseph Holman, Truman Whitcomb, Wm. M. Roworth, J. B. Chaffee, Eben. Smith, H. W. Lake, A. S. Bennett, John Gray, M. H. Root, Job V. Kimber, James Clark, J. Q. A. Rollins, Enos K. Baxter, A. J. Vanderen, Geo. Sparks, A. VanCamp, J. P. Waterman, H. M. Orahood, George Stegner, and others.

Goldrick publishes the following list of pioneers now residing at or near Denver.

Among the Fifty-eighters now with us, we note the following: J. H. Dudley, J. J. Riethmann and brother, E. A. Willoughby, Robert Hamilton, N. H. Rice, A. H. Barker, A. J. Williams, R. E. Whitsitt, D. C. Oakes, Capt. R. Sopris, Ed. W. Wynkoop, George C. Schleier, J. T. Younker, Jim Cochran, Dad Clark, and a few others who now escape memory.

Among the Fifty-niners now here and hereabouts we note as follows, for the special benefit, also, of the future historian: W. N. Byers, Amos Steck, J. L. Dailey, J. W. Donnellan, W. J. Curtice and brother, Chas. E. Semper, J. W. Iliff and brother, J. W. Wier, J. D. Anderson, A. Dibble, Wm. Wise, Geo. Aux, John Yeager, L. W. Bacon, Carl. Mann, W. T. Shortedge, M. Silverthorn, R. B. Bradford, J. McBroom, and brother, J. H. Geerish, E. W. Cobb, J. S. Maynard, S. Monk, J. Sanderson, W. W. Webster, James Henshal, W. W. Whipple, Dr. J. H. Morrison, L. W. Cutler, G. W. Drake, O. A. Whittemore, D. K. Wall,

M. M. Seavy, A. H. Miles and son, Dr. H. H. Hewitt, W. R. Ford and brother, Ed. McClintock, Jere Lewis, i. L. McCormick, H. M. Foster, Dave Conly, W. C. McClellan, D. M. Richards and brother, D. D. Shaw, Joe Payne, N. M. Nimrick, J. P. Sears, C. A. Cook, L. Barney, J. A. Nye, D. Tom Smith, W. F. Stone, S. M. Logan, Jno. Good, Wm. Cole, Jim Boutwell, S. J. Anthony, J. Crowley, H. J. Brendlinger, John Armor, W. H. Morgan, E. C. Sumner, Wm. Carson, D. O. Wilhelm, J. L. Baily, A. Jacobs, Wolf Londoner and brother, I. H. Batchelor, F. Z. Solomon, A. C. Hunt and brother, J. M. Broadwell, J. C. Spencer, A. M. Stanbury, A. D. Cooper, Wm. Lee, Chas. G. Chever and brother, G. W. Brown, A. M. Allen, E. J. Sanderlin, E. M. Hamilton, J. S. Wheeler, J. Milheim, O. J. Goldrick, J. A. Conners, H. P. Bennet, Daniel Witter, C. H. McLaughlin, Jere Kershaw, G. W. Clayton, C. Clements and son, H. Z. Solomon and perhaps a score of others. In the mountain towns and in southern Colorado, there are doubtless a few hundred more names to be added to the above list."

The lives of Colorado pioneers were often replete with wild and daring adventures, startling scenes and amusing incidents. Volumes of story and anecdote, could be written concerning them, but as this sketch relates more strictly to general history, the reader will pardon omission in a work of this kind.

In 1865, a daring but unsuccessful attempt was made in Black Hawk to rob John Sensitive, of a large number of gold retorts, worth many thousands

of dollars. The scheme was frustrated through the exertions and activity of Sheriff Cozzens and Marshal Robert A. Clark.

Of the business houses of Central in 1860, Nuckolls & Hawk took the lead. F. J. Marshall, now of Georgetown, and John Armor, and Mike Curran were also prominent merchants of Central and Missouri cities. Wm. M. Roworth established what was afterwards so generally known as the Central City Bakery. In Black Hawk, David Ettien, Warner & Scobey, and others, were doing a flourishing business.

The first regularly elected officers of Gilpin county were chosen in September, 1861. Columbus Nuckolls was county treasurer, and held the office nine years. For one third of that time he was also treasurer of the territory, and of Central City. Jesse L. Pritchard was sheriff and was succeeded by Wm. Z. Cozzens in 1863. B. S. Buell was county clerk and recorder. Although all of these offices were then very lucrative, that of recorder stood first in regard to profit. For nearly four years, from ten to fifteen clerks were employed, and during this time Buell's position was worth about \$20,000 per annum. This was owing to the vast amount of recording caused by numerous sales and discoveries of property, to the consolidation of the districts, etc.

Gilpin county may be termed the mother of most other mining districts, for it has aided very essentially in peopling and developing them. A large number of the miners and leading business men of other

localities were once residents of Central, Black Hawk or Nevada. This is especially noticeable in Georgetown and in Clear Creek county, in the silver and tellurium districts of Boulder, and in Park and the southwestern counties, where several thousand Gilpinites congregate here and there in greater or lesser numbers. It was a jolly crowd that went to make up the life, activity and controlling individuality of the mountain towns, five or ten years ago. "The boys" represented the leading element in those days, and a better, more generous, whole-souled or livelier crew never gathered together than that around Central. Money was plenty and "times were good." Old and young (all were young in feeling in the early days), made the most of the situation. Of the scores who helped to make life pleasant or endurable in the first decade of our history, one-half have crossed the dark river. Of the remainder, some broken in fortune, and others on the high wave of prosperity, are fighting life's battle, amid other scenes and localities.

The most productive gulch in the territory was California, in Lake county, which for several summers succeeding 1860, gave employment to four or five thousand men, with a yield of nearly one million dollars per season. For the past twelve years this locality has been worked, but the best deposits were obtained in 1860-64. The Oro Ditch Company, now fairly ready for work, will operate very extensively in that section for years to come.

In September, 1861, the town of Nevadaville was

almost entirely destroyed by fire. Denver was also visited with a severe conflagration in 1863. On the 21st day of May, 1864, a terrible flood came down Cherry creek, carrying everything before it. The bed of the creek was usually free from water, and many buildings had been erected therein, or along the banks. These were all carried away, together with a safe containing many of the records or titles of town property. The *News* office went down the stream with the rest, and its contents were never heard of afterwards. Very heavy rains on the "divide" and in the hills above the city caused this sudden rise of the creek, which, without previous warning, came down in the dead hour of night with a wall of water from fifteen to twenty feet in height. People had barely time to escape from their buildings, and all were not even thus fortunate. From this time, a wide berth was usually given to Cherry creek by builders. A second and less severe flood occurred in 1876, when but little damage resulted.

The first officers of Pueblo county, under the territorial government established in 1861, were as follows: Sheriff, John B. Rice; clerk, S. Smith; probate judge, W. Chapman; Among the settlers at that time were O. P. H. Baxter, Geo. A. Hinsdale, John W. Shaw, Col. J. M. Francisco and Mark. G. Bradford. John A. Thatcher, now one of the wealthiest men of that section, drove in a yoke of oxen pulling a small wagon load of goods, with which he stocked a store.

The following graphic account of life in those days is taken from W. F Stone's history of Pueblo county:

"In a large log building which served as the hotel, with its great comfortable fire place and its sufficient force of sleek, well-fed bed bugs, we used to have our first dances. Ah! in those halcyon days we didn't fool round and fall down over two yards of draggling silk trail, but we came down to genuine flat-footed dancing. And such fiddling! Perched on a candle box in the corner, the fiddler made no pretensions to a knowledge of Strauss or Ole Bull or any of those foreign chaps, but he just straightened back, shut his eyes, called so he could be heard to the St. Charles, and made the cat-gut howl. And the names of the tunes were such as you could understand if you wanted to call out your favorite, such as the Arkansaw Traveler, Five Miles from Town, The Devil's Dream, and Soapsuds Over the Fence.

Society was rather crude up to this period. The cheerful hum of the bullet and the soothing slash of the bowie knife had occasionally enlivened the community. Bercaw had committed three cold blooded murders; Charley Dodge, the very prince of the chivalry of desperado gamblers, had assassinated his partner in crime; and several lynchings had ornamented the limbs of cottonwood trees in the vicinity.

The first post office was kept by Simms, and then by D. J. Hayden, in a store opened in 1863 in the old adobe building now used by Mr. Jenner. Postmasters didn't put on the style in those days that Billy Ingersoll now assumes back of the pigeon holes where no one can get at him to hit him. The mail bag was

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emptied on the floor and the crowd told to pitch in 'them that could read,' and pick out what belonged to them. What was left after this promiscuous sorting was put in an empty candle box and when people came to the post office, they were told to go and look for themselves and not be bothering the postmaster."

The town grew slowly, and it was not until 1868 that the first church, St. Peter's Episcopal, was erected. Says the same author, "Its bell was the first church bell south of Denver, and when its tones sounded over the village, it brought to many a heart the tender memories of a childhood's home, long buried by years of life on the Sabbathless border."

As years passed on Denver and Central became flourishing cities, with an air of permanence about them not known in their younger days. Elegant school and church buildings were erected, some costing from twenty to thirty thousand dollars; banking houses increased in number and wealth; handsome blocks and attractive private residences were becoming numerous; libraries and societies were instituted; and the advent of the railroad brought a general improvement in hotels, newspapers, &c., and a reduction of prices of labor and in the cost of living and conducting business. The most destructive conflagration ever experienced in Colorado occurred at Central, May 21, 1874. The business portion of the city, principally built of wood, was almost entirely destroyed by fire in less than three hours, and the total loss of property was estimated at \$750,000. The work

of rebuilding commenced immediately, and handsome, and substantial blocks of brick and stone, as solid and enduring as the hills that overshadow them, attest to the enterprise of the people of this mountain city, and to the permanence and lasting character of her mines.

After the silver mines of Clear Creek and Summit counties had been operated several years, and developed very slightly, other silver districts began to be opened. That of Caribou attracted general attention and a large number of people in the summer of 1870, and the Park county mines of the Mosquito range became famous one year later. Subsequently the silver mines of Rosita, Geneva, Hall's Valley, the San Juan country and lastly of the Rabbit Ear range, were discovered and have been extensively developed.

The total yield of Colorado's gold and silver mines from their discovery in 1859 to the present time, a period of seventeen years has been estimated at from \$60,000,000 to \$70,000,000. Hollister gives the U. S. mint returns up to June 30, 1866. The bullion that had been deposited there was almost entirely gold, and footed up \$12,401,374, which good authorities state was less than one-half the actual yield of the territory. After the silver mines were fairly opened the bullion exports largely increased, averaging in later years from five to seven millions of dollars, or double what they did in the previous decade.

CHAPTER XII.

POLITICAL AND GENERAL HISTORY.

The fight for Statehood—1864-7—Election of State Officers—Andy Johnson's Veto—The advent of the Railroads—Beneficial effect thereof—Subsequent Prosperity and rapid advancement—Passage of the Enabling Act of 1875—Adoption of a Constitution—State Election.

In 1863, the politicians again began to agitate the state-question. A convention assembled at Denver, July 11, 1864, and within ten days brought forth a constitution for the proposed commonwealth. Among the members of this body were W. N. Byers, Geo. T. Clark, J. H. Gest, Henry M. Teller, R. Sopris, C. M. Tyler, Chase Withrow, and O. A. Whittemore, who was chosen president. Congress had previously passed an enabling act for the admission of the state. At an election held subsequently, the constitution was rejected, and at the same time A. A. Bradford was elected delegate to congress. The vote stood as follows: For the constitution, 4,219, against, 5,006; For member of congress, in case the constitution was adopted, John M. Chivington, 3,652, A. A. Bradford, 479; for delegate to congress, A. A. Bradford, 4,625; John M. Chivington, 2,850. Another convention framed a constitution at Denver in 1865, which was adopted on the twelfth day of August, of that year, by the following vote: For the constitution, 3,025,

against, 2,870. The question of negro suffrage was submitted with the following result: for, 476, against, 4,192.

A state legislature was elected November 14, 1865. During the previous year, Henry M. Teller and ex-Governor John Evans, although not elected, had been the proposed candidates for the two seats in the United States senate to which the coming state would be entitled. This legislature however elected Evans and Jerome B. Chaffee. A full complement of state officers was also chosen by popular vote. Colorado's first territorial governor, Wm. Gilpin, a republican, was elected governor; G. A. Hidsdale, democrat, lieutenant governor; J. H. Gest, secretary of state; and Geo. M. Chilcott, republican, congressman. Gilpin received 3,123 votes for governor; Craig, 2,599; and Scudder 1,835. For congressman, Chilcott had 3,104 votes; D. D. Belden, democrat, 2,119; and James M. Cavanaugh, democrat, 1,696.

A constitution had thus been adopted, and senators and state officers chosen, without again applying for an enabling act, it being taken for granted that one could be readily obtained. That congress however refused to take favorable action thereon. Some time after, however, congress in order to secure reinforcements in its great contest with President Johnson, passed an enabling act which the President vetoed. The struggle for statehood ended for years to come in the winter of 1867-8, when it was found impossible to pass the bill over the veto; and so none of the

above named gentlemen came to fill the positions to which they aspired.

In 1864, A. W. Atkins become territorial treasurer, succeeding Geo. T. Clark; and R. E. Whitsett, auditor. In 1865, Alexander Cummings succeeded John Evans as governor, and A. C. Hunt was United States marshal; the justices of the supreme court were Stephen S. Harding, C. S. Armour, and A. A. Bradford. Frank Hall succeeded S. H. Elbert as secretary of the territory in 1866, and George W. Chamberlain became attorney general. U. B. Halloway was marshal, and G. W. Lane assistant treasurer and superintendent of the United States mint. The justices of the supreme court were Moses Hallett, G. W. Gorsline and Eyster. Columbus Nickolls was territorial treasurer, and D. J. Martin deputy or acting treasurer. A. C. Hunt became governor early in 1867.

At the congressional election of 1866, Geo. M. Chilcott, of Pueblo, was elected delegate to represent the territory at Washington. The vote stood:

Geo. M. Chilcott, (republican,) - - - -	8,529
A. C. Hunt, (independent,) - - - -	8,421
Scattering, - - - - -	46
	<hr/>
Total, - - - - -	16,996

In the month of September, 1868, Allen A. Bradford was elected to congress, by the following vote:

A. A. Bradford, - - - - -	4,092
D. D. Belden, - - - - -	4,075
	<hr/>
Bradford's majority, - - - - -	17

Congressional election of 1870 :

Jerome B. Chaffee, republican,	- - -	6,450
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George W. Miller, democrat,	- - - -	5,058
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Chaffee's majority,	- - - - -	1,392
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Congressional election of 1872 :

Jerome B. Chaffee, (republican,)	- - -	7,596
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A. Cameron Hunt, (liberal,)	- - - -	6,260
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Chaffee's majority,	- - - - -	1,336
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At the commencement of President Grant's first administration in 1869, Gen. Edward McCook was appointed governor of Colorado in place of Hunt, while secretary Frank Hall was re-appointed. Marc M. Shaffenburg had become U. S. marshal. In 1873, Samuel H. Elbert succeeded McCook as governor. McCook, after being removed, went east, and in January, 1874, secured his own appointment in lieu of Elbert. Grant's action in this matter and his subsequent removal of Frank Hall, for J. W. Jenkins; of postmaster H. P. Bennet, for Cheever; and other officials caused severe criticism and much bitter feeling on the part of those who had so long led the republican party in Colorado. Here arose "the war of the factions." One of these comprised those who had held or controlled the federal and political appointments of the country, and included the moneyed power, and a majority of the voters of the party; the other those who supported the President's appointees. With the former were delegate Chaffee, who was mak-

ing a desperate fight at Washington to prevent the confirmation of the new appointees, by the senate. He was backed by Evans, Elbert, Moffat, Bennet, Steck, the *Denver News* and *Times*, and most of the press of the territory. With the McCook wing of the party were Henry M. Teller, J. B. Belford, H. P. Bromwell, the *Tribune*, and many others. The new appointees were classed as "carpet-baggers," and that cry proved an effectual one in the ensuing campaign. J. W. Jenkins become secretary and acting governor, and Champion Vaughn succeeded W. R. Thomas as adjutant general; Geo. C. Corning was appointed treasurer to succeed Moffat, September 10, 1874. The republicans held their territorial convention at Denver about the first of August, 1874, and nominated H. P. H. Bromwell for delegate to congress. This convention was controlled by the McCook or newer element. The democrats nominated Thomas M. Patterson of Denver. The campaign was a sharp and exciting one. The "old time," or Chaffee and Elbert men, having failed to defeat their apponents in Washington, devoted their attention to defeating them at home. How well they succeeded, is shown by the returns of the election of September 8, 1874. Instead of the usual republican majority of thirteen or fourteen hundred, Patterson, the democratic nominee, received a majority over Bromwell of 2,163.

The vote stood as follows :

Thomas M. Patterson, (democrat,) - - -	9,333
H. P. H. Bromwell, (republican,) - - -	7,170
Scattering, - - - - - - - - - - -	49
	<hr/>
Total, - - - - - - - - - - -	16,552

The discontent caused by the new Federal appointments, and the long and bitter feud that ensued, rendered the people more decided in their desire for a state government with rulers of their own choosing. Consequently another state movement was inaugurated. The war of the factions was quieted by the appointment of a new set of government officials, who came from neither wing of the republican party of Colorado, but were taken from the states direct. This had a tendency to re-unite the party and to still the fierce war of words with which the public press had been teeming.

The new appointees made in 1875, were, John L. Routt, goveanor; John Taffe, secretary; A. W. Stone and A. W. Brazee, justices of the supreme court; — Bradley, vice Alleman, United States attorney; and C. C. Tonmkins, United States marshal.

As time passed on, the wonderful mineral resources of Colorado became better known and understood. Her stock-growing and agricultural capacities were also becoming fairly tested. This induced a more permanent settlement of the region in place of the transient population that had been known heretofore. The advent of the railroads in 1870, was the grand

move that gave an impetus to the progress, development and advancement of the territory. Such rapid growth followed as had never before been experienced. Communication with the east and west became rapid, easy and cheap. Immigration set in at the rate of from twenty to thirty thousand annually. The climatic advantages and attractive nature of this new land of the west, became more fully known, and the invalid and pleasure seeker began to visit Colorado by thousands. Many of these eventually became permanent residents. From almost no increase at all in preceding years, the population had grown from 39,700 in 1870 to 135,000 in 1876.

There has been an equal advance in the founding and growth of towns, in mining, farming and stock raising, in the newspaper press, and in railways. In 1870, there were but four daily newspapers in Colorado, viz: the *News* and the *Tribune* of Denver, and the *Register* and the *Herald* at Central; there were only five weekly papers published in the territory at the same time; now the number of Denver dailies has doubled, and there are six daily and thirty weekly issues in Colorado. There were then no towns of any considerable size outside of Denver and Central. Now there are a score of lively towns and cities, several of which number as many inhabitants as Denver itself possessed in 1870. Railroads both local and foreign began to be extended north, south, east and west, and to nearly all settled parts of the territory. Beautiful towns and cities grew as if by magic, on

every hand, and the mines, farms, and stock ranches were more generally profitable than those of any other section of the country.

Under these circumstances it was not strange that a general sentiment began to make itself manifest in favor of a state government. In the congress of '74-5, Jerome B. Chaffee, Colorado's delegate in congress, secured the introduction of an enabling act, and after a hard fight it passed both houses. It was so amended however, as to postpone the date of admission, in case a constitution was framed and adopted, to July 4, 1876; hence the title "Centennial State," from its admission on the nation's centennial.

The convention called to frame a constitution was in session during the greater portion of the winter of 1875-6, and the instrument was adopted July 1, 1876, by the following popular vote: In favor of constitution, 15,430; against, 4,053. Arapahoe county polled 5,591 votes at this election. The constitutional convention comprised the following members:

J. C. Wilson, president; H. P. H. Bromwell, Casimira Barela, George Boyles, W. E. Beck, B. L. Carr, Wm. H. Cushman, W. M. Clark, A. D. Cooper, H. R. Crosby, Robert Douglas, L. C. Ellsworth, C. P. Elder, F. J. Ebert, W. B. Felton, J. M. Garcia, Daniel Hurd, John S. Hough, Lafayette Head, Wm. H. James, Wm. R. Kennedy, Wm. L. Lee, Alvin Marsh, Wm. H. Meyer, S. J. Plumb, Geo. E. Pease, Robert A. Quillian, Lewis C. Rockwell, Wilber F. Stone, W. C. Stover, H. C. Thatcher, Agapeta Vigil, W. W.

Webster, G. G. White, E. T. Wells, P. P. Wilcox, J. S. Wheeler, J. W. Widderfield, A. K. Yount, W. W. Coulson, secretary.

The republican state convention was held at Pueblo, August 23, and nominated the following ticket:

For member of forty-fourth and forty-fifth congresses, James B. Belford; for governor, John L. Routt; lieutenant governor, Lafayette Head; secretary of state, Wm. M. Clark; auditor, D. C. Crawford; treasurer, Geo. C. Corning; for attorney general, Archibald J. Sampson; for superintendent of public instruction, Joseph C. Shattuck; for judges of the supreme court, Ebenezer T. Wells, Henry C. Thacher, Samuel H. Elbert.

The democratic convention, held at Manitou, August 29, nominated as follows:

For member of 44th and 45th congress, Thomas M. Patterson; for governor, Bela M. Hughes; for lieutenant governor, Michael Beshoar; for secretary of state, James T. Smith; for auditor of state, James F. Benedict; for state treasurer, Thomas M. Field; for attorney general, George Q. Richmond; for superintendent of public instruction, John B. Groesbeck; for judges of the supreme court, Wilber F. Stone, Ellsworth Wakley, George W. Miller.

This was the most hotly contested of Colorado campaigns, and resulted in the success of the republican ticket by majorities (estimated) of from five to twelve hundred. The election occurred October third, and the total vote polled approaches 30,000.

CHAPTER XIII.

THE RAILWAY AND THE PRINTING PRESS.

Staging in the Far West—Its Perils and Hardships—Approach of the Pacific Railway—Building of the Denver Pacific and Colorado Central—The Denver and Rio Grande and other roads—Their beneficial effect—The Atchison, Topeka & Santa Fe—The great Southwestern Highway—The first Newspapers and their history—Rapid growth of Journalism—Colonics—San Juan—Tellurium Land.

FOR a long period of time the stage driver and freighter have been steadily receding from an immense scope of country, in which they were once indispensable. Year after year they have been called to "move on" before the ever encroaching ends of the railways, and the sharp competition of lower prices. Yet the same lips that welcome the approach of the steam motor, utter a heart-felt good-bye and God speed to the friends of other days. But although crowded from their former haunts, they are still the autocrats of travel over an empire of park and mountain, as matchless for grandeur and beauty as it is boundless in extent. Here the tourist or pleasure seeker can still be treated to an exhilarating drive from cañon to mountain top, or be whirled at break-neck speed around the brink of yawning chasms until the brain grows dizzy, and tired nature weary of the occupation. No showers of Indian bullets greet the driver and his load of human freight as before the

days of Pullman sleepers and fashionable watering places, but there is enough of excitement in one of these mountain drives to satisfy the average traveler. And, while we turn to note the advance of the railway and telegraph, let all honor be accorded the gallant knights of the ribbons, who have conducted themselves with equal credit whether in scenes of peril and danger, or in the routine every-day duties of life on the road.

The Union Pacific railroad reached Cheyenne, just beyond Colorado's northern boundary, late in 1867; and Denver was within one hundred and five miles of an eastern outlet by rail. Steps had been taken by ex-governor John Evans and other Denverites to construct a road from the Capital northward to the Union Pacific, and the Denver Pacific Railway Company was organized. Arapahoe county aided the enterprise by voting bonds to the amount of \$500,000. The Kansas Pacific was constructed through the state of Kansas to Sheridan, in 1867-8, when work was temporarily suspended to await further subsidies from congress. Some time after, track laying began on the Denver Pacific, and amid general rejoicing the locomotive gave its first shrill notes of welcome to the men of the border in July, 1870.

In the meantime the Kansas Pacific had been making rapid strides westward, and on the completion of the Denver Pacific, began to build eastward from Denver, as well as west from its temporary terminus. The road was finished on the fifteenth day of August,

1870, by the laying of fourteen miles of track in a single day. This is the greatest achievement in railroad building the world can boast of. Eight miles were laid from the eastern end and six from the western, the point of union being some eighty miles east of Denver. The road is 640 miles in length.

For several years a scheme had been projected and a company chartered to construct a railroad up Clear Creek cañon to the mining districts of Central and Georgetown, and thence on to Utah. H. M. Teller, and W. A. H. Loveland, were the leading spirit of this enterprise. By untiring exertions and a liberal expenditure of their own money, they, in connection with eastern capitalists, secured the construction of seventeen miles of track in 1870, making connection between Golden and Denver, and the eastern roads. And now came the most difficult and expensive portion of the undertaking. Not only was their treasury nearly empty, but opposition was experienced from a competing company. The remainder of the route extended through the mountains, up the rugged, narrow cañon of Clear Creek, where sharp curves and steep grades are of constant occurrence. A rise of over 2,100 feet is experienced in a distance of twenty-one miles, between Golden and Black Hawk. In many places a way could be found only by blasting it through the solid and overhanging walls of granite. In other localities, the roadway must be built in, or beside, the bed of the torrent, whose dashings through countless ages had worn itself a channel deep down

in the heart of the mountains. To capital and competent engineers this was practicable, but without the former the building of such a road, whose pecuniary merits were yet to be tested, seemed a very doubtful



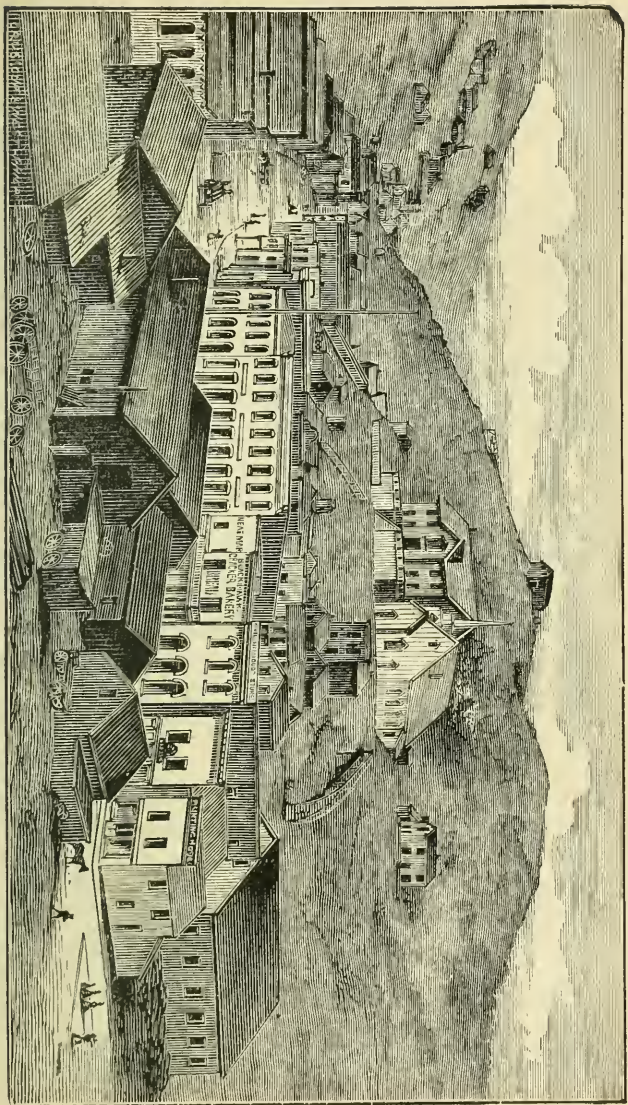
COLORADO CENTRAL RAILROAD—CLEAR CREEK CANON.

undertaking. Energy and pluck finally triumphed, however, and the construction force and track layers steadily pushed their work forward until the wild

cañons of the "Rockies" echoed with the scream of the locomotive, and the "iron horse" steamed grandly into the mountain-walled city of Black Hawk. This was early in 1873. Subsequently another line of road was constructed from the forks of north and south Clear Creeks toward Georgetown, which point it will doubtless reach within another year. Another division of the road was constructed from a point east of Golden, northward through the coal lands along the eastern base of the mountains, to Boulder and Longmont. The counties of Jefferson, Boulder, and Gilpin, voted altogether \$450,000 in bonds in aid of the enterprise. The mountain division of the road is a marvel of engineering skill and a monument of western enterprise. Its benefit to the mining towns can hardly be estimated.

In 1871, the Denver, Rio Grande and El Paso railway was built south from Denver, a distance of seventy-six miles, and a town laid out at the southern terminus, called Colorado Springs. This place is now one of the most beautiful and flourishing cities in Colorado, and with its neighbor Manitou, forms the most fashionable and attractive watering place west of the Atlantic seaboard. General Palmer was at the head of this road. Like the mountain division of the Colorado Central, it is of the narrow gauge of three feet. Its ultimate destination south, is the city of Mexico, and its three southern branches are already completed respectively to Trinidad, near the New Mexican border, to LaVeta, and to Cañon City.

BLACK HAWK.



One line will strike southward through New Mexico, and the other west across San Luis Park, into the San Juan mountains.

The South Park road, organized by ex-governor Evans and others, was built from Denver to Morrison, (just beyond the base of the mountains), in 1874, and is now being pushed forward up the Platte cañon towards South Park, and the San Juan country. The Boulder Valley, extending from Denver through the coal fields to Boulder, and the branch road from Carson to Las Animas, are dependencies of the Kansas Pacific.

While the Pacific roads were advancing westward by means of heavy government subsidies, an organization of solid and substantial capitalists began to build a new road, whose objective point is Santa Fe, New Mexico. But its projectors desired not alone to secure the extensive and remunerative traffic of the southwest; southern Kansas, the fertile valley of the Arkansas, extending west to the mountains, and better still Colorado, were leading inducements for the undertaking.

The organization took the name of the Atchison, Topeka and Santa Fe Railway Company. Quietly, but steadily, the road was constructed westward and up the valley of the Arkansas until it reached the great stock growing country on the borders of Kansas and Colorado. New towns sprung up and became great shipping points for cattle and sheep. In one season over one hundred thousand buffalo were slaugh-

tered and their hides shipped east from Fort Dodge station. The road was next built as far west as Fort Lyon, near which the town of West Las Animas was founded. This became the point of shipment for the cattle men as well as for the New Mexico trade, and for a time was one of the liveliest and wildest of border towns. Then the railway company extended their road to Pueblo, the metropolis of southern Colorado, this portion of the line being known as the Arkansas Valley railway. Here connection is made with the Denver and Rio Grande, running north, south and west. The completion of the Atchison, Topeka and Santa Fe road to Pueblo, made that city a railroad center, and gave to Colorado a new and competing line and outlet to the east. This was sadly needed after the union of interests on the part of the Kansas and Union Pacific companies. Untold benefits have been secured for southern Colorado and the wonderful gold and silver mining region of the San Juan country. Direct rail communication is now afforded to a vast scope of country, and the shrill neigh of the iron horse will soon be heard in the streets of Del Norte, and the cañons of the San Juan mountains. This company have constructed over six hundred miles of railway, (unequalled in the far west), over the most feasible and attractive route to Colorado. Pullman cars, and every convenience and luxury known to first-class roads, are supplied. This line of railway is proving of vast benefit to the state, and more especially to the sections which it intersects. Southern and

central Colorado and New Mexico, will give it an annually increasing business until it assumes immense proportions.

The press was liberally patronized by the cities of the mountains and plains. The *Journal* was established at Black Hawk, in 1861, and D. C. Collier and others started the *Miners' Register*, at Central, in the spring of 1862. Frank Hall, who with O. J. Hollister had been publishing the *Journal*, bought into the *Register* in 1865. The *Journal* was sold and moved to Central near the close of 1866, and was then known as the *Times*. From that time it was democratic in politics. One year later when T. J. Campbell became its owner, the name was changed to *Colorado Herald*. Three years after Frank Fossett became proprietor and remained so until the publication was discontinued late in the summer of 1873. Just before this time, Collier retired from the *Register*, and Hall & Whipple, were the publishers up to the time of Mr. Whipple's retirement in 1876. George Collier conducted the *Black Hawk Journal*, during portions of 1872-3. All of these papers had both daily and weekly editions.

Of the older Denver papers the *News*, for a long time was owned by W. N. Byers and John L. Dailey, and by the former alone, during the past six years. Its first number was issued April 27, 1859. The *News* absorbed the daily *Commonwealth* after the Cherry creek flood of 1864. L. M. Koons founded the daily *Tribune*, in 1867, and R. W. Woodbury and John Walker

soon after became part owners and afterwards, full owners of the establishment. Woodbury at length became sole owner, succeeded by the Tribune Association, and it by Henry C. Brown. Herman Beckurts purchased from the latter in 1875. The *Farmer* represents the agricultural, and the *Mining Review* the mining interests. They have done good service since their establishment over three years ago.

Fred. J. Stanton, published the Denver daily *Gazette*, from 1864 to late in 1868. O. J. Goldrick established the Rocky Mountain *Herald*, early in the latter year. R. W. Woodbury founded the Denver daily *Times*, in 1871, and Stanley G. Fowler, the *Mirror*, in 1873. Several daily publications have been started at Denver during the past few years, such as the *Democrat*, *Sentinel*, *Transcript*, etc.

The Pueblo *Chieftain*, made its first appearance as a weekly in 1867. George West, started the Golden *Transcript*, in December 1866, and the Georgetown *Miner*, dates back to 1867. These, and the Boulder *News*, embrace all of the older publications of the country, excepting several transient, or short lived affairs that have not been noticed here. The thirty-five or more daily and weekly publications of the present time are scattered among twenty-four towns and cities, and many of them are very creditable journals. The Denver press excels in many ways that of any other city, large or small, between St. Louis and San Francisco, and of any place of equal size in the world.

Several colonies were established in Colorado during the years 1869-70-71. Some of them proved successful and permanent enterprises, and others were failures. Of the latter class the German settlement in Wet Mountain Valley, was an instance, and Greeley, Longmont, Evans and Colorado Springs, were the successful ventures. Greeley, located in Weld county, was founded in May 1870, and now embraces 2,000 people. Longmont and Evans, although smaller, have had a healthy growth. Colorado Springs, dates from 1871, and is now one of the largest, most beautiful and prosperous cities of the state, outside of Denver.

One of the most important events in Colorado's history was the discovery and development of the great San Juan mineral belt and the settlement of that section. This has occurred during the past four years, and has drawn heavily on the population of the older counties of the state. Recently more than half of the immigration to Colorado has drifted into that highly favored region.

The Tellurium mines of Boulder county have also created no little interest in that county of infinite resources. These date from 1873, and during the past two years have yielded heavily and caused the settlement of numerous towns and mining camps.

The historical portion of the book ends with this chapter. The author does not claim this to be a complete and comprehensive history, but rather a rambling narrative of events down to the time Colorado donned the garments of statehood. That it may prove

accurate in every particular, is our sincere wish. Historical notes of mines and districts will be found in the mining chapters, while the result of the recent State election and other political and miscellaneous facts and figures will be embodied in the closing chapter of this volume.

CHAPTER XIV.

THE LAND OF SILVER AND GOLD.

Its Advantages, Attractions and Resources—A Haven for the Invalid—For the Tourist, Recreation and Pleasure—For the Industrious, a Home—The Mineral Belt of Colorado—Its Extent, Character, and Formation.

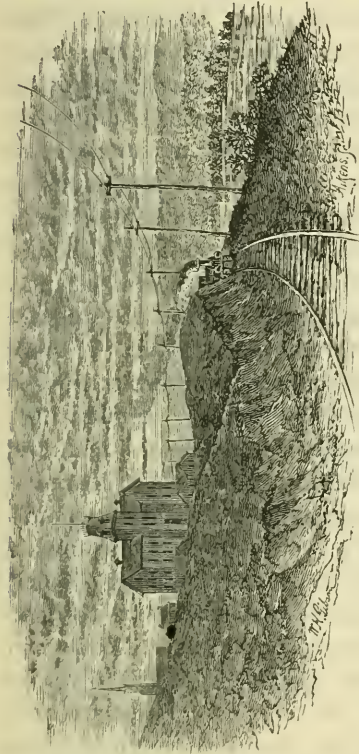
COLORADO enters the Union with prospects that any Commonwealth might envy. No other state or territory can compare with her in extent of mineral bearing lands, or in number and variety of minerals. Her deposits of gold, silver and coal, although but slightly developed, undoubtedly exceed those of any portion of the west. Besides these, her deposits of iron, lead, copper, salt, lime, gypsum, fire-clay, etc., will yet add largely to the common revenue.

The agricultural and stock growing resources are of the first order. A ready cash market in the adjacent mines, added to a most bountiful increase and production, has rendered these avocations unusually remunerative. Colorado's climatic advantages and scenic attractions are unrivaled, and have given her a world-wide reputation. Here the invalid finds relief, while the sight-seer is amply rewarded for the distance traveled. No climate on earth possesses such invigorating health renewing properties, nor can any land claim such wealth of mountain scenery. The sportsman finds his fondest dreams realized among our

beautiful parks and mountains, and wishes for no better hunting ground.

In addition to these great natural advantages, Colorado has a population unsurpassed for intelligence, enterprise, thrift and energy; and this population is now of a settled and permanent character. Her educational and religious facilities are of the highest order, and no where are churches and schools endowed with equal liberality. The finest or most prominent building in a Colorado town is usually that devoted to the public school, while church edifices are always neat and attractive, and often costly and elegant. The public school system of Colorado, is based on the very best known at the east, and the greatest interest is taken in the education of the rising generation. Besides this, are the state and other universities, and a number of private seminaries, academies and convents. No state ever entered the Union with a people possessing an equal degree of culture, refinement and wealth. Her mines are yielding millions annually, although mining is still in its infancy here. The farmer and stock man are blessed with plenty and a rapid increase of flocks and herds, of property and property valuation. Old mines are being steadily opened and new ones discovered; beautiful towns are starting up on every hand, and the older cities are enjoying an unusual degree of prosperity. More miles of railway are said to have been constructed in Colorado during the past year than in any state in the Union—and this for a community

under a territorial government, and removed hundreds of miles from densely populated regions.



The countless mines of this vast mountain region and the unoccupied lands capable of being used for pastoral and farming purposes, afford room and opportunities for the profitable investment of tens of millions of dollars, and of the employment of countless thousands of laborers at remunerative wages. Railroads now enter or closely approach many of the rich mining districts, affording easy, speedy and cheap communication.

No community of the older states is more orderly or law abiding than that of Colorado. During the past fifteen years there has been less crime and fewer deliberate murders than in most eastern districts of an equal population. This speaks well for a newly settled mining country, whose people are drawn from all parts of the world.

So much for this land of silver and gold, of plenty and prosperity; a region flatteringly spoken of by visitors as "The Switzerland of America," "The World's Sanitarium," and the "Sportsman's Paradise."

As has before been stated the eastern portion of Colorado is occupied by the great plains, admirably adapted for pastoral purposes and at intervals to husbandry. The eastern base of the mountains is flanked by the coal beds. These crop out at frequent intervals in the upturned strata of the foot hills, and extend out on to the plains for an unknown distance. With them are associated beds of iron ore and fire clay. The coal of Colorado is a lignite of very superior quality. The mountain regions are composed of foot-hills, parks and lofty ranges. Innumerable cañons and sharp and deeply cut ravines are met with in every direction. Streams, many and beautiful, descend from the snow-capped summits of the mountain tops which supply power for mills and manufactories, and water for the farms and irrigating ditches.

The mountain ranges are traversed from north to south by the mineral belts, or system of lodes, in which occur the precious metals, gold and silver, in combination with lead and copper. These are only partially explored and are found to be broken at intervals by unproductive regions. The great mineral belt extends through Boulder, Gilpin, Clear Creek, Park and Summit counties. Broken by a slight interval it appears in the southwest in the counties of San Juan, Lake, Hinsdale, La Plata, etc. In the northern

counties, as far as discovered, it has a width of from five to ten miles, and rarely twenty, and is not far from one hundred and twenty miles in length. Geological reports show the veins to be usually enclosed in granitic and gneissic or schistose rocks of metamorphic character. They present the characteristics of true fissure veins, and very many of them are rich in gold, silver, copper and lead.

Colorado's wealth and population has trebled since the advent of the railways in 1870. Her population is now upwards of 130,000, and the valuation of real estate and personal property, exclusive of mines, is not far from \$75,000,000. She paid an internal revenue tax in 1875, of \$70,531.82, or nearly as much as the states of Nevada and Vermont combined. While yet a territory seven lines of railways, embracing one thousand miles of road, had been built within her borders.

The following table will show the growth of towns and cities; the census returns of 1870 being compared with careful estimates for the present year:

	1870	1876
Denver,	4,759	21,000
Central, Black Hawk and Nevadaville, . . .	4,401	5,500
Pueblo,	666	5,500
Georgetown,	802	4,500
Boulder,	343	3,000
Colorado Springs,	None	3,000
Greeley,	480	2,000
Golden,	587	2,000
Del Norte,	None	2,000
Trinidad,	562	2,000
Lake City,	None	1,500
Rosita,	None	1,400
Canyon City,	229	1,200
Las Animas,	None	1,000
Spanish Peaks,	None	1,000

Beside these, Fairplay, Alma, Longmont, Evans, Silver Plume, Idaho Springs Sunshine and Caribou, some of them new towns, have from five hundred to eight hundred inhabitants each.

Colorado's production of gold and silver for the past four years, computed at currency values, was as follows: 1872, \$3,792,220; 1873, \$4,070,000; 1874, \$5,362,000; 1875, \$6,299,000. There was an equal increase in the production of stock and of farm products.

The gold belt extends from the northern part of Boulder county south through Gilpin and into Clear Creek. It is again manifest in the placers and a few gold veins of Park, Summit and Lake. Still further south it crops out in the Sangre de Christo mountains east of San Luis park, and in the Summit mountains some distance southwest of that great natural basin.

The telluride belt extends for a distance of nearly twenty miles in length, and about five miles in width, through a portion of Boulder county. This mineral is claimed to be found in the Hotchkiss and other mines in Hinsdale county in southern Colorado.

The silver belt is much more extensive and continuous than either of the others. It usually lies nearer the main range, and often directly upon it, crossing and recrossing it in many localities. The most northern of the valuable veins are found in Boulder county, and from that section south to New Mexico silver is profitably mined in every mountain county. The most prominent districts so far developed beginning



at the north are those of Boulder, Clear Creek, Park, Summit, Hinsdale, San Juan and La Plata counties. More silver veins have already been discovered in Colorado than in the entire west beside. When development is fairly under way their total yield will be tenfold what it is at present. The gold veins are also exceedingly rich and numerous, and show a handsome annual increase in their production. Mining operations are yet in their infancy, but are rapidly attracting attention and capital, which augers well for the future of Colorado.

In this Rocky Mountain mineral belt there are a great number of what are known as true fissure veins, besides numberless spurs, feeders or offshoots from the main lodes. What is called a "fissure vein" is a body of gold or silver bearing quartz, inclosed in a perpendicular crevice between the granite walls of the country—as if the quartz had forced its way from the interior of the earth, splitting the granite in rising toward the surface. Different veins vary in "pitch" or direction from the perpendicular to thirty or more feet in a hundred. A few are nearly flat, and those of the Mount Lincoln district, in Park county, are in the form of deposits, some of them egg-shaped and others flat or irregular. The coal deposits of Colorado usually have flat veins.

In gold and silver mines, barren or worthless ground or rock of greater or less extent is met with at intervals. These are called "pinches" or "caps"—places where the granite walls come nearly or closely

together. But little ore of poor quality or none at all is obtained in such places. This often continues for months, and sometimes the shaft is sunk for a year through the hard granite before the vein or crevice opens out to its natural proportions. This is what has discouraged and caused the suspension of many mining companies or firms who had little or no working capital on hand to carry them through to paying ore. In the early days, when this "cap" was first met with, the owners believed the mines were exhausted, and declared them "played out." This caused many claims and lodes to be sold for a mere song in 1859-62 that were afterward made to yield hundreds of thousands of dollars, and which were sold at exorbitant prices in 1864-5, and even at later dates. Many mines have been abandoned after driving the shaft through a long "pinch," when subsequent work proved the ore body to be but a few feet below. A large proportion of those who enriched themselves in working mines returned to the states, as the country east of Colorado was called, sometimes selling their mines on time, but often for good figures. In these cases the pockets, chimneys or ore deposits had usually been worked out, and a considerable outlay was required to find pay again, and the search was often abandoned. The veins are not always true in their direction, and many a miner has sunk his shaft away from the crevice for a hundred feet or more and then given up in despair. Many cases are reported where the vein was found years afterward by the original

operator, or some leaser or purchaser, who discovered it by driving a cross cut or putting in a blast at the side of the shaft. From all this it will be seen that care, skill and good judgment are requisite for successful mining, and that the lack of these has been the cause of most of the failures that have occurred.

CHAPTER XV.

A CHAPTER ON MINING.

Causes of Former Failures and Present Successes—Eastern Companies of 1864-8—Mining Then and Now—The Record of a Dozen Years—Reduction of Expenses—Skilled and Intelligent Labor—What it Costs to Mine—Price List of Labor and Supplies—Deep Mining—Improved Basis—Present Operations.

IN order that the subject of Colorado mining will be better understood, this chapter will be devoted to explaining the causes of failures in the past, as well as successes at the present time. The causes of failure may be briefly summed up as follows:

Twelve years ago, when the sales were made, the rich ore bodies were generally temporarily exhausted and the mines had reached those depths where steam hoisting works became necessary. Heavy outlays were consequently required at the start for machinery and for sinking unknown depths for new ore bodies. Another discouraging feature was the refractory character of the ore as depth was gained, causing much difficulty and loss in milling. The free gold quartz had been exhausted near the surface.

Unfortunately the companies were organized with non-assessable stock and little or no working capital. Consequently a few stockholders could block further

operations by refusing to contribute assessments for necessary development or improvement. The fatal mistake was usually made of erecting an extensive mill before testing or exploring the mine purchased. These mills were often filled with costly machinery prepared for some untried and worthless process. Every move, from the purchase on to the failure, seemed to be made without knowledge or proper examination. This arose largely from the speculative character of the times. It was a grand lottery. Few expected to get their money back when they invested. When other operations subsequently broke them up, however, they began to think of the trifling amounts they had lost in Colorado mines, and have ever since condemned the country.

The agents and superintendents sent to manage affairs were usually incompetent, reckless, extravagant, and entirely ignorant of mining. They were usually relatives or friends of the directors or president, sent here to manage great interests because they were of no earthly use at home—when it is a well established fact that mining and milling require as much skill, attention and experience as any other calling that can be mentioned. If the agent did evince some energy or sagacity, his plans were often overruled at the head office in New York or Boston, and so were of no effect. The breaking out of the Indian war on the plains very effectually blockaded the only route to the mountains, causing an enormous rise in the cost of freights, provisions, etc. So large a num-

ber of companies beginning operations at once, either in building mills or operating mines, caused an equal increase in the price of labor, so that previous estimates or calculations were entirely inadequate. The result of all this was that many companies never operated their mines at all. Others gave up when their pet processes proved a failure. Many that continued to work their mines (owing to the lack of working capital and to want of authority to make assessments on stock) were obliged to borrow money to carry on affairs when the mine was "in cap," or when their mill men did not know how to save the gold. This money or working capital was raised by mortgaging the mine, and moneys were often raised in this manner to pay off debts that had accrued, in order to escape a sheriff's sale of the property. There were a number of agents who were worthy men, and a few understood their business, but usually mining was conducted in such a worthless, good-for-nothing manner that it was impossible for it to succeed, no matter how rich the mine was. Companies who had good mines often became discouraged at the first call for money, and shut down. The truth is, in many cases, they abandoned work a little too soon. Many men have leased abandoned mines from companies and sunk shafts but a few feet or fathoms before veins of the richest character were exposed.

Another grand cause of failure was that the claims or properties purchased were too small. For each separate property required, sooner or later, steam

hoisting works above it, whether it was 50 feet or 500 in length, and these required a heavy outlay to buy as well as to keep running. A company often bought single claims of a hundred feet on half a dozen lodes, requiring as many sets of hoisting machinery, shafts, engines, etc., for each as was necessary to operate 1,000 feet of contiguous territory. Consolidation is one of the causes of success to-day. The foregoing refers to the gold mines of Gilpin and vicinity.

Although much utterly worthless property was purchased, there were many mines so rich, that, with careful management, they should have to this day proved profitable investments, notwithstanding the high prices of labor and supplies. As it was, one after another of these companies shut down work and abandoned their mines. New companies started at intervals, and individual mining was often carried on successfully, but the affairs of the country were not conducted on the sound, healthy basis of the present day, and a gradual decline was the result as far as this county was concerned. Those companies that weathered the disasters of 1864-66 had a season of prosperity for a time afterward. Occasionally a company here and there would resume work. From 1869 to 1872 there was a gradual decrease in the bullion product of Gilpin county, and at the latter date but one or two of the old companies continued to operate their mines. Considerable mining was done, however, during those years by Colorado men, practical miners, who had unbounded faith in the district, and they were usually successful.

The ore bodies were temporarily exhausted in so many mines at about the same depth and time, that there was no little doubt in the minds of many as to the permanent value and character of the veins, as well as to the expediency of further explorations for ore. Capital was not often possessed in sufficient quantities by the miners to reopen these mines, or for undertakings of the required magnitude—for most of those who had made fortunes had removed to the states or had lost their money in speculations.

The causes of success, which is now the rule instead of the exception, are improved mining and milling, better reducing facilities, the great reduction in the price of labor and supplies, and the skill, care, economy and intelligence that are displayed in all branches of this industry. These are as requisite in mining as in any other business or avocation, and, although there is room for much improvement, great progress has been made during the past decade. Mining, when conducted systematically and intelligently, offers better chances for the rapid accumulation of wealth than any other calling.

Expenses have been reduced fifty or sixty per cent. Milling has been improved until two or three times as much gold is saved as formerly. Smelting and concentrating works have done much for the miner. These alone are sufficient to convert the losing business into one of profit.

At length skillful and experienced miners of the more venturesome kind invested what capital they

possessed in opening some of these deserted mines. The water was removed at great expense, shafts were deepened, and levels run, in search of the wealth they firmly believed lay concealed beneath. The soundness of their judgment has been attested by the splendid results that have followed deep mining as conducted by Fagan, Sullivan, the Briggs brothers, Buell and others on the Kansas, Burroughs, Gregory and Leavitt, by Kimber, Fullerton & Co. on the Gunnell, and by the companies on the Gregory and Bob Tail. The success attending these operations has caused work to be resumed on many idle mines, some of which are paying handsomely near the surface and others at great depths. Several heavy combinations on lodes, now idle or worked on a small scale, are being effected by different parties, and these will increase the gold product and working force of the district largely.

At the present time mining operations are almost universally conducted by individuals or firms who have leased or purchased several or many contiguous claims. A few years ago nearly everything was conducted by stock companies organized at the east. Many of these are now defunct. Others have sold out, leased or abandoned their property.

For several years mining affairs have been getting down to a paying and more economical basis. A mine must pay in the long run in order to be kept running—as there is no eastern capital to draw from. Consequently the bright showing made at the present

time is the result of the labor of Colorado men and capital. One advantage Gilpin county has over others is a railroad to the mines themselves, thus cheapening expenses in bringing coal into competition with wood and reducing the price of fuel. The railroad renders the district accessible and desirable to those who desire to cast their lot among these rugged but golden ribbed mountains. Millions of tons of ore that were formerly left standing in the mines, or were dumped down the hill side, because they contained too little gold to pay for milling, are now handled at the mines and mills with profit. The saving here will be still greater when the water supply is more plentiful.

The deep mines have been carried downward in 1875-6 from 100 to 200 feet deeper, and many shafts had attained depths of from 500 to 700 feet. The valuable bodies of ore found there showed the veins to be continuous and unfailing, with no diminition, but greater uniformity in their value. This caused mining affairs to wear a brighter appearance. At from 500 to 1000 feet deep the ore deposits are found to be as rich as anything that has been met with since the first surface pockets were mined, and to be more extensive and lasting. A steady increase of bullion is the result. Several of the larger mines are having shafts deepened steadily, so that there may always be a large body of unexhausted ground opened. The Ophir-Burroughs shaft is 1,000 feet deep; the California, 740; the Briggs part of the Gregory and Gunnell, 700 feet and over; and several other mines are

to be opened to depths of 900 or 1000 feet, without delay.

Coal is being substituted for wood at many of the mines and mills. The completion of the C. C. R. R., puts Black Hawk in communication with the coal mines and thus reduces the price of fuel.

Expenditures in Gilpin and neighboring counties are about as given below. The price of labor, miners supplies, milling, sinking shafts, running levels, etc., will be found here. Most mining is done by contract, so much per foot being paid for ground opened:

Miners, per day of ten hours,	\$ 2 50 to \$ 3 00
Mill hands and surface men, twelve hours,	2 50 to 3 00
Machinists, eleven to twelve hours	3 50 to 4 00
Milling, per cord (7 or 8 tons),	20 00 to 25 00
Hauling, per day of ten hours	7 00
Quicksilver, per pound,	1 00 to 1 25
Lumber, per M	25 00 to 30 00
Powder, per keg, of twenty-five pounds	4 25
Fuse, per 100 feet,	1 00
Steel, per pound	20
Wrought iron, per pound	06 to 10
Castings, per pound	07

At the above figures, the cost per ton of mining and milling gold ores, is from \$5 to \$10 per ton, and the average yield, exclusive of smelting ore sold, \$11.60. Some of the larger veins that are developed extensively and have first-class hoisting works and mills immediately over the mines, are worked at a total outlay of \$5 or less per ton. Of such the Buell, the New York, and the Briggs-Gregory are examples. The Bobtail, with mills near by, is also worked at an expense of from \$5 to \$6 per ton. The Fagan-Kansas also has a mill over the mine, and thus avoids the heavy expense of hauling.

Machine drills are coming into use and work will doubtless be greatly expedited thereby, and shafts, levels and drifts opened in a fraction of the time now required, and at much cheaper rates. The greater part of the miners work on contract and are paid so much per foot, or fathom of ground opened. The price paid depends upon the character of the rock to be broken—whether it is hard or soft, crevice matter or granite—and the size of the crevice has much to do with it. In some mines contracts are let for sinking a shaft, as low as ten dollars per foot—size of shaft five feet by nine—but the price varies from five to thirty dollars per foot.

The total cost of sinking some of the great shafts, (from seven to ten by sixteen feet), where water is very troublesome, is from fifty to eighty dollars per foot. Drifting or running levels, costs from ten to twenty dollars. Stoping has been done at from six to twenty dollars a fathom. In the above cases the miners furnish their own supplies, such as powder, fuse, candles, etc.

The facts and figures given above refer more particularly to gold mining. While the cost of labor and supplies are the same in silver districts as in gold, provided they are equally near or remote from railways, the outlays for mining, and more especially milling are far greater on silver ores. Silver ores are usually bought on the basis of a charge of from \$35 to \$45 per ton, according to value. No cheap process is available with them. Miners who own silver mills

are able to extract the precious metal at one-half or two-thirds of the above cost. Most silver districts are more remote or inaccessible than those of gold, and this somewhat increases the necessary outlay. While the average values of the vein or pay streak in a silver mine are greater than those of gold, the veins are generally smaller, entailing greater expense in opening ground, in sinking, drifting, etc. Outside of these points this chapter applies to one species of mining as well as to the other. In each, equal advancement has been made in mining and milling, and in reduction of costs and necessary outlays.

CHAPTER XVI.

HOW THE PRECIOUS METALS ARE EXTRACTED.

Gold and Silver Processes—Roasting and Smelting—Chlorodizing-roasting and Amalgamating—Detailed account of the Stamp Mill process—The Bolthoff Pulverizer.

A NUMBER of processes are in use in Colorado for the extraction of the precious metals. Several methods of smelting are in operation which treat both gold and silver ores. The most successful of these is the Swansea process adapted by long experience to the treatment of ores of this region. Works of this character have been established at Black Hawk, Alma and Golden. Other methods of smelting are conducted at Golden, Boulder, Denver, in the San Juan country and elsewhere. Roasting and amalgamating are extensively carried on at Georgetown and Nederland. Chlorination and lixivation is the process used at North Boulder, and about to be introduced at Lake City, and there are several blast smelters in the state. All of these, except the first two named treat silver ore exclusively.

All Colorado silver ores require roasting as well as amalgamation, thus necessitating an increase of time and expense over those of some Nevada mines. Ores are taken to the mill, sampled and crushed, and then roasted. They are then either smelted or amalga-

mated according to the process used. The chlorodizing-roasting and amalgamating mills of Georgetown are similar to those of the state of Nevada. The reverberatory furnace and pan amalgamation comprises the mode of treatment. Judd & Crosby's mill has a "seven hearth furnace," through which the pulverized ore is moved until thoroughly roasted, when it goes to the pans. The Pelican and Nederland roast in revolving (Bruckner) cylinders and amalgamate in barrels. Detailed accounts of both of these methods are given in the Clear Creek mining departments.

The Colorado Dressing and Smelting Company's works at Golden, are similar to those at Black Hawk. As they have no facilities for parting the gold and silver from the matte, they ship the latter to the Boston and Colorado works for separation. The blast smelting establishments experience some difficulty in procuring ores carrying the desired percentage of lead. More of this class of ore is found west of the range, in Summit county, than in most other localities.

Gold is extracted from the quartz by the stamp mill process (amalgamation) and also by the smelting process, already referred to.

Almost the entire ore product of Colorado gold mines is handled in stamp mills; only the more valuable qualities going to the smelter. Cheapness is the redeeming feature of the former; only from forty-five to sixty-five per cent. of the assay value being usually saved. It is found more profitable to sell the picked or first-class ores to the smelter, for while they are

usually bought on the basis of a charge of from \$35 to \$45 per ton, as against a charge of \$2.00 and \$3.00 in the mills, the returns are nearly double. Ninety-seven per cent. of gold saved, as against forty or fifty, counts heavily in favor of the miner on very valuable ore. It will be seen that stamp mills are preferable on most ores containing less than \$75 per ton in gold, but not on those assaying above that figure. No silver or copper to amount to anything are saved under the stamps, while the smelter recovers as large a proportion of them as gold, which is another point in his favor. Concentrating works like those of Collom at Black Hawk, however, render certain classes of low grade mineral available for the smelter.

The stamp mill process is a very imperfect one, but has been vastly improved during the past fifteen years. From forty-five to sixty-five per cent. of the gold is saved, as proved by assays of ore, or double what was once obtained. A larger percentage is sometimes saved, especially when blankets are used, and when tailings bring good prices as at present. The actual cost of treating most ores in stamp mills, without counting the general wear and tear of machinery, is \$15 or \$16 per cord, or \$2.00 per ton. These are the figures given by men who own or operate mines, and handle their own ore in steam mills. Where the mills are run by water-power, the expense is considerably less. Custom mills charge miners from \$20 to \$25 per cord, or from \$2.50 to \$3.50 per ton. A few mills when run by water-power in the summer season have treated ores at the low charge of \$18 per cord.

The ore, in which the gold is generally distributed in infinitesimal particles, is crushed to powder by the stamps. Under this crushing process, the gold falls to the bottom of the mortars, and uniting with quicksilver, forms an amalgam, from which it is subsequently separated; quicksilver being used to catch and retain the gold.

The mortars into which the ore is shoveled and in which it is crushed are simple iron troughs twelve or fourteen inches wide and nine or ten deep, resting on solid wood foundations, on and above which is stationed the heavy frame work containing the stamps or batteries. A steady stream of water flows into these while the stamps rise and fall and the crushing goes on. What is called a battery usually contains five stamps, but often four or six, each stamp having a weight of from four hundred and fifty to seven hundred and fifty pounds—five hundred being the most common in Colorado quartz mills. These iron stamps rise and fall from twelve to eighteen inches, with a revolving motion, from eighteen to thirty-five times per minute. They are ten or twelve feet high and consist of a stem, head, shoe, and a collar by means of which the cam raises the stamp, as narrated above, while the ore is crushed. The stem is made of wrought iron and is from two to three inches in diameter, while the shoes attached to the lower part of the stem are thicker, and made of steel or hardened iron. The stamps or batteries within the wooden frame work are connected with a cam shaft running the entire length

of the batteries, or the mill, or portion of it, if a large one. This is driven by a geared wheel, though the shaft carrying the driving pinion is commonly operated by belting.

With the exception of the Briggs mill, which has issues on *either* side, the ore as it is crushed is forced or washed through sheet iron screens, fastened on the side of the batteries opposite that where the feeding is done, on to inclined copper plated tables usually eight or nine feet long, and four or five wide, or the width of the battery. Quicksilver is fed into the batteries as often as the mill man finds it necessary, while the crushing continues. Quicksilver is also used on the copper plated tables and the composition tables to retain and secure the gold in the form of amalgam (quicksilver and gold,) while the water carries the light dirt and the waste material on to the creek. This latter material goes by the name of tailings, and these are usually subject to a washing or concentrating process and then sold to the smelting works at paying prices for the gold, silver and copper they contain and for their fluxing qualities.

The batteries and plates of the tables are cleaned up at intervals—in some places once a day and in others, once in three or four days—and the amalgam that has collected is removed. Blankets are used on many tables, and Bartola, Chillian and other pans, assist the gold saving operations in many mills when the more refractory ores are met with. The amalgam after being skimmed and cleaned is pressed in a cloth

so as to squeeze out as much of the quicksilver as possible, when the remainder is retorted and the crude bullion is then sold at the bank at from fifteen to eighteen dollars or more, per ounce. Gold from different mines varies considerably in fineness, the quantity of silver having much to do with this. The average fineness of this mill gold or retort is seven hundred and eighty-seven parts pure gold to one hundred and ninety-eight parts pure silver and fifteen parts copper. The retorts used are conical pots of cast iron, which in the large mills are of a size holding from one hundred to three hundred ounces. The bullion obtained is usually one-fourth to one-third and sometimes one-half of the original quantity of amalgam. The quicksilver after being condensed is recovered for further use.

The pulp or slimes after passing from the mill are buddled and sold to smelting works, as stated above, at their assay value, less \$22. This price is better than in previous years, when \$26 and \$28 per ton was retained. Formerly no effort was made to save these tailings and they were allowed to wash down the creek or gulch. Their importance may be estimated from the fact that they often increase the receipts of a lot of ore from five to twenty per cent. clear of expenses incurred in saving them. It is estimated that eight or ten tons of ore crushed in the mill will form one ton of slimes or tailings, or that quantity can be saved. Were \$12 received for all of these per ton, the yield of the total amount of ore crushed

would be increased in value \$1.50, or nearly that sum per ton. With the aid of buddled tailings it is claimed that some stamp mills on favorable ores obtain from sixty-five to eighty per cent. of the assay value. In Gilpin, 5,000 tons of these buddled tailings were sold last year to the smelting works, or something over one-third of what could have been saved. These works require them for fluxing purposes, to mix with the ores to be smelted, and the company in January last contracted for all of the tailings from the leading mills, paying the assay value of them, less \$22, and when those terms do not pay, the seller's expenses of transportation are paid. Some of them contain much gold and others are quite lean.

The Bolthoff Pulverizer and Amalgamator, is the name of a new mill to be used in place of stamps. It was invented by Henry Bolthoff, of the Hendrie Brothers & Bolthoff foundry, at Central, and is apparently doing good work. Its cost is \$1,200 to \$1,500 according to size of the machine, being much cheaper than a stamp mill of equal capacity. It is operated cheaper as much less propelling power is required. These pulverizers are used in several localities successfully. The same kind of tables are used with stamp mills. Professor G. H. Gray, Territorial assayer, thus alludes to this machine in his last annual report:

“It consists of a revolving cylinder five feet in diameter, containing about 1,000 pounds of balls; it is fed with ore and water from a hopper running through the centre; the bars around the periphery have rectangu-

lar slots, which allow the ore to pass through and come in contact with the quicksilver which is contained in recesses outside the bars. By this device the ore is kept in almost constant contact with the quicksilver. After the ore has become sufficiently fine to float, it discharges from the centre and flows over amalgamated copper plates in the same manner as in stamp mills. The capacity of the mill is equal to eighteen stamps by actual test. It pulverizes much finer and at less cost per ton, than stamps. The exact per cent of saving over stamps, has not yet been ascertained. The present year will give it a much more thorough test than it has had heretofore.

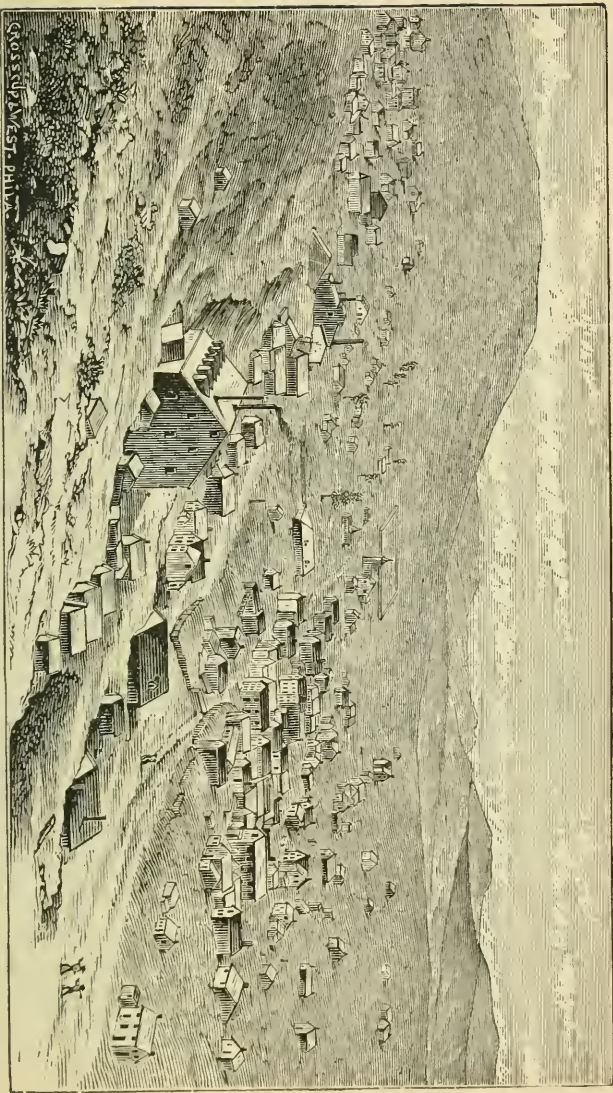
CHAPTER XVII.

GILPIN COUNTY.

The Richest Gold District of the World—Geological Features—Its Towns and Cities—Railway Connection—Gulch Mining and Lode Mining—Methods of Extracting the Gold—Location of the Mines, etc

Gilpin, although much the smallest county in Colorado, is said to contain the most valuable mineral deposits in the world, when size and number of veins and quantity of ore is taken into consideration. It is separated from the plains by portions of Boulder and Jefferson counties, from which it extends south and west to the crest of the main range of the Rocky Mountains. It is composed of rugged hills, mountains and ravines, once heavily timbered, but now partially bald and bare. The county varies in elevation from 7,500 to 11,000 feet above sea level, and from 2,500 to 6,000 feet above the level of the plains at Denver. Mining is almost the only industry, although farming is carried on successfully. The population is found mainly in the towns of Nevadaville, Central and Black Hawk, which, together, number 5,500 inhabitants. The county is bounded by Boulder on the north, Jefferson on the east, Clear Creek county on the south, and Grand county on the west—the main range of the mountains forming the dividing line with the latter.

Nevadaville is about 8,900 feet above sea level, and



GROSS & WEST - PHILA.

NEVADAVILLE AND BALD MOUNTAIN.

is situated in Nevada gulch, between those famous depositories of wealth, Quartz and Gunnell hills. One mile east, and six hundred feet lower, is the business centre of Central. Here Nevada, Spring and Eureka gulches unite and form Gregory gulch, along which the city extends eastwardly to Black Hawk. The last named city is built in the lower parts of Gregory and Chase gulches, and on North Clear Creek, into which the former streams empty. Towering far above these places are a number of lofty mountains, among which Gunnell, Casto, Mammoth, Gregory, Bobtail, Quartz and Bates, are famed for their immense mineral deposits. Beneath the gulches, streets and hill sides, mining is carried on to depths of hundreds of feet, while along the streams and busy thoroughfares the noise of the stamp mill never ceases. The central part of Black Hawk is five hundred feet lower than the business portion of Central, and one mile further east. These places form almost one continuous city for over three miles. Trade, banking, etc., are mainly conducted at Central, while the smelting works and a majority of the stamp mills are located at Black Hawk.

So restricted is the space for building that streets and residences are built in tiers, one above the other, up the hill sides, and at one or two points but a single street maintains its winding way between the overhanging hills and rocky bluffs. But the gold is here and that started the towns and retains the people. Notwithstanding its unfavorable location, Central can

boast of substantial blocks and streets of brick and stone that would do honor to much older and larger cities, and Black Hawk is not far behind her. Handsome mercantile and banking houses and neat and attractive residences attest to the wealth and prosperity of the community. The Teller House is one of the largest and most costly hotel buildings west of St. Louis. The industries and local interests of the county are advocated by the *Central City Register* and the *Black Hawk Post*.

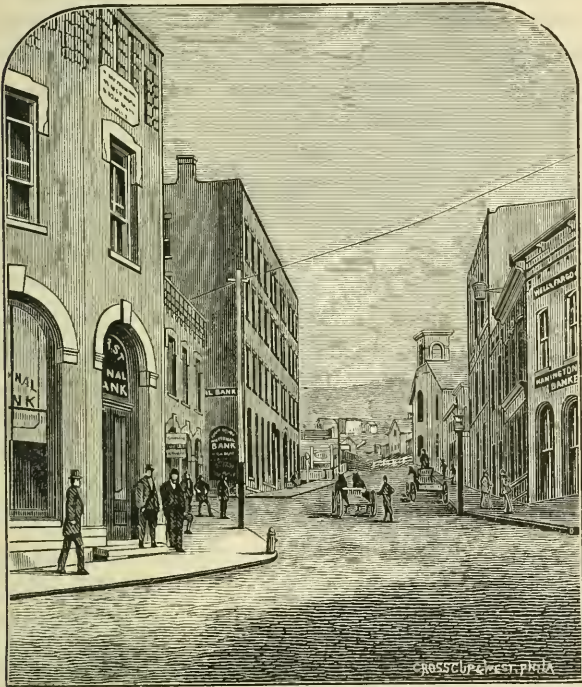
Central has three sound and well conducted banks, all doing a good business. These banks purchase or ship from \$125,000 to \$200,000 worth of gold, etc., monthly.

There is also an elegant theatre building, a fine public school library—the largest in the state—and a well organized fire department, water works, etc.

These three places, two of which are incorporated cities, contain nine churches, some of them elegant and costly stone edifices. The public schools and school buildings compare with those of eastern cities. The Central and Black Hawk school buildings cost \$24,000 and \$14,000, respectively, and St. Aloysius academy, \$14,000. Many of the business houses carry heavy stocks of goods and do a very large annual trade.

Railway communication is afforded with Denver, Boulder and the world by means of the Colorado Central railroad, via Clear Creek Cañon. Well conducted stage lines connect with Caribou on the north, Idaho Springs and Georgetown on the south, and the Middle Park on the west.

The gold district of Gilpin county, or the Central gold region, is almost entirely comprised in a space a little over two miles in length by from one half a mile to a mile in width—these limits including most of the



EUREKA STREET, CENTRAL CITY.

valuable portion. A silver belt of smaller dimensions lies to the south and passes by a westerly course into Clear Creek county.

In the above mentioned gold belt are thousands of lodes, spurs and claims that have been recorded, many of them of wonderful richness. This district contains more valuable lodes, developed and undeveloped with probably more wealth deposited therein, than any known mining district in the world. Over sixteen thousand claims have been recorded in this county altogether, representing several thousand lodes and veins. From these came the gold that was once found so plentifully in the ravines, low grounds and streams. The average yield per ton of ore is said to exceed that of any gold district outside of Colorado.

Gulch mining is still carried on in Russell and Lake gulches, and their tributaries, and in North Clear Creek below Black Hawk. At the latter point Alex. Cameron introduced Chinese labor in 1873, and had one hundred and fifteen of these laborers at work in 1874, but finally discarded them in favor of white men, whom he now considers more desirable and effective. Gulch mining at Russell and vicinity is carried on in the summer season by means of water from the Consolidated Ditch. About fifty men find employment there at present where at one time a thousand found "good pay." The richest of the gulch diggings were exhausted during the five years beginning with 1859 and ending with 1864. Although they are quite limited at present enough remains for profitable work for five years to come. Unlike gulch or placer ground, lode mining never gives out. The veins of Gilpin county vary from a few inches to ten

or twenty feet in width—two or three feet being the most common size. They often carry valuable ore for their entire width. To use common phrases they “widen out” at one point or “pinch up” at another—disclose a “pocket, ore chimney or bonanza, ” or “go into cap.”

The country rock of Gilpin is gneiss or granite, in which the veins occur, with a course, generally five to ten degrees north of east and west, and mostly taking a direction between east and west and northeast and southwest, but there are some exceptions to this. The decomposed surface rock of these veins usually extends down seventy or eighty feet. Below this comes the copper, iron pyrites, or sulphurets of iron and copper, carrying a large percentage of gold.

The methods of extracting the gold or precious metals from the ore in this district are restricted to stamp milling and smelting, a small proportion only being handled by the last named process. The failure of the mills to save the gold in 1862-3-4, after the surface quartz was exhausted and about the time so many eastern companies began work, was due to the inexperience of the mill men. The process mania that followed from 1864 to '67, was still worse and its damaging effects are still felt. The stamp mill process was reinstated where discarded, and is found to be the only practicable treatment for low grade gold ores in Colorado.

The veins of this district are often immensely rich in certain localities at and near the surface. Almost

fabulous amounts are reported of the rich yield of the "slide" and surface quartz of Gregory, Bates, Bobtail, Kansas, and other lodes. Thousands of dollars were cleared by poor men in a few weeks, or a single season. From five to twenty dollars per pan were often washed out, and hundreds of dollars per ton of dirt were sometimes obtained. When the miners got down to the iron the veins were found to be less rich but more lasting and consequently surer objects of investment.

In the lower part of this district are Bates, Bobtail, and Gregory hills, divided by gulches and intersected with the lodes of the same name and the Running, Fisk, Gregory Second and others. Above is Mammoth hill with the Buell, Hunter, German, Kip, O. K. and the Mammoth. The latter is considered the great mother vein from or to which other lodes drift more or less directly—yet its ore is usually of low grade.

West of Central is Casto hill containing the Winnebago and other mines seemingly of a less uniform character than those already named. Rising from the city of Central, Gunnell hill extends to the westward. Its great vein is the Gunnell, with which as with the Mammoth, Kansas, and others, numberless lodes and spurs unite like branches to a tree. On the upper part of Gunnell hill are the Prize, Suderberg, Jones and Hubert lodes.

Quartz hill is a mile and a half in length and is situated southwest of Central and directly south of Nevada. This is one of the most wonderful formations in the known world. It is one vast network of veins with here and there huge deposits of ore—some

of them of immense value. Millions of dollars have been obtained therefrom, and "there's millions in it" yet—and many times what has come out of it. There are two or three grand mother lodes, into which the others gravitate, and some claim these are offshoots of the Mammoth on the west. These are the Kansas, the longest well defined lode in the county—the Burroughs—and further south on this eastern and northern slope of the hill, for a distance of nearly a mile, extends what is known at different points as the Borton, Roderrick Dhu, Gardner, California, Hidden Treasure and Indiana. All of these veins on the northern slope of Quartz hill dip to the south, but in less degree as the summit is approached.

From the eastern part of the hill, and also crossing the rich surface of the "Patch," comes the Illinois. Nearly in a line further west is the Egyptian, and on the extreme summit the Alps and Mackie. Here the veins are nearly vertical.

South of Quartz hill are groups of veins located in and around Leavenworth, Russell and Lake gulches. Through this section the Consolidated Ditch takes its course. Flourishing towns stood here in the palmy days of gulch mining, and work is still conducted profitably on a small scale. This locality and North Clear creek comprise about all of the surface diggings of the county.

Still further south the silver belt comes in from North Clear creek and extends over Virginia mountain into Clear Creek county. These silver veins are large and often rich in silver and lead.

CHAPTER XVIII.

MINING STATISTICS OF GILPIN COUNTY.

Resumption of work in the deep Mines—Bullion products compared by Years and Months—Export of Stamp Mills and Smelting Works—Fineness of Bullion—Percentage of Loss—Facts and Figures—\$28,000,000 in Gold—The Consolidated Ditch—Depth and yield of the Leading Mines.

MINING operations in Gilpin county for the past four years have been largely of a preparatory character for more extensive and regular production hereafter. Yet there has been a steady increase in the bullion yield and in the general prosperity of the district. This gratifying condition of affairs has been brought about almost entirely by the expenditure of local capital and labor, no eastern money in any large amount having been invested during that time. Many mines were filled with water when leased by Colorado miners and its action had sadly damaged them. Much time and money was required to remove water and place the mines in a safe condition. When this had been done it was generally necessary to deepen the shaft or to "sink" in search of paying ore—for the ore bodies had been worked out in many cases by the companies or original owners. All of this required no little labor and money as well as faith in the value of the mines. Further than this, it must be bestowed on the property

of far away corporations. And yet such operations were undertaken and successfully carried out, with outlays of from ten to forty thousand dollars, before any returns were obtained. Long leases and purchases were not uncommon. What eastern capitalists lacked the nerve to do was done by those whose earnings had been obtained by years of labor with the pick and shovel. Several miners would often combine their scanty capital and if that gave out they would go back and work for wages until another "stake" was raised and then start in again on the mine. They would often be heavily in debt when the rich ore body was finally uncovered. When this could be done by those destitute of sufficient funds to purchase the necessary machinery to operate with economically, it can easily be seen how much more could have been attained had capital in sufficient quantities been at their disposal.

What is considered profitable ore in most gold mines yields in the mills from \$10 to \$20 per ton, and of course, assays considerably higher. Large veins that are well opened with deep shafts, long levels, powerful hoisting machinery and ample milling facilities, can return a profit on much poorer ore, as their total outlays are but five or six dollars per ton.

The bullion product of Gilpin county for the past four years was as follows:

1872	\$1,389,289 00
1873	1,530,000 00
1874	1,631,863 00
1875	1,763,985 48

The present rate of production indicates a yield of over \$2,000,000 for 1876. With a plentiful water supply, which can be obtained at a moderate outlay, this could be doubled in succeeding years. The figures given above for 1872, '73 and '74, are about \$25,000 too much in each case, as that amount of gold credited as coming from this county and shipped by the Central banks, came from gulch diggings and lode veins in Clear Creek county. The amount given for 1875 is correct and the gold purchased by the banks from other districts is not included therein. The burning of the shaft house and hoisting works on the Gunnell gold property in September will cause the falling off of over \$25,000 per month from the gold shipments for the remainder of the year. The heavy snow and flooding of the mines in May also caused a serious loss.

The bullion yield for 1875, for Gilpin county or the Central mines was as follows;

Gold	\$1,598,063 05
Silver	112,482 43
Copper	51,000 00
Lead	2,440 00
Total	<u>\$1,763,985 48</u>

The same was derived from the following sources:

The Stamp mills turned out	\$1,240,109 08
Boston and Colorado smelting works	502,000 00
Ore sold to Golden works and elsewhere and jewelers gold	<u>21,876 40</u>
Total	<u>\$1,763,985 48</u>

Of the bullion obtained from the mills \$1,221,627.08 was gold and \$18,482.00, silver. Of that from the

smelting works \$357,000 was gold, \$94,000 silver and \$51,000 copper. These figures allow a premium of sixteen cents on gold, which is about the average for 1875.

The following is the currency value of mill gold by months :

January	\$ 99,933 53
February	72,868 30
March	87,610 05
April	90,734 97
May	85,097 51
June	110,667 78
July	107,036 60
August	119,934 23
September	112,755 35
October	109,563 00
November	112,308 90
December	132,499 46
Total	\$1,240,109 08

The coin value of mill gold shipments for the years 1874, 1875 and nine months of 1876, compared by months was as follows :

	1874	1875	1876
January	\$ 53,280	\$ 86,149 56	\$ 87,420 61
February	72,396	62,817 50	88,615 10
March	85,129	75,526 76	127,136 74
April	79,691	78,219 80	108,568 69
May	104,244	73,359 92	104,324 07
June	105,712	95,403 25	119,588 88
July	83,943	92,272 80	101,346 52
August	78,039	102,615 21	128,733 07
September	84,469	96,340 81	116,189 63
October	100,596	94,450 86	
November	76,774	96,818 01	
December	111,769	114,223 67	
Total	\$1,036,022	\$1,068,198 35	\$981,923 31

The figures from April 1st, to October 1, 1876,

while they may not be perfectly accurate, cannot be but a very few dollars out of the way. This shows that very nearly as much gold was produced in nine months of 1876 as in either of the entire years previous. Nine months of 1876, gave a yield of \$981,923.31 as against \$762,705.61, in the corresponding months of the previous year. But this does not show the full increase, as the Colorado Dressing and Smelting Company, commenced operations in April, and have purchased a large quantity of ore of the class formerly sent to the stamp mills. The yield from Gilpin county ores sold to this company and to the Golden smelting works, has been something like \$125,000.00, which would make a total, principally from low grade ores, of \$1,106,823.31, or a gain of forty-five per cent. A portion of this is sunk in furnace bottoms, so that it will not find its way into the channels of commerce. The Boston and Colorado works have exported more gold than during any previous time of the same length.

A banker's statement from the records of several months' purchases of gold, gives the following in regard to the fineness of gold and silver, and the *coin* value per ounce of crude bullion:

	FINENESS IN GOLD.	FINENESS IN SILVER.	COIN VALUE OF CRUDE BULLION.
Briggs	803½ to 816	172 to 180	\$16 31 to 17 01
Bobtail	849½ to 866½	128 to 140	17 00 to 17 82
Bates	746	241	14 29
Borroughs	833½ to 820	158 to 166	16 93 to 16 58
Illinois	781½	211	15 99

The gold ores of Gilpin county contain about \$1.00 in silver to \$4.00 in gold or about 1 ounce of gold to 3.90-100 ounces of silver. The average fineness of the gold of the county is .787 in gold .198 in silver and .015 in copper. The percentage of silver is generally much higher in the mines at, and around Nevadaville, and the value of the bullion consequently less, while at the eastern or lower end of the district the gold percentage is higher and the bullion is more valuable. The retorts from the mines on Quartz hill are examples of the first mentioned class. Kent county gold usually sells for \$16 an ounce in currency, Kansas runs down from \$18 at the eastern end to \$16 at the western. Gunnell gold is worth about \$18.50. Gold from the Buell, Fiske, Gregory and Bobtail, examples of the class where the percentage of gold is higher, usually sells for \$19 per ounce in currency.

The amount of ore treated in 1875 was 106,900 tons in the stamp mills and about 3,500 tons in the smelting works. About 5,000 tons of buddled tailings from the stamp mills were also used at the latter, and about 50 tons of lead ore have been sold out of the country. The average yield of the mill and smelting ore per ton was therefore \$15.93; of the mill ore alone \$11.60, and of the smelting ore between \$96 and \$100 per ton. The latter comprised the very rich ores usually selected from a large quantity of ore mined, forming in some mines 10 per cent. of the whole, and in others only 2 or 3. In some mines the average of mill ore was below the average of all given above,

(\$11.60) as with the Gregory, and in many like the Kansas, Burroughs, Gunnell and others, it was much higher. But the quality of ore of the same mine varies greatly, being rich in one place and poor in another. A large portion of the ore treated comes from a multitude of mines or prospect holes, some of which runs so poorly as to fail to pay for crushing, when the miner moves to some other mine or vein to try his luck. An old mill man says the outlook is very encouraging when only one-fourth of the ore goes far below expenses, another fourth barely meets them, and the remaining half more than pays expenses. But this is for the general mass of ore that is brought to custom mills from a large number of small mines as well as a few large ones.

The average number of mills running in Gilpin county in 1875 was 22, and of stamps 440.

The excellent report of Geo. H. Gray, Territorial Assayer, for the year 1875, has the following:

“Boston & Colorado Smelting Works. Amount of ore treated from Gilpin county, 3,500 tons; average value 4.25 ounces gold and 15.75 ounces silver; average price paid by the works, \$45; ores assayed about 3 per cent copper. These works also treated 5,000 tons of buddled tailings, averaging 1.03 ounces of gold and 4 ounces silver. The gold contained in the ores is to the silver as 1 to 3.5. Fifty tons of lead ore were sold out of the county during the year at an average price of \$30. The average yield of the mill

stamps is about 50 per cent. of the assay value of the ore, although some mills have saved as high as 65 per cent.

Stamp mill returns	\$1,250,040.00
Buddled tailings from mills, 5,000 tons at \$34.20 per ton	171,000
	<hr/>
	1,421,040
The assay value of 106,900 tons at \$23.20 per ton is . .	2,500,080.00

This shows a loss of 43.1 per cent. of the assay value, or of \$1,079,040.

Although only 5,000 tons of buddled tailings were saved, 15,000 could have been saved, and probably nearly that amount will be hereafter. The loss given above is certainly to be regretted, but shows a great improvement over the earlier years of the country, when only one million in seven or eight was saved, while the remainder was washed down the creeks."

Twenty-eight million dollars or more in gold bullion have been obtained from the lode mines and from the gulches of Gilpin county, since the first discoveries were made in 1859. The most productive years were 1863, 1869, 1875 and 1876. Those dates represent the most successful years, first of individual and surface mining, second of company mining in deep mines, and lastly of still deeper mining by individuals and practical and experienced miners.

In 1875 less than 1,300 men were directly engaged in mining and milling and their connections with a return of \$1,763,985.48. Had this been equally divided, each man employed would have received over \$1,300, or every man woman and child in the mining towns and camps, would have received \$300.

Besides the yield from the mines the large number of fertile and productive ranches located between the mountains and on the sloping hill sides have proved extremely remunerative. Their crops are bountiful and often enormous, returning large profits to the farmer.

The following gives the names and yield, and depth of the deepest shafts of most of the leading lodes of Gilpin county:

	DEPTH OF SHAFT.	TOTAL PRODUCT.
Gregory	575	\$8,571,764
	650	
	770	
Bobtail	650	4,000,000
Gunnell	700	2,500,000
Burroughs	500	1,500,000
	1000	
	587	
Buell	550	850,000
Bates and Bates and Hunter	300	800,000
	400	
	350	
Kansas	627	1,500,000
	690	
	590	
Roderick Dhu	450	450,000
Gardner	400	600,000
California	740	610,000
Hidden Treasure and Indiana	400	100,000
Alps and Mackie	450	500,000
Flack	600	250,000
Forks	517	500,000

There are many other lodes, possibly as good as some of the above, that have yielded all the way from \$500,000 down to \$50,000.

Succeeding pages will contain facts, figures and notes concerning many of the mines of Gilpin. It

is not claimed that this list contains all of the valuable mines. Of the multitude that the district contains only a portion can be noticed in this brief work. Many mines that are worked on a small scale are unnoticed, and probably many that are as good as some of those this article refers to, are omitted. Others that are idle or abandoned are not mentioned—and some of these may soon be alive with miners, and ranking among the first producers. But all mines that are operated on a large scale are given space and attention.

The figures of the bullion yield of the county for 1875, are more accurate than those given for any previous year. The yields of the mines are in many cases taken from the books of the owners or lessees, or from the banks. In other cases estimates, or the yield in round numbers, have been obtained from the present or past owners. The exact figures of the product of the mines since their discovery cannot be given because they have usually changed hands so many times that all of the records are not obtainable. What is remarkable is the very large number of lodes that have yielded from one to ten thousand dollars or from ten thousand to half a million.

The Consolidated Ditch, ten miles in length and bringing water from Fall River to Russell district and adjacent localities, was completed in July, 1860, at an outlay of \$100,000. It was built to render the surface deposits, or gulch diggings, available, which without water were worthless. It has since been of service to

stamp mills. It is an open ditch and furnishes water from May to November. Its completion largely increased the gold product, especially in the upper and southern parts of the county. For years schemes have been projected for increasing the water supply of Nevadaville and Central, which is entirely inadequate. Water powers are needed at and near the mines, and can be obtained only by the introduction of water from Fall River. It is pretty well settled that the Consolidated Ditch owners possess the only available water right or franchise. The county has voted one hundred and fifty thousand dollars worth of bonds for the purpose of introducing water, and probably this franchise will be purchased.

The plan is to improve this ditch by laying pipe the entire distance—that there may be no waste of water—and to change its course by cutting through the divide south of Bald mountain, and thus let the water down through Nevadaville along the base of Quartz hill. The sum voted is amply sufficient to accomplish this. By this means, it is claimed, nearly one thousand inches of water can be obtained eight months of the year, and one half that quantity nearly or quite all of the remaining months. Forty or fifty mill powers, of thirty-three and one third feet fall each, would then be obtainable in Nevadaville and Central, besides power for hoisting purposes at the various mines. The benefits resulting from the accomplishment of this project would be immense.

Milling and hoisting expenses would be reduced

thirty per cent. by the substitution of water for steam power, and the large outlays for hauling quartz would be avoided with mills at or close by the mines; and mines that cannot now be worked successfully, would then yield a profit, and the number of men employed and the amount of bullion produced would be doubled. This project has been reviewed at length, because past results cannot compare with what will be achieved after the introduction of a plentiful supply of water.

CHAPTER XIX.

STAMP MILLS AND SMELTING WORKS.

List of Mills in Operation—Details Regarding Several Mills—The Work of a Year—The Colorado Smelting and Dressing Company.

WELL developed gold mines in Gilpin county send from one tenth to one fortieth of their ore to the smelter—that being the proportion of very valuable ore produced. The remaining ore goes to the stamp mills unless sold to the dressing works. The average number of mills running in 1875 was twenty two, and of stamps four hundred and forty. There were about 106,900 tons of ore crushed, yielding an average of \$11.60 per ton. The average amount of ore crushed in twenty-four hours by each stamp, was three-fourths of a ton.

The increase of mining and of ore, started several idle mills in motion in April and May, 1876. These were the Consolidated Gregory, fifty stamps; the Miley, (bought by Wheeler & Co.,) twenty-five stamps; Senderfer and Eagle, each with twenty stamps; Lake's (water mill), fifteen stamps. One new mill—Potter's—of twenty-five stamps, was built in 1875, twenty-five stamps were added to the Briggs, and fifteen to the Black Hawk. In 1876 the Fagan-Kansas mill received twenty additional stamps, the Wheeler fifteen the Fullerton eighteen and the Lake, five. This shows

an increase of sixty-five new stamps in 1875, and of fifty-eight in 1876, while two hundred more stamps are running now than in the winter, or during 1875. The following mills are at work (October, 1876).

NAMES.	NO. STAMPS.	LOCATION
Arrighi	10	North Clear Creek
Sensenderfer	20	" "
Fullerton & Co	33	" "
Holdbrook (Fullerton & Co)	15	" "
University (Fullerton & Co)	20	" "
Lake	25	" "
Kimber & Co	35	" "
Mellor	20	" "
Bobtail Company' Black Hawk	75	" "
Bobtail Company's Eagle	20	" "
Norton	23	" "
Wheeler	50	" "
Lake	15	" "
Consolidated Gregory	50	" "
Waterman	20	Eureka Gulch
New York and Colorado	40	Gregory Gulch
Briggs	50	" "
Buell	60	" "
Monmouth-Kansas	52	Nevada Gulch
Whitcomb	24	" "
Potter	25	" "
Clayton	25	" "
Total	707	

Here are twenty-two mills, and seven hundred and seven stamps as against the usual quota of from four hundred and twenty to five hundred and fifty. Besides the above a number of mills have been run at intervals, such as the Miley mill, with fifteen stamps, and the Rowe, Tascher and Winnebago mills. The work of these make up for loss of time on some of those given in the table. The average number of stamps running for the six months ending October

1, 1876, was something like six hundred and twenty, and for the nine months to that date not far from five hundred and sixty.

Several of the most prominent mills are noted in after pages in connection with mines with which they are connected. Among the best conducted and most prosperous and extensive milling establishments of the district are those of Kimber & Fullerton, who are also extensively engaged in mining. These parties have mill sites embracing 3,000 feet of continuous ground.

The Kimber mill, owned by J. V. Kimber and F. C. Young, contains thirty-five stamps with improved pans and other arrangements, making one of the best ore reducing concerns of the country. Last year a solid stone structure, 65x90, was built over the old frame which was removed. A raceway allows the mill to run on water power nearly the entire season, from April to September, and lessens the amount of steam required during the remainder of the year. A record of the business of this mill for two and one half years, shows that 2,500 cords or 17,500 tons of custom ore were crushed, coming from one hundred lodes or claims, but mainly from seventy-five. This produced 11,250 ounces of gold, at an average value of \$17.00 per ounce, worth \$191,250. This gives an average of four and one half ounces per cord, or \$10.93 per ton. The best qualities had been previously selected from most of these veins which assayed from sixty-five to two hundred and fifty dollars per ton.

This mill has been constantly at work for many years.

A short distance up the stream Fullerton & Kimber have two mills, formerly called the University (twenty stamps), and the Holdbrook (fifteen stamps). Still further above they have what is called the Fullerton mill. This, like the Kimber, has recently been rebuilt, the old frame giving place to substantial stone walls. Eighteen new stamps were added, making the whole number thirty-three. Water power is used with and without steam in different parts of the year, and no better milling is done anywhere in the district. These four mills with one hundred and three stamps, crush custom ores for all who choose to bring them, but are largely engaged in handling those from that part of the Gunnell operated by Kimber, Fullerton & Co., which has lately been very productive.

The Wheeler mill is located in Black Hawk just above the smelting works. It is comparatively a new mill and originally had twenty-five stamps and more recently thirty-five. It received an addition this summer, with fifteen stamps and a forty-five horse power engine, and fifty stamps have been running since the close of August. This mill has always been at work, mainly on custom ores from whoever chose to bring them, together with some ores from Wheeler & Co.'s mines. Its reputation for work, good returns, capacity and management has been second to none in the country, and it has always been crowded with ore. The stamps weigh five hundred pounds each, and are run at the rate of about thirty drops a minute. Bar-

tola pans are used in the mill and the tables and other appliances are much the same as with other first-class establishments in the county.

The following statement has been furnished, of the work done by the mill in fifteen months from April 1, 1875 to July 1, 1876, during which time thirty-five stamps were in operation:

1875.	CORDS OF ORE CRUSHED.	OUNCES OF GOLD RETORT.
April	119	623
May }		
June }	319.3	1819.52
July }		
August	117.1	502.65
September	99.3	532.86
October	93.1	511.06
November	103.2	515.8
December	121.1	450.4
1876		
January	94.3	546.6
February	107	504.2
March }		
April }	363.3	1684.8
May }		
June }		
	<u>1539.25</u>	<u>7690.89</u>

This shows an average yield of 4.99 ounces of gold per cord of ore taken from mines all over Gilpin county, or of \$11.32 per ton. At \$17 per ounce, 7,690.89 ounces of gold would show a currency value of \$130,745.13. The mill, making no allowance for temporary stoppages, crushed an average of 3.38 cords or 25.35 tons per day, and turned out 16.90 ounces of gold retort, or \$287.35, during the same time. The mill is superintended by Theodore Wheeler, one of the best mill men in the country, and of many years' experience among the stamps and tables. It is owned by Wheeler & Randolph. With fifty stamps in operation the product is largely increased.

Potter has milled at Nevadaville continually since 1860. In 1869 he completed the Enterprise mill, with fifteen stamps, located at the head of the gulch. From July 1, 1869 to April 1, 1871, a period of twenty-one months, this turned out 4,800 ounces and three dwt. of gold retort, worth (counting at the low rate of \$16.67 per ounce) \$70,018.60. No record is obtainable for portions of subsequent years, having been destroyed with the mill July 24, 1874. From January to June 1872, the yield was 1,739 ounces, 6 dwt. For the year 1873, 2,124 ounces, 16 dwt. In 1874 up to July 24th, 684 ounces, 18 dwt, with about as much more of which the record is lost. This shows a total of 9,349 ounces and three dwt of gold retort, worth at \$16.67 per ounce, \$145,850.43, or \$158,935.60, at \$17.00 per ounce. The gold, of which no record is extant, would probably swell the amount turned out by this fifteen stamp mill in five years, to \$200,000. The ore came in lots, large and small, running from an ounce up to thirty ounces per cord, and from two hundred or more leads. The Forks lode had sixty-two and one quarter cords of ore crushed in 1869, that yielded five hundred and forty nine ounces and one dwt., or about nine ounces to the cord.

September 22, 1875, Mr. Potter began work in his present or new mill, and ran fifteen stamps up to about the beginning of the year. Then the capacity was increased to twenty-five stamps, with pans, etc., forming altogether one of the most complete and economical steam mills in the country. In three months

work with fifteen stamps, and in six months with twenty-five stamps, three hundred and thirteen and one half cords of ore were handled, and the yield of gold retort was 2,447 ounces, worth \$42,109. This came from three hundred lots of ore from over fifty different lodes or claims. Three cords of ore from the Jones returned one hundred and six ounces of gold or \$1,800, and one cord gave thirty-two ounces and two dwt. Other yields of twenty-six and twenty-eight ounces occurred.

The Enterprise mill, burned in 1874, was located in a ravine at the head of Nevada gulch. This was blocked with snow one winter so that no ore could be wheeled to the mill until a tunnel had been excavated through the huge snow drift. This tunnel under the snow, one hundred and forty feet long, furnished a roadway from January until May. A little back stopping was occasionally required to obviate the settling of the snow, but otherwise no work was required to keep a passage clear.

Among other stamp mills that have fine records in treating custom ores, is the Mellor mill, of twenty (five hundred-pound) stamps, located at the junction of North Clear Creek and Chase gulch. This was rebuilt in 1869 from the old mill of Kinkead & Hayes. Since then it has run night and day, with the exception of two or three temporary stoppages for repairs. In fourteen months ending December 1, 1875, seven hundred and twenty cords (5,040 tons), or sixty cords per month, were treated, yielding \$57,902.60. This

shows an average return of four and six sevenths ounces of gold per cord, or \$11.48 per ton. Two men are employed at night and two in the day beside the proprietor, who acts as the foreman. Every twenty-four hours \$7.50 worth of coal is consumed, as against a cord and half of wood previous to last year.

Henry W. Lake owns two mills at Black Hawk, one run by steam power on North Clear Creek, above Chase gulch, and a water mill just above the smelting works. The latter is not run during the winter months. Its fifteen stamps are employed by ore from the Field claim on the Bobtail. The steam mill was recently enlarged and improved and had five new stamps added, making twenty-five in all, of five hundred and fifty pounds each. The copper plated tables are eight feet long to which are attached composition and blanketed tables. There are three Bartola pans which are used on the more refractory ores. The stamps are kept in motion at the rate of thirty to thirty-two drops per minute, by a No. 7 Woodbury engine of twenty-five horse power, capable of running a forty stamp mill. The capacity of this mill is eighteen cords per week or three cords of ore daily.

The following is an accurate statement of the work and production of this mill for the year 1874, when it contained but twenty stamps. The main cause of the remarkable yield of the mill was that two-thirds of the ore came from the Ophir-Burroughs and Fisk lodes—the first of which gave the extremely large average yield of thirteen and fourteen ounces of gold

to the cord, while the Fisk usually gave from nine to thirteen ounces.

ORE TREATED:

1874.	CORDS	OZS	DWT	GRS
January	65	446	4	1 ¹
February	64½	462	17	5
March	61	570	5	13
April	61½	573	3	6
May	67¼	440	9	17
June	63	509	4	23
July	65¼	395	2	2 ²
August	52	422	3	2 ²
September	54½	489	16	21
October	61½	633	8	6
November	55¼	474	15	—
December	64¼	707	9	1 ²
	735	6130	1	14

At the common average value of \$17 per ounce these 6,130 ounces of gold show the mill's production in 1874, to have been \$104,211. Here is the extraordinary average yield for the entire seven hundred and thirty-five cords, or 5,880 tons of ore of over eight and one-third ounces per cord, or of \$17.72 per ton, allowing eight tons to the cord.

The Collom Dressing and Smelting Company has a large establishment on North Clear Creek, in Black Hawk, for the purchase, dressing and concentrating of ores which are eventually sent to the works at Golden for smelting. In 1874 this company bought the great Keith mill, remodded and enlarged it and placed the immense quantity of machinery therein, necessary for this (wet) concentrating process. But little work was done till April 1876, when the smelter was completed. Since then the establishment has been in operation

the greater portion of the time. The company was organized in Trenton, New Jersey, and has expended over \$60,000 here. Very good prices are paid for ores, and certain varieties have been made available which were not adapted to the stamp mill process and were too poor to pay for smelting until concentrated. About seventy tons of ore can be dressed here daily, but the works have been run up to their full capacity only a portion of the time. Prof. Behr and the Coloms, have charge. A success is said to be made of handling copper bearing gold ores and on lead ores. Quartz carrying zinc blende and some of the purer gold ores, are not as well adopted to the process, and do better in the stamp mills. These works have caused several large veins to be worked successfully that were losing concerns before.

Near the above are the West Smelting buildings, erected in 1870 but which did not prove successful. Recently tailings from the stamp mills have been purchased here for roasting and shipped to the Golden Smelting works, by superintendant West. For these tailings the assay value is paid, less \$22 per ton.

The Golden Smelting works have an ore purchasing agency and sampling works, at the Norton mill in Black Hawk. Their favorite class of ores is that carrying a high percentage of lead.

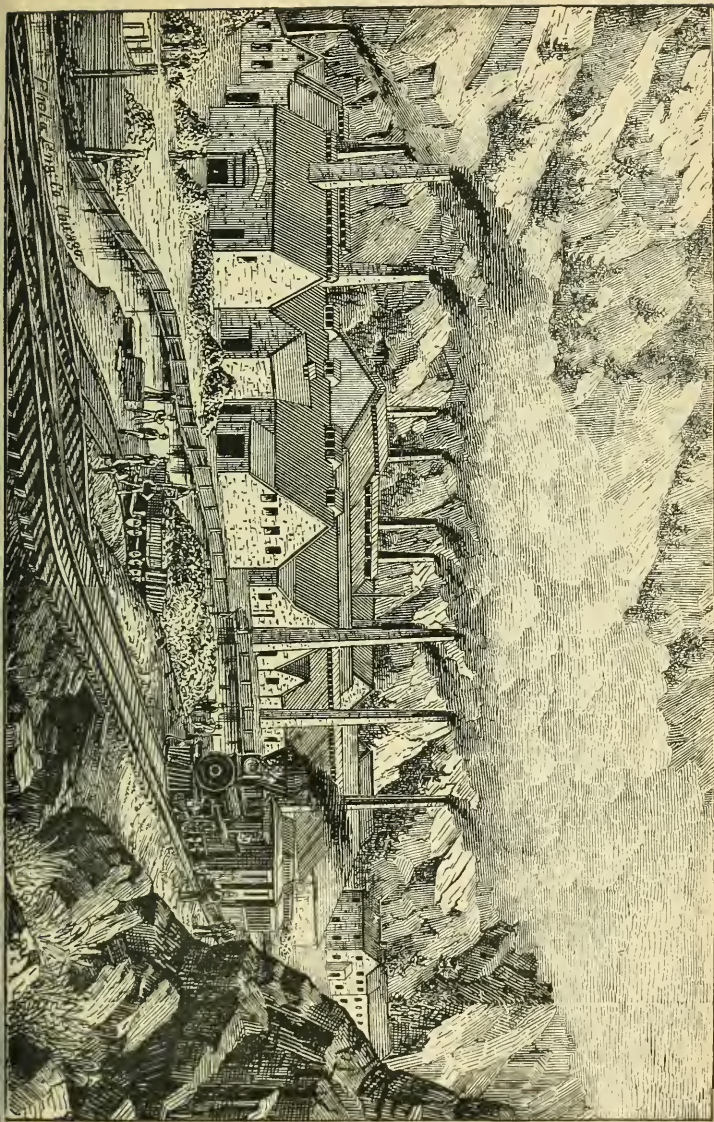
CHAPTER XX.

THE BOSTON AND COLORADO SMELTING WORKS.

The Champion Bullion Producer—Its Foundation and growth. Some account of the works. Full statement of production. Annual shipments \$2,000,000 per annum—thirty-six tons of pure Silver, and nearly one of Gold. Ninety-seven per cent.

The Boston and Colorado Smelting Works were established in 1867 by Prof. N. P. Hill, under whose management they are still successfully conducted. They are located beside North Clear creek, in the lower portion of Black Hawk, and one mile from Central. Additions and improvements have been successively made until they have no superior, if an equal, in America in mode of treatment, and in amount and character of bullion produced. They have proved of vast benefit to the miners in furnishing a ready cash market for the product of the mines. For the treatment of the more valuable ores of Gilpin county, this establishment is found indispensable, by reason of the much higher percentage of the precious metals saved than can be done at the stamp mills.

Ores are purchased from all parts of Colorado, the larger portion coming from the silver mines. Latterly the telluride mines of Boulder county have figured heavily in the purchases. The amount of money invested in newly-bought ores, tailings and ores in



process of treatment never falls below \$750,000. The capital paid-up stock of the company has lately been increased from \$500,000 to \$750,000, embracing 7,500 shares, valued at \$100 each. The resident manager of this grand establishment, including the branch works at Alma, is Prof. N. P. Hill, while Mr. Henry R. Wolcott has charge of the office business of the Company, and Mr. Richard Pearse superintends the metallurgical department.

Four acres of ground are occupied by the ore yards and necessary buildings. The latter include, beside the office and assay departments, nine groups of buildings used for storing ore, for the various furnaces, (of which there are seventeen for smelting and calcining) and the leaching and refining houses. Some of these are from 150 to 250 feet in length. A side track from the Colorado Central Railway extends into the yard, and trains loaded with ores arrive almost daily.

Since the commencement of the present year these works have had a capacity for treating fifty-three tons of ore daily. Ninety-four men are employed. \$15,000 are paid out monthly in about equal proportions for fuel and labor, and from \$125,000 to \$175,000 for ore. A brick building for gold and refining purposes was completed in January last, and more recently one for refining copper. The work of the former is done by a new method, the invention of Mr. Pearse. By this the company are enabled to part the metals so that the gold and copper are now shipped

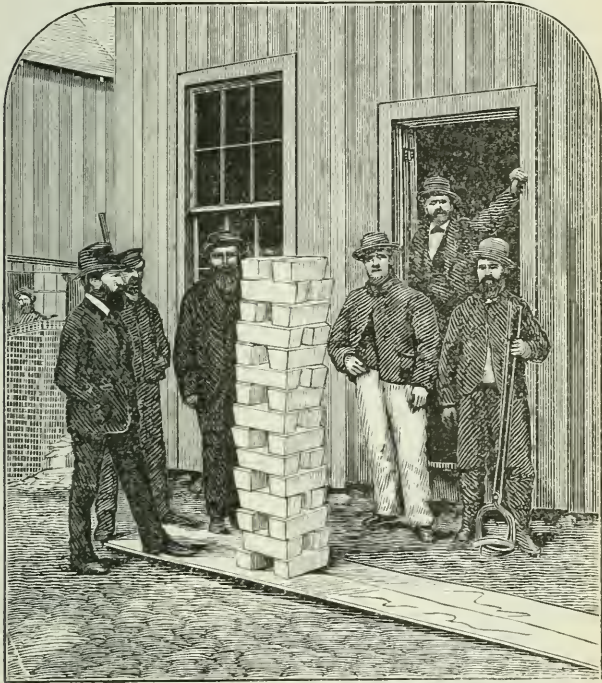
in the metallic state, instead of being forwarded to Boston in the form of matte for separation as formerly.

During the first quarter of 1876 eight gold bars, about 800 fine and of an average value of something over \$18,000 each, were sent away. The copper refinery turns out six tons of copper per diem, and is operated whenever a supply has accumulated—forty tons having been run out during a single week.

A new stone building 150 feet by 90, has recently been erected near the office to be used for storing ores, and another of smaller dimensions, containing machinery for ore crushing purposes. This contains a Blake crusher of the largest size, and a heavy set of Cornish rollers. These are designed to do all the crushing of the products of the works. The old machinery will be used exclusively for crushing custom ores so that no delay in this respect will hereafter be experienced by parties selling ores. All of the frame buildings except those used for smelting and calcining have been enclosed or supplanted by solid stone structures, and these as well as the frames and bricks are to be covered by iron roofs, rendering the place comparatively fire-proof.

The Alma branch works in Park county have been in successful operation over two years, are of twenty-five tons capacity, and the ores handled in 1875 turned out \$678,000. The matte is sent to the Black Hawk works for separating and refining. This concern was built, and was operated under the supervision of Henry R. Wolcott until January last, when the

present superintendent, Henry Williams, took charge. The value of gold produced at the Black Hawk works in 1875 was \$521,000, of copper \$70,000, and of silver \$1,353,000, making a total of \$1,947,000, as



BULLION SHIPMENT—A TON AND A QUARTER OF SILVER—VALUE \$45,000.

against \$1,638,877 in 1874, which was the best preceding year. The silver comprised about thirty-six tons of bright shining bars, absolutely pure (from 999

to 999½ fine) being probably the handsomest silver turned out by any ore reducing establishment in the country.

The following is the first detailed statement ever published by the company, and shows the amounts of gold, silver and copper obtained from the ores purchased from the various counties of Colorado.

The production of the Boston and Colorado Smelting Company for the year 1875, was as follows:

GILPIN COUNTY ORES.

Gold	\$357,000	
Silver	94,000	
Copper	51,000	\$502,000

CLEAR CREEK COUNTY ORES.

Gold	\$4,000	
Silver	438,000	442,000

PARK COUNTY ORES.

Gold	\$41,000	
Silver	618,000	
Copper	19,000	678,000

BOULDER COUNTY ORES.

Gold	113,000	
Silver	74,000	187,000

FREMONT COUNTY ORES.

Silver	126,000	126,000
Gold and Silver from San Juan and other sources, .		12,000

\$1,947,000

The above production was made with a capacity of forty tons daily, while the present capacity is fifty-three tons, and the works are always supplied with ores far ahead of their immediate needs. From this it will be seen that there is every probability that the

shipments of 1876 will exceed \$2,500,000. The first quarter of each year for various causes always shows a much smaller output than any other. During the three months ending April 1, 1876, the shipments amounted to \$460,445, of which \$311,445 was silver, and \$149,000 gold. A large amount of skilled labor is employed, for which liberal prices are paid, and the general management of the establishment has ever been of a character to ensure success. As has been stated before ninety-seven per cent. of the gold, silver and copper contained in the ores are saved. Purchases are made on a basis of a charge for treatment of not far from \$35 or \$45 per ton, according to the value of the ores. These terms are said to be more favorable than are obtained in similar establishments in other states and territories.

The following statement of the production of these works, by years, from the time they were established, appears in Cushman & Waterman's book, on the mines:

1868	\$ 270,886
1869	489,875
1870	652,329
1871	848,571
1872	999,954
1873	1,210,670
1874	1,638,877
1875	1,947,000
Total	\$8,058,162

CHAPTER XXI.

THE KING VEIN OF THE DISTRICT.

Its discovery and subsequent history—Over \$8,000,000 in Gold—The days of “sixty” and “sixty four,”—How fortunes were won and lost—Sales to Eastern Companies—\$1,000 a foot and \$1,000 a day—Threads of Gold and Tons of Bullion—A record of seventeen years—Present operations and Deep Mining.

The Gregory has been the most productive lode in Colorado and is probably the most widely known. Like most other veins in its vicinity, it is supposed to come from the Mammoth—its course diverging therefrom at an angle of forty-five degrees in a northerly direction. From Mammoth and Packard gulches it passes through Gregory hill and Gregory gulch through Bates hill, a distance of over 4,500 feet or possibly a mile. Only the central 2,340 feet have been well developed. Fifteen hundred feet of this have been pretty well worked out to a depth of five hundred feet and in some places to over six hundred. On the northeastern slope of Gregory hill is a parallel and branch vein of the lode known as the Foot and Simmons and further east is a similar vein called the Briggs. A granite wall, varying in width from a few feet up to seventy, separates the Briggs and the Gregory veins.

Clarence King, of California, in his excellent report

of 1870, says of this vein. "The country rock of the Gregory lode is generally similar to that of the Bob-tail—a granitic gneiss poor in mica, at other times abounding in that mineral, and having an appearance of mica schist. It frequently shows parallel bands or lines of structure, and of varied mineral compositions which usually dip flatly to the eastward. The walls are not very regular. Sometimes they are quite smooth and well defined, but usually there is little or no gange or selvage, and the removal of the vein matter near the wall leaves a ragged and uneven surface. Where the walls have been left standing they frequently scale off and fall in large pieces: sometimes bits of a highly micaceous character occur, which soften on exposure to the air, rendering the walls insecure. The distribution of the ore is variable occurring in seams of two or three inches to two or more feet with intervening bands of poor rock, and sometimes pinching out altogether, leaving the vein filled with barren matter, consisting of hard quartz and feldspar."

The discovery was made by the pioneer prospector John H. Gregory, on the sixth day of May 1859, being the first lode vein found in Colorado. The surface dirt was washed in the gulch by sluices, and was exceedingly rich. Gregory and five men took out \$942 in five days; Henderson & Co. \$607 in four days; Zegler, Spain & Co. \$2,400 in three weeks; Defrees & Co. \$2,080 in twelve days; Leper, Gridley & Co. \$1,000 in one day and Foot & Simmions \$300 in three days. These are only examples of what was done.

Gregory sold out his two hundred feet in two weeks. The remainder of the lode was preempted, portions of it were sold and resold and finally became the property of eastern companies in 1864.

Near the crest of Gregory hill is the Narragansett property—400 feet—composed of claims nine, ten, eleven and twelve. E. W. Henderson bought the latter in 1860 and sold it in 1864 for \$20,000, at the time Cofield bonded the four claims to sell them to the company. Joseph E. Bates and Lull sold No. 11 for \$50,000. This was the best, while No. 12 ranked next. Tuttle sold for the same figures. Eben Smith, was the most influential in raising the company, and became agent, took a large amount of stock and afterwards lost heavily by the operation. The sales were made June 8th and 28, 1864. Expensive hoisting works and costly stone buildings were erected over the mine. In 1868, the main shaft had reached a depth of 450 feet and is now about 550 feet deep. This portion of the lode has usually been unprofitable.

The Consolidated Gregory—500 feet—embraced claims four to eight inclusive. The Foot and Simmons vein now considered a part of the Gregory lode, lies close by and parallel to it. Of the first owners, Wilkes Defrees, had claims four and seven, and John H. Gregory, five and six. These properties changed hands several times. In 1860, John Bruce bought one-half of claim No. 4, of Mason and W. N. Dickerson bought the other half of Boswell. These purchasers made fortunes rapidly. The surface quartz

yielded at times \$400 per cord, and up to the beginning of 1864 they had taken out over \$200,000, of which sum, two thirds was profit. They then sold for \$50,000 each.

On the twenty-ninth day of May 1859, only thirty-three days after the discovery, E. W. Henderson and A. Gridley paid John H. Gregory \$21,000 for claims five and six. They cleared \$18,000 from washing the surface dirt that summer. Gregory had mined and prospected in California previously. He discovered the Bates and Gregory Second a few days after finding the Gregory, and was then hired by a party to prospect for lodes at \$200 per day. He is said to have returned to the states in September 1859, with \$30,000 in gold dust. He came back to Colorado in 1860, with a stamp mill, which he run a short time and then sold. He was an inveterate gambler and finally brought up in Montana, where he died poor, sometime prior to 1865.

Wilkes Defrees sold No. 7 to Leeper, Barber and Stanwell. Henderson & Gridley continued to work five and six until they came down to the pyrites of iron and then to the barren cap rock, when they, like many others after them, were surprised and disconcerted at their failure to save the gold. The vein seemed to them to have played out, as far as value was concerned. They did not give up in despair, however, as so many did in those days, but continued to work their property until they were able to obtain "pay" again. They sold portions of their claims

several times, but received some of it back again owing to the failure of the buyers to settle. Their two hundred feet of ground yielded \$24,000 in 1859, \$59,000 in 1860, and from the date of discovery to 1863 a total of \$100,000, worth of gold was sold to one bank alone.

At that time Pullman, now of Palace car fame, and James E. Lyon, late of Little Emma notoriety, were operating extensively in this district. They obtained possession of claims seven and eight, and one-half of six, and effected the sale of those and adjoining claims to the Consolidated Gregory Company, March 31, 1864, each claim owner receiving \$1,000 per foot. Henderson & Gridley received \$100,000 for No. 5, and Dodge \$50,000 for the west half of six, and Bruce and Dickerson sold as above stated, making with that of Pullman & Lyon five hundred feet in all. The property was then stocked for \$5,000,000, in New York, and the company began operations in May,, 1864, with James E. Lyon, as managing director and Benj. Rule as superintendent, while W. M. Rule, had charge of affairs in the mine. M. B. Hayes, was agent for several years and was succeeded by Henry Hannington in 1868 who had previously been in the company's service at the head office in New York. The latter had charge of affairs for five years. Lyon had completed some expensive smelting works at the toll gate in Black Hawk, in 1866, whose ruins can be seen to this day. They were a failure. In 1868, the company completed and started up their fifty stamp

mill at the same point, which is now operated by Richmond & Miller. The mine was not worked steadily, but was sometimes very rich. From the fall of 1867 to that of 1869 from forty to seventy men were employed, sixty tons of ore were raised daily yielding from two to twenty ounces per cord, or from \$5.00 to \$50.00 per ton, and assays gave at the rate of from \$10,000 to \$34,000 per ton. A streak of nearly pure gold was found extending from No. 4 into No. 5, for a distance of sixty feet, and as thick as ones finger. Quartz carrying lumps of pure gold were often found. In one month of 1867 a profit of \$14,000 was cleared. One of the largest shipments of gold and silver ever made from Central came from this mine in 1868. It weighed one hundred and fifty-two pounds and two ounces, and was worth in currency, over \$37,000. Some of the ore produced \$250 per ton, but the yield of the vein was very uneven, most of it running from \$4.00 to \$10.00. Probably \$250,000 was produced in two years, up to near the close of 1869. After that time owing to the shutting down of the Black Hawk mine, whose great pump kept these claims clear of water, mining was conducted on a much smaller scale and usually by leasers. The Briggs brothers will soon have their levels from the Briggs shaft run under this property, at a depth of from 800 to 1,000 feet.

What was formerly the Black Hawk property was by far the richest part of the Gregory in bygone years. It consisted of claims one, two and three west. C.

M. Zigler preempted No. 3 and C. M. Fiske and others the remainder. Subsequently other parties bought in. In 1860, Lee, Judd & Lee bought this three hundred feet, one-half of No. 1, being obtained from S. E. Miller. This ground paid well on the surface and at intervals below. In the fall of 1862, after passing through barren ground, an immense deposit or chimney of soft iron ore was found over two hundred feet down, which yielded enormously in gold. That fall each member of the firm received \$3,000 per month from the profits, after paying for mill sites, building, and constructing a large mill and flume thereto in Black Hawk. The vein was often twenty feet wide. In the following spring a dividend of \$120,000 was obtained, and still it continued to yield. Up to the spring of 1864, they had taken out \$500,000 with a profit for each man of over \$125,000. At that time Wm. L. Lee started for the states by coach and took a large leather carpet bag filled with gold retorts, some of them as large as a man's head and worth together nearly \$90,000. It was all that most men could do to carry or move it about. And yet in 1862, before "pay" was found, they would have sold their three hundred feet for \$6,000. Lee, Judd & Lee sold to the Black Hawk, Company April 8, 1864, taking stock of the company for pay. They disposed of some of this, but never realized much for their property. Total stock of the company, \$5,000,000. The purchase included two hundred and seventy-two feet on the Bobtail and many other claims, two mills etc.

Wm. L. Lee, who held a large amount of stock, was induced to become agent in 1866, when it was found that the first agent had run the company \$200,000 in debt. J. M. Marshall, took Lee's place for seven months in 1867. Lee threw up the position in 1869, when Geo. E. Congden took charge.

Early in 1860 J. S. and C. H. Briggs arrived in the gulch and bought 240 feet of the Gregory next east of the Black Hawk for \$1800 of Gregory and Reece. The usual profits were made on surface dirt. A part of this property was in the gulch itself, where the Briggs brothers owned a gulch claim. In working the latter they discovered another vein nearly parallel with the Gregory which they called the Briggs. This was in the summer of 1860. This is now known as a part of the great Gregory lode and extends into the New York and Colorado property.

In 1864 the Briggs brothers sold the property to the Briggs Company and bought it back again on a sheriff sale in 1868. The mine has usually been one of the most profitable in the country, and continued to make big dividends until 1870, when work was suspended and the Briggs Brothers went to the States, where they remained until 1873. The cause of this abandonment was the previous shutting down of the Black Hawk Company's mine, which contained the great pump that kept these veins free from water. The Briggs brothers endeavored to lease or purchase the pump or the mine, and after returning with powerful pumps of their own in 1873, freeing the Briggs from

water and resuming work, they finally effected a purchase of the very valuable Black Hawk claims for the small sum of \$40,000. The purchase was made from C. S. Jackson who had obtained possession after the property had passed into the hands of the bondholders.

At an early day Ben. Smith and D. S. Parmelee obtained three hundred feet of the Gregory in and west of the gulch. Here they tapped the Briggs vein. Some time before, the owner of the property had made several efforts to sell for \$1500 or less. After working the mine at times very successfully they formed a company in New York early in 1864, and Benj. Smith became the first agent, succeeded by Parmelee. In 1865 D. D. Belden became agent and held that position until succeeded by B. T. Wells early in 1869. Up to that time the company had taken out over \$500,000 worth of bullion. Probably over a quarter of a million dollars has been taken out since. The New York and Colorado company has succeeded the New York and the Smith and Parmelee companies.

About June, 1864, after the sale of the various properties to the companies, Messrs. Lee, Judd & Lee, Kinney and others who had sold, met together and figured up as nearly as possible the value of the gold that had been taken from the Gregory lode from the time of its discovery, a period of five years. The sum totals came very close to \$5,000,000! The five most productive parts of the Gregory lode have all been idle at intervals, and the remainder nearly all of the time. The longest stoppage was from 1869 to 1873-4,

the greater part of which time the Briggs and Black Hawk claims were idle, and the Consolidated Gregory and Smith & Parmelee partly so.

About two hundred and twenty men are employed on the Gregory lode, including the force engaged in running the two stamp mills, with a yield of seventy-five tons of ore daily, or 2,250 monthly, returning about \$20,000 or less than \$9 a ton, including all grades. The expenses of mining, hoisting and milling are \$5 per ton or under, being perhaps the lowest in the country. Three firms or companies have been at work for several years operating on the New York and Colorado (800 feet,) the Briggs (1,040 feet,) and the Naragansett (400) feet.

The New York and Colorado company owns and works the eight hundred feet on the Gregory and Briggs veins north-east of and adjoining the Briggs property. Directly over the six hundred and seventy foot shaft is a fine forty-stamp mill, with a powerful Cornish pump and hoisting works, all driven by an eighty-horse power engine. The shaft will be sunk to a depth of 900 or 1000 feet without delay so as to obtain stoping ground. From thirty to forty tons of ore are raised daily, giving a yield in 1875 of \$76,310.75 and for the three months ending April 1, 1876, \$18,180.51. B. T. Wells has been agent and manager since the beginning of 1869. Much money has been expended in improving the condition of the mine and mill, and in opening the former for extensive operations in the future. When this is accomplished

and the present lean body of ore is passed, good profits may be expected.

The Briggs brothers own the two hundred and forty feet known as the Briggs claims, and the three hundred feet formerly owned by the Black Hawk Company, and lease the five hundred feet once operated by the Consolidated Gregory company. Over the Briggs claims and shafts is a fine brick mill building containing powerful hoisting works, pumps, and fifty stamps (twenty-five having been added last year) with double issue batteries throughout. Here is the main shaft, over seven hundred and fifty feet deep, which is being driven down to attain a depth of 1,000 feet. It is forty feet long and ten wide. All of this ground is now worked by means of levels from the Briggs shaft, additional depth being gained thereby. The old shafts on these claims were from five hundred to five hundred and seventy-five feet deep. The great fifteen-inch pump placed in the Black Hawk pump shaft by Lee in 1868, keeps the mines clear of water.

The following will show how productive and profitable were the Briggs and Black Hawk claims at one time, notwithstanding it was in the era of high prices and heavy expenses. The cause of the disasters that finally overtook these and other companies, was that through mismanagement they had become involved, and their properties had been mortgaged—all due to the fact that the stock was non-assessable. In 1867 the Black Hawk company obtained 12,193 $\frac{3}{4}$ ounces of gold worth \$279,647.76 from about 12,000 tons of

ore, showing an average yield of \$23.30 per ton, with an outlay of \$194,425.63 or at a total average expense of \$11.43 per ton, or over double the cost at the present time. The pump then broke down and the water prevented further mining operations until a new and powerful pump was placed in the shaft. During the year ending July 1st, 1869, when the company closed business the yield was \$154,135.76, the outlay \$92,381.78, and the profit \$61,753.98. In four years and six months previous to 1869 the Black Hawk three hundred feet produced \$1,358,149. In four years and eleven months the Briggs two hundred and forty feet yielded \$534,615.

The consolidation of these properties reduced the expenses greatly and the outlays for mining and milling are probably a little less per ton than anywhere else. In one year's time three hundred feet of stoping ground, one thousand and forty feet long, will extend above the nine hundred-foot level. Nearly forty-five tons of ore are crushed in the mill daily, and a small quantity mined by tributors is treated elsewhere. The selected ore brings from forty to one hundred and fifty dollars per ton at the smelting works. The expenses attending each ton of ore are about as follows: Mining or breaking the ore, \$2; hoisting, fifty cents; milling, \$2; total, \$4.50. The average expenditures per month are about \$10,500, of which \$6,500 are paid for labor, \$4,000 for supplies, \$1,100 for coal, \$400 for powder, and \$200 for candles. Over one hundred and fifteen men are usually employed in the

mine and mill, and about fifty tons of ore are raised daily. Something like 18,250 tons of ore were milled or smelted during the year 1875, making the average for high and low grades, taken together, \$8.64 per ton. A large amount of two-ounce ore was broken down and milled that had been left standing in the mine years ago, because it would not then pay expenses.

Yield of the Briggs mine in 1875 :

Stamp mill ore	\$ 100,146.57
Smelters paid for ore	34,487.53
Total	\$ 134,634.10

The following figures will represent pretty fairly the yield of the Gregory for 1875 :

New York and Colorado	\$ 76,310.75
Briggs-Gregory, chiefly from the Briggs claims	134,634.10
Amount of gold in smelting ore over what was paid by smelter for the above, and tribute gold in Briggs, etc	25,000.00
Narragansett	25,000.00
Total yield for 1875	\$ 260,944.85

The following is something near a correct statement of the yield of the Gregory lode from its discovery down to the present time, a period of little over seventeen years :

Yield of the entire lode, as stated by Lee, Judd & Lee, and others, up to May 1864	\$ 5,000,000
Smith & Parmelee Co., to 1869	500,000
Smith & Parmelee and of New York Co., to the present time	300,000
Briggs mine, 1864 to 1869	534,615
Briggs mine since 1869	354,000
Black Hawk, 1864 to 1869	1,358,149
Black Hawk, since 1869	50,000
Consolidated Gregory, 1864 to the present time	350,000
Narragansett since 1864	125,000
	\$ 8,571,764

These figures are certainly not too high, some well-informed parties placing the total yield of the Gregory at \$10,000,000—and nearly all of this came from 1,340 feet of the lode in less than ten years of active mining operations. For the past two years the ore from the Gregory has been very poor in quality, but has lately been improving in the shaft and lower level. Since July much of the Briggs mineral has become exceedingly rich. The selected or richer ores have amounted to quite an extensive figure, and have been sold in three classes at or near one hundred and twenty-five, eighty and forty dollars, respectively, per ton. The mill ore will doubtless yield so much better in the future than in the past two years as to double the bullion product.

CHAPTER XXII.

THE BOBTAIL LODE.

How it got its name—A Golden Shower—How some tumbled into fortunes, and others out of them—The Companies—History of the Lode and its yield—The Bobtail Company—The Tunnel—Other parts of the Lode, etc.

THE Bobtail is one of the richest gold bearing lodes in Colorado, and has ranked next to the Gregory in production, \$4,000,000, at least, having been obtained from it. There was a period of three years in its history when its average yield per ton was greater than can be shown by any other gold vein for the same quantity of ore. It crops out on the northern slope of the hill of the same name, about five hundred feet above the level of Gregory gulch and street. The development and yield has been almost entirely confined to less than 1,000 feet in the Bobtail hill and ravine, between a kind of porphyry dyke on the west and the Sioux City lode on the east, both of which cross the vein. The lode continues, however, in either direction beyond these limits, and is being mined here and there by small forces of men. The Bobtail is claimed by many to be the east continuation of the Mammoth, both having nearly or quite the same direction.

The following names appear as original preemptors on this vein, originally called the Field or Bobtail.

B. O. Russell & Co., had No. 6; L. D. Crandall, No. 7; L. D. Crandall & Co., No. 3; W. F. Ross had four, J. A. Johns and R. Branch, three; W. F. Ross and N. Squires, eight; J. F. Fields, five. The names of Smith-ern, Thomas and Fay & Co., also appear. These were all on claims numbered east from the gulch.

Brownlee had No.'s 3 and 4 west. Most of the claims changed hands often in 1859-60, and generally for trifling figures. J. F. Field preempted claim No. 2, west. A large number of individuals recorded 2,000 feet of territory on the lode east of any claims above noted. Among them were D. S. Parmelee, J. S. Stone, D. D. Belden and W. N. Byers.

A relocation of the lode left claim number 4 with only seventy-two feet, as Field & Co. refused to move on so as to allow the claim to be a full one. Field and the Cottons divided, Field retaining thirty-three and one third feet, which he owns to this day. The Cottons sold to Ben. Smith and after a big yield Smith and Parmelee sold to Eb. Smith and J. B. Chaffee in 1862.

Before the relocation of the lode the Reem brothers of Iowa, owned a bobtailed ox, with which they were accustomed to haul the rich surface dirt, that lay scattered on the hill side, down to Gregory gulch, in beeves hides, to be washed in the sluices. John H. Gregory gave the lode the name of "Bobtail," from this ox and it has ever since retained it, although the earlier records gave it as the Field, or Bobtail. When the Reems thought they had exhausted the "pay dirt" they sold claims one to four west inclusive, to W. H.

Hurlbut, together with the historic ox, for a trifle. He sold No. 3 to B. O. Russell, in September, 1859, on time, and leased No. 1 to Walters. In two months Russell had taken out gold enough to pay \$500 for the claim and have \$1,200 to return to the "states" to winter on. Several lots of ore were crushed at the three stamp Prosser mill put up in October near claim No. 1 on the Gregory.

B. O. Russell and his partner Crandall, took the first quartz from the Bobtail vein itself. Walters worked all winter and took out a large quantity of dirt, but the cold weather prevented sluicing it until the opening of spring. Joseph W. Holman bought a half interest of numbers 2 and 4, in April, 1860, for a sack of flour and an old pistol. Just after that Walters began to sluice his pay dirt, which proved the value of the lode. It yielded \$11,500, the result of his winter's work. Hurlbut sold No. 1 to the Grinnell brothers. The surface dirt, or quartz, was extremely rich all along the lode for a distance of several hundred feet. Russell & Co., sold No. 6 to Hill & Armstrong, in the spring of 1860, for \$3,000. The following summer John Sensitivefer bought it of other parties and made money on it for a while.

In six months Holman purchased Hurlbut's interest for \$8,000. He then had claims two and three east, number 4 east and number 1 west. Afterwards Holman sold a claim to Lee, Judd & Lee, for \$4,000, they paying one half of the money down. After holding it a year or more, and being unable to pay for it,

they let Holman have the trade back. Afterwards this same ground paid immensely. The shaft had not been sunk deep enough. From 1859 to 1864, chiefly during the last twenty months of that period, Holman took out \$204,000, mainly from No. 2. This three hundred and seventy-two feet of ground with sixty-six and one-third feet beside, was then sold to the Bobtail company for \$292,000. So rich was the surface quartz and vein that miners on the Bobtail often obtained more gold from a single "clean up" than one of them could carry. Holman and Hurlbut have been seen with a sack of gold tied to a stick which they carried between them to the bank.

At first the true value of the lode was unknown. It was then considered no better than hundreds of others. Brownlee gave away one claim to J. F. Field, which the latter sold in after years (1864), for \$60,000. He sold his remaining ground for \$10,000 in 1862 and thought he had done a good thing. The lode was not generally paying well at that time. Soon after he left with Nuckolls' great mining expedition bound for the Salmon river and Bannock mines, of Idaho territory, and did not find his way back for ten years.

Many fortunes were were made by pre-emptors and early purchasers, and the mine was usually gouged out without care or method.

In the spring of 1860, D. G. Wilson brought a stamp mill from St. Louis and traded it for an interest in Russell & Crandall's claim No. 3. Two months after the vein closed up and no gold was obtained until

1861. Then for two years the yield was enormous. From a depth of sixty to two hundred and fifty feet below the surface there was no stop in the golden shower that fell to the lot of these fortunate miners. The vein was three and one half feet wide, mostly composed of ore that yielded hundreds of dollars per cord in stamp mills, and the amalgam often gathered so thick upon the tables that two "clean ups" were required per day. And yet it is said that but ten or fifteen per cent of the gold contained in the ore was saved by the rude and imperfect mills of that day—and unfortunately there were no smelting works then for the richer ores. Eighty dollars per cord were paid to one Hepburn for getting the ore out of the mine, and thirty dollars per day for the use of an eight stamp mill in Chase gulch. The owners would not touch any ore that yielded less than \$125 per cord, but allowed Hepburn to mine and mill that at his own expense and take the proceeds. The total yield in two years was several hundred thousand dollars. Crandall was so elated with his sudden wealth that he drank himself to death in less than a year.

Wilson disposed of his interest in the spring of 1862 and went off to the Salmon river mines. He mined, traveled and prospected over nearly the entire west and South America before his return to Colorado—which was in the fall of 1874. Russell sold to a Mr. Woods, in July, 1862, for \$3,250, Hale and Patterson having previously acquired a two-thirds interest. These three men sold to the Sterling company for \$280,000, in 1864.

The thirty-three and one third feet retained on No. 5, by Field, proved to be almost one perpendicular chimney of ore, and has yielded altogether something like \$500,000. It is reported that its owner retired to the states with \$400,000. It is now mined to a depth of five hundred and twenty-five feet, or seventy-five feet below the level of the tunnel. Ten cords of ore yielded \$5,000, and one cord \$1,800.

Sensenderfer had used up the money he obtained from No. 6 in "sinking in cap," and wanted more to make a trip to the states. Smith & Chaffee had become heavily involved in mining on the Clay County lode. They loaned Sensenderfer six hundred dollars for six months, getting the use of his mine for their money. Soon after, they passed through the barren ground and struck it enormously rich. They are said to have cleared thirty-five thousand dollars before his return, and in the meantime bought the adjoining sixty-six and two-thirds feet. Sensenderfer got his claim back and he is said to have obtained \$150,000 before he sold it, but to have realized little or nothing from the sale. Chaffee and Smith continued to work their claim and then formed a company upon it. They retired in 1864 with fifty thousand dollars each.

In 1864, eastern companies purchased most of the best developed part of the lode—the Bobtail Gold, in April and May, four hundred and thirty-three and one third feet; the Black Hawk, seventy-two feet, April 8; the Sensenderfer, one hundred and twenty-eight feet, June 25, the Brastow, sixty-six and two-thirds feet on

No. 5 east, December 20. At other dates the Trust and Sterling companies each purchased sixty-six and two-thirds feet. Each company worked through separate shafts, and the average depth of these in 1870, was five hundred feet. The limited extent of ground owned by each was a serious drawback to success, and resulted eventually in the sale of the properties of several companies. In 1872, most of the shaft houses along the line of the lode, were destroyed by fire together with a portion of the timbering in the shafts.

The Bobtail tunnel, that was long before started from Gregory gulch, was then driven forward to intersect the lode. It first intersected the Fiske lode five hundred and seventy-four feet in, and at last tapped the Bobtail 1,150 feet from the tunnel's mouth, and five hundred feet down on the vein. Mr. A. N. Rogers, who had acted as agent for the Bobtail Gold company since 1865, accomplished the great work in 1873, and then induced the heavier stockholders at the east, Messrs. Litchfield, Hoyt and others, and Mr. Chaffee, of Colorado, to favor the purchase by the company, of the Black Hawk mill and of the adjoining claims on the lode, and to proceed with the work of reopening the mine. In 1874, this company had secured with their original territory, nine hundred feet of continuous ground, less Field's thirty-three and one third feet, which divides the property; and in 1875, the vein had been opened so as to produce largely. But up to the present year so much "dead work," development and machinery had been necessary

together with the rebuilding of the Black Hawk mill, that the profits were small compared to what they are and will be in 1876-7. From thirty to forty per cent. of the gross receipts will probably be profit as soon as the mine is opened with shafts and levels as now contemplated.

The following will show the value of some of this property purchased. In the two years ending September 1st, 1868, the Sensitivefer one hundred and twenty-eight feet produced \$197,155, which was mined and milled at a cost of \$77,935, leaving a net profit of \$119,220, or of over 60 per cent. Ten dividends of \$10,000 each were paid previous to November, 1867. At that time mining, milling and other expenses footed up an average expense of \$18.30 per ton as against less than \$6 at the present time.

The Bobtail as consolidated under A. N. Rogers, has been worked through the tunnel, which has been driven in two directions along the line of the lode. The mine is worked out to the tunnel level or to a depth of five hundred feet, and the ore now comes from between that level and the one hundred and thirty-five foot level below. This is being run east and west along the vein. A double shaft is being driven near the centre of the property. Its size is six feet by sixteen, and cages and cars are to be used for hoisting ore. At present the ore is of rather low grade, averaging \$10 per ton after the more valuable mineral has been selected—say ten per cent. of the whole quantity.

The Black Hawk and Eagle mills were purchased in 1874, and last year the interior of the former was remodded and rebuilt with new stamps and machinery, making the largest and one of the best and most complete mills in Colorado. The number of stamps was increased to seventy-five, and three fine twenty-five horse power engines propel the same. For a year seventy-five stamps have been crushing Bob Tail ore, 1800 tons having been handled monthly. The yield of this company in 1875 was \$207,000, mostly obtained after May 1. Much ore was held in reserve until last summer for the water mills. In May, 1876, the Eagle and Sensitive mills (twenty stamps each) owned by the company, were started up, while twenty-five stamps were idle in the Black Hawk mill in June, when repairs were going on. Later—one hundred and fifteen stamps have been crushing 2,700 tons of ore monthly, the yield of September being \$25,000, beside \$6,000 received for smelting ore. Previous to July 1,800 tons of ore and from twenty to twenty-five thousand dollars was the amount of business done. In the month of March however, the total yield was \$26,200. The ore lately mined is richer than during last year, and the yield will be increased.

In the three months ending April 1st, 1876, the yield was \$68,050 or nearly \$23,000 a month. There is every reason to believe, now that the three mills are employed, that the product for the year ending May, 1877, will approach \$400,000.

Two ton cars, drawn by mules over the tunnel

track, convey the ore from the mine to the tunnel mouth, whence it is taken to the mills in wagons. At the junction of the tunnel with the mine are the engines, boilers and hoisting machinery, which have a capacity for operations of the largest scale. The boiler smoke stack passes up one of the old shafts, five hundred and twenty feet to daylight—the lower two hundred and fifty feet being of brick, and the upper portion of iron. Machine drills and Rand's electric blasting batteries are used in the mine. This company employs one hundred and sixty men.

Outside of the Bobtail Gold company's property more work is being done than for several years. H. W. Lake is again working his claim No. 2 west, where he had quit work on account of water, and for the purpose of putting in machinery, including an engine. The shaft is now four hundred and twenty-five feet deep. It was sunk for a distance of one hundred and forty feet through "cap," but has passed through low grade ore for the last seventy-five feet, which yields from four to five ounces and under. Owing to development and improvements made, the expenses have been heavier than they will be in future, but by running the ore in this water-mill the mine paid its way last year. Its yield in 1875 was \$12,800. Mr. Lake is now working the Field claim of thirty-three and one-third feet, which has a five foot vein of four or five ounce ore below the tunnel level, through which the ore is conveyed to daylight. Two and a half ounces pays expenses now that the ore is treated at the water-mill.

J. H. Lafrenz owns claim No. 8 east, which he bought of the Black Hawk company. After sinking two hundred and forty feet through "cap" he struck a fine body of ore near the close of last year, which produced nearly \$2,000 in a short time and is turning out much better now. Still further east Holman is working the Denmark, east 1,500 feet of the Bobtail vein, and is sinking a shaft to a depth of two hundred and fifty feet, to develop the property.

The following was the yield of the entire lode in 1875 :

Bobtail Company received for stamp mill gold and from the smelter	\$207,000
Actual yield of smelting ore, &c , over am't paid (estimated)	26,000
Lake's claim	12,800
La Frenz and others	1,900
	<hr style="width: 100%; border: 0.5px solid black;"/>
	\$247,700

The lode will probably double these figures for the year 1877.

West of the ravine, J. W. Holman has surveyed the course of the lode and claims to have the vein in the 1,500 feet of ground he has patented as the Cashier. The value, size and appearance of the crevice indicate it to be the extension of the Bobtail west. Here is a shaft one hundred and fifty feet deep, with a fifty foot drift to an air shaft. Two hundred and fifty cords of ore have yielded from two and one-third to nineteen and one-half ounces of gold to the cord.

CHAPTER XXIII.

THE BATES AND OTHER LODES.

*The Bates Lode—Remarkable yield of several Properties—
Other Lodes in the Eastern part of the District—German,
Fiske, Mammoth, Running, Central City, etc.*

THE Bates is one of the main veins of the country but has been worked only at intervals. It passes completely over Bates hill, across Gregory gulch on to Mammoth hill, where it is known as the Bates and Hunter and is probably identical with the German. It is owned and more or less developed for a distance of nearly a mile, and has given a total yield of about \$800,000. This amount was taken almost entirely from two or three properties on the lode, in four or five years time, the lode having been idle more than twice that length of time. The course of the vein is about northeast, being parallel to the Gregory, Gaston and Gregory Second.

The Bates was discovered by John H. Gregory, of the Gregory lode, May 19, 1859, and was the second lode found in the district. Captain Wm. H. Bates had obtained the services of Gregory, but recorded the claims as his own, and then deeded Gregory one-half of the two hundred feet which the law of that time allowed a discoverer.

In early days a rude kind of tramway, consisting of a track of three smooth poles was constructed from

scores of mines (located far up on the steep hill sides) on which the rich surface dirt was sent down to the gulches below in sacks deposited and fastened on beeves hides. There the dirt was panned, washed or sluiced and the gold obtained therefrom. From the surface workings of this lode, Captain Bates and Packard, often obtained from \$50 to \$75 from a flour sack full of dirt.

In 1863 and 1864, ten eastern companies bought and came into possession of parts of this lode. On the southeastern slope of the Bates hill, the Union Gold Company owns two hundred feet, the Bates and Baxter three hundred. The Rocky Mountain, owns two hundred and fifty feet. In the spring of 1864, E. K. Baxter, sold to the Baxter Company three hundred feet. Afterwards, when the company agents started up work, they got off of the crevice thirty feet, in sinking a distance of one hundred feet, and believing the mine was of no value abandoned work. It paid well when Baxter owned it. In the first three months of 1864, with only two drills at work, he took out \$40,000 at a cost of only \$20,000; \$28,000 being taken from one shaft, while the yield of January alone was \$16,333.

On the other slope of Bates hill is the Loker Company's property, four hundred feet, which in 1875 and '76, has been worked through a tunnel from Chase gulch by a party of leasers and has paid well. The southeastern part of the vein, ascending Mammoth hill takes the name of Bates and Hunter and is owned

as follows: J. H. Borham, two hundred feet, H. B. Morse, two hundred feet; Thos. I. Richmond, three hundred feet; T. H. Becker, four hundred feet; and the Susquehanna Company, or Rockwell & Co., three hundred feet. Parts of the lode have been worked at intervals, but none of it continuously for the past decade.

The two hundred feet bought by the Union Gold Company, (Nos. 1 and 2 west) had no vein or ore bodies of consequence near the surface as did other claims, and the shaft was sunk two hundred and fifty feet before any "pay" was struck. Then it proved enormously rich. The average width of the vein is five or six feet, but it varies from two to twenty feet, carrying ore that mills from four to twenty ounces per cord, or from \$10 to \$50 per ton, while the picked ore, sells to the smelter at from \$50 to \$300 per ton. Between the two hundred and fifty and three hundred foot level, the deepest point of the mine then reached, \$500,000 was obtained, and \$205,000 of this came out in sixteen consecutive months of 1866. Owing to company difficulties the mine has remained idle nearly all of the time for the past six years, although immense masses of rich ore were left standing in the mine. The mine was leased in January, 1876, since when the shaft has been sunk seventy feet, being now four hundred and twenty feet deep, with rich ore in the bottom. The writer has recently seen an offer of \$240 per ton for the smelting ore. Colorado has few veins as good as this.

The Rocky Mountain Company sunk their shaft nearly four hundred feet, and put up expensive buildings and machinery, but were not very successful. The Borham property has yielded altogether \$150,000 of which \$100,000 came out in ten months of 1868. This mine is now three hundred and fifty feet deep, and is worked on a small scale. Other properties have been opened to various depths.

The German lode is evidently the extension southwest of the Bates-Hunter. It is worked in three adjoining places and yields a fair profit. A shaft near the east end, or the Bates-Hunter, has been deepened over one hundred feet lately. This shows a very rich ore body. Further west are eight hundred and fifteen feet of ground owned by the Susquehanna Company, and worked under lease by Nichols and Rowe. Deepest workings two to three hundred feet. Beyond this, is four hundred and eighty-five feet of territory owned and worked by the Kline brothers, who have a fine four foot vein in the two hundred and fifty foot shaft. In a period of two years this lode yielded 3,900 tons of ore and 8,775 ounces of gold, worth \$166,825 or an average of \$42 per ton.

The Fiske lode, is situated on Bobtail hill, and is intersected by the Bobtail tunnel, five hundred and seventy-four feet from the mouth of the latter and at a depth of two hundred and seventy-five feet. It is owned by a number of companies and individuals, and at one time and another has yielded a large amount of gold. Since May 1873, George W. Mabee has

leased the property from a company and worked it to a depth of four hundred and forty feet, or one hundred and sixty-five feet below the tunnel level. For over a year he has made no use of the tunnel, but has hoisted the ore to the surface on the hill side. In twenty months, ending January 1, 1875, this mine is said to have yielded \$67,000. The average expenses of mining and milling were \$12.86 per ton, and the average yield was \$21.38, for mill ore, and \$124.63 for smelting ore. Since then the yield of the mine is said to have been greater and the expenses smaller. The current expenses are usually large by reason of the vein being narrow and the rock very hard.

J. W. Holman, has patented 1,500 feet on the Fiske vein, commencing at No. 13, and extending east, under the name of the Sleepy Hollow, on which numerous shafts have been sunk. A party of Cornishmen are working claim No. 12, next to Mabee with great profit. John Rank owns No. 13 east, and Holman's property extends from there, over and down Bobtail hill into Black Hawk.

The Smith lode, crosses the sharp rocky ridge between Chase and North Clear creek gulches. It is thought to be a continuation of the Buell and Gregory Second. The part opened to any extent, is now leased and worked by Wm. Lindsley, and has one shaft one hundred and twenty feet deep, and has been worked out thirty feet on each side to a depth of twenty-five feet. The crevice is from five to fourteen feet wide, and the yield of the ore crushed in the

stamp mills has been unusually large, averaging six and one-half ounces or \$134.55 per cord. The yield from this limited development has been \$31,000.

On Mammoth hill are the Mountain City and the Cashier lodes. The former produced from two men's work \$5,000 in 1875. The ore was of very fair quality. The Cashier is owned by J. W. Holman. In sinking a shaft ninety feet \$4,120 were obtained besides what was paid for very rich smelting ore. Near by is the Treasure owned by Holman & Co. Shaft fifty-five feet deep covered by a building eighteen by twenty-two feet. This vein is five feet wide, largely composed of ore yielding seven ounces. The propertay is a relocation.

The First Centennial is situated on the south side of Chase gulch, a half mile above Black Hawk. It is owned by L. C. Miley and R. S. Haight, and has five shafts. The vein is very large and yields from twenty to sixty dollars per ton.

There are a number of lodes that have produced largely on the surface, or at some time of their history but have been nearly or entirely idle for years. Their pay veins, or pockets, had given out, and their owners or those who purchased them, were either afraid or had not the money to sink down upon them. Fortunes were made from several of these.

The Gaston, on Bates hill, was immensely rich on the surface. On the north side of Chase gulch is the Maryland, now owned for a length of three thousand feet, by T. H. Becker. The original owners took

from the soft surface material of this lode by washing, in one month in 1859 and two months in 1860, the snug little sum of \$42,000. They then came down to the "iron" and that stopped them, as it did everyone in the early days. Now almost the entire dependence of the country, it was then the signal to quit work. "Iron" is the term applied by the miners to the common gold ore of this district.

The Casto, on Casto hill, was one immense pocket of surface quartz spangled and glittering with gold—but this was exhausted in time, although parts of the vein are still being worked. The Sullivan, or Ute, the Spinney, and Justice, are examples of this surprisingly rich surface material and are to-day enriching their owners.

The Gregory Second, on Bates hill, is evidently the west extension of the Leavitt. It is owned by various companies and individuals and has been worked at intervals ever since its discovery in 1859. The Havilah company own the best developed part. Sam. Mellor, and others, have worked this to a depth of four hundred feet.

The Running lode extends over Bobtail hill, down to the vicinity of the Black Hawk depot. It is a large vein and usually quite rich in lead, but carrying a fair quantity of gold. It is owned by Commodore Rodney French, the hero of the "Stone Fleet" sunk in Charleston harbor, in 1861. He personally operated the mine some years ago. At present it is worked under lease and is paying well.

The Mammoth extends along Mammoth hill in an east and west direction from near the western terminus of the Bobtail, for a distance of nearly 3,000 feet. Further west in a line with this lode, after crossing Spring gulch into Quartz hill we have the Borton, Roderick Dhu, Gardner, Illinois, Egyptian, California, Kent County, and others, some of which may be continuations of the same vein. The Mammoth is a vein of immense size, but much of the ore is of low grade. With proper management or with the outlay of a small amount of capital for development and putting the mine in shape, this may yet prove one of the most profitable pieces of property in the country. Previous to 1875 but little work had been done upon it for several years. One leaser is said to have cleared \$10,000 last year on one claim, and others on one part of the Morse property are now taking out large amounts of ore from a depth of sixty feet, where the crevice is from five to twelve feet wide, with an average value of about \$9 per ton. H. B. Morse owns 1,500 feet, most of it lying together near the centre of the lode. There is one shaft over four hundred feet deep on this property, but no work has been done there lately. There are several owners to other parts of this lode, which was preempted in the "early days" for a distance of 3,000 feet.

On Central City hill are the Bugher and Bull of the Woods lodes, owned and worked by Joseph Hafer & Co. Over 2,000 tons from the former yielded at the rate of \$12,50 per ton. The latter has much more valuable ore.

The Central City lode owned by Dr. A. A. Smith, and discovered in 1860 has a northeast and southwest direction, and the main shaft is situated just above the corner of Spring and Gregory streets, and above the City buildings. Some work was done on this lode in 1872, but the "gouge" only was taken out, leaving the main body of ore standing on the foot wall. This was not known then, and work was stopped, and the mine left idle. In May, 1876, Nichols, Peers & Co. leased the lode (eight hundred feet.) Their first shot was fired in the "gouge" lying against the south wall, and the result was the discovery of the main vein or ore body, which is of unusual size. This was at a depth of one hundred and forty feet. As far as drifted the crevice has been eight feet wide—all paying ore. Less than ten tons of rock has been found that was poor enough to throw away, while four hundred and fifty tons of ore were sold or treated during the months of May and June. The ore is of low grade, but the great quantity is what renders the mine so profitable. A few cords of ore were crushed in stamp mills, yielding from two to three and-a-half ounces of gold and over to the cord. Nearly the entire product has been sold to the Collom Dressing and Concentrating works, and afterwards smelted at Golden. This establishment buys the ore and has paid from \$3.20 to \$5.60 per ton. It costs \$1.50 per ton to mine and raise the ore, and less than seventy-five cents to transport it to the selling point. The receipts for the two months were about \$1,890 and expenses \$1,000, leaving a

profit of \$890. The yield can be made much larger now that the mine is getting opened so as to admit of a larger force. Of course the smelting works obtained several thousands of dollars from the above ore. The ore carries iron pyrites and some streaks of lead are becoming visible, making it average about eight and a-half tons to the cord. Sinking and drifting are going on steadily, and the yield of July has been from seventy to one hundred tons of ore per week. The vein is eight or nine feet wide. The mine has maintained its previous yield for the past three months and shows no signs of giving out.

CHAPTER XXIV.

THE BUELL AND THE O. K. MINES.

One of the Treasure vaults of Gilpin—A Mine beneath the City—What has been done there—The Buell mine and mill—The O. K. lode—Systematic and intelligent mining—A store house of ore.

THE Buell mine, one of the largest and most valuable in Gilpin county, is owned by Bela S. Buell, and has produced altogether nearly \$1,000,000. It comprises the Leavitt, Vasa (U. P. R.), its extension west, and the Kip, connecting with the Leavitt at an angle of twenty-five degrees. Here are five thousand feet of veins, twenty-four hundred feet of which are covered by United States patents. Nine shafts have been sunk upon the property, four of which are working shafts, varying in depth from two hundred and twenty to five hundred and sixty feet, and opening up the ground for a length of two thousand feet. The mine is opened and timbered in first-class shape and has three sets of hoisting works. It is located in the very heart of Central.

The Leavitt vein extends under and across Gregory gulch southwesterly into Mammoth hill, and at length becomes the Vasa, and eventually the O. K. In the opposite direction it passes through Bates hill under the name of the Gregory Second, and is probably identical with the Smith, on the eastern side of Chase

gulch. Like the Gregory and Bobtail, the vein is of unusual size, having an average width of from six to eight feet, but is often fifteen or twenty feet wide. But little work was done on it until 1871.

At that time the mine began to yield largely, and after it had been opened extensively, and furnished with powerful hoisting works, it equalled, and at times surpassed in production, any other property. In four years Buell obtained therefrom between \$500,000 and \$600,000. This was obtained from four hundred feet of ground, in the centre of which is the main shaft, worked down to a depth of five hundred feet. There are over four thousand feet of levels, run at a distance of fifty feet one below another. Forty-five tons of ore were mined, hoisted and crushed daily, with an average yield of ten dollars per ton. A large quantity of ore was sold to the smelting works for over one hundred dollars per ton, indicating a value of one hundred and fifty dollars. The Leavitt vein carries a kind of silicious feldspathic rock that is mined very cheaply. The usual cost of running levels has been five dollars per foot, and of stoping, fifteen dollars per fathom, which is much less than with most mines. Sinking the main shaft formerly cost fifty dollars per foot but now costs thirty-five dollars. The ore is mined, hoisted and milled at the small expense of five dollars per ton. Mining the ore costs two dollars and fifty cents, hoisting, fifty cents, and milling two dollars. The mine and mill have usually given employment to one hundred men.

The writer has obtained the exact figures of receipts and expenses for a portion of 1872 and for 1873. They will show the reduction that has taken place in the cost of mining, and to some extent the capacity of the mine when it was opened only to a limited extent. The yield for the last eight months of 1872, was 7,917 tons of ore, for which \$105,185.98 were received, being a yield of \$13.28 per ton, including two hundred and three tons of smelting ore, at \$112 per ton. The outlays per ton were \$7.07 for mining, \$3.19 for milling, and twenty-three cents for incidentals, or a total of \$10.49 per ton, or of \$83,443.49 in all, leaving a profit of \$21,742.49, or \$2.79 per ton. In 1873 the mine was shut down one month owing to the miners' strike, leaving but eleven months of actual work. There were 14,850 tons of ore mined including the smelting ore, which usually sold for \$100, but occasionally for \$200. The returns were \$143,706.86, or at the rate of \$9.67 per ton, with a profit of \$3.16 per ton. The expenses were \$96,822; profits \$46,878.86. The outlays per ton were, for mining, \$4.25, hauling, fifty cents, milling, \$1.60, incidentals, seventeen cents, or a total of \$6.52. This is a reduction of \$3.97 per ton over the cost of the preceding year, or of nearly forty per cent. More recently expenses of all kinds have been cut down to five dollars per ton, while the ore yields as ever, and as soon as contemplated development is accomplished, the total cost of mining, milling and hoisting may be reduced to four dollars per ton, which will leave a wide margin for profits.

In some portions of the property ore is now being mined and raised for \$1.25 per ton. The amount of coal used for the mill and hoisting works is about one ton of coal to twelve tons of ore mined and milled, or four tons per day, at a cost of \$5.25 per ton.

After considerable time and expense, Mr. Buell succeeded in consolidating the Leavitt, Vasa and Kip, as one property. The latter mines are located further up the (Mammoth) hill. On the Vasa is one shaft two hundred and sixty feet and another two hundred and fifty feet deep, the latter being the old U. P. R. shaft. In eighteen months this property produced nearly seven thousand tons of ore, worth \$18 per ton. The vein at this point is usually from three to six feet wide. On the Kip, which comprises twelve hundred feet of territory, are two shafts two hundred and sixty and two hundred and twenty feet deep, respectively, with levels from one hundred to three hundred feet long. This vein almost compares with the Leavitt, being from four to eight feet wide, and occasionally from fifteen to twenty, with mill ore yielding from \$8.00 to \$20.00 per ton, and smelting ore that assays \$100.00. There are nearly two thousand feet of levels in the Kip and Vasa. The latter has one level (one hundred and ten feet deep), which is six hundred feet long.

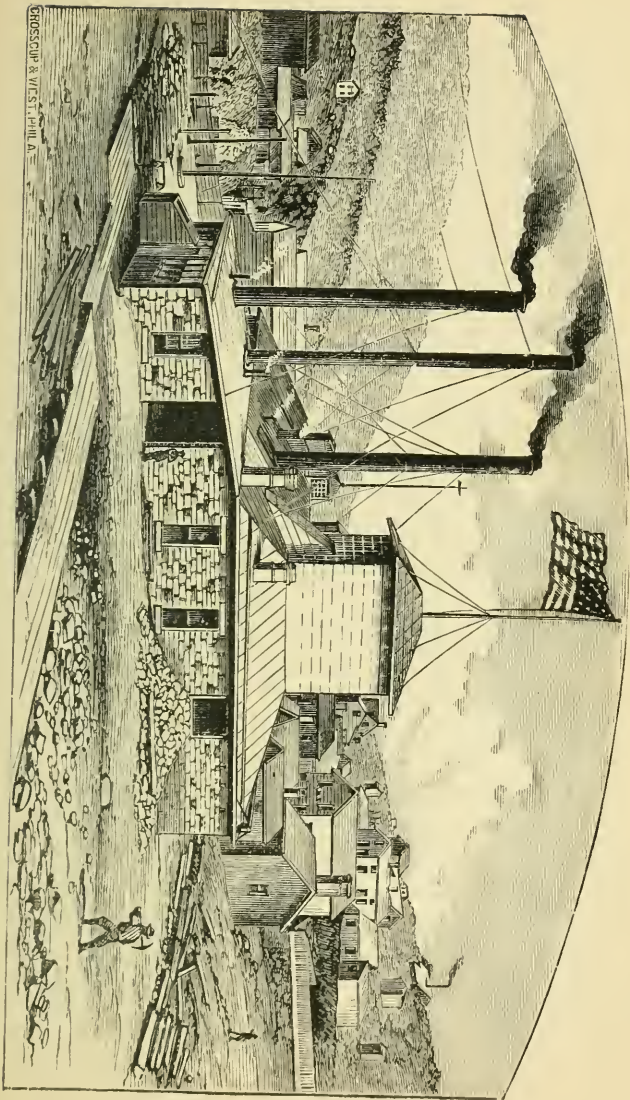
The mill site is in Gregory gulch and beside the main street intersecting Central and Black Hawk, and comprises 67,500 square feet of ground. On this stands the massive fire-proof stone building containing

the stamp mill and hoisting works, machine shop and blacksmith shops. It is one hundred and thirty-five feet in length and varies in width from fifty to one hundred feet. The mill—one of the finest in the country—contains sixty stamps, one half of which weigh five hundred pounds each, and the remainder six hundred and fifty pounds each. The lighter stamps are run at the rate of thirty drops per minute, and the heavier ones at twenty-five drops per minute. The mill contains four sections, each having three five-stamp batteries, in front of which extends a track eight feet above the floor, from which the ore is dumped from cars as it comes from the mine. On the opposite side of the stamps a copper plated table eight feet long by five feet wide, is attached to each battery, succeeded by another set of tables, or sluices where California blankets are used to save what has failed to amalgamate on the copper plates. There are six large Freiberg pans that are next brought into requisition to save what has escaped the previous treatment, and the washings of the blankets are deposited in them every half hour. From sixty to seventy per cent. of the assay value is saved. The entire machinery of the mill is run by an eighty-horse power engine and the steam is supplied by three tubular and two five-flue boilers.

The powerful hoisting works, capable of raising upwards of one hundred and fifty tons of ore daily, and of sustaining a strain of 40,000 pounds, and having no superior in the district, occupy the western por-

tion of the building. Below is the main shaft five hundred and sixty feet deep and steadily growing deeper. A depth of 1,000 feet will be attained before sinking will be discontinued, which would give a depth on the Kip of 1,300 feet. The entire property will be worked from this shaft by levels. The hoisting machinery is run by a seventy-horse power vertical double-cylinder engine. The main shaft (which is perpendicular) is timbered in the most substantial manner, and is divided into three compartments. Two of these are arranged for safety cages, on which iron cars containing one ton of ore can be raised—one ascending as the other descends. Upon reaching the surface or mouth of the shaft these cars are placed on the track, run forward to the batteries and emptied. The same car is then returned to the bottom of the shaft and run upon the tracks, starting from that point on through the subterranean levels, to that part of the mine where needed, when the same operation is repeated. The steam and water pipes connecting with the pumps are located in the other department of the shaft. The mine is kept clear of water by two of Knowles steam pumps, one at the three hundred and one at the five hundred foot level. They are capable of throwing one hundred gallons of water per minute a distance of five hundred feet—although the mine makes but twenty-five gallons per minute. Another larger pump of the same manufacture is being put in below the others.

Outside of the mill are huge reservoirs and settling



CHROSSCUP & WEST, PHILA.

THE BUELL MINE AND MILL.

tanks for retaining water, so that it can be used over and over again. Without them the water supply would be too limited. They have a capacity of 500,000 gallons. With the ample water power that the completion of the Consolidated Ditch enterprise would ensure, expenses would be so reduced that the annual profits of the Buell mine would be increased many thousands of dollars.

Near the mill building are the office, storerooms and assay office of the mine. The Territorial assayer, Mr. Gray, makes his headquarters here.

The total cost of the mill, hoisting machinery and other surface improvements completed in 1874 was over \$100,000, and this came from the profits of the mine in three years time. The total outlay for sinking the main shaft—seven feet wide by fifteen long—has been reduced to \$35 per foot. Another year will see the entire mine opened up so that it will produce far more extensively than at any previous time.

The O. K. lode is a continuation on the west of the great Buell or Leavitt vein. The principal workings have been opened since November, 1875. One of the shafts was then covered by a large substantial shaft house in which a California whim for hoisting was placed. This shaft has since been deepened from forty feet to three hundred and thirty, and is daily getting deeper. Recently steam power became necessary for hoisting, and a thirty-horse power engine works &c., supplanted whim or horse power. The mine is being opened by a number of levels. Not long ago the

forty-five foot and the two hundred and twenty-five foot levels had been run about fifty feet in each direction from the shaft. That run at a depth of one hundred and thirteen feet was one hundred and twenty feet long. Nearer the bottom of the shaft are other drifts. It has been the purpose of the owner to thoroughly open the mine before taking out any ore except what must be removed in sinking and drifting. Consequently a very large mass of ore remains in the mine ready to be broken in the future.

Few mines have been as systematically operated from the beginning, and the good judgment displayed will tell most satisfactorily hereafter. For a time the vein maintained a width of from two to three feet, but more recently it has increased to four. Most of the ore milled six ounces per cord, or \$15 per ton, after a quantity had been selected that the smelter paid from \$30 to \$90 per ton for. Various lots of ore have been sold to the different smelters. Collom paid from \$15 to \$17 per ton for much of the common vein matter which he afterwards concentrated. It contained eleven per cent. of copper. From ten to twenty tons are mined daily. A vein of solid ore of this description and having a width of four feet is not often met with and proves extremely profitable. Fifteen men are employed and more will be. There will be no water of any consequence until a depth of one thousand feet is attained, as the Buell and Gregory drain this crevice. This property, 1,500 feet in length, is owned by

James W. Hanna, who has secured a government patent thereon. It is considered one of the best lodes of Gilpin county, and its yield has shown that there are good things still to be found outside of the deep mines.

CHAPTER XXV.

THE GUNNELL LODE AND THE WHITING.

Story of the Gunnell and its early Operators—How Fortunes were made—Big pay and Big Sales—Disasters of the Companies—What has been accomplished by Gilpin County Miners—A Big Bonanza—Enormous Profits—The Whiting—Is it the main Vein?—Satisfaction

THE Gunnell lode, so justly celebrated in former years, is again one of the main supports of Gilpin county, and bids fair to realize dreams as extravagant as those of its original owners. A portion of it was brought into condition this year to yield more gold than the entire vein did in its palmyest days, while the remainder is being put in shape for future operations. The vein has been opened and is now worked for the distance of a mile.

Among the thousands who drifted westward to this land of gold in search of a fortune in 1859, was a New York boy by the name of Harry Gunnell, who had previously followed the avocation of a clerk. He knew nothing of mining or prospecting, but was kindly shown how to search for lodes by a newly made friend. Like hundreds of others, he started out over the hills that surrounded Central, and soon found what has since proved to be one of the great fissure veins of the country, and to which he gave his name. The

yield of the Gunnell has been second only to those of the Gregory and Bobtail. The surface quartz was extremely valuable, and the lucky finder, after three years of very successful mining, sold the two hundred feet, to which he was entitled by right of discovery, for \$40,000. The remaining claims on the lode, were taken up by numerous other parties. Some of them secured one hundred feet, while one preemptor obtained but eighteen inches and another seven feet.

At the time of high prices, wild speculation and ready sales in 1863-65, almost the whole lode was sold to various companies at the east, the entire purchase money aggregating \$800,000, and then the property was stocked for millions. Harry, like so many others who have suddenly acquired wealth, could not stand prosperity, but squandered his snug little pile of \$40,000 and died poor, but never envious of those whose fortunes he had been the cause of making.

During these years surpassingly rich ore had been mined from the Gunnell. On what is now known as the University and Coleman claims, it was no unusual thing to obtain \$100 worth of gold from a single pan full of dirt, and to receive hundreds of dollars from a single cord of ore. Gunnell discovered the vein on the eastern part of what is now known as the Gunnell Gold property. The surface dirt and quartz, was extremely rich, and several parties retired with a competence.

Among the memorable characters connected with this lode in the early days was a kind genial gentle-

man from Wisconsin, named Doe, who, like many others walked into the country with his pack upon his back. "Fifty-niners" may remember a sermon he preached on the Sabbath after his arrival, on the point of rocks near what is now the heart of Central. Several hundred men gathered to listen to the eloquent speaker who was then called Reverend. His exhortations to his fellow gold hunters to follow the paths of truth and righteousness, and the vivid pictures he drew of the far off homes they had left behind them, brought tears to the eyes of many of his hearers. He closed by inviting them to visit his tent that evening to hear another sermon. A number put in an appearance but somehow the discourse that night proved to be a social game of "Twenty one," and Doe's earnings therefrom enabled him to buy a claim on the newly found Gunnell, which he mined with great profit. He afterwards gallantly led a Wisconsin regiment in the war of the rebellion, and in course of time, resigned and returned to Colorado to work his mine, which he subsequently sold for \$100,000.

The following are the names of the original pre-emptors on the main part of the Gunnell proper; besides Harry Gunnell east of discovery, J. F. Baily, and D. McLeod, had claim No. 1, (one hundred feet,) C. Cooper & Co., No. 2, David J. Sanders, No. 3, J. B. Percy, had eight feet, and C. L. Malory fifteen feet, Chase, Sewry, and Morey, had nearly three hundred feet, A. P. Wright et al, had claims one to five west, inclusive, five hundred feet, Getz and Bashore and

afterwards C. Cooper & Co., had No. 6, west of discovery, and W. C. Simpson & Co., had seven to eleven west inclusive. Among the owners of the first and earlier years who mined extensively were A. P. Wright, Col. W. H. Doe, John Ralfe, John Scudder, John H. Hense, Alexander and Coleman. James White, obtained in the earlier years, twenty-six feet, through a loan of \$3,000. From that day to this he has allowed any one to mine it who chose; they to keep all they made.

Among the companies organized at the east, on this lode, was the Central Gold Mining Company, which bought two hundred feet on the eastern part of the vein, of John Armor, W. H. Russell, and John Scudder, for \$80,000 and paid the money down.

The Gunnell Gold Company purchased four hundred feet of A. P. Wright, W. H. Dodge and Warren Hussey, for \$300,000, March 16, 1864. Before the sale was effected, a request came from New York, to extend the time for which the property was bonded another month. At a meeting of the owners in Hussey's bank, much opposition was displayed to this proposition until Doe entered the bank with an immense gold retort, the result of the last mill run. Then the time was very readily given. That month \$40,000 were obtained from the mine, more than half of which was profit.

In those times the richest part of the lode and the largest profits were made on what are now the University and Coleman properties, and the entire Gunnell

vein yielded not far from \$500,000, up to 1864. June 21, 1864, the University Company paid Otis and Wilson \$40,000, for one hundred and thirty-two feet. Coleman sold one hundred and fifty-five feet to the Coleman Company for \$70,000. It paid \$10,000 down, but never delivered the remainder. J. H. Hense, sold No. 7 west. Kimber has No. 8, and G. W. Gorsline, has Nos. 9, 10 and 11.

The following are the present owners of the Gunnell proper, beginning at the eastern end:

	FEET.
Central Gold Mining Company	200
University Company	143
Coleman	155
Gunnell Central Company (property divided,)	200
Sweetzer	25
James White	26
W. M. Roworth	50
Cook Company, of Boston	50
Gunnell Gold, recently purchased by Kimber, Fullerton, Mackay, Moseley and Clinton	485
Little Gunnell Company, or J. V. Kimber	200

West of here comes the enormously rich Grand Army Gunnell, and to the east of the first named company are the Sayer and Scudder properties.

The first agent of the Gunnell Gold company was General Fitz John Porter. He received a salary of \$15,000 per annum, and had a full staff of high-priced clerks and subalterns. A large stone mill was built in Black Hawk under his supervision, but its costly machinery, that came across the plains at enormous expense during the Indian blockade of 1864, was never set in motion. The only use the building was ever put to was as the depot and general freight and

ware house of the Colorado Central Railway, for which purpose it is now occupied. Porter shipped east \$109,000 from the mine during the year ending July 1, 1865. John B. Fitzpatrick succeeded Porter, and shipped \$482,000 worth of gold up to August 1, 1867, making \$591,000 currency value, in about three years. During this time there was a great deal of mismanagement, and for various causes, labor, mining supplies, and other expenses, were enormously high, and a heavy bonded indebtedness was incurred.

The Gunnell Gold company abandoned work in 1867, when a depth of five hundred feet had been attained, and the mine was left to fill with water. The property afterwards passed into the hands of the bondholders, Foster, Thompson & Co. of New York. The careers of several other companies were also quite eventful, showing large returns at times, but eventually winding up in somewhat the same manner as the above, or allowing the property to fall into other hands. The vein was often extremely rich and productive, and some idea of the yield of the entire lode may be obtained in those years of activity from the above figures given by the bookkeeper of the Gunnell Gold company for that single mine.

The Gunnell Gold property lay idle from 1867 to 1872, when the Church brothers leased it, removed the water, and in fifteen months sold \$53,718 worth of gold. The ore body then gave out and for lack of capital the leasers suspended work.

In January, 1874, Kimber, Fullerton, Clinton,

Mackey and Moseley leased this property, and after a heavy outlay placed the mine in working order, and began to operate the same, together with ground claimed by them on the west. They sunk the five hundred foot shaft down to a depth of seven hundred feet, and ran levels east and west. Before this the outlook was as discouraging as that of the Consolidated Virginia and California before the great bonanza was found. The ore body began to increase in size and value as explorations continued west. This firm received the following for mill gold and smelting ore in 1874, the actual value being a little higher for the former, and from thirty to fifty per cent. greater for the latter.

2,225 oz. 12 dwt. 6 grs. mill gold	\$40,293.93
Ore sold to smelting works	2,830.93
	<hr/>
	\$43,124.86

The gold came from the Gold company's claim until October 1, 1874, when the levels entered the ground further west, (and claimed by them,) known as the Little Gunnell. All surplus receipts were expended in machinery and the development of the mine. The yield for 1875 was as follows:

6,269 oz. 13 dwt. 12 grs, mill gold	\$117,565.16
Smelting ore	10,164.40
	<hr/>
	\$127,729.56

Of the product of 1875, the Gold Company's claim gave one hundred and ninety-two cords of ore, yielding \$13,628.25. The remainder, \$103,936.91, from

six hundred and ninety-four and one quarter cords of ore, came from the claims further west, showing an average return, including smelting ore, of eight ounces and one dwt. of gold, or \$149 per cord. The yield of January, 1876, was \$9,466.40 from the mill gold and \$2,996.88 from the smelting ore. Profits began to be retained in March, 1876. For the eleven months, ending February 1, 1876, the books show the following:

Total yield of eleven months	\$ 128,198.04
Total Expenses	84,639.44
Profits	\$ 43,558.60

From this can be seen what skilled labor and practical miners can accomplish, for although the yield was much smaller than in 1865-67, the profits form about thirty-four per cent. of the receipts. These would have been much larger but for the contest that was going on with the owners of the Grand Army, west of the Little Gunnell, and from the fact that the ore is crushed in Black Hawk custom mills, a mile and a half distant, at an expense of \$32.00 per cord—\$7.00 of which is paid for hauling. Here was a total outlay for hauling and milling, of \$28,360, while if these miners had owned a mill over the mine, as with the Gregory, Buell, Kansas and Illinois, the outlay would be but \$16.00 per cord instead of \$32.00, effecting a saving of \$14,180, bringing the net profits of the mine up to fifty per cent. of the gross receipts. But the present year has made a vastly better showing than any previous one, as will be seen by the figures given below.

The following is the yield of the same properties, with the expenses and net profits attending the same, for the four months ending May 1, 1876. Seventy miners and seventy mill stamps were employed :

1876	RECEIPTS	EXPENSES	PROFITS
January	12,463 28	7,853 28	4,610
February	16,740 00	9,180 00	7,560
March	25,695 00	10,199 00	15,496
April	24,732 00	10,121 00	14,611
Total	\$ 79,630 28	\$ 37,353 28	\$ 42,277

This statement shows a yield in March and April of \$50,427, and a net profit of \$30,107, or about sixty per cent., which would have been increased to seventy-five, if the ore had been milled immediately over the mine. The yield is said to have been still better during a portion of the summer.

About the middle of September the buildings and hoisting works over the Gunnell Gold shaft were destroyed by fire, which also damaged the shaft. This closed operations and reduced the bullion product of Gilpin county twenty thousand or thirty thousand dollars monthly. The plucky leasers of the mine did not give up after this disaster but purchased the property for \$50,000, cash in hand. This is but a small part of what they had previously cleared on their lease, but a large sum will be required to get the mine in working order again. A stone building fifty-five by ninety feet is being put up which will contain the necessary hoisting works and pumping machinery.

Before that is completed the mine will be nearly filled with water, and a heavy outlay will be required to remove it. Good ore is reported in the bottom of the deep shaft.

The Gunnell vein pitches to the south. The gold is from .805 to .830 fine and is worth \$18.10 to \$18.30 per ounce with gold at twelve and a half cents premium. Last year the average value of the ore was \$18.61 per ton. This year it is still larger, being unusually rich for a vein of this size and showing a steady improvement.

The Grand Army part of the Gunnell is eight hundred feet long and adjoins the Little Gunnell on the west, and is of course west of the Gunnell Gold. This is the property that was owned partly by Miller and Newton, and partly by G. W. Gorsline, and was covered by the Miller patent. It is now controlled by J. C. Fagan. One of the shafts is four hundred and seventy feet deep, and is being sunk at the rate of two feet per day. The vein or ore body of this property, at the present time, excels that of any other gold mine in Colorado, when size and value are considered. Its shaft and the levels running from the Gunnell Gold claims show a vein from four to eleven feet wide, composed of ore worth over \$150 per cord, or \$20 per ton, and this extends from a depth of three hundred feet below the surface down to the seven hundred foot level and an unknown distance beneath. It reaches west into the Fagan lode or west Grand Army, which is undoubtedly the true Gunnell instead of what is

claimed as such further north. When the shaft reaches the lower workings and is supplied with powerful hoisting works and a mill, as it soon will be, there is every probability of a yield of \$500,000 annually, and of a profit of seventy per cent. of that sum. It is believed the ore body cannot be exhausted in four years.

What is now often called the East Gunnell includes that part of the lode east of the Gunnell Gold property extending east to Main street, Central, a distance of 2,500 feet or more. This was once operated by various companies, some of them named above, but is now mainly owned or controlled by John Scudder, who is working it by shafts located at intervals along the vein. The University and Coleman shafts are down three hundred and sixty and two hundred and fifty feet respectively, while those on the eastern slope of the hill have not yet attained that depth, but are being deepened steadily. While none of this portion of the lode is paying well at present, it is being systematically developed, and indications point to better things below.

Immediately west of Pine street is a shaft worked by Scudder & Company. This Gunnell vein extends easterly under Pine, Main and Spring streets, and this portion was relocated and discovered for a distance of 1,500 feet by the above parties under the name of the Satisfaction. West of this Sayr & Atkins own on the Gunnell, and it is currently reported have sold to Scudder. By some the Satisfaction is thought to be

the east end of the Whiting. That part worked by Mr. Scudder was once bought by the Central Company as Gunnell. The developments of the next two years will prove the identity of the two lodes, as the point of intersection must be on this property. The main objection at Washington, to issuing a patent for the town site of Central, was furnished by Becker and Scudder concerning this property, although Scudder and Hense were the only actual owners. The patent has recently been issued to the city, reserving such rights as the mine holds under the rules and regulations of the miners previously claimed.

It is thought by some that the St. Louis and Pleasant View mines, both extensively worked, are offshoots of the Gunnell. The north wall of the latter, for the entire distance from the shaft now being sunk on the Sayr & Atkins property, west to the pump shaft, 1,200 feet, is of such a nature that no lode can cross it. The wall, wherever found, is very firm without a spur or slip in it. On the north slope of the hill are also the Sapphire, Mechanics, Jackson and other lodes now being operated, that all lose themselves in the Gunnell. The owners of the Coleman bought the Jackson in 1865 or '6, fearing a lawsuit. Subsequent developments have shown that the Jackson does not cross the Gunnell, but is a feeder or spur thereof. The total yield of the Gunnell has exceeded \$2,500,000.

The Whiting lode lies south of and parallel with the Gunnell and is operated at intervals to the depth of from fifty to two hundred and fifty feet. James E.

Lyon, James Miller, E. W. Henderson, and others, have a government patent on 1,500 feet. The Whiting discovery claim is four hundred feet south of the Gunnell Gold shaft and such is the difference in the pitch of the lodes that this shaft will probably enter the Whiting, at a depth of one thousand feet. The latter is a vertical vein while the Gunnell pitches to the south and to the Whiting. The lodes also form an acute angle so that they will come together on the surface some distance east of the Coleman, University, and Gunnell Central claims. The Whiting being the oldest title, will take in the larger or eastern portion of the Gunnell, when further developed, as in the Suderberg and Prize. A big lawsuit will probably ensue but must result favorably to the Whiting owners. The western extension of the Whiting for a distance of 1,500 feet is owned by Fagan, Sullivan and Miller, and is called the Wheeler.

CHAPTER XXVI.

THE KANSAS LODGE,

THE RODERICK DHU, GARDNER AND CALIFORNIA.

Location and History of the Kansas—Its Reopening and Remarkable yield—Rich pay and plenty of it—What pluck and energy will do—Fagan's operations—Facts and figures—The Borton and Roderick Dhu—One of the Mother veins—Wonderful yield of the Gardner and California—The reward of faith and hard work.

THE Kansas is one of the longest, best defined and richest lodes in Gilpin county. It has ranked among the first of bullion producers nearly all of the time for over six years, and the surface dirt and quartz obtained in the early days was extremely rich. Previous to 1870 there had not been worked regularly, and with the exception of two other properties to no great depths. The vein has been developed more or less for almost the entire length of Quartz hill, from Nevada gulch on the northeastern side up along the northern slope to the Forks lode near its western extremity—a distance of one and three-eighths miles. This lode is divided among many different properties owned by various companies and individuals. Most of them have yielded well, with here and there masses of barren ground, such as are found in all mines. In the yield of gold the Kansas is said to rank next after the Gregory, Bobtail, and Gunnell, and good authori-

ties give the total yield from the time of discovery to the present day, at nearly \$2,000,000. There are from twenty to thirty shafts on the lode, many of them from two hundred to six hundred and fifty feet deep. From 1870, to 1872, this lode was the centre of great activity, as it is to-day; but mining is now carried on in a much more systematic and permanent manner.

In 1804, several companies purchased portions of the Kansas. Among the most valuable, were the University, First National and the Kansas-Colorado. The last named company paid \$200,000 for three hundred feet of the Kansas and three hundred and forty feet of the Camp Grove lode, at the point of their union. At this place the Kansas vein dips to the south 186.56 feet in a depth of six hundred and thirteen feet in the main shaft, while the Burroughs which comes in at an acute angle from the east and south, dips only half as strongly in the same direction, or less than 15 degrees in 90, uniting the veins four hundred feet down. They unite on the surface five hundred feet west at the dry gulch, while four hundred feet east of the main shaft they are two hundred and seven feet apart on the surface. They steadily diverge from one another from their point of union eastward.

The Kansas-Colorado Company invested \$100,000 in erecting a large mill and in placing the machinery in the same, for the worthless Crosby and Thompson process, instead of expending their working capital in developing the mine. The property afterwards passed into the hands of B. C. Waterman, who had been the

company's agent. In 1873, James C. Fagan, who had some time before worked on this lode, leased the property and began what was considered the very doubtful venture of putting it in working order and of sinking and exploring through the barren ground in search of "pay." After removing vast quantities of water from the long deserted chambers of the mine and putting them in safe condition, the main shaft was driven downward one hundred feet further, when exceedingly rich ore was found. Up to the time when the mine began to pay, \$23,000 had been expended by the lessee. Mr. Fagan then bought the property and leased 1,000 feet adjoining on the east, on the Kansas and Burroughs lodes, known as the First National property. This he has since developed to a depth of six hundred and fifty feet with valuable ore in the lowest workings. In 1874, the shaft on the three hundred feet bought by Fagan of Waterman, was sunk to a depth of six hundred and thirteen feet, and levels were run east and west. The ore vein was from three to four feet wide and extended through the lower two hundred and fifty feet of the mine giving the very profitable return of seven ounces per cord, or \$18 per ton beside a quantity of rich smelting ore. From December, 1873, when pay was struck, to June, 1875, (eighteen months,) this three hundred feet of ground with its thirty-two stamp mill produced as follows:

The mill gold sold was 6,680.5 ounces, averaging \$16.77	
per ounce, worth in currency	\$112,032 03
Smelting ore sold	5,265 44
Tribute work produced	3,875 65
Earnings of mill, in addition to crushing ore from mine	6,593 62
Total	<hr/> \$127,766 74

The total expense was about \$80,000, leaving over \$47,000 profit. The average monthly yield was \$6,200 and profit \$2,600. The Monmouth Company purchased this property and took possession May 1, 1876, and the deep shaft is again being sunk.

In 1874, Fagan purchased the three hundred feet adjoining the above on the west, then owned by Whitcomb and Teller, and in 1875, organized the Monmouth Company thereon. This has been worked by four levels, driven west from the Waterman deep shaft and began to pay in July, 1875. The following complete statement for ten months ending May 1, 1876, is given:

MONMOUTH THREE HUNDRED FEET OF KANSAS.

1875 MONTH	GROSS PRODUCT	EXPENSE	NET
July	\$ 2,448 17	\$ 1,649 77	\$ 798 46
August	6,453 42	3,136 86	3,316 56
September	7,372 99	3,515 85	3,857 14
October	5,110 30	3,010 30	2,100 00
November	7,972 85	4,036 70	3,936 15
December	11,230 92	6,770 89	5,460 03
1876			
January	8,921 85	4,611 39	4,310 46
February	7,273 37	5,258 46	2,014 91
March	7,675 00	5,439 54	2,235 46
April	5,979 91	3,225 11	2,754 80
	\$70,438 78	\$40,654 81	\$30,783 97

About one ninth of the gross receipts were from smelting ore. The cause of the falling off in the last three months given, was the cutting down and re-timbering and straightening of the main shaft and the placing of a pump therein. Hoisting is usually sus-

pended entirely on such occasions, as well as mining, but in this case there was no cessation, although considerable interruption of operations. At the same time the mill over the mine, whose capacity was increased some time ago to thirty-two stamps, received another addition of twenty stamps. This mill building is of great size, having been originally constructed for a process. The entire cost of these improvements was over \$20,000.

The Monmouth Company now owns the above mentioned mill, and six hundred feet of ground, together with three hundred and forty feet of the Camp Grove lode. Mr Fagan is half owner in the company's stock. The ore body in this mine is extremely valuable being one of the richest, very large and continuous ore veins in the country. The five hundred and six hundred foot levels have been driven west clear through the Monmouth into the Littleton or Fagan claim (lately purchased), and explorations indicate an ore body west of the main shaft eight hundred feet long, and extending from near the surface (excepting a small space worked out), down six hundred and fifty feet, and an unknown distance further. Although sinking is now resumed there is ore enough in sight to supply the mill for several years. At some points the crevice is from six to ten feet wide.

After leasing the Ophir-Burroughs last year, in company with Sullivan and Wheeler, Mr. Fagan bought of Littleton the Kansas Extension west, four hundred and ninety feet, now called the Fagan Kansas,

which crosses the dry gulch that comes down the hill at this point. The Mount Desert, eight hundred and thirty-one feet, and the Irish Flag, eight hundred feet, were also purchased by him. The former has one shaft three hundred feet deep, and branches out from the Kansas near this gulch on the south side, as does the Irish Flag from the north side, both having however nearly a westerly direction. These are to be worked extensively hereafter.

All of these Kansas properties with the English Kansas, Ophir and First National Burroughs, including over 5,500 feet, together with the Grand Army and Fagan, Gunnell and Wheeler lodes of four thousand feet, or altogether 9,500 feet of valuable veins, are under one management, and superintended by D. Sullivan, who is also elsewhere interested in mining and milling. The Kansas part of this property keeps three mills and ninety six stamps employed, and with the Ophir-Burroughs supplies over one hundred and ten stamps in all. One hundred and fifty miners and mill hands, find work, and the mines are being brought into such shape and condition as to admit of a yield of 100 tons of ore daily, and of nearly \$40,000 monthly.

Shafts and levels are being extended rapidly. The Kansas pay vein is from three to four feet wide and usually yields about one ounce or \$16,50 per ton, but occasionally as high as \$30. The selected or smelting ore is often very rich, and even the mill ore has given yields from the lower workings of from \$50 to \$100 per ton.

East of the First National property, which has lately begun to pay its lessee (Fagan) handsomely, are a large number of properties, only a few of which are now worked.

In eighteen months of 1871 and '72 George Easterbrooks worked the University Company's two hundred feet, and took therefrom \$130,000. At other times altogether \$70,000 came from this property. The shaft is five hundred and ninety feet deep.

A half mile further east are four hundred feet purchased by an English company of the Hardesty brothers. This was idle from 1860 to 1871, as the owners did not feel inclined to risk money in opening it to test its paying qualities. Gray, Root and Bennett then leased it for one year, and after sinking a thirty foot shaft forty feet further, struck an excellent body of ore, which steadily continued to improve as depth was gained. In seven months they took out \$46,650, one-tenth of which was paid to the owners, the Hardesty brothers, as rental or royalty. It was then sold to an English company, and the lessees were paid a large sum to throw up their lease. The company took possession and the mine continued to produce largely, even up to the time it abandoned work.

Yet owing to incompetent and wasteful management it proved a losing venture. In nineteen months the company took out over \$91,000, of which \$28,000 was received for smelting ore—an unusually large proportion of the whole amount, showing very high grade ore. The total yield of the mine up to the fall

of 1873 from all parties is said to have been \$166,000. Recently Medcalfe and Fagan bought this four hundred feet of property., together with three hundred feet adjoining on the west, two hundred feet on the Water Mill lode in the gulch below, and the Hardesty stamp mill close by it. Work has been resumed in this part of the Kansas with a very fine vein of ore in the bottom, three hundred and sixty feet down. Fifteen men are already at work sinking and drifting, and more will be soon. The Water Mill lode is yielding very rich ore.

The above results on the Kansas show what a moderate outlay of capital combined with skill and careful management can effect on mines that had been abandoned because less capable managers could not operate them successfully, or because they became discouraged and left them as soon as barren ground was met with. Below will be found a statement of receipts and expenses on the united Monmouth-Kansas—six hundred feet—for three months ending August 1. The mine has since done much better.

MAY.

From Tribute Workings	431.90
“ Smelting ore	310.69
“ Mill ore	
455 1-20 ozs. gold	<u>7,600.00</u>
Total yield	\$8,342.59
Expenses, and repairs on mine and mill	<u>4,679.24</u>
Net profit	\$3,663.35

JUNE.

From Tribute Workings	125.35
“ Mill ore	
310 3-20 ozs. gold	<u>5,200.00</u>
Total yield	\$5,325.35
Expenses, and repairs on mine and mill	5,331.63
Loss occasioned by building expenses and stoppage of work	

JULY.

From Tribute Workings	99.76
“ Smelting ore	913.54
“ mill ore	
445 ozs. gold	<u>7,600.00</u>
Total yield	\$8,613.30
Expenses, and repairs on mine and mill	<u>5,614.20</u>
Net profit	\$2,999.10

The Borton, Roderick Dhu, Gardner and California are all parts of the same great rich vein, over a mile in length, which west of the California takes the names Hidden Treasure and Indiana. Nearly all of the three first named, embracing 3,000 feet of contiguous ground, will probably be worked on a very large scale under one management, within a few months. The entire ledge, 5,500 feet, has produced altogether nearly \$1,700,000.

The Borton. James Clark owns four hundred feet of this vein, and Prof. N. P. Hill five hundred. The latter joins, and will probably take in the Roderick Dhu, as it has the oldest record.

The Roderick Dhu comprises 1,000 feet, the eastern half being owned by John Scudder and the western half by Foster and Thompson of New York, two wealthy capitalists who are heavily interested in the Gunnell lode, the Consolidated Ditch and other prop-

erties. The five hundred feet owned by Scudder, has been worked to a depth of five hundred and fifty feet and has three thousand feet of levels. The crevice has varied from two to seventy feet in width and the ore yields from two to ten ounces per cord, or from \$4.00 to \$20.00 per ton—the smaller returns coming from where the vein is the widest. From the beginning of 1870 to 1872, this mine yielded one thousand seven hundred cords of ore and \$110,000. It has been worked on a small scale for several years, giving from \$10 to \$20 per ton in the mills after smelting ore has been selected. With water power and a mill over the mine, or at the mouth of Quartz hill tunnel, which will soon intersect it, this mine would pay enormously, as it has done at times without these advantages. The total yield of the lode has been between \$400,000 and \$500,000.

The Gardner is between the Roderick Dhu and the California and forms a part of the same great vein or ore channel that extends along Quartz Hill between the Illinois and the Burroughs and Kansas. It has been owned and worked by various companies and lessees since its discovery, in 1860, and has produced nearly or quite \$600,000. The crevice is usually from three to five feet wide, with ore yielding from \$10 to \$15 in stamp mills, and from \$50 to \$200 at the smelting works. The Clark-Gardner and Philadelphia and Colorado Companies' claims have been mined to depths of from three hundred to four hundred feet. In the latter the vein is large and regular,

and from three to twelve feet wide, with a good degree of uniformity in the ore, which can be mined and milled at an expense of five or six dollars per ton. This mine cleared its lessees \$14,000 in two or three weeks, in 1871. The Gardner, beginning at the eastern end, is owned as stated below :

Philadelphia & Colorado G. M. Co.,	300 feet
Clark-Gardner G. M. Co.,	200 feet
David Utley	100 feet
Hawley-Gardner	200 feet
Sid. B. Hawley	354 feet
Jones (formerly Waterman)	100 feet

Hawley's property has yielded at the rate of from \$25 to \$225 per ton.

The California once went under the name of Gardner for some distance, and is a part of the same vein west. The rich ore found on Stalker and Standley's three hundred and fifty feet to a depth of forty feet, induced them to continue to sink the shaft. The result for a year was most discouraging, They sunk all the money they could raise and still kept at work. At last at a depth of two hundred and twenty feet they were about to give up in despair, when the vein began to appear, and soon rich ore rewarded their labors.

From depths of from three hundred to five hundred feet, from two to six feet of ore extended, containing a rich seam of very high grade mineral. In less than a year Stalker was able to pay Standley \$75,000 for his half interest, and \$25,000 to other parties for three hundred feet adjoining, and for spurs of the lode.

The ore treated in the stamp mills gave unusually

large returns, averaging twelve ounces to the cord, or \$21 per ton—there being considerable silver. The month of April, 1870, returned \$30,000, or the unusual yield of \$1,000 per day. In three and one half years—from 1868 to 1871, inclusive—the mine produced \$465,000. After this the ore body became exhausted. Stalker continued sinking the shaft and opening the mine until he had reached a depth of seven hundred and forty feet and had become somewhat involved. Standley then came into possession of the original three hundred and fifty feet, which has been idle for some time, but work may be resumed soon.

West of the Stalker claims is the Harper property, four hundred feet, owned by Wm. M. Roworth. Joseph Harper obtained altogether about \$85,000, therefrom. To the eastward considerable work has been done with a yield of about \$40,000. The entire lode has given not less than \$610,000, from first to last.

CHAPTER XXVII.

THE BURROUGHS AND ILLINOIS MINES.

One of fortune's favorites. Pat Casey and his night hands—A veritable bonanza—History of the Ophir—More golden deposits—A case of clear grit—The deepest shaft in Colorado—Other properties—Discovery of the Illinois—A rich vein—Fine mill and hoisting works—A good record—What two men can do.

The Burroughs lode is about four hundred feet north of and almost parallel with the Gardner and California. The point of union with the Kansas is 2,509 feet from the vein's easternmost developments. The Ophir shaft is 1,000 feet deep, and there are eight shafts on different claims, varying from two hundred to five hundred and thirty feet in depth. Ben. Burroughs discovered this lode in May, 1859, and afterwards the Kansas. It is worked in several localities, the western half being operated by three different firms.

The Ophir-Burroughs is the richest portion, and embraces four hundred and sixty-two feet, owned by the Ophir company. This has ranked with the most productive mines in Colorado. Here the famous Pat Casey made his "big raise" in 1862-3. He bought several claims, one after another, of Benj. and A. D. Burroughs, between February 19, 1861, and May 29, 1862, embracing two hundred and sixty-two feet, for

\$7,750. He was to pay for them from the gold he might obtain therefrom. He soon found paying ore. Casey was an uneducated Irishman, but energetic, lively and generous, as well as capable of managing the big mine that so luckily fell in his way. When the vein "capped on him," he never abandoned it, but kept on sinking the shaft as long as he could get credit from the merchants and his own miners. At length he reached a *bonanza* that rivalled those of the Gregory and Bobtail, and wealth rolled in on him in a steady stream. McIntyre was his financial man and business manager, but it took "tin pencils a day" for Casey to do his own figuring. A very large force of miners was employed, and "Pat Casey's night hands" are remembered to this day. They were mostly a wild rollicking set, and a terror to their foes, or to all who offended them. In a few short months Casey was transformed from the ragged miner of the pick and shovel to the capitalist sitting behind a team of thoroughbreds, and instead of "Pat" it was "Col. P. D. Casey sur."

Numerous anecdotes are told about him, of which the following are samples: He bought a span of black horses valued at about \$500. They pleased him so well that when the assessor called for a list of his personal property, Casey gave their value at \$2,500, and insisted on paying taxes on them at that rate.

About the time of his last purchase on the Ophir he made a contract to sell all his property on that lode to John Scudder, who was then acting for

Wm. H. Russell. The price agreed on was \$40,000. Turner & Hobbs, the bankers at Central and Denver, were to pay him in their drafts on the State Bank of Missouri for Scudder. When the payment was tendered him, he changed his mind, and to avoid the sale he demanded coin. He knew there was not that amount of coin in the country; and so the sale was not effected. Soon after this the ore body gave out and the mine was in "cap" and Casey got in debt to every one who would trust him. Among his creditors was the firm of Nuckolls & Hawk, to whom he owed about \$9,000 for supplies, which they had sold him at a profit of from forty to seventy per cent. Casey settled with them by giving his note drawing ten per cent. interest per month—they to continue to furnish supplies for the mine. This went on for some time when one morning there was a big cave in the mine caused by improper timbering, which exposed a large body of ore on the south wall, showing he had been sinking his shaft off from the crevice. Had the mine been properly timbered the golden treasure which that lode has poured forth might have remained undeveloped to this day.

Casey's property was sold in New York Oct. 13, 1863, by Hiram A. Johnson, Warren Hussey and Wm. H. Russell. It was about the third sale made at the east on Colorado properties. Casey received about \$60,000 as his share. After paying claims against the property, he invested all his money in tobacco, just in time to get the benefit of the first tax levied by the

government, and in one year made more money out of his tobacco than he had made out of his mine.

Ben. Burroughs, the original discoverer of this lode, who had sold out before its great value was known, is now quite wealthy and is taking solid comfort on his large and beautiful farm near Quincy, Ills.

The company was not very successful in operating the Ophir. This was not because the mine was not good enough, or for any lack of ore of the most desirable kind, but on account of mismanagement and incompetent direction. The yield was usually from \$18 to \$30 per ton, with a pay vein two feet wide or over—and yet the company eventually suspended operations. During this time several hundred thousands of dollars were added to the product of a quarter of a million produced in the earlier years. In 1869-70 a force of miners worked out the balance of pay due them, after which the mine was "shut down."

In March, 1873, Roberts & Co., Cornish miners, who had been previously employed in the Ophir, and knew the "lay of the ground," and where to look for the ore, obtained a lease from the company's agent, G. E. Randolph, and after many months, pumped out the water that had filled the mine for several years. They sunk the shaft and ran levels, and in twenty months after the mine had been put in working order, they had taken out \$160,000, of which \$100,000 was profit. They went back to Cornwall with \$16,000 each in their pockets. This shows what miners who understand their business can accomplish when they obtain a good mine.

When Roberts & Co's lease expired in March, 1875, Sullivan, Fagan & Co. leased the property. The lowest workings were then seven hundred and fourteen feet deep. The rich ore body that had been yielding nearly \$30 per ton was worked out, and it was found necessary to sink the shaft deeper to obtain another body of ore. There was nothing of a very encouraging nature for a distance of two hundred feet. The outlays were large with but little income. Finally, the vein began to improve and to yield as in previous years. In April, 1876, a depth of 1,000 feet was attained, the lowest point reached in Colorado mines. This is the longest stretch of continuous sinking ever accomplished among the deep mines, although similar instances will be recorded before the year is out. Some rich ore has been taken from the lower workings of the Ophir.

The Burroughs vein has varied in width from ten inches to three feet. Although not as large, it has been richer than most others. The Ophir mine is centrally located on the lode and its characteristics fairly represent the entire vein. The walls are usually well defined, smooth and regular, sometimes carrying a thin gouge of clay, and again with the ore seam resting directly upon them. Thirty dollars per ton from the mills, and from one to two hundred from the smelters are the ordinary receipts when the mine "is in pay." At the seven hundred foot level the vein divided, one part pitching north and the other south. The deep shaft was driven on the south vein, but little

ore has been found in it. A cross cut is being driven northward from the nine hundred foot level to find the north vein.

The Gilpin property, next east of the Ophir, is leased by other parties, and is paying a profit. Its shaft nearly five hundred feet deep is four hundred and fifty feet east of the deep shaft. The split in the vein began here at a depth of only three hundred and fifty feet.

West and north of the Monmouth-Kansas, Mackay and Brewster have what they call the Burroughs Extension. If this is the Burroughs vein, it crosses the Kansas instead of losing itself therein as claimed by some. This firm began work last summer. They put up a shaft house, engine and hoisting works, and have already sunk a shaft two hundred and fifty feet deep into plenty of paying ore.

The owners of the Burroughs east of the Kansas are: First National Company, one thousand and two feet, leased and worked by Fagan; Ophir, four hundred and sixty-two feet; H. M. & W. Teller, twenty feet; Colorado, two hundred feet; and at the eastern end W. H. Cushman's two hundred and sixty-seven feet. The Phoenix Company has absorbed the Burroughs Gold Mining Company's one hundred and fifty-five feet, the La Crosse fifty, and the Burroughs one hundred. The Teller brothers own the old Conlee claim.

What is known as the Illinois mine, comprises the Illinois and Confidence lodes—1,000 feet on the former and 1,400 on the latter. These veins unite on

the western part of the property. John H. Gregory was the discoverer (June, 1859,) while employed by Illinois men. The location is on the eastern slope of Quartz hill. The first owners worked together one summer and then divided. In 1861, P. F. Tobin, bought two hundred and fifty feet of the Illinois, including a ten stamp mill. In 1861-2-3, the lode paid well, the ore yielding from twenty to forty dollars and over, per ton. George R. Mitchell organized a company on the Tobin property and three hundred and ten feet and a stamp mill, bought of Buell for \$30,000. He then erected an immense building containing costly hoisting works and a twenty-two stamp mill, at an outlay of \$100,000. In 1867-8 the mine was producing better than ever before—average yield, \$15.80 per ton.

In 1869, the mine, for a length of three hundred feet had been worked down to depths of one hundred and fifty and two hundred feet. This space had yielded over \$300,000. In the fall of that year, Buell, Jacobs, and Woods, bought from the company, and have since owned the entire mine. Buell operated it for a year, and it has been worked at intervals since, and continuously for the past two years. The Illinois and Confidence lodes are uniform, from two to four feet wide, with four to twelve inches of mineral. The filling of the vein is soft, requiring but little blasting, and of course is worked cheaply. Average assay of ore sold to the smelter in 1875-6, \$150, price paid \$100; average mill return, \$15 per ton; total cost of

mining, milling and hoisting, \$5.00 to \$7.00 per ton. In 1868, 1,500 tons milled \$15.88 per ton and 40 tons sold for \$112 per ton.

The immense buildings over the mine and the two shafts contain a twenty-two stamp mill, shops, store rooms, and offices necessary for an establishment of the largest kind, and a splendid set of hoisting works, unrivalled save at the Buell and Bobtail, all of which could not be replaced to-day for \$50,000. Two wings are attached to the central or main division building. The whole is one hundred and seventy-five feet long, by one hundred deep. There is one horizontal engine—fifteen and one half by thirty-six inch cylinder—connected with a large tubular boiler. The eastern shaft, two hundred and thirty feet deep is furnished with a Cornish self dumping skip, arranged for hoisting both ore and water, with a capacity of twenty cubic feet per load, and operated by a frictional winding drum. Power is transmitted to this by a line of shafting resting upon stone pillow blocks and connecting with the stamp mill in the western part of the building. Tramways run from the skip shaft to the mill. Near the latter is the bucket shaft, one hundred and eighty-seven feet deep. At a depth of one hundred and seventy feet a level has been driven five hundred and fifty-five feet east of this shaft, and thirty feet deeper another level extends seventy-five feet east of the shaft and three hundred and sixty west.

Occasionally the vein widens, showing ore bodies ten feet thick. Recent sales and mill runs show a

steady increase in value. The entire mine, mill and buildings with two mill sites, are owned by Bela S. Buell, G. W. Jacobs and H. A. Woods who have a government title. There are four hundred and ten fathoms of unworked paying ground (ore) in the mine above its first level. A recent report on the Illinois says the average width of the vein is fifteen inches, viz: five inches of solid ore at two tons to the fathom, and ten inches of crevice matter at two tons to the fathom. In addition, one ton per fathom is allowed for branches running into the main vein. This would give five tons per fathom and 2,050 tons of ore on this level. On the second level, are about two hundred and ninety fathoms, containing 1,450 tons. There is no lack of ore at the bottom of the mine although the vein is somewhat pinched near the skip shaft.

The Confidence is considered a strong branch of the Illinois. The mine makes but little water. What the mine now requires is to have one shaft sunk to a depth of five hundred feet, with levels starting therefrom, sixty feet one below the other. It would cost \$30 per foot to sink the Murray shaft, or \$10,000 to reach a depth of five hundred feet, and \$5.00 per foot to run the levels, or \$10,000 for five levels, each four hundred feet long. Winzes etc., might cost \$5,000 more. The mine would then be opened up with ore enough in sight to insure a large fortune. One year would be required for this developement, and the reserves of ore ready to be worked would require several years labor to exhaust. The value of the ore

now standing above the lower workings is, judging from a large number of average sample assays, \$30,000, and the expense of mining and milling this will be \$15,000, leaving an equal amount for profit.

One locality in the mine near the skip shaft from fifty to one hundred and fifty feet below the surface, has been worked by two men, and portions of the time by three. The following statement, although making a better showing than most parts of the mine, will give an idea of how profitable mining can be carried on, even on a small scale. It includes the labor of these men for twelve months and twenty days, ending August 14, 1876, being the same as eight hundred days work for one man. They raised three hundred and forty six tons of ore that were crushed in stamp mills, and sold fourteen tons and eight hundred and eighty pounds of the richer mineral to the smelter.

RECEIPTS.

Three hundred and forty-six tons or forty-six and one quarter cords of ore yielded 362 oz 17 dwts of gold or \$18 per ton	\$6,242 36
Fourteen tons and eight hundred and eighty pounds smelting ore sold for from \$70 to \$135 or an average of \$92.80 per ton	1,340 92 \$7,583 28

EXPENSE.

Eight hundred days work at \$2.50 per day	\$2,000 00
Hauling and milling three hundred and forty six tons of ore with smelting ore	1,408 00
Powder, Fuse, Candles and Timbers	272 38 \$3,680 38
Net Profit	\$3,902 90
Actual returns for their labor	\$5,902 90

More extensive operations have been inaugurated recently on this mine.

CHAPTER XXVIII.

GUNNELL, QUARTZ AND OTHER HILLS.

Pleasant View—Suderberg, Jones and Hubert—The Kent County, Alps, Ute, Pyrennes, Saint Louis and others—The Forks, Flack, and American Flag—The Adeline, Pierce, Etc.

The Pleasant View mine, near the eastern end of Gunnell hill, after lying idle for seven years, is again paying handsomely. It was discovered in 1864, and in 1867 and '68 gold was sold to the value of \$42,718 with \$22,000 profit. In November, 1868, the mine caved in and was then abandoned. In December, 1875, the Pleasant View Mining Company was organized, with a capital of \$200,000, in 20,000 shares, of \$10 each—trustees and officers Colorado men—and the mine was placed upon the Denver Mining Stock Board. After paying for the property, \$5,000 still remained in the company's treasury as a working capital. A twelve-horse power engine and hoisting apparatus were purchased and the mine was placed in working order. It has since given a good profit. Large quantities of ore have been raised worth \$22 per ton, more or less. In May and June, at a depth of two hundred and thirty feet and over, the vein, composed almost entirely of pay rock giving an average yield of from \$11 to \$14 per ton, had widened out to twelve feet. Ore of this value, and in such

quantities, ensures enormous profits. Ore has recently been sold to the Dressing Works for \$50 and \$60 per ton, and splendid returns have been obtained from blanket tailings. This property consists of 1,200 feet of continuous ground. The officers of the company are, Wm. M. Roworth, President; A. J. Bean, Secretary; Joseph A. Thatcher, Treasurer; and George W. Briggs, Superintendent. In the first week of July, a handsome and shapely brick of gold was shipped east, weighing two hundred and eighteen ounces, and worth \$3,800, or \$17.40 per ounce. This was the return from Pleasant View ore crushed in stamp mills during one month. Since then the yield has been larger.

The St. Louis is owned by the Kilbourne brothers. It is located near the Gunnell and Pleasant View, and a short distance south of Eureka street. Steam hoisting machinery has lately supplemented whim power. Shaft is three hundred feet deep and the mine is well opened by levels. The vein is very large, most of it being eight feet wide. Seventy-six cords gave an average yield of five ounces. Sufficient ore is raised to supply twenty-five stamps. Large quantities of ore have been sold to the Dressing works. At the bottom of the shaft there are nine feet of ore yielding nine ounces of gold per cord, or \$21 per ton. That return has been made for several hundred cords.

The Winnebago lode, on Casto hill, has been worked to a depth of four hundred feet. A fifteen-stamp mill stands over the mine, but both are idle. This prop-

erty has changed hands several times and has not usually been very profitable.

The Grant County extends from Chase gulch into Castle Rock mountain, from a point opposite the mouth of the Belden tunnel. Wm. M. Rule owns 1,600 feet on this lode which is of fair quality and six feet wide. He is working it by means of a tunnel.

The Eureka lode is situated on the south slope of Eureka hill between which and Gunnell hill comes Prosser gulch. A dozen years ago the Sierra Madre company put up buildings and expensive machinery, but never accomplished much. Alexander Taylor owns the central 1,400 feet of the lode. Several years ago, after exhausting the surface "pocket," he mined the property unsuccessfully and left it. After "getting another start," he returned to the mine prepared to expend it in searching for the ore body he was certain existed there. A fortunate blast in the wall of an old level disclosed the fact that he had left the crevice in his previous working and that he had been sinking the shaft through the granite and off the vein. The ore had been left standing all this time above the lower workings. It was very rich and there was plenty of it, and Mr. Taylor has been making money ever since it was met with in the fall of 1875. The crevice ranges from two to twelve feet wide, and the mine is nearly three hundred feet deep, with no signs of the ore body giving out.

The Arlington lode, in Eureka district, is worked by Gray & Bond. The crevice is five feet wide with

two feet of copper, pyrites and galena. Four men during the summer months obtained twenty-seven cords of ore, with a yield of \$1,846.46. Counting the labor of the operators, the profits were forty per cent. of the receipts. A quantity of wire and nugget gold has recently been found. At a depth of one hundred feet the vein is better than above.

The Prize extends over the upper and eastern part of Gunnell hill, where it and the Suderberg come together. The Prize and Commonwealth companies have taken out large quantities of gold. The former, under the management of John Scudder, was worked to a depth of four hundred and fifty feet in 1870, and began to pay enormously, when a contest and litigation ensued with the Suderberg.

The Suderberg is owned by Nat. Young & Co., or their estate, and by E. L. Salisbury, for a distance of 1,900 feet, with the exception of a half interest in one hundred and fifty feet, which is owned by R. Mackey. In 1870-71 this mine paid immensely. A party of Cornishmen worked the property for a while under lease. Then Richard Mackey obtained it and Leyden and Wightman bought into Mackey's lease and afterwards sold to Young, who was also mining on the lode. They reached an ore deposit of wonderful value over five feet wide, and owing to the difference in the "pitch" of the veins, opening straight down into the Prize. Then the great contest began with John Scudder, who was operating the latter. In 1870-71, nearly \$250,000 was obtained from the

Suderberg workings. A very large sum came out of the Prize, which the court decided was taken from the Suderberg vein, and an injunction was obtained on the former. Mackey afterwards worked these claims, and his share of the profits is said to have been \$30,000. He paid Kimber & Co. alone \$18,000 for crushing ore, and took out \$75,000 while working the mine in 1872-3. The different shafts are from four hundred and fifty to five hundred feet deep. The eastern part of the lode is worked and the centre will be as soon as the estate of Nat. Young & Co. is settled.

The Jones is situated on a line, and nearly west of the Suderberg. Its vein is often narrow but is remarkable for giving some of the highest average returns ever reported in the county. A Mr. Darby owns three hundred feet, and Capt. J. F. Phillips and Mr. McGonigle each own portions further west, all of which have been worked to a depth of three hundred feet. Sullivan & Andrews worked the eastern and central part of the lode in 1869, when it paid largely, and the following are the returns they gave for only fifty feet of the Phillips property, for five months:

1869	RECEIPTS	EXPENSES	PROFITS
June	\$ 1,767 86	\$,899 66	\$ 868 20
July	1,268 97	1,423 09	
August	2,070 57	1,886 52	184 25
September	3,316 45	2,158 12	1,158 33
October	3,170 10	1,196 75	1,973 35
Total	\$11,593 95	\$ 7,564 14	\$ 4,030 01

No accurate data are obtained from this or other parts of the lode worked then or since, but the yield and profits are said to have been equally good from all of them during several years, the common return being from \$32 to \$42 per ton. From these facts it will be seen how profitable and valuable this lode would become if worked under one management instead of being divided into such small properties. The claim known as the McGonigle, is equally rich. On the Phillips claim \$900 were cleared in sinking the shaft thirty feet from the surface and in running a level fifty feet—three and one-half cords of ore, yielding one hundred and five ounces of gold, or \$1,863. This lode paid handsomely in 1874-5, when the ore was as rich as ever.

The Hubert lode, owned by Balsinger & Co., has one shaft three hundred feet deep, with from one to four feet of ore, much of which carries from thirty to sixty-five per cent. of lead. The vein also contains in localities, considerable zinc blende. When treated for gold in stamp mills the returns were not always very satisfactory. Considerable ore was sold to the smelting works, at Black Hawk and Golden. For months after the Colorado Dressing and Smelting company (Collom's) began operations at Black Hawk, from seventy to ninety tons per week were sold there, at from \$9.00 to \$16.70 per ton. An assay of Hubert ore gave one ounce in gold, thirty-six ounces in silver and two per cent. of copper. The value of the mine is believed to be largely in its lead riches, but it produces large quantities of stamp mill ore.

In May, levels had been extended east and west from the main shaft until the vein had become much larger than at any former time, and the ore was of greater average value. For a time five cords, or forty-five tons of ore were mined and milled daily, of an average value of four ounces or over \$65 a cord. A smaller yield still keeps up, and is liable to be maintained for a long time to come. Those portions of the ore that are rich in lead are sold to the smelter at Golden, and blanket tailings have brought at the rate of \$80 per ton.

The Ute is a lode on Quartz hill, near Nevada gulch, from which it strikes southeasterly so as to intersect the Kansas. It has been developed by the owners, Andrews and Sullivan, since last November. They own 1,435 feet, divided by another property. It has been one of the most remunerative properties in that vicinity, and has yielded over \$40,000 in eleven months, of which much more than half was profit. One thousand tons of ore milled, gave an average of thirteen ounces per cord, or \$38 per ton. Besides this smelting ore was sold. The vein has been from one to six feet wide and is easily mined. The shaft is over one hundred and fifty feet deep with engine and hoisting works. Fifteen men are employed.

The Alger, thought to be the east extension of the Kansas, is owned by Jacob Tascher. Peter Rue has been obtaining much valuable ore from the vein, which has varied from a few feet up to twenty in width. Two or three veins, apparently, lie very close to each other at that point.

The Baxter and Crispin lode, in Spring gulch, owned by E. K. Baxter, includes one thousand and six hundred feet covered by a government title. Although not worked at present, it is evidently a very valuable piece of property. At one time assays of from \$80 to \$280 per ton were often made and ore was sold to the Keith works for \$300 per cord.

Among other lodes on Quartz hill are the Sullivan, Barnes, Camp Grove, and the Lewis, all valuable properties. The last, owned by Henry Dobson & Co., has yielded very rich ore.

The Lindon lode extends from Nevada gulch through the southeastern part of the Gunnell hill. It is owned by a newly formed company of which B. O. Russell is agent. It is composed of several old properties, which have been found to be on a single vein. The ore is improving in appearance.

Well up on the northeastern slope of Quartz hill is a cluster of lodes that together have yielded about \$300,000. These have directions varying from northeast and southwest to southeast and northwest, several of them crossing each other at nearly the same locality. The names of these lodes are the Columbia, Lewis, South Lewis, Adeline, Corydon, Pierce, Lyman, Vanderbilt and Cork, embracing eight thousand feet of veins. They have been opened by shafts two hundred feet apart, that vary in depths from thirty to two hundred and seventy-five feet. The entire ground is covered by United States patents, and every lode shows a well defined crevice from one

to eight feet wide, carrying ore that runs in stamp mills from three ounces to fourteen ounces of gold per cord. The Lewis has paid large profits for some time and has a vein, from three to eight feet wide, of ore that runs from \$10 to \$25 per ton. The design is to develop the entire cluster of lodes by sinking one main shaft at the junction of the Lewis and South Lewis, and to cross-cut from this shaft and level into the various veins; and this is now being done.

On the northeastern end of Quartz hill is the Missouri, pretty well developed but now idle.

The American Flag lode has a southwesterly course from Nevada gulch near the Clayton mill, and strikes up over the west end of Quartz hill near the Forks. The American Flag Gold Mining Company own five hundred and thirty feet, on which are seven shafts of various depths and the total yield of this property had exceeded \$200,000 prior to 1864. The Clayton portion of the lode yielded a large amount of gold in 1872-3. Other parts of the vein have been worked at intervals for the last ten years.

The Forks lode, near the west end of Quartz hill, has figured quite extensively in the past. It has a course north of east and intersects the Flack and California. It is a large wide vein from eight to ten feet broad, and carries considerable lead. It produced very heavily from 1860 to 1863, and in some subsequent years, footing up a total of not far from \$500,000. Owners; Wheeler, one hundred and thirteen feet, J. B. Chaffee five hundred feet, Success Company the

remainder. Has been worked to a depth of five hundred and seventeen feet, but is now idle.

The Flack is another famous mine running above, and parallel with the California and Indiana on the northern slope of Quartz hill. The vein is usually eighteen inches wide and often very rich. In six months of 1863, it yielded \$90,000. Nearly \$500,000 has come from it altogether. Owned by Waterman.

The Kent County lode is situated on the upper part of the northern slope of Quartz hill. It is above and nearly parallel with the California and Kansas lodes. The Ætna Company own the eastern nine hundred feet, Tomlinson owns one hundred and ninety-six feet and Richard Mackay the western one thousand two hundred feet. Maddern & Company worked all but the latter portion for a year. They sunk the three hundred and forty foot shaft, one hundred feet deeper and found plenty of ore. Eight men raised from ten to twenty tons of ore daily worth \$15 per ton. Twenty tons per month were sold to the smelter at from \$113 to \$125 per ton. They sunk the shaft at an outlay of \$10 per foot, run levels for \$2.25 to \$4.25 per foot, and stoped at a still smaller cost. The mine has now four thousand feet of levels and two shafts between four hundred and five hundred feet deep. It has been operated since 1860. That year and the succeeding one, gave a yield to the Cissler brothers of six hundred cords of ore and \$72,000. In four months of 1872, leasers obtained \$32,000 from the Ætna alone. The Madderns took out nearly \$50,000 in 1875-6. In

September, Tomlinson's shaft house and hoisting works were burned. Since then Mackay has leased that claim in order to work his own property through the deep shaft. He has put up a frame building thirty by fifty-two, and a powerful set of hoisting machinery, capable of raising ore and water one thousand feet. The boiler and engine are first class. He has a large force of men and will run levels west of the dry gulch so as to open up his property in fine shape.

The Alps and Mackie are one lode. The former takes the western seven hundred and fifteen feet of the vein, and the latter, the eastern eight hundred feet. Moody, Mackie and Whiting made the discovery in 1863 and in two months took out about \$80,000, of which \$40,129 was profit. A single cord of ore gave \$1,675 and the amalgam was sometimes scooped up from the tables in the stamp mill with a shovel. In 1864, the Alps and Grenada companies came into possession of the property. They expended \$59,000 in building the "Blue Mill" near the head of Russell gulch, and a large sum in the hoisting works over the mine, which like everything put up under Mitchell's supervision was first-class and extensive enough for all operations required for many years. Before the mine was brought into "pay" again the working capital was exhausted—and here the mistake of making the stock non-assessable was apparent. Owing to the refusal of a part of the stockholders, no more money was forthcoming for further development of the mine, and the mill on which so much had been expended was

of no service. The agent Geo. R. Mitchell, managed however, to continue work until a fine ore body was reached, and the yield was very large during the remainder of the two or three years of this company's administration. Subsequently other Chicago men took hold of the property and for a while were quite successful. In 1875, Geo. R. Mitchell, who then had possession of the property, sold, and it is now owned and operated by a New York company. The main shaft is five hundred feet deep with levels at proper intervals located where the Alps and Mackie unite. About \$500,000 has come out of this lode altogether. In 1863-4 three hundred and sixty-five tons of ore yielded \$32,000. The mine is now leased by Robert Brewster who employs a force of eighteen men.

The Pyrenees lode, owned by George Estabrooks for a distance of one thousand nine hundred feet, is on the summit of Quartz hill, nearly due west from the Alps and Mackie. The vein is from one to three feet wide and the shaft has already attained a depth of two hundred feet. Six men are taking out about thirty tons of smelting ore per month and one hundred and twenty-five tons of mill ore. The assay value of the former is \$100 per ton or over, and the latter returns seven to eight ounces per cord, or about \$15 per ton. This vein carries considerable lead, sometimes as high as forty-five per cent. Ores have been sold to the Colorado Dressing and Smelting Company, (Collom) at very profitable figures. Some very large and handsome masses of ore were sent to the Centennial.

CHAPTER XXIX.

RUSSELL AND LEAVENWORTH.

THE SILVER BELT.

TUNNELS.

Russell District contains a large number of veins, and the gulch below them has yielded large quantities of gold. On the north side of the gulch are the Topeka and Hillhouse, both large and valuable lodes. On the south side are the Pewabic and Saratoga, which have been worked in places to depths of over two hundred feet. The former is partly owned by H. M. and W. Teller. The Saratoga is owned by companies and by Hal Sayr.

The Mazeppa is a large regular vein, believed to be the extension east of the Saratoga, and is located on a ridge of land lying between Russell and Willis gulches. It has been worked to the depth of one hundred and ten feet, with some few levels. In a period of two months over \$6,000 was taken from the mine. Since then it has not been worked for the reason that, at that depth, capital, which the owners did not possess, became a necessity for timbering and making a proper shaft, the walls of the mine having caved in. As the vein lies between two of the richest gulches of the country there is no doubt that it has added largely to their wealth. When properly developed will pay largely. The owners will resume work when they are prepared to do so on a large scale.

The Hillhouse lode crosses the hill between Russell and Leavenworth gulches, and is the same vein as the Perrin, its western extension. David Barnes took \$15,000 from the surface workings of this lode in one summer. It was afterwards sold for \$25,000. After remaining idle for some time it was relocated in 1874 by Dr. R. G. Aduddel, who owns 1,033 feet.

The Wood has yielded pitch blende in such quantities that the ore sold for \$1,50 per pound and assayed sixty-seven per cent. of oxide of uranium. In Leavenworth are the Gold Ring, Wyandotte and Leavenworth lodes, owned by Killeen and the Hazard brothers. The first has a two foot vein, producing nine ounces of gold to the cord. The second is from two to seven feet wide, and mills from three to nine ounces, and the last yields ten ounces and over per cord. A number of shafts and drifts have been run. The East Leavenworth lode just above Leavenworth gulch, owned by the Martin brothers and Cheatly, has been worked continuously for 1,200 feet. It has paid good dividends for over three years. The "pay vein" is from one to three feet wide; yielding from \$15 to \$25 per ton or from five to eight ounces of gold per cord. This fine showing has been made on surface quartz and without any systematic development or deep workings.

On Gold Dirt hill, near the borders of Gilpin and Boulder counties, is a cluster of lodes that were developed very extensively from ten to fifteen years ago. Their yield at times was enormous, especially near

the surface. Owing to the "capping" of some mines, and company difficulties in others, they have been worked but little for many years. Here are the once famous Gold Dirt, Perigo and Maurer. Up to 1865 the first named was worked to the depth of five hundred feet and produced \$500,000. The others were opened for two hundred or three hundred feet. The Rollins gold company had been operating the Gold Dirt, New York, Racine, Boston, Maurer and other mines. J. Q. A. Rollins now owns the property, together with a fine large mill, and extensive meadow and uplands at Rollinsville. Work has been resumed on some of these mines.

The Chihuahua lode is located in Wide Awake district, and is owned by W. H. Bush & Co., who have been developing it for twenty months. A tunnel nearly three hundred feet long has been driven in on the vein, and recently a splendid body of ore has been found. It is twenty-one feet wide, eight inches of which is worth \$55 per ton. The remainder contains some rich pay streaks. Very high assays have been obtained. The owners' heavy outlays and unbounded faith are at last being rewarded.

The Silver Belt of Gilpin county contains some very good veins. The most northerly lodes of this belt are the Coaley and Gilpin, in Slaughter House gulch. The former yielded \$66,000 in 1869. The ore was worth from a few hundred to several thousands of dollars per ton. Assays of choice pieces gave \$28,000.

On Virginia mountain is an immense silver lode, from five to fifteen feet wide, which extends for a distance of over two miles as far as developments have proved. It is known in various parts as the Kokomo or Searle, the Aduddel, Clifton, Owatonna and Rara Avis. The last three comprise 1,400 feet each. The lode has been opened by some deep shafts and several tunnels. Its silver, lead and copper deposits are very extensive. Wm. Ramage is working the Searle and Clifton.

The Aduddel is opened by shafts one hundred feet apart for a distance of 1,800 feet, some of them being from one hundred to two hundred feet deep. This is again being worked and at one point displays a vein from five to ten feet wide of ore that sells at from \$20 to \$90 per ton at smelting works. The vein carries at this place a paying quantity of silver, considerable gold, and from fifteen to fifty per cent. of lead. Good ore has been obtained from various other parts of the mine as well as from the entire lode, and there is no doubt, if opened up properly and with capital, that it would prove one of the best paying properties in the mountains. The best ore has netted from \$100 to \$200.

The Clifton company formed under the limited liability act has its head office in London. It owns altogether 6,000 feet of mines. The buildings and machinery are of the best description. There are two tunnels, one four hundred and ten feet long and one two hundred and fifty, besides several shafts. The north wall is well defined, and the crevice is twenty

feet wide in places, as in the Aduddel; partly ore, with some "gouge." The Searle has a shaft one hundred and twenty-eight feet deep, three hundred and fifty feet of levels and hoisting machinery. Ore sells at from \$10 to \$175, and assaying some \$50 additional. The Aduddel, Searle and Clifton are all worked, and comprise one of the largest veins in that section.

There are eight or nine tunnels in Gilpin county that are worthy of note. These enterprises are valuable for draining and exploring purposes, and as a means of avoiding hoisting and ore hauling expenses. Owing to the gradual slope of most of the hills there are not as many desirable tunnel sites in Gilpin county as in some of the silver districts. Still several very practicable schemes are being pushed steadily forward.

The Bobtail tunnel is 1,150 feet long, and is very useful as an outlet to the mine from which it takes its name. It cost \$40,000. This has been noticed in the chapter on the Bobtail lode.

The Central City tunnel is located near the northeastern base of Quartz hill, having its starting point from Nevada gulch, about 1,000 feet west of the Quartz hill tunnel. The site was preempted long ago by B. O. Russell, but the work of driving the present enterprise did not commence until June 10th, 1876. Just before that time Mr. D. G. Wilson organized a company in New York upon a capital stock of \$1,200,000, and a working capital of \$25,000. The object of the enterprise is to penetrate Quartz hill, to cut the Fortune lode (owned by the company,) and to explore

the mountain for new discoveries or blind lodes; also to aid in the development of mines already found on the surface. At a distance of seven hundred and twenty feet the rich Fortune lode will be intersected 320 feet below the surface, and within the next seven hundred feet, the Burroughs, Roderick Dhu and Illinois, will be crossed at a depth of five hundred feet. The direction is twenty-four degrees and fifty-one minutes west of south, pointing towards Leavenworth gulch, 3,000 feet distant from the starting point. The size of the tunnel is five and a-half feet wide by six and a-half high. At its mouth is an excellent mill site and dumping ground. The first vein was cut one hundred and thirty feet in, being a new discovery of iron and copper pyrites, three feet in width. One hundred and eighty feet from daylight another large vein was crossed, and seventy feet beyond, the Kansas was intersected. The tunnel is a fine piece of workmanship, being timbered in the most substantial manner, and supplied with a railway over which the rock and ore are transported in iron cars. Here are two stone buildings used for storing ore and for blacksmith and repair shops. The tunnel is now over two hundred and fifty feet long, and has been driven at the rate of fifty feet per month since getting into the hard granite. Work is prosecuted night and day under the immediate supervision of Mr. Wilson, the agent of the company. The mountain will be thoroughly explored and, it is confidently expected that the new discoveries made, and to be made, will

net a handsome revenue and pay all expenses of driving the tunnel. The location is extremely favorable, heading as it does directly for the main belt of lodes on Quartz hill.

Quartz Hill tunnel starts from Nevada gulch, opposite the upper part of Nevada street, Central. This enterprise was inaugurated in 1865 by citizens of Central, and has been prosecuted steadily until the eastern part of Quartz hill has been penetrated for a distance of nearly 1,000 feet at a cost of \$35,000. The expenses are defrayed from assessments on the shareholders. In case the assessments are not paid the stock of the delinquent party is sold after due notice has been given. No one member can hold over three shares, and none of the stock is for sale, the holders having the utmost faith in the value of their undertaking. A few of the original shareholders have been sold out, have died or left the country, but many remain and the work still goes on, often slowly, but never abandoned. No veins of any value have been found, and consequently there have been no receipts, but instead one continuous outlay. Yet it is expected that the great gold belt of Quartz hill will be tapped at an early day, and but a few hundred feet ahead of present workings. The eastern portions of the Burroughs, Borton and Illinois cluster of lodes will be cut nearly five hundred and fifty feet deep. The officers are H. Atwater, president; F. Folster, vice president; H. J. Kruse, secretary; Henry Kruse, treasurer; J. H. Lafranz, superintendent; trustees, E. Goldman, G. Steinle, W. Hambly and L. C. Rockwell.

The German Tunnel. The company operating this was incorporated under the laws of Colorado in January, 1875, and consists entirely of Central City men. The stock comprises thirty shares, which number cannot be increased, nor can any one member own more than three of these. The company was formed to explore Central City hill and develop whatever veins might be discovered there. The tunnel site once belonged to the Washington Tunnel company, and the hill was penetrated sixty feet when the enterprise was abandoned. The present owners purchased it for a small sum and then began work.

Two hundred and fifty feet of the tunnel were driven for \$8 per foot. The next contract was let for \$12 per foot, and the present for \$15 per foot. When the present contract of one hundred feet is completed the tunnel will be five hundred and nine feet long, constructed at an outlay of about \$4,800. The rock is run out over the iron railway and emptied into the gulch below Turner Hall, affording a good dump, at the same time that the lots located there are filled up and made more valuable. The mouth of the tunnel is on Gregory street, in the heart of the city, and opposite Turner Hall, affording a convenient point for loading ore for the mills. Five lodes have already been intersected. The only one known is the East Boston, the others being newly discovered. In time the Gregory No. 2, the Tierney, Maine, Girard and Mammoth lodes will be cut, the latter five hundred and sixty feet deep. No tunnel can be run cheaper,

as no company official is paid a dollar, and there are no expenditures except for the work of driving the tunnel, (which is let on contract) and for the track, &c. The officers of the company are president, A. Carstens; vice president, George Stegner; secretary, S. I. Lorah; treasurer, P. Pflum; superintendent, N. H. McCall. The stockholders include beside the above H. J. Kruse, F. Kruse, J. Mack, Wm. Lehmkuhl, and Messrs. Lewis and Richards.

The Bugle Tunnel is owned by Bela S. Buell, and starts southward from Gregory street near Kruse's store, and northward from a point in Virginia canon, above Idaho. Little has been done upon it, but the enterprise has an inviting field before it. It will pass under Mammoth hill, Russell district and Virginia and Seaton mountains, a distance of three miles and 1,060 feet. Twenty-seven prominent lodes will be cut at various depths, and of course many blind lodes will be found.

The La Crosse Tunnel, a half mile above the Central City, occurs in the lower part of Nevada and has been driven southerly into Quartz hill over nine hundred feet. It will soon cut the Roderick Dhu and other prominent veins. An immense mass of ore seventy feet wide has been passed by this tunnel, but it is of too low a grade to be handled until water is brought into Nevada gulch in sufficient quantities to be substituted for steam mill power.

The Belden and Tennel Tunnel was taken hold of by a company organized in Denver by D. D. Belden.

It starts from a point in Chase gulch near the old mill, and is designed to pierce Casto, or Winnebago hill. Among the old lodes it will intersect are the Winnebago and Casto, at a depth of three hundred and fifty feet, and one thousand feet in. In driving the tunnel three hundred and forty feet, three valuable veins were discovered that had not been found on the surface. The first of these was called the Ellery, west of the tunnel, and the Furnald east of it. Fred. Kruse is making money rapidly in leasing a part of the latter. Drifts and shafts have been sunk, and four feet of seven ounce ore found. The Ellery was discovered in December, 1875, and began to be worked extensively in February. From that time to August 5th, ninety-six and one half cords of ore were milled, yielding six hundred ounces of gold, or \$9,900. The yield has since been equally good, sometimes giving two-thirds profit. Eight dollars per foot was the first contract price of driving the tunnel and \$16 at the present time. The company will soon have government patents on seven thousand and eight hundred feet of lodes already discovered, and after paying those and all other expenses, \$3,000 remains in the treasury as the result of driving a tunnel for eleven months and working the veins. The Ellery is five feet wide.

Some fifty men are engaged in gulch mining in Russell and its tributaries, and as many more on North Clear Creek, below Black Hawk. Among the valuable claims in the former locality are those of

Wm. Queen, embracing two thousand, one hundred and eighty feet of placer ground, which have yielded \$8,000 in a single year. Joseph Welch and others are obtaining considerable quantities of gold in North Clear Creek.

Powder and high explosives for blasting purposes are sold in Gilpin county alone to the amount of \$50,000 annually—that amount being required there for the quantity of mining done. Laffin & Rand, the California, the Hazard, and Giant powder companies furnish the supply. One Central druggist has sold quicksilver to the value of \$150,000, within eight years, and there are four dealing in the article in the county. This was used in securing gold from the ore crushed in stamp mills.

There are probably four thousand lodes, or spurs and offshoots claimed as lodes, in Gilpin county. Over thirteen thousand claims have been recorded. The value of a hundred mines has been established. There are hundreds more that may yet prove sources of profit and perhaps of wealth to their owners. Capital and a free use of muscle, powder and fuse will tell the story. The hills about Central are literally "honey-combed" with prospect holes, shafts &c., that were excavated in searching for golden veins. This shows that a great deal of digging is often done before securing a prize.

The knowledge gained by years of experience and labor among these mines is one cause of advancement in the main industry of this section. Consolidation

of properties and a reduction of expenses are other causes. But while some mines are operated as they should be, there is great room for improvement in the greater part of the mining that is done. In fact, it is wretchedly conducted in many quarters. This is often the case where properties are leased. All the "pay in sight" is taken out, while no improvements are made, the mine is left in an unsafe condition, and a considerable outlay is required from the next operator to place it in shape for work. Still, more mines are being operated for continuous work than at any previous time. Ground is kept open ahead of what is needed for the time being, and this is a most promising sign of the times.

CHAPTER XXX.

CLEAR CREEK COUNTY.

*Grographical features—Mountains ribbed with Silver—
The Nation's Treasure Vaults—Bullion Statistics—
Annual Statements—The Silver Queen—A lively city
—Silver Plume, &c.*

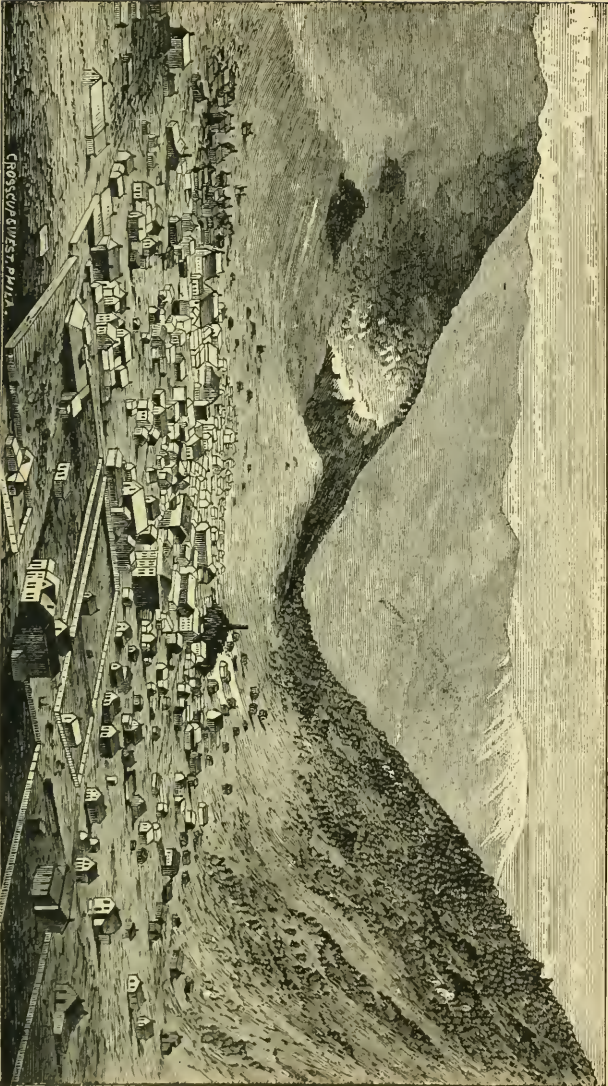
Clear Creek county includes the region drained by South Clear creek, and embraces the best known and most productive silver district of Colorado. It is bounded by Gilpin county on the north, Jefferson on the east, Park on the south, and Summit and Grand on the west. South Clear creek and its branches sweep down the canons in and below the Snowy Range, forming long narrow valleys wherein the population mainly finds its abiding place. The steep and rugged mountains that flank these valleys and ravines are ribbed with veins of silver, often of immense value. Here and there are newly-built villages, thriving mining camps or solitary cabins, to indicate the presence of the miner or prospector. The entire section up to elevations of 11,200 feet is more or less thickly covered with pine and other forest species.

Two beautiful streams, fresh from the springs and eternal snows of Gray's Peaks and Argentine Pass, unite at Georgetown, and form the southern fork of South Clear creek. Between them extends a spur of the main range, known under the names of McClellan

and Leavenworth mountains. East of Georgetown are Griffith and Anglo Saxon mountains. Another spur of the great range lies between the valleys of Silver Plume and Georgetown, and that of Empire. To the west this is called Brown Mountain, then Sherman, and further east and north Republican and Democrat.

These elevations and Kelso mountain embrace all the prominent silver-bearing localities near Georgetown. Of the lodes that have given them their notoriety the Stevens, Belmont and International are conspicuous on McClellan mountain; the Equator, Colorado Central, Saco, Gates, Pulaski and Gilpin on Leavenworth; the Anglo-Saxon and Griffith on the mountains of the same name; also the Magnet and Comet; the Rogers, Polar Star, Queen of the West and Silver Cloud on Democrat; the Dives, Pelican, Pay Rock, Phœnix, Snow Drift, Silver Plume, and Hercules on Sherman, and the Terrible, Silver Ore, Gunboat, Brown, and Roe on Brown. These are only a few of the multitude of veins with which this section is intersected.

North of Empire is a gold belt that has produced largely. East, and further down South Clear creek, the silver belt continues with some interruptions to Spanish Bar, from which exceedingly valuable mineral deposits extend over into Gilpin county. To the south, Chicago creek takes its rise among rich silver mines. South Clear creek has yielded large quantities of gold from Spanish Bar down to a point several miles below Idaho.



The veins of Georgetown district are rich in silver, but few of them carry gold. The country or surrounding rock is granite or gneiss. Many varieties of structure and mineral composition occur in close proximity to each other. The veins are commonly not very wide, dip at a high angle, often vertically, and the greater portion have an east and west course. A smaller number strike north fifty-five degrees east. The Equator is an example of this character. The veins near Idaho carry a much higher percentage of gold, especially near the surface. The Seaton, Whale and others were once worked as gold veins, but as depth was gained the percentage of silver increased. The Hukill still carries a large proportion of gold.

Georgetown, the "Silver Queen," is located at the upper end of South Clear Creek valley, fourteen miles above Idaho, and fifty miles from Denver. Its location is grand, picturesque and beautiful. It is surrounded on all sides but one by lofty mountains, that rise almost perpendicularly to the height of from two to three thousand feet above the town. It is built on the nearly level bottom of the valley, which expands here to a width of nearly half a mile. Far above like grim sentinels tower the grand old mountains covered with pine and ribbed with silver.

The town site is about two miles in length, the business portion of the place lying to the south and under the shadow of Leavenworth mountain. Here are located four large silver reducing mills and a number of dressing, sampling and ore-buying establish-

ments. Georgetown is well built and few western towns can boast of a better class of private residences or better patronized marts of trade. The streets present a bustling animated appearance, that must be seen to be appreciated. Especially is this the case on Saturdays and Mondays, the great days of arrival and departure to and from the hundreds of mines on the far-away mountain sides. Ores that have been mined during the week are then brought in more than at any other time, and supplies are taken back on the return trip. The transportation of freight, merchandise and ore is carried on constantly to and from the larger mines, and the stores and mills. The newer or more inaccessible lodes, to which no roads have been constructed are reached by means of donkeys, or "pack trains," as they are called. It is a novel sight to the eastern traveler to see these patient and docile animals, "loaded down to the guards" with timber, powder, steel, merchandise and supplies of almost every conceivable description, file through the streets bound for the mines on the mountain tops.

Everything that can be expected of a first-class, wide-awake town of twenty thousand people is afforded here, except a railroad, and that is forthcoming. The telegraph, newspaper, church, theatre and hotels of the best description, are all here. There are banks, first-class schools, a well organized fire department, and hundreds of neat and attractive residences, all of which attest the wealth, enterprise and prosperity of this go-ahead town among the mountains, 8,452 feet above sea

level. The town has recently been illuminated with gas, and many solid and substantial business houses have been erected. There are five churches, several large silver reducing mills and ore sampling works, and a population of perhaps 5,000 as against 888 in 1870.

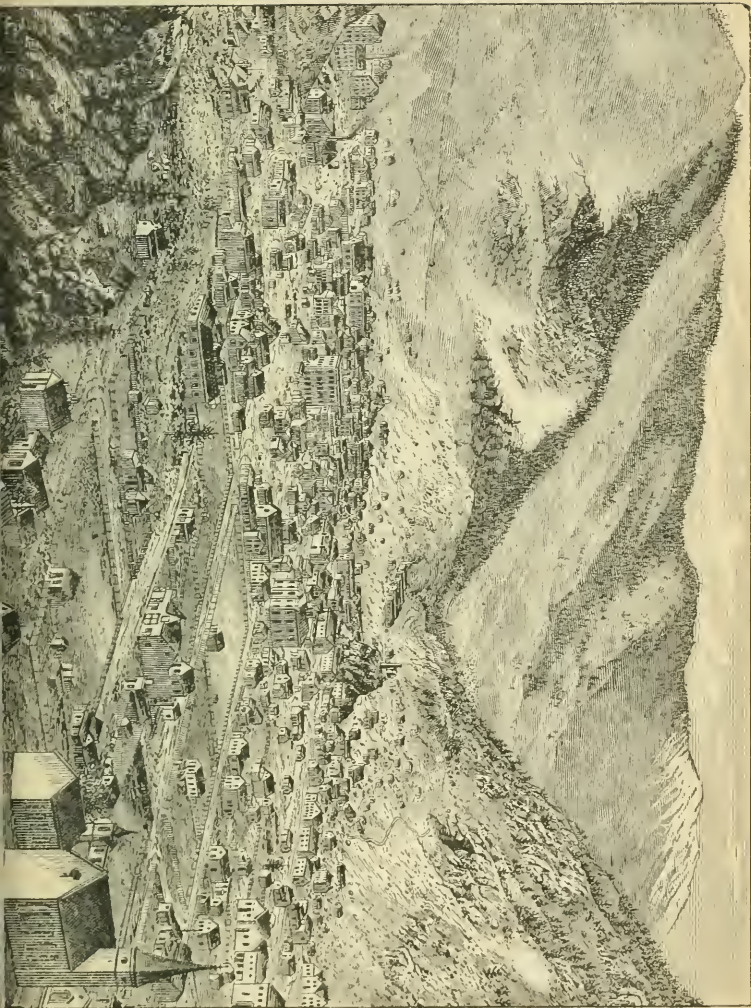
Two streams come dashing down the mountain gorges into either side of the valley affording splendid power for mills and reducing works. This permits waterworks of the most efficient character, a natural fall of one hundred and forty feet being obtained just above the town. These works were completed at a cost of \$22,000, derived from fees on titles to city lots, issued when the government patent for the town site was granted. A stately school building costing \$22,000 is the most conspicuous object seen when entering the city. Georgetown's population is made up from all nationalities, but comprises wonderful enterprise and energy, and much intelligence and refinement. Rich and poor, cultivated and illiterate, all form parts of this seething tide of humanity, all bent on achieving a fortune.

The Georgetown *Miner* published the following business summary for 1865:

There were 16,747,870 pounds of freight received in 1875 over the Colorado Central Railway, and 10,008,000 pounds of ore sent away over the same road. The expenditure for schools was \$31,873.72, of which \$6,073.72 were paid for current expenses, \$23,500 for school buildings, and \$2,500 for furniture.

There were nine hundred and sixty persons of school age, most of whom were enrolled as pupils. One news depot in Georgetown sold newspapers and periodicals to the number of 73,712 copies. Money orders were forwarded through the Georgetown office of a total value of \$110,194. The arrivals at the hotels exceeded 16,000, and the Beebee House, at Idaho Springs secured half as many more. The amount of lumber turned out at the saw mills aggregated 2,920,000 feet, and 1,500,000 of shingles were manufactured. A first-class stage line affords connection with Central and the Colorado Central Railway terminus, at the lower end of the county.

Clear Creek county possesses a number of flourishing villages. Idaho Springs is situated in a valley on South Clear Creek, at the foot of Virginia cañon, and fourteen miles from Georgetown and six from Central. It is on the only traveled route from Denver to the "Silver Queen," and will soon have connection by rail with the cities of the plains. The present terminus of the Colorado Central Railway is at Floyd Hill, five miles away. The hot and cold soda springs of this place give it a world-wide celebrity, and the result is a watering place and pleasure resort of the first order. Thousands visit the Springs every summer to partake of the health-giving mineral waters, or to escape the heat and bustle of city life in lands farther removed from heaven. The mines at and around Idaho Springs do much to maintain a steady annual trade for its merchants. The population is something like five hundred.



A lively and flourishing place sprung into existence in the lovely valley below Sherman mountain subsequent to the discovery of the rich silver veins. It was given the very appropriate and pretty title of Silver Plume, after one of the main lodes. The Pelican, Dives, Baxter, Phoenix, Pay Rock, Silver Plume and Snow-drift mines are in full view of this town, and skirt the mountain side, one above the other, with their huge embankments of waste rock and granite, like so many forts or frowning battlements. The town contains six hundred inhabitants, a church, school and the usual post office, stores and saloons, as well as stages and expresses to Georgetown.

One mile further up this cañon, lined with mountains three thousand feet high, is Brownsville, supported by the Brown and Terrible cluster of mines. On the other side of Leavenworth mountain is the new mining camp of Silver Ore.

As has already been stated, gold was discovered in Clear Creek county in 1859 and silver in the fall of 1864. As there were no silver miners or mill men, slow progress was made for over two years. The first bullion obtained was in December, 1866. Its value was \$500, and constituted the year's silver production. Below will be found the product of the mines of Clear Creek county by years. All but that for 1875 are the figures of either the Georgetown *Miner* or *Review*, or of R. W. Raymond, United States Commissioner of mines.

BULLION PRODUCT OF CLEAR CREEK COUNTY, (COIN.)

1859 to 1868, Gold product	\$2,500,000 00
1866, Silver	500 00
1867, "	40,000 00
1868, Gold and Silver	91,820 35
1869, " "	248,000 00
1870, " "	481,354 08
1871, " "	869,046 34
1872,* " "	1,389,289 00
1873, " "	1,259,761 06
1874,† " "	2,203,947 97
1875,‡ " "	2,064,000 00
Total	<u>\$11,157,718 80</u>

*Raymond, \$1,503,391 43.

†Miner, \$2,368,781 95.

‡Mining Review, \$1,988,699 55. The figures for 1875 represent currency.

The yield of Clear Creek county in 1871, was from the following sources:

Stewart Silver Mill,	\$239,528 60
Palmer & Nichols mill,	100,002 49
Brown mill,	25,845 00
International mill,	26,125 70
Baker mill,	4,509 45
Gold, lode and placer	20,000 00
Total bullion	<u>\$416,011 24</u>
Ore shipped elsewhere,	453,035 10
Total,	<u>\$869,046 34</u>

Raymond's report on this county for 1872, prepared by Stoelting and Napheys gives the product for that year as follows:

Bullion matte,	\$265,187 43
Ore shipped east, etc	831,556 00
Ore sold to N. P. Hill	406,648 00
Total	<u>\$1,503,391 43</u>

CLEAR CREEK BULLION REPORT FOR 1873,
(Georgetown *Miner*.)

Stewart Smelting and Refining Company, Coin value . .	\$325,000 00
Masonville mill	20,263 46
Placer and retort gold, Idaho and Empire	34,000 00
Total	<u>\$379,263 46</u>

ORE SHIPPED OUTSIDE COLORADO.

	TONS	VALUE
G. W. Hall & Co.	428	\$225,251 44
Wm. Bement	136	45,000 00
Terrible Silver Mining Company	110	70,000 00
J. G. Pohle	85	47,000 00
Pelican, Baltimore Company Eggers, Iselin, Jones, small shippers }	160	54,500 00
Total	919	<u>\$441,751 44</u>

TREATED AT WORKS IN COLORADO.

	TONS	COIN VALUE
Bagley & Sons, Golden	231	\$ 25,675 00
Swansea Smelting Company	438	63,971 16
United States Gold Smelting and Mining Co. (Whale mill) estimated		150,000 00
Boston and Colorado Company, Black Hawk		200,000 00
Total		<u>\$438,746 16</u>
Making a grand total of		<u>\$1,259,761 06</u>

The Swansea works treated \$6,552.29. There were 2,000 tons of gold and silver ore treated.

Raymond's annual report gives the yield of Clear Creek county in 1874, as follows:

Silver bullion	\$ 555,268 49
Ore treated in Colorado out of the county	520,968 60
Ore shipped out of Colorado	1,085,210 88
Placer and stamp mill gold	42,500 00
Total(coin value,)	<u>\$2,203,947 97</u>

Number of tons of ore mined 9,490, average value \$224 per ton; of this, 3,275 tons, average value \$186, were treated in the county; 2024 tons, worth \$230,

in other counties, and 4,191 tons worth \$260 per ton in eastern cities and in Europe.

Lead to the value of \$48,239 was contained in the ores shipped, being an average yield of 20 per cent to the ores producing it. A full record of lead ore was not kept. The ore reducing facilities of the county were increased during the year, and the establishment of ore buying agencies for eastern and foreign works vastly improved the market and gave the miners better prices.

Below is the substance of the *Miner's* report for 1874, giving \$2,368,781.95, currency value.

SHIPMENT OF ORE BUYERS AND OTHERS.

	TONS	VALUE
G. W. Hall & Co	772¼	\$364,832 00
Cree & McCann	121	29,894 00
Terrible Company		176,840 00
Wm. Bement	1,068	208,109 66
Boston and Colorado Company		33,184 17
All others		318,500 00

BULLION AND GOLD DUST.

	TONS	VALUE
Pelican mill		\$ 76,000 00
Stewart Silver Reducing Company	2,647	436,181 43
Judd & Crosby works	427	55,951 52
Swansea works { Silver		10,036 67
{ Gold		932 80
Whale mill	445.14	58,652 50
Gold, lode mines		5,300 00
Gold, placer and bar		87,000 00

The production of the county in 1875 was as follows (currency value):

Silver bullion from the Stewart, Pelican and Judd & Crosby mills	\$ 617,200
Silver ore sent to Boston & Colorado Smelting works	438,000
Ore to Golden Smelting works	29,958
Ore sent out of Colorado	951,744
Gold ore from Empire and elsewhere	10,000
Gold ore sold to Boston and Colorado works	4,000
South Clear Creek placer gold sold to Central Banks	23,961
Total	\$2,064,863

Here is a summary of the *Miner's* annual statement for 1875, coin value:

	TONS	VALUR
G. W. Hall & Co	1,037	\$316,910 00
Wm. Church (B. & C.)	1,680	343,592 62
Wm. Bement	638.8	70,326 55
L. F. Olmsted (Golden)	272 5	29,958 00
Mellis & Morris	743.8	153,344 78
Total shipment	4372.1	\$914,131 95

SILVER BULLION.

Stewart Silver Reducing Company,	\$280,667 49
Judd & Crosby works	236,531 94

No separate statement is given for the Pelican mill. The gold product is given at \$85,500.00; an over estimate, based on the production of bar and creek gold. The currency value of of the county's total yield for 1875 is given at \$1,988,699.55.

During the six months ending July 1, 1876, the First National Bank of Central, purchased 680 ounces 16 dwt and 6 grains of gold from the bar and creek diggings of Clear Creek county. Reckoning its value at \$19.00 per ounce, \$12,936. The other banks of Central purchased in the same time and from the same section, gold to the value of \$1,000 making a yield of \$13,936 for the first half of the present year. Very nearly all of the gold from this source is sold at those banks.

The notes which will follow, concerning the mines of Clear Creek, are not generally as extended as those of Gilpin for several reasons. Their history and record does not extend back as far, and does not embrace so many years of production. Litigation prevents complete statements of the yield from being obtained in many cases.

CHAPTER XXXI.

HOW THE SILVER IS EXTRACTED FROM THE ORE.

Concentration and Reduction—Chlorodizing-Roasting and Amalgamating—The Stewart Works—Leaching—The Pelican Silver Mill—Judd and Crosby Works—Concentrating and Ore Dressing, Dry and Wet—The Clear Creek Dressing and Reduction Works—Other Establishments.

THE methods of treatment of ores for the extraction of silver in Clear Creek county, are confined to chlorodizing-roasting and amalgamation, and to the Hunt-Douglas and Stewart process.

The latter has been in operation at Georgetown in the Stewart Reduction Works for a few months only, or since the rebuilding of the mill destroyed by fire. These works contain twenty stamps, reverbatory furnaces, eight Wheeler amalgamating pans, eight tanks with stirrers, and a set of vats for the precipitation of both silver and copper. The capacity of the works is twenty-four tons of ore daily. J. Oscar Stewart is at the head of the concern, and his mills operated in former years by a different process, turned out nearly \$1,500,000 in silver bullion. Ores to be treated here, must contain copper, and if it be absent, copper ore must be added. The larger the per centage, the more energetic will be the subsequent action of the solution on the silver. Ores carrying gold, silver and

copper can be treated by this process. The various steps taken at this mill, as stated by the company, are as follows :

- I. The choice of suitable ore ;
- II. The grinding of the ore ;
- III. The calcining or the chlorodizing of the ore ;
- IV. The treatment of the oxydized or chlorodized ore with a solution of protochlorid of iron and salt, in order to dissolve out the copper and most of the silver,—and the precipitation, in the metallic state, of the copper and the silver thus dissolved ;
- V. The lixiviation of the sands, thus deprived of their copper and of part of their silver, with hyposulphite of lime to extract the remaining silver, and the precipitation of the silver thus dissolved by sulphide of calcium ;
- VI. If gold be present, leaching the sands exhausted of copper and silver with chlorinated brine, and the precipitation of the dissolved gold from this by sulphuretted hydrogen or sulphide of calcium.

A large portions of the ores mined in this county are purchased and sent to Black Hawk, Golden and elsewhere for milling. At the Boston and Colorado Smelting Works, Black Hawk, gold ores are roasted in heaps in the open air. Wood is laid in piles and the ore heaped thereon something after the style of burning brick. Fires are kindled and this ignites the sulphur in the ore, which continues to burn for one or two months, or until it is consumed. The ore is then ready for smelting and for the remainder of the process. The fumes from these piles, whose smoke ascends continually to heaven as long as any brimstone remains, are exceedingly strong and are carried for a long distance. Silver ores, not containing enough sulphur to maintain combustion without the aid of other substances, are roasted in reverbatory furnaces, and then smelted. The furnaces are tapped,

letting out the molten lava on to a sand floor. This contains several pits, and the part containing the precious metals being the heaviest, settles in these depressions. This is called matte, while the worthless portion, called slag, flows over the floor and is broken up and carted away as refuse. The matte is crushed and roasted in another furnace in order to expel what sulphur remains and to form sulphate of silver. It is then put in vats where hot water dissolves this sulphate. After leaching, the solution runs into wooden tanks lined with copper. The latter metal liberates the silver from the solution. The silver thus precipitated, is gathered at intervals, washed and pressed into cakes, melted and run into bars etc. After the silver has been precipitated, the solution passes into other tanks containing scrap iron which, separates the copper from the solution and the latter flows on to waste. Gold, in gold bearing ores, is separated by a method invented by Mr. Pearce. The ores of Gilpin county carry a heavy percentage of copper. It will be noticed that the gold ores treated at these works in 1875, yielded \$357,000 in gold, \$94,000 in silver and \$51,000 in copper. These works show the true proportions of these metals rather than the stamp mills, as the latter are unable to secure but a small percentage of the silver and copper.

The Pelican mill is located at the west end of Alpine street, Georgetown, and on the Argentine fork of South Clear Creek. It contains ten stamps, five Bruckner cylinders, eight amalgamating barrels, and

has a capacity for treating from eight to ten tons of ore daily. The third class or poorer product of the Pelican mine supplies the mill. The original building has been enlarged until the entire concern covers a large extent of ground. The stamps weigh six hundred and fifty pounds each, and the frame work enclosing them, is probably the most substantial in Colorado. These stamps rise and fall ninety times per minute and sometimes much faster. The batteries are double issue, and dry crushing is the method. The ore when brought to the mill is deposited on an iron floor, heated from beneath, and thoroughly dried. It is then shoveled into the batteries and crushed to a powder by the stamps. At the same time this pulverized mineral is forced through the screens of the batteries, falling below and on to a double chain elevator, which, like those of flour mills, conveys it to a revolving screen, through which it passes into a large bin. Any particles not fine enough to go through the screen are returned to the stamps for more crushing. When required, this pulverized ore, in "charges" of 3,500 pounds, is dropped into the cylinders, which are then set in motion at the rate of one revolution in two minutes. This is to keep the charge moving so as to thoroughly expose all parts to the heat, and later to mix the salt therewith. The sulphur contained in ore must be expelled before the precious metals can be thoroughly extracted. This is done by an intense heat from the flames of the furnaces, which pass through the cylinders and escape

with the sulphur up the chimney. After four hours, salt is introduced, equal in weight, to from six to eight per cent of the ore, and the machine is again set in motion. Pelican ores must be roasted in these cylinders from fourteen to twenty hours, according to the amount of lead and zinc they contain. Ores from most other mines contain less of those minerals, and require less time and expense. After roasting, the ore is discharged in cars and conveyed to a cooling floor, where it is screened.

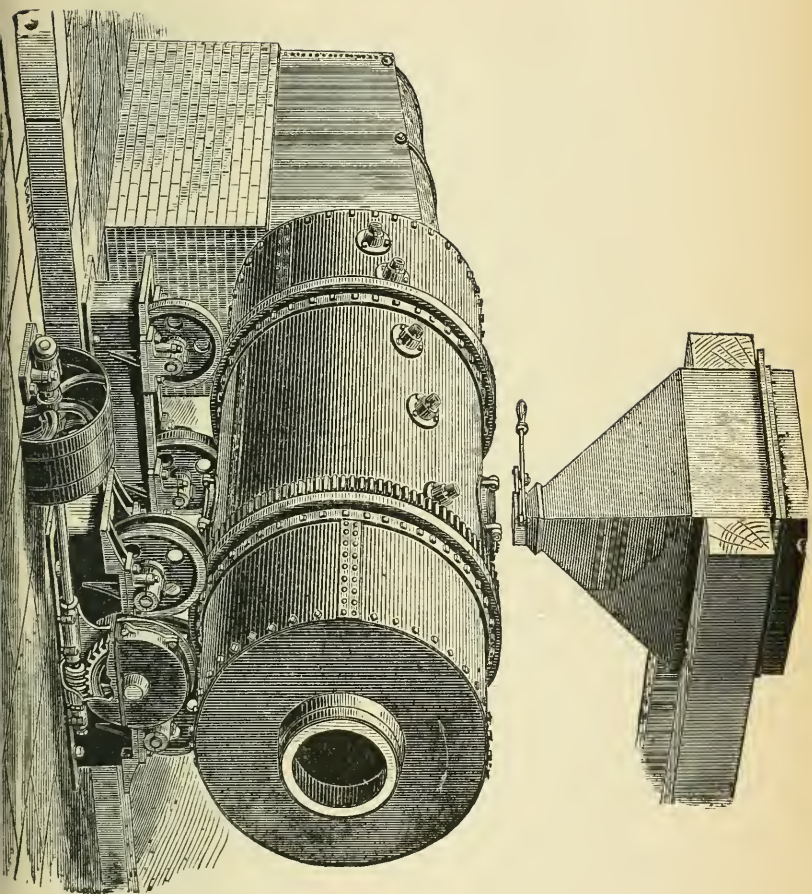
The Bruckner cylinder is a horizontal cylinder, constructed of iron and lined within by fire brick, designed to roast ores at much less cost than required by the reverberatory furnace. It is usually eleven or twelve feet long by five or six feet in diameter, and is supported on rollers so as to revolve freely. One end communicates with a brick fire place and the opposite end opens into a stack, so that the flame is drawn through the cylinder (which is partially filled with ore) at the same time that the turning of the cylinder keeps the ore in continual motion, and subjects all portions of it to an equal heat. Within the cylinder there is a partition running through the greater part of its length. This is made of iron and covered with fire-proof material. This insures, as the cylinder is revolved, an intimate mixture of the whole mass of ore. Between the end of the cylinder and the stack is a dust chamber, in which the material that is carried through with the draught may have an opportunity of settling.

It is then placed in the amalgamating barrels in charges of about 2,000 pounds, mixed with water enough to form a moderately thick paste. Before adding quicksilver, (one hundred and fifty to five hundred pounds), the charge is revolved for four hours with several hundred pounds of scrap iron, in order to partially reduce the chlorides present, which would otherwise be performed at the expense of the quicksilver. The chloride of silver, after being partly reduced, is amalgamated by the quicksilver. These barrels are arranged to revolve much after the manner of the cylinders, and are made of wooden staves, often six inches thick, but when lined with blocks, have but half that thickness. The ends are of thick plank and the barrels are strongly bound with iron.

After the barrels have revolved for sixteen hours longer, and the combination of quicksilver and silver has been carried by its great weight to the bottom, it is drawn off, while the sand or waste material is washed into the creek, a further saving being at the same time effected. The precious compound is then pressed in canvass bags to extract as much quicksilver as possible. After washing, what remains in the bags (called amalgam) is "retorted." This is done in an iron retort by the application of great heat, which expels the quicksilver (through a pipe whose lower end dips in water) and condenses it so it can be used again. But a very few pounds of quicksilver are lost in these operations. The silver is then taken from the retort, melted and run into bars or bricks of about 1,000

ounces, and 830 to 900 fine, and shipped to New York for sale. The fineness or value is determined by chipping off a corner from either side of the bar and assaying the same. The result is stamped upon the bars, together with the name of mill, &c., and the address of the consignee. The monthly bullion production of this mill is from \$25,000 to \$30,000. It costs \$18 or less per ton to mill Pelican ore of the character handled here, which yields from \$100 to \$125 per ton, and contains fourteen per cent. of zinc, two and-a-half of copper, and eight of lead. Lighter ores can be handled at \$8 per ton in summer and \$12 in winter. The difference in cost is caused by the motive power used. In summer the mill runs by water, and in winter by steam. Garrett, Martine & Co. began milling here with one cylinder and afterwards two. Huepeden followed and then came Palmer and Nichols. Afterwards Geo. C. Munson and the Pelican company leased the place and remodeled it. Then the Pelican company bought it, doubled its size and added three cylinders, several barrels and the stamps. For over two years Benj. F. Napheys, who is thoroughly acquainted with the process, and is a most competent mill man, has been superintendent of the establishment. Work has gone on without interruption for nearly two years, and under the present administration half a million in silver bullion has been obtained.

Concentration has been introduced in this silver district during the past few years and has been of



incalculable benefit to the miner. While there is always a considerable quantity of ore mined that is very valuable and pays a large profit, the larger portion of all silver veins is composed of ore of too poor a quality to pay the expense of mining and milling. By this system of dressing ores the waste or gangue rock is separated from the richer material, and the milling or salable matter is then so much reduced in quantity as to admit of a charge of \$35 or more per ton. By this means the ore is reduced to from one-third to one-eighth its former bulk, many mines have been made to yield a profit that could not do so before, and others to increase their production greatly. George Teale did the first work of this kind by the wet process on ore from the Terrible lode, of which he was superintendent. Then the Teale and Eddy ore dressing works were established at Silver Plume, and have been in operation for over a year. They have been handling from twenty to forty tons daily. For a time the immense "dump piles" or waste rock from the great Dives and other mines were sorted over and handled here very satisfactorily. Rock that had been thrown away as worthless was thus made available.

In 1870-71, and previous to the introduction of the wet process, Wm. Bement had operated the Krom Separator (dry concentration) at the Washington mill. This was destroyed by fire. Both wet and dry processes embrace very extensive combinations of machinery that do the work far more rapidly and effectually than it can be done by "hand sorting" or manual labor.

The Clear Creek Ore Dressing and Reducing Company was established in 1875. The location is in the heart of Georgetown and just above the Pelican mill. The Dressing and Concentrating portion of the concern began operations last January. Dry concentration (Krom Separator) is the process used, with a capacity of sixty tons daily. The average quantity of ore handled is about thirty tons daily. During the present year the Clear Creek company have supplemented their dressing works with silver reducing works of nearly the same character as those of the Pelican company. This splendid mill was completed in September, 1876, and is on the same grounds as the dressing works.

The mill has stamps, four Bruckner cylinders, and a set of leaching tubs furnished with copper plates. The latter, something like the Hunt-Douglas-Stewart process of leaching with copper, supply the place of pans or amalgamating barrels. Of the lighter classes of ores this mill can handle twelve tons and over daily. F. M. Taylor is superintendent of concentrating and reducing works.

The following firms or agents are engaged in the purchase and shipment of ore at Georgetown:

G. W. Hall & Co., for the East and Europe, Church brothers, Wm. Bement, for Pennsylvania Lead Company, Silver Queen Works, L. F. Olmsted, for Golden, Matthews & Co., and Cree & McCann. All these have sampling works. The home reducing works of Stewart, Judd & Crosby and the Clear Creek Company

(Taylor) purchase their ore supplies from the miners. The most valuable ores are sent to Europe for treatment.

The Silver Queen Concentration Works were recently established in Georgetown by W. W. Rose.

The Judd and Crosby silver mill of Georgetown is located near the base of Burrell mountain, and beside the Brownville fork of South Clear creek. This creek furnishes an excellent water supply, which aids to lessen expenses. The mill was altered and remodeled at times and did not fairly get down to steady work until late in September, 1874. During the remainder of that year its bullion export was \$55,591.52; in 1875, \$280,667.49, and in the first six months of 1876 it was \$121,095.72. The latter sum is obtained by reckoning silver at \$1.29 per ounce, coin value, when in reality that was too high an estimate for the currency value of silver. The product for the year will not probably exceed \$240,000.

This is a custom mill. Ores are brought here from mines all over the neighboring mountains. The process is chlorodizing-roasting in reverberatory furnaces and amalgamating in pans—differing from the Pelican mill in the instruments used to attain the same end.

When the ores are brought to the mill, they are first broken in Dodge crushers and Cornish rollers, then dried upon the drying floor sampled and assayed, and when their value is determined, are purchased, allowing for a charge of from thirty-five to forty-five dollars per ton for treatment. Coming as they do

from so many lodes, they vary in value from fifty dollars up to hundreds, and rarely thousands of dollars per ton. Dry crushing under the stamps, of which there are fifteen, follows—batteries double issue, with 60 mesh screens; 360 holes to the square inch. The pulverized ore is conveyed by elevators so as to drop into a hopper arranged with car and scales for weighing—then is dropped into another hopper and on into the furnace in charges of 1,000 pounds. When it is thoroughly desulphurized, salt (8 per cent. of weight of ore) is added. The ore is moved by long iron shovels, in the hands of the furnace tenders, from one hearth or department of the furnace to another and kept all the time at a glowing heat—one hour in each case being sufficient for chlorodizing. This improved reverberatory furnace has seven hearths, but it is reported that only five of them have been used of late.

After roasting, the desulphurized ore is cooled on a floor and taken to four large pans, 2,500 pounds to each, when water is supplied and the “mullers” are set to revolving to grind the pulp to greater fineness. In one or two hours the mullers are raised from the bottom of the pans and from three hundred and fifty to four hundred pounds of quicksilver are added. After this, the grinding continues from eight to twelve hours longer. The pulp is then thinned by water. The specific gravity of the quicksilver and the silver it has attracted causes it to seek the bottom of the pans, from which it is drawn off through pipes or cups, the pulp or dirt is discharged into settlers, and

the amalgam still adhering to the pans is scraped and removed, leaving the pans ready for another charge. Thus the furnaces and pans are constantly kept employed to their proper capacity, fresh charges entering as others are taken away. This, and all Colorado reducing works or stamp mills, are constantly kept at work night, day and Sunday, without intermission unless for repairs. The amalgam is then retorted, the silver separated, melted and run in bars, as elsewhere. P. McCann has been superintendent from January 1st, 1875, since when the management of the establishment has been vastly improved.

CHAPTER XXXII.

THE SILVER MINES OF BROWN MOUNTAIN.

The Terrible lode and the "Silver Ore"—Sulphurets—veins of Silver—A big sale—£100,000—Hamill's fight for a fortune—"Rich strikes"—The Brown and U. S. Coin—Big Silver buttons—Consolidation and a strong team—The Atlantic, Shively, etc.

The western extremity of the mineral belt of the dividing ridge between Empire and Brownville valleys is apparently on Brown mountain. Very prominent among the lodes in this locality is a cluster discovered in 1872. This includes the Atlantic, Shively, Pacific, and some others, all of great value. They have all yielded very considerable quantities of ore worth from \$100 to \$1,500 per ton.

One mile east is Brown gulch, which partially divides Brown from Sherman mountain. In this locality are several clusters of lodes, nearly parallel in their course, but situated several hundred feet one above another on the rugged mountain side. First above Brownville come the Brown, Coin, Mammoth and others. Four hundred feet above are the Silver Ore, Terrible, Gunboat and a number of productive veins. Still further up are the Roe and its neighbors.

The Terrible mine became the property of Crow and Clark in 1867 or 1868, and was discovered but a short time previous. It is located in Brown gulch.

The vein, although narrow, was exceedingly valuable. For years it was the richest continuous silver vein in Colorado. In 1869, \$85,000 (coin) had been obtained. Seven hundred feet of it was sold to English capitalists early in 1870 for £100,000, and the Terrible Lode Mining Company was organized. Up to September, 1870, the yield was \$270,000, coin value. The year 1872 gave the following yield :

	TONS	VALUE PER TON	VALUE (CURRENCY)
First class	110	\$500	\$55,000
Second class	556	135	75,000
Third class	857	45	38,565
Total	1,523		\$168,625

A wire tramway was built from the mouth of the tunnel of the mine to the ore house at the base of the mountain. Here a system of concentration, partly the invention of the agent, Mr. George Teal, was started in 1872. The following is his statement of the yield of the mine for 1874 :

	POUNDS	PRICE RECEIVED PER TON	VALUE (CURRENCY)
First class	193,520	\$550	\$53,218
Second class	768,570	150	57,642
Third class	5,102,000	12	30,612
Fourth class	2,982,000	11	13,960
	9,046,099		156,432
Costs, etc			68,000
Profit			88,432

The actual coin-value of this yield is about \$203,000, of which amount \$6,000 represents the value of the lead, the remainder being that of the silver.

The concentration works in connection with this mine went into operation about July 1, and closed the season's work late in October, having proved an undoubted success. The material treated was the third and fourth classes of the above table,

which had heretofore been thrown away as worthless or stacked on the dump or along the course of the suspended tram-way leading from the mouth of the tunnel to the gulch. At the commencement of the year the stock of this ore on hand was estimated at 3,500 tons, of an average value of \$12 per ton. This stock was increased by the addition during the year of the 4,541 tons given in the above table, third and fourth, making, in all, about 8,000 tons. During the season about 2,500 tons were passed through the works, producing the following classes of marketable material:

CLASS	POUNDS	ASSAY	VALUE REC'D
		Ounces per ton	
A	47,253	525	\$ 7,448 25
B	94,141	279	2,602 50
C	9,488	500	2,466 00
D	190,420	199	15,614 50
E	12,619	408	2,625 50
F	133,135	142	7,130 00
G	15,092	211	1,140 00
H	380,000	150	9,500 00
	885,058 = 442½ tons		58,827 25
Expense			7,328 61
			51,498 64

It will be seen that about six tons of crude material have been concentrated into one ton of salable product. The composition of the eight classes is as follows:

- A.—Impure galena, 60 per cent. lead
- B.—Second class for Cornish jigs, 20 per cent. lead and 30 per cent. zinc.
- C.—First class pickings, 45 per cent. lead, 10 per cent. zinc.
- D.—Second class pickings, 10 per cent. lead and 40 per cent. zinc.
- E.—Iron and copper pyrites from the enriching jigs, carrying the brittle silver.
- F.—Zinc-blende from enriching and automatic jigs, (nearly pure).
- G.—Best work from slime-tables.
- H.—Savings from picking-table, (to be recrushed and re-treated).

The Terrible Company has been doing nothing for eighteen months. It has been enjoined by the courts from working at that locality where the greater part of the rich ore came from. Wm. A. Hamill, owner of the Silver Ore, Gun Boat and Tycoon lodes, has had a contest with those who owned the Terrible for seven or eight years. He claimed a portion of the Terrible, and also claimed it to be the same as some

lodes of his own. In order to secure himself, he bought all adjacent veins that he did not already possess. He warned the Terrible Company against purchasing, unless his claims were settled; but as he had no money then to prove up his property, no attention was paid to him. Meantime, the silver continued to roll out from that famous vein. Hamill asserted that his lodes took in the valuable part of what the company was mining. Although securing more or less development on his property, he was able to do but little towards solving the problem until he became manager of the great Dives mine, at the beginning of 1874. The company had the money and the ore deposits, and its workings were far below any depth he was able to reach. Furthermore, his veins did not pay largely then. The lowest point attained on the Terrible was between five and six hundred feet below the surface of the mountain side. When the heavy yields and large profits of 1874 were obtained, Hamill offered to relinquish his claim for \$125,000, but his offer was not accepted. Having money at his command then, he immediately began to develop his property in order to "prove up" the same. After sinking and drifting for some time, the Gun Boat was eventually found to be the Terrible, and the Silver Ore was shown to possess the rich ore deposits that the Terrible Company had been mining. These veins had the oldest titles, having been discovered first; consequently there was no difficulty in securing an injunction on the company to prevent further work by it in

that direction. Hamill then asked \$200,000 for the two veins, and two successive agents of the company recommended the purchase. Negotiations were broken off, however, and nothing was effected. This was in the spring of 1876. Since then the Terrible Company has done nothing, while Hamill, and more recently Hamill and Chaffee, have steadily been working. It is said that the Silver Ore had produced, up to October, 1876, \$140,000, most of which was taken out within two years. More than that sum may confidently be expected per annum hereafter; and as much more from the Brown, not to speak of this firm's other valuable properties.

The ore of these veins consists chiefly of galena and zinc blende, with some iron and copper pyrites. With these are associated some rich silver minerals, comprising stephanite, silver glance, fahlerz, some native silver, and occasionally ruby silver. The gangue mineral usually found is crystalized quartz, with which are associated flour spar, heavy spar, etc.

The Brown lode once ranked with the Terrible in its silver yield. It was sold to a company in the earlier years of silver mining, and J. W. Watson was agent. He erected large and expensive reduction works. The mine was two hundred feet deep September 29, 1870, and had then produced \$166,554. Up to the time the works shut down in 1871, its yield was \$380,000. The mill was afterwards destroyed by fire.

The U. S. Coin, near the Brown, was owned by the

same company, and was very profitable. In time, both of the mines became the property of Jerome B. Chaffee. Work continued, but the ore bodies were small and less silver was exported. When Watson had charge, the bullion was shipped away in large buttons, one of which was worth \$11,000.

In the summer of 1876, Jerome B. Chaffee and Wm. A. Hamill consolidated their properties in this neighborhood. These included the Brown, U. S. Coin, Silver Ore, Gunboat, Old Missouri, Glasgow, and Mammoth—all paying properties, and many others such as the Tycoon and Last Chance, in all some 43,000 feet of veins. Two tunnels, the Union and Silver Ore also came into the consolidation. Steam drills and eighty men are now employed, principally on the Brown and Silver Ore, and operations of a very extensive character are about to be inaugurated. Ore from these lodes yields from \$200 to \$600 per ton. The tunnels are being driven forward with all possible vigor. The Union is one hundred and eighty feet long, and when a distance of five hundred feet is attained, will cut the vein four hundred and forty feet below the surface. The Silver Ore is already intersected by the tunnel of the same name, and this will eventually cut the Brown, three hundred feet beyond. A thirty horse power engine has been put up at the Silver Ore shaft, and a Knowles steam pump introduced to keep the mine cleared of water. Thirty men are at work here.

The East Terrible is owned by the Clark Mining

Company. From eight to twenty men employed for over a year—Mine over three hundred feet deep—first class ore worth \$500, second class \$150. Average yield twenty-five tons per month. Teale, Foster & Co. are the agents and sub-lease the mine. This embraces five hundred feet of the Terrible lode. The English company have eight hundred feet west and three hundred east of it.

The Atlantic is owned by Newman & Co. and leased by Ebert & Co. One lot of five tons of ore sold for \$2,890. First class ore contains from \$500 to \$1,000. Pay vein, one to four inches. Shaft over 300 feet deep.

CHAPTER XXXIII.

SILVER MINES OF SHERMAN MOUNTAIN.

The Pelican and Dives—Kings among Silver Mines—History of these famous properties—A strike that had “millions in it”—A monster lode and a mint of money—\$3,000,000 in Silver—\$65,000 in a single week. The Phoenix-Coldstream, Silver Plume, Baxter, Snowdrift and Payrock The richest cluster in the coronet.

THE Pelican and Dives, the most famous of Colorado silver mines, are situated on Sherman mountain, about seven hundred feet above its base. They are in full view of Silver Plume, which dates its birth from the opening of these great ore deposits. Like most lodes of this chain of mountains the direction is nearly parallel with the creek and valley below. The leading ore veins of the Dives and Pelican have never entirely given out. What is called the vein has varied in width from six inches to four feet, with an average of over two feet, but often widening to seven, twelve and even more. Seventeen feet of ore was claimed at one place. Of course much of the matter was “gangue” or waste rock, when this width was maintained. The truth is, this is one giant vein of unknown extent. A tunnel or cross cut has been driven across the lode for two hundred feet, and yet no north wall has been found! It is the grandest ore channel yet developed. Of the above width, of course only a

small portion is composed of ore. There are numerous spurs, seams, veins and feeders, something like the branches of a tree, (but usually maintaining a more parallel course,) which are found in all parts of this immense crevice. Most of these ore seams are narrow, the main one being described above. At several localities there has been from five to seven feet of solid ore, yielding from \$100 to \$500 per ton, but more frequently "gangue" is mixed with mineral, requiring sorting and often concentration. The ores like very many near Georgetown, carry argentiferous galena, zinc blende, gray copper, silver glance, and sometimes native silver. So far the Pelican and Dives have proved the kings among Colorado silver veins, and have completely distanced all others in production. Owing to litigation it has been impossible to obtain statements of their total yield, but it can hardly fall short of \$3,000,000, and some estimate it as high as \$4,000,000. This has been obtained in spite of continuous litigation, of injunctions on portions of the property, and of a contest and struggle for possession that leaves all other mining suits, east or west, completely in the back ground. Had there been no hindrance to development and production, the yield of the past four years would probably have aggregated six millions. The combination of great size and extraordinary richness, which all hope to get, is here represented. Although there are vast quantities of vein matter that are of little or no value, there is enough that yields handsomely to return a product that no

other mine has yet produced for the amount of ground opened.

The Dives was discovered in 1868. At a later date John H. McMurdy of Georgetown, and the Perdue Silver Mining Company of Lafayette, Indiana, came into possession of it. The latter owns the western five hundred feet adjoining the Pelican; and the part now held by Senator John A. Logan, and others, and the estate of John H. McMurdy, comprises 1,000 feet. In 1871-2-3 John H. McMurdy and E. Hollingsworth, stockholders of the company, managed the Perdue property.

During these years litigation had commenced with Streeter and McCuniff of the Pelican mine, who claimed a portion of the Dives as a part of the Pelican and Zillah lodes. The latter had been bought of S. C. Bennett and A. Medley, and had yielded enormously. As the suit went on the most able legal talent in the territory had been secured, and the lawyers' fees amounted to thousands monthly. Up to November, 1871, the Pelican mine yielded as follows :

	TONS	OZ. PER TON	OUNCES
Ore treated at Georgetown	124	240	32,280
“ at Silver Plume mill	30	510	15,300
“ “ mine	200	250	50,000
“ sent to Swansea	27	510	14,770
“ sold F. J. Marshall	4	572	2,288
“ “ N. P. Hill	1		294
Total	389		103,932
Cost equal to			10,000
			93,932
Coin value with silver at \$1.29			\$121,172.28

There are five miles of tunnels, levels, &c., on the Pelican and Dives lodes. Sinking is progressing steadily on both. The Main shaft of the former is five hundred and thirty feet deep, and the lowest level is four hundred and ten feet deep. For a distance of 1,300 feet the average width of the vein is from twenty-four to thirty inches, but in some locations there has been twelve feet of solid ore. The yield is from five hundred ounces down to a figure where concentration is necessary. The ore is assorted into four grades. The two most valuable classes are sold to Eastern or European works, some of it going to Wales and some to Germany. The third class, which averages not far from \$100 per ton, is treated at the company's mill in Georgetown. The poorer qualities are dressed or concentrated and then sent to the mill. The mill derives its supply of eight or ten tons per diem from the two grades last mentioned.

The Pelican lode was opened in the spring of 1871, by John McCunniff and E. S. Streeter. They were both experienced miners and prospectors, but "luck had gone against them" for some time previous to this discovery. This mine began to pay from the surface, and has never ceased doing so. For two years to date, the low grade ores have given a yield that cannot fall much short of \$500,000, and may exceed that figure. There are two grades still more valuable that are sent to Europe for treatment, and yield from \$200 to \$500 and over per ton. The mill, capable of treating eight or ten tons daily, is kept

busy on the poorer qualities and the concentrations that are returned from the dressing works. The vein is claimed for 3,000 feet by the present owners. In 1873, E. Y. Naylor and Jacob Snider each purchased one-third of the Pelican, the former owners retaining the other third. The mine has been worked by shafts and four tunnels, one above another.

Streeter and McCunniff found this lode in the fall of 1868, and from the fancied resemblance of the crevice in their "prospect hole" to a Pelican's bill, Streeter gave it the name it bears. It was not thought worth the payment for recording for two years. In 1871, Thomas and M. McCunniff thought they would do a little more work on it. The result was the opening of the great vein that an eminent mining expert once said, "is incomparably richer than the Comstock."

The Perdue Company's portion of the Dives has produced far more silver than the eastern division, but latterly both have been yielding splendid mineral. Sandels, and Bishop work the former under lease or per centage. Its "output" can be estimated from the fact that these men lost \$1,500 in a single month by the fall of silver on the ore mined and sold. A tunnel cuts the vein at a depth of two hundred and thirteen feet. Large chambers have been cut in the solid granite at this point, and a seventy horse power engine and boiler were placed therein last spring. Below that point are three levels from two to three hundred feet long. There are nearly or quite seven

feet of ore in these. The first and second classes sell at \$300 and \$200, respectively, per ton. On what is called the McMurdy property much work is being done with large profits.

At the commencement of 1874, Wm. A. Hamill became superintendent of the Dives. At this time the suits had reached such a stage that the Pelican owners were attaching all of the ore that came from a certain part of the vein claimed by both parties. The Dives men then mined their ore during the week and ran it down on Sundays to Georgetown to a purchaser, or to some place of concealment. Wagons were on hand at 12 o'clock Saturday night, and the work of transportation continued twenty-four hours. Armed patrols and guards were hired at enormous prices to guard the ore and mine from capture. "Dives and Pelican," and the big suit and contest were almost the only subjects of conversation. It was truly a royal prize, and well worth the strenuous efforts made to secure or hold it. Men of "nerve" were required to carry on the contest, and they were not lacking. Contracts and sub-contracts were let in the Dives, the ore rolled out and the money rolled in and circulated more or less to the benefit of everyone. At this time the richest pocket was worked that had ever been found in these silver mines, when size as well as value is taken into consideration. There was an ore body seven feet wide, and most of it sold at from \$500 to \$700 per ton. Over \$70,000 worth of ore was run down to Georgetown in two successive

Sundays. Under ordinary circumstances the profits should have been ninety per cent. At length, \$65,000 in ore went down within twenty-four hours! Of course, this represented the labors of a week. Then came an injunction, procured from the courts by the Pelican party, restraining further work in this spot of contested ground. Mining was continued on the remainder of the mine for over a year. In 1875, the Pelican Company took possession of the disputed ground. Then came another time of excitement and the shooting of Jacob Snider, one of the Pelican owners, by Jackson Bishop, one of the lessees of a portion of the Dives underground workings.

In the spring of 1876, and after half a million dollars had been spent in litigation, an agreement was entered into by the Pelican and Dives owners, whereby further legal proceedings were for a time discontinued. Everything was left *in statu quo*, so that litigation could be renewed if desired. The disputed ground was divided, each working up to a certain point. Thus were law and lawyers dispensed with by mutual concession. They will not probably be required again, both parties having united in an effort to sell the entire property.

A union of interests may some day be effected, in case these mines are sold. Meantime both mines are worked vigorously, giving employment to nearly two hundred men altogether. The Diamond tunnel, now 1,150 feet long, will cut these veins within one hundred feet of its present heading. This will

tap the vein at a depth of six hundred and fifty feet or more, or below the lowest point reached. When this is accomplished, however, the shafts of both Pelican and Dives will probably be down to that level. The ore can then be run through the tunnel, thus avoiding hoisting and freighting over the steep and difficult road, that takes a zigzag course around the mountain side and up to the mines. The latter will also be effectually drained of water, and a vast saving will be made in many ways. The entire production of the Dives and Pelican is probably forty tons of milling or saleable ore daily. Probably nearly as much more is mined that is of too low a grade for treatment, and most of this is concentrated and then milled or sold.

Sherman mountain is east of Brown, and between that and Republican. It is one of the grandest natural depositories of wealth the world can boast of. The main cluster of lodes is on the eastern part of this mountain, and under and east of Cherokee gulch. West of and crossing this ravine is the Phoenix-Coldstream. The Pelican also crosses the gulch, and further east are the Dives and Dunkirk. Lower down the mountain side are the Baxter and Antelope, and above and northeast of all are the Pay Rock, Silver Plume, Snowdrift, Hopewell, Morse, Centre and others. These are all apparently lodes of the first class.

The Hercules lode was once held by five different parties, each claiming to have a distinct vein. Samuel

Watson held a portion of this, and of the Roe or East Roe, a larger and nearly parallel vein crossing it where both lodes cross Brown gulch. A long and bitter contest was kept up for possession. The International company on the Hercules took out \$150,000 in those years, and Watson & Co. took out large quantities of silver.

In 1875 the various interests were consolidated as the East Roe and Hercules and Seven-Thirty. Monthly dividends were then disbursed. At the beginning of 1876 the Consolidated Roe and Hercules Mining company succeeded the above. The property includes 1,500 feet in the Roe, and 5,000 on the Hercules. The latter extends on towards the upper part of Sherman mountain. The workings cost \$80,000, and consist of six shafts and 2,500 feet of levels and tunnels all near Brown gulch. Considerable depth is gained each way from this ravine. The Burleigh tunnel will probably cut the eastern part of the Hercules at some time in the future at a depth of 1,500 feet. The Roe is six feet wide and over between walls, with from six to twelve inches of mineral and a few narrow seams. The vein like all others is "pinched" at times. The Hercules is somewhat smaller. The average receipts from all ore sold was \$241. Timbering costs but little as there is a forest of great extent above the mine. From fifteen to thirty men are usually employed. Total yield \$250,000.

The Bismarck is a valuable mine and is located above the Hercules.

The Phoenix lode on Sherman mountain and lies adjacent to, and in nearly a southwesterly direction from the Pelican. It is owned for a distance of 3,000 feet, by Crow and Kalbaugh. It has been opened to a depth of three hundred feet, showing a large, rich and well defined vein, width from three to ten feet of crevice. It carries mineral from a width of four inches in some places, to four feet in others. Sometimes a ton of ore to the man has been broken daily. Discovered in 1867—little work done until 1871. Mill runs give from \$100 to \$1,600, but \$200 is a fair average. Working force, twenty men. J. F. Phillips is superintendent. The Coldstream, formerly called the Maine, is claimed to be on the same vein and is now held by the above mentioned parties. These properties have yielded altogether, \$300,000. The vein and character of ore has been much the same in both. The Maine was located in 1871, and yielded in eight months thereafter as follows:

	OUNCES OF SILVER
Ore sold to Stewart, 29 tons 556 pounds	13,350 32
Ore sold to Hill, 100 tons	19,350 00
Ore sold to Bement 13 tons	1,509 00
Ore at the mine	1,548 00
Total	49,689 32
Expense of mine equal to	10,000 00
Net	38,689 32

The coin value of an ounce of silver was then \$1.29.

W. T. Reynolds & Co. sold the property to W. W. Glenn late in 1871, for \$50,000. The matrix of the vein is feldspathic rock and quartz. "Pay streak," argentiferous galena, interspersed with gray copper,

ruby silver, iron and copper pyrites—granite formation. Two hundred and twenty-two tons gave an average yield of \$223.

Cashier. A strong rich vein midway between the Pelican and the Terrible groups. Worked at intervals. It is said to have been cut by the Burliegh tunnel.

Mendota. Near and above the Cashier. Rich in silver and lead.

Mammoth. Eastern extension of the East Terrible—consequently is on Sherman mountain, near Brown gulch.

Hopewell. Above and northwest of the Silver Plume, etc.

Silver Plume. Comprises 3,000 feet. Owned by a company of the same name. Teale, Foster & Co. agents. Leased, with twenty men at work. Opened by adits and levels one hundred feet deep. Vein one to six inches wide. Yield, \$100 to \$500. Yield in 1874, \$60,000.

Snowdrift. Comprises 1,500 feet, owned by Snowdrift Company. Teale, Foster & Co. agents. Worked on lease. Vein three to fourteen inches—value of ore, \$80 to \$800. Assays like its neighbors, way up in the thousands. Lower tunnel three hundred feet deep. The Snowdrift yielded in two years, ending with 1871: two and one-half tons, 696 ounces of silver; six tons, 1,269 ounces; twenty tons, 3,800 ounces; fifty tons and 1,131 pounds, 14,064 ounces; one hundred tons, 26,913 ounces; twenty tons,

\$22,130. Total, currency value, \$96,316.80. The Snowdrift strikes on to Republican mountain, crossing Silver Plume at something less than a right angle. These lodes contain what is often called black sulphuret ore, while the Pelican, Terrible, Roe and Brown groups carry galena, gray copper and zinc.

The Pay Rock, is a vein of great size and quite profitable. Owned by Pay Rock Silver Mining Company. Thos. Ellis is superintendent, Chas. Morris, cashier. The lode has yielded about \$300,000 in a little over three years.

Centre. A large rich vein, crossing the Silver Plume and Snowdrift. Has a large vein carrying three feet of ore. P. Skeahan owns eastern part.

Dunkirk. East of Dives and owned by Chas. Morris & Co. Has steam hoisting works and a large building. Thought to be very valuable.

The Baxter has lately been proving itself a fine piece of property. Building and machinery have been put up over the shaft. As high as twelve tons of ore have been sold in a single week, yielding from \$300 to \$550. A ton of rich ore was sent to the Centennial.

CHAPTER XXXIV.

THE MINES OF CLEAR CREEK COUNTY.

McClellan Mountain mines—Region of Eternal Frost and Snow—Leavenworth Mountain—The great Equator and Colorado Central—An enormous lode—Ore too rich in silver to stamp—Billy Linn's discovery—Mines of other mountains—The Saco, Gates, Polar Star, and others—A Cloud with a Silver Lining.

Beginning at the extreme western end of Clear Creek county is the Baker lode, situated on Baker or Kelso mountain, ten miles from Georgetown and but two or three miles from Gray's Peak. Its elevation is over 12,000 feet above sea level. The general direction of the lode is about north, eighty degrees east, true, and it dips to the north at an angle of fifty-five to sixty degrees from the horizon. Its width varies from three to fifteen feet, with well defined walls—country rock, gneiss or granite. The ore seam is not continuous, but occurs in disconnected bunches or pockets. The mine has been operated by several tunnels connected by winzes. The ore has yielded from \$50 to \$300 per ton.

A large and expensive mill was erected by the company in 1868-69. The process was smelting with lead, etc., but owing to the want of lead, chlorodizing-roasting, with barrel amalgamation was adopted. Two of the Bruckner cylinders used are now in the Pelican

mill. This establishment was destroyed by fire several years ago.

In this district is the Brooklyn lode, which is rated very highly and is producing considerable silver.

In full view of the Baker, on another division of the Range, and one or two thousand feet above the ravine, 12,600 feet above sea level, is the famous Stevens mine. This mine has an arctic temperature, being situated above timber line and far up on the northwest face of McClellan mountain, that rises 2,500 feet above the valley leading to Gray's Peak. It was first opened in 1867, the float ore leading to its discovery. The severity of the climate and its almost inaccessible position have retarded development, but it has been worked pretty steadily ever since its discovery. A ropeway was at first used in going and returning from the mine, and then a wire tramway, eight hundred and sixty-seven feet long. A second tramway is now being built, 1,100 feet in length. In this manner the ore is conveyed to the wagon road in the gulch below, the cliff being too steep for transporting anything by man or beast from the mine.

The mine is worked in five different levels or tunnels, the lowest of which, just completed, is three hundred and twenty feet below the others and four hundred feet below the main opening. A vein of argentiferous galena ore from two to twelve inches wide, yields from \$100 to \$300 per ton. It carries from fifty-five to sixty per cent. of lead, with some

antimony but no zinc. The rock and crevice matter, no matter how far into the mountain one goes, is always frozen, summer or winter. Usually, at night fires are built at the heads of the levels so as to thaw the ground for the next day's operations. Less blasting is necessary than in mines of lower elevations.

The miners live in houses that are fastened down into the cliffs, not coming down except when going to Georgetown, ten miles away. In winter, when snows are constant, and the storm king, whose home is in these solitary peaks, holds high carnival around the mountain's brow, days pass when it is impossible to see across the gulch. Communication is then shut off from the rest of the world; and in fact the miners lay in their winter's supplies in the autumn months.

The yield of the Stevens has been many thousands of dollars annually and occasionally per month. From fifteen to twenty men have usually been employed. The mine is at present more profitable than ever.

The Belmont and International, on McClellan mountain, are famous by reason of their early discovery, the first silver ore in Colorado, outside of the Coaley, in Summit county, having been found on the first named lode. Their elevations are somewhat similar to those of the Stevens and Baker.

The discovery of the Belmont has already been noted in the history of Clear Creek county. The Pine Silver Mining Company was organized in 1865 on this property, with G. W. Lane as agent, who was succeeded in 1871 by P. A. Skeahan. That year the

silver bullion from this mine carried off the first premium at the Denver fair. Much "dead work" was done in opening the vein, which usually maintained a width of twelve inches, and yielded \$240 per ton. The mine is two hundred feet deep and has 1,200 feet of levels. Elevation 12,500 feet. Total yield, \$50,000. it has recently been worked under lease.

The International is located seven miles from Georgetown, and is reached by a good mountain road. The ore is a heavy galena with feldspathic rock, quartz and gangue. The crevice, between slick-inside walls, is from three to five feet wide—ore vein, four to fifteen inches. The International Company, Frank Dibbin, agent, obtained eight hundred tons of ore and over \$50,000 in two years. A Bruckner cylinder mill was in operation then.

The Hukill Silver mining Company, a new organization, owns eight hundred feet on this lode and are working it. An adit has been driven on the vein 400 feet long. The course of the vein is nearly at right angles with that of the mountain.

Passing eastward from McClellan mountain on to Leavenworth mountain brings one into a cluster or belt of lodes of wonderful value. Chief among them is the great Equator and Colorado Central vein. This is one of the wonders of this truly wonderful region. It is one vast ore channel or ledge, like the Pelican-Dives and several Summit county and San Juan discoveries, being of immense size and carrying veins and ore seams of surpassing richness, that radiate through

the crevice matter like branches to a tree. Cross-cuts have been driven for distances of from sixty to eighty feet without finding the south wall. Clarence King made an examination of this lode prior to recent explorations and reported as follows:

“Its course is north, fifty or fifty-five degrees east, the dip nearly vertical, inclining to the north. The north wall is well-defined, smooth and regular in its course; but the south wall is less clearly marked, making it sometimes difficult to determine the width of the vein. In some places where cross-cut, it is said to be fifteen feet wide, but the average width is four feet. The filling of the vein is of soft material, consisting chiefly of quartz and feldspar; but it sometimes passes into a harder rock, more granitic in appearance. The ore is galena, zinc blende of different varieties, considerable fahlerz, with ruby silver and native silver.”

The ore has yielded all the way from \$100 to over \$1,000 per ton. In 1868, and up to 1869, the mine had produced about \$68,600 coin value, or nearly \$100,000 currency value. Of a large quantity of ore milled, the average yield per ton, in coin value, was as follows: Forty-four tons, \$550; one hundred and thirteen tons, \$120.16; one hundred and sixty-eight tons, \$116.80; ninety tons, \$120. Since the year 1870, the mine has been worked on a small scale by leasers, but more extensive operations are now on the tapis. The owners have plenty of money, and all but one of them reside in the States and do not care

about taking out a large quantity of silver. John Turk is the resident manager of the property.

In 1871-2-3 over one hundred men made good wages and often as much as ten dollars per day in picking over the "slide," or loose rock that had in former ages fallen down the mountain side. This was often very rich in silver, and the prospectors knew it must have come from some lode above, thought to be the extension of the Equator. But this slide of loose rock and boulders was so deep that all who attempted to penetrate it in search of a vein gave up in despair. At last Wm. Lynn, who had been making a desperate fight for fortune for several years, began to prospect at this point. After several discouraging ventures he sunk a shaft through this difficult and dangerous "slide" and then drifted for the vein, and to his intense gratification at length discovered what he called the Colorado Central. His difficulties in this undertaking can be appreciated when the character of such ledges as are described above is taken into consideration. The lode was all that Lynn's fancy had painted in the days when he was "hard up" and trying "his luck" in prospecting for it. Ore was obtained that yielded hundreds and even thousands of dollars. Of course the seam of the latter character was extremely small, but the entire lode proved very profitable. Weaver, Shephard & Co. leased the mine and worked it in company with Lynn. Then Gen. F. J. Marshall became a partner. It put money in the purses of all connected with it.

The Marshall Tunnell company was organized some seven or eight years ago by Gen. F. J. Marshall, for the purpose of driving tunnels through Leavenworth mountain, from one side to the other. This would develop lodes already discovered, and open all veins in that locality that lay across the proposed route. The Robinson tunnel is furthest up on the mountain side, and is three hundred and fifty feet long. Then there are the Thompson four hundred feet long, and the Bruce two hundred. The Marshall tunnel is located far below the Robinson and is 1,300 feet long. What is called the McCoy shaft extends from a point on the mountain side down to the tunnel, a distance of five hundred and fifty feet. Through this a smoke stack reaches up to daylight. This is for the boiler and engines stationed there. A lease has been given to another organization for the purpose of driving a shaft 1,000 feet below the tunnel level. Previous to the time when work began last fall, a large room had been blasted out of the solid rock for the above mentioned machinery, which was to be stationed there. To give the event an appropriate "send off" a ball was held there which was largely attended by people from far and near. It was a novel and attractive scene, this dance down in the brilliantly illuminated ball room in the heart of the mountain, over eight hundred feet from the tunnel's mouth, and 9,382 feet above sea level.

At this point Marshall Tunnel lode Number Five crosses the tunnel, a vein of great size, and carrying exceedingly rich ore. From this and other lodes

opened by this company, \$250,000 has been obtained in a period of less than four years. The Robinson tunnel level on the above lode and on the Colorado Central vein is five hundred feet long. A lower level connecting the McCoy shaft and the Tobin shaft (eighty feet deep) is three hundred feet in length. The eastern levels from the Robinson tunnel are sixty, one hundred and one hundred and ten feet long respectively.

The lodes, cut by these tunnels, have the following amount of shafts, levels, etc. Compass and Square, five hundred; Reynolds, four hundred; O. K. fifteen hundred.

The Colorado Central, the western part of the same great ore channel as the main lode of the tunnel, comprises 1,500 feet, and is owned by Marshall & Company. This is considered the largest and strongest ore body on the mountain. Levels extend from the main shaft, one hundred and fifty feet deep, and a winze carries the total depth down to two hundred feet below the surface. From a part of the vein two hundred feet long by two hundred deep, \$150,000 have been obtained since the discovery was made four or five years ago. The ore that has been sold or milled yielded from \$150 to \$1,500, the average being about \$300.

East of the Colorado Central is the Saco. This has had some enormously rich "pockets." The ore has yielded all the way from a hundred to several thousands of dollars per ton. In 1872 Gaskell &

Co, leased this mine and made a small fortune out of it in a few months. The receipts were often \$500 a day and three-fourths profit. The property has since been worked extensively but has not paid as well. Total yield \$20,000.

The Gates mine is above the Saco and was discovered in July, 1873, by running the Kirtley tunnel. It is owned by Kirtley and Roberts, for a distance of four hundred feet, they giving up their claims to the remainder to avoid a law suit. The crevice is from five to nine feet wide, with a very rich "pay streak" in the centre. The owners have cut the lode with another tunnel and have sunk shafts and run levels from both tunnels. In 1873, twenty-two tons of ore sold at the Whale mill for \$5,400. Here are the returns for a little over a year ending February 1, 1875, and while the mine was not fairly opened.

	PRICE RECEIVED
Whale mill bought 22 tons ore	\$ 5,400 00
Church bought 31 tons 612 pounds	5,689 14
Bement bought 3,110 pounds	983 94
Stewart bought 20 tons and 1,210 pounds	2,380 45
Stewart bought 4 tons 263 pounds	5,258 04
	<hr/>
Total value	\$ 19,711 57

But few men were employed and the profits formed a very large portion of the receipts. During the past twenty months the mine has paid equally well.

The Gilpin is considered one of the best mines on Leavenworth mountain and yielded largely in 1871-2-3.

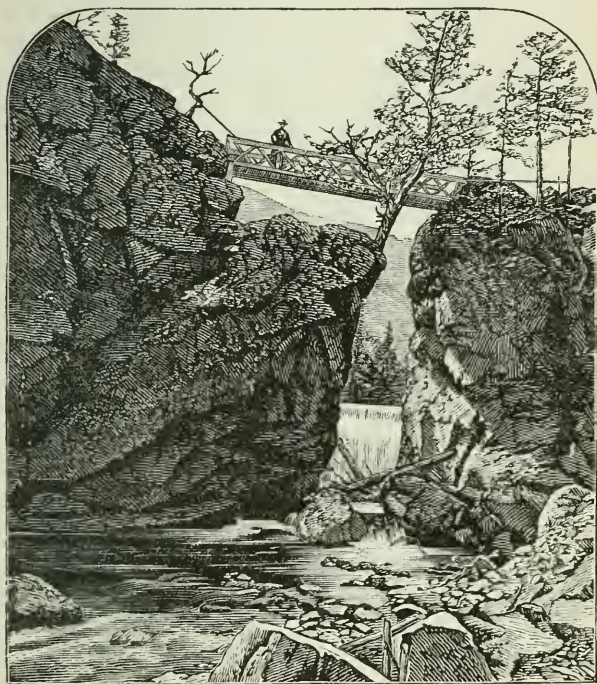
The Pulaski presents the singular feature of what

may be called a gold lode in a great silver belt. It is situated far up on the northeast side of Leavenworth mountain, and can be plainly seen from the road leading from Georgetown to Silver Plume. Some time ago it was sold to the Pulaski company of Ohio, comprising the same men who operate the Silver Plume Concentrating Works. The crevice is very large—fifteen to twenty feet wide—and has been producing twenty tons of ore daily—mine worked over one hundred feet deep. Average assays two ounces of gold, \$35, and fifteen ounces of silver, \$18. The ore is concentrated at the works above noted. A tunnel has nearly reached the lode which will be nine hundred feet long, and will strike the vein five hundred feet down. With this advantage it is thought the property can be opened rapidly and profitably.

Leavenworth mountain is a long and lofty ridge bordered on either side by the two streams that form the south fork of South Clear creek. Far up on its pine covered crest is a natural basin of water called Green Lake. Its elevation is 10,000 feet above sea level, and 1,500 feet above Georgetown. It is a great resort for tourists and pleasure seekers in the summer months. Its owner, Wm. H. Cushman, president of the first National Bank of Georgetown, has colonized its waters with trout, and these have increased to many thousands. With the Saco lode we come to the point where Leavenworth mountain breaks off into the valley of Georgetown. On the eastern side of the valley rises another exceedingly high moun-

tain which looks proudly over the Silver Queen city to Republican and Democrat. It is called Griffith.

On Griffith mountain is the Griffith lode, which carries a large vein of galena ore, usually of rather low



THE DEVIL'S GATE--GEORGETOWN.

grade. The Anglo-Saxon, owned by J. B. Chaffee, has been noticed before. It displayed a pocket of ore when discovered, that assayed from one to twenty-

eight thousand dollars. This was soon exhausted. The purchasers did no work for years after, and no more ore could be found until recently. The lode is now paying large profits. Near it is the Federal.

The Magnet has two rich veins of mineral eight inches wide at present. One of them is mainly composed of two hundred dollar ore and the other yields from \$100 to \$800 per ton. Mr. Bronson and H. H. Argue, bought the mine in 1875. Worked by tunnels. One is 385 feet long and cuts the vein 500 feet deep. G. B. Thompson the lessee, works 38 men, obtains five tons of ore per month and is making money.

The Comet is another grand vein some distance south of the Anglo Saxon, and is owned by J. B. Chaffee.

Republican mountain adjoins Sherman on the east. Here are the White, Elijah Hise, James Guthrie, Cal- edonia, Ben. Hardin and South America, all notable veins.

To the northward is Democrat mountain. Discoveries were made here years ago, but were generally considered to be of little value until 1874. That year a party of Nebraska farmers purchased the Fred. Rogers lode. It had never amounted to much, and its owner wanted to get clear of it, and the grangers wanted to dispose of their land back in their former home. So a trade was effected. Almost the first blast fired in the mine disclosed a rich "pocket." The shaft was deepened and a fine vein was disclosed, yielding from \$200 to \$2,000 per ton, and the lucky

purchasers were soon making more money than they knew what to do with. This started the prospectors in that direction, and also caused all having lodes there, that had been idle for years, to resume work upon them. The result was many valuable discoveries, and the development of many supposed worthless properties into paying mines.

The Queen of the West is developed by some hundreds of feet of tunnels and levels. This has yielded a small fortune to its owners. The Silver Glance is a continuation.

The Silver Cloud is owned by Barrett and McClellan. Ten men are employed. Sinking and drifting goes steadily on. In one locality the pay vein is from six to eight inches wide on one wall, and returns of \$600 down to \$.200 have been obtained. On the foot wall there are five inches of ore, gray copper, worth \$1,000 per ton. Truly a cloud with a silver lining.

The Polar Star has yielded large quantities of rich silver ore. As high as sixteen tons of ore have been mined by five miners in a single week. Brittle and native silver are found. The West Denver Dry Ore Reducing company recently became interested in this lode, and it supplies them with several tons of ore daily. The Astor is similar to the above. The Henry Ward Beecher and New Boston lodes carry low grade silver ores, but are rich in lead.

It has generally been believed that all Colorado silver ores could not be treated by the cheap process of raw amalgamation. It is now asserted that many of those of Democrat mountain can be.

The Nuckolls lode is on Columbia mountain, Griffith mining district. This was one of the earliest producers of silver, and many thousands of dollars were obtained from it in a very short time. The pocket having been exhausted, the owners went elsewhere in search of wealth and left a fortune behind them. It was recently purchased by the Hukill Company and will be operated hereafter. The Baltic and Washington, on the same mountain, are paying largely. A tunnel supplied with railway track and cars furnishes the means of operating the former.

The Young America is located on Red Elephant mountain, just below the lower junction of the Empire and Georgetown roads and six miles from the latter place. It is owned and worked by J. N. Winders and James Kirkland. Eight years ago they worked out a rich pocket and then sunk over one hundred feet without finding anything. Nothing further was done until last spring. The old shaft was then cleared of mud, rock, and 120 feet of water, and after sinking for a short distance another ore deposit was found, which has yielded from \$199 to \$1,288 per ton. Seven thousand dollars was taken out before the shaft was 240 feet deep. Fifteen men have been kept at work and over \$25,000 were expected to be obtained during the last month, of which the writer has no report.

It is well to remark here that the reader should not consider high grade ore to be the sure and only indicator of a valuable mine. The size of the vein should

be taken into consideration as well as the value per ton of ore mined—for its quantity may make up for the lack of quality. Furthermore, large veins are always more uniform and continuous than small ones. The latter often “cap” or dwindle to nothing for long distances. This is why large silver veins, nearly or quite two feet wide, like the Pelican-Dives or Hukill, that yield one or two hundred dollar ore, but can produce many tons per diem, are far more profitable than less regular veins, carrying only a few inches of ores that yield \$500 to \$800 per ton. Gold veins, whose contents carry but \$15 or \$20 per ton, but have a width of many feet, and can be treated by raw amalgamation, are also extremely profitable.

CHAPTER XXXV.

MINES OF CLEAR CREEK COUNTY.

The Idaho and Spanish Bar Silver Belt—A Treasure Vault that Never Fails—The Peerless Hukill—A mine Worth trying to—Its Record and Capacity—The Seaton—Gold Lodes and Placers.

At the lower and near the northeastern end of Clear Creek county, is a silver belt which extends from Gilpin county over the divide to Fall River. This embraces the Clifton and extensions, the Seaton and its neighbors, and the lodes in the mountains bordering Clear Creek in the vicinity of Spanish Bar, of which the Hukill is chief.

The Hukill mine is situated in Spanish Bar mining district, two miles above Idaho Springs, and seven miles from Floyd Hill station, on the Colorado Central railroad. It extends from the banks of South Clear Creek through and over a mountain that rises abruptly therefrom, and is directly opposite the Whale mill. The location is admirably adapted to tunneling directly on the vein, and the lode has been opened by this means—one level starting just above the creek level. An immense amount of ground can be stoped out as the levels or tunnels progress toward the mountain's interior, without the expensive work of sinking shafts that many mines require.

Probably no better silver vein has been developed

in Colorado than the Hukill. None have shown equal uniformity, combined with size and great value of vein material. These are the requisites for a profitable mine. The Hukill possesses them to such a degree, that it is undoubtedly capable of giving a higher percentage of profit than any mine yet opened, when the total yield is taken into consideration.

Many lodes have paid better for a time on rich ore deposits or "pockets." Other lodes yield more silver to the ton of ore, but their veins are usually so narrow that fewer tons can be mined; and some have broader veins but poorer ore, much of it incapable of yielding a profit. Silver veins usually vary greatly, "widening out and then pinching up," but the Hukill never has done so to any noticeable extent during all of the years it has been operated.

The Hukill combines all of the desirable qualities, richness, size and uniformity, and with two years further development, will doubtless equal any mine in the state, one year after another, in regularity and amount of dividends. That its yield so far has been smaller than many, is due to the fact that no ore was removed except what was necessary in opening passage ways to explore the lode and ascertain what it was made of. These passage-ways consist of a few short shafts and levels, driven the width of the crevice, and to the height of six feet and a fraction. All of the ore between these shafts and levels above and below, has been left standing, ready to be removed when desired by the cheap method of stoping. The

vein of mineral or rich ore has everywhere maintained an average width of eighteen or twenty inches and often more.

The average value of all the ore obtained has been \$114.82 per ton. Beside this there has been a much larger body of low grade ore that goes to fill up the crevice. There is a width between the well defined walls of five feet, but occasionally of from eight to twelve. A large portion of this is concentrated, and the valuable portion secured and sent to the smelter along with the contents of the pay vein itself. No work of any importance was done until the year 1871. Since then no month has failed to return a profit, and no money has been used except what came from the mine. The same regular vein has been maintained year after year, with no signs of failing, but, on the contrary, gaining in value and size—and this is an unusual occurrence.

The character of the ore is argentiferous, auriferous and cupiferous. The containing rock of the mine may be classed as granitic. The vein is readily traced by its strong outcrops on the surface as well as by the open cuts and shafts sunk upon it. Prof. J. G. Pohle's report on this property contains the following :

The outcrops show blossom rock, interspersed with gold and copper bearing pyrites, and stained with various colors of green, blue and brown; these large and characteristic outcrops at once indicate it to be a strong and rich ore depository.

In February, 1871, John M. Dumont began opera-

tions on the Hukill. The ore was of a quality that paid large profits. It was sold at the Boston and Colorado Smelting works at Black Hawk. At first gold predominated, but as the levels entered the lode the proportions of silver increased and finally exceeded in value the yield of gold. Instead of removing all of the ore as fast as he came to it, as most miners do, the owner of this property left the entire ore deposits between the levels (driven fifty feet, one above another) stand as reserves. Had these been disposed of the yield would have been over three times as large. As it is, 5,000 tons of ore can be taken out hereafter, furnishing an ore supply for two years to come, while still larger portions of the vein in the heart of the mountain are being opened than before. Thus the lode can be developed in advance of the ore supply, always keeping reserves worth hundreds of thousands of dollars ready to be drawn upon. The following handsome showing was obtained simply from 1,608 feet of levels and shafts, run but a little over six feet high and the width of the crevice, for a distance of 300 feet on the vein and principally above the creek level.

Yield for five years to September, 1876:.

Ore mined, 1,700 tons returned	\$195,200
Total cost of production.	<u>167,140</u>
Net profit	\$ 28,060

These results are from what is usually termed "dead work," on a mine; that is putting it in shape for production. The design was to secure large ore reserves,

but mainly to ascertain what the lode contained. Its value can be estimated from the three hundred feet in length now opened, as there is every probability that the vein extends thousands of feet into the mountain.

This property comprises 1,288 feet on the Hukill vein. The mine is well opened every forty or fifty feet by levels, as follows: First level, 300 feet; second, 300; third, 168; fourth, 90; total, 858 feet. The shafts and winzes have the following depths: Discovery shaft 100 feet, main, 160, tunnel 150, creek shaft, 40, surface shafts, 150, winzes and air shafts, 150; total, 750 feet; making total number of feet sunk or drifted on the mine, 1,608.

Three months ago the ore left standing between the various levels was estimated to represent the following quantity, value and profit.

Estimated number of tons of ore in reserves	5,298	
Estimated value.		\$476,820
Estimated cost of production.		<u>261,350</u>
Net profit		\$215,470

Every item in the above is based on low estimates for quantity and value, and high estimates for expense. The actual average value of the ore sold was \$114.82 per ton. The estimated cost is placed at \$90 per ton. This is based on previous expenses, whereas the ore bodies now standing can be stoped out at much less expense than ore can be mined in running levels and sinking shafts. Expenses are now thirty-three per cent less than during much of the period of part of the workings on the mine. Furthermore, the state-

ment is based on allowing three tons of ore per fathom of ground, when the vein in many places is wide enough to produce six tons per fathom. Subsequent developments have not only opened up more ground on the vein, but have proved that the mine and ore deposits have a greater average value than given above. So that in two years the profit is likely to exceed \$350,000 from the ore now in sight, or sixty-five per cent. of its yield, with every probability that at the end of that time an additional amount of ground will have been opened of equal if not greater value, and whose yield should be \$700,000. For the interior workings yield better than those near the surface, and the developments of the past three months prove the mine to be better, and capable of making a far superior showing to any statement given here. The time taken to secure the past yield and bring the mine to its present condition was five years; the capital employed, intelligence and labor; the result the opening of a treasure vault that "knows no such word as fail."

A few months ago Dumont sold the Hukill for \$200,000, cash paid in hand and it is now operated by the Hukill Mining Company. Prof. Pohle's report of this mine contains some interesting facts and figures, as will be seen below.

Assays from ten to thirty samples, taken promiscuously from many points of the mine.

Gold, 5.37 ounces	\$105 00
Silver, 94.27 ounces	112 80
Copper, 7½ per cent	15 00
Total	<u>\$232 80</u>

Careful estimates give a result of 1,631 tons of this description.

The argentiferous galena in this body is interspersed with large blotches and patches containing about 2 per cent. of the whole, most of which can be separated by hand so as to yield over 60 per cent. in lead. An assay of the galena showed it to yield:

Lead, 70 per cent	\$50 00
Silver, 29 ounces	34 80
Total	<u>\$84 80</u>

This product realizes largely at the lead smelting works.

Average of imperfectly concentrated ore, four tons into one, from another locality gave the following result:

Gold, 3.88 ounces	\$75 00
Silver, 15.83 ounces	19 20
Total value per ton	<u>\$94 20</u>

Other assays gave \$160 52 and \$160 25 and all the way from 2.2 ounces in gold to 7, and from 5.25 in silver to 196.

The gangue rock rises in different parts of the mine, being mainly hard and quartzose in the southwesterly and the northeasterly ends of the drifts, with a central stratum of soft porphyritic rock and micaceous schist conglomerate, lying between the two, the walls on either side of the lode being mainly a gneiss and mica schist formation. The entire cost of stoping out the underground workings would be \$42.50 per fathom or \$5.31 per ton—freight to Black Hawk, \$5.00 per ton—total, per ton, \$10.31.

The Seaton mine is one of the most celebrated of Clear Creek county. Its yield has not been less than a quarter of a million, but may be far greater. It was first worked for gold, but as depth was attained that metal became less abundant, and finally nearly the entire product was silver. Portions of this mine changed hands in the years between 1868 and 1873. One portion owned by a Louisville company was extremely productive in 1870-1-2. It has not been steadily or properly operated since then. A report made at one time several years ago by a careful expert contained an estimate of ore in sight giving it a value of \$161,331, with a probable cost to mine and mill the

same of \$105,000, leaving over \$56,000 profit. More than that sum was cleared in the years mentioned above. The main ore vein was from four to six inches wide and would usually mill over \$100 per ton. Ex-Senator Wigfal of Texas managed another part of this lode for a time. T. J. Dean and others own portions of it.

The Seaton was the first Colorado mine that changed from a rich gold vein on the surface to one of silver in the depths below. This was in 1862 and before the existence of silver was thought of here. The low grade of the gold retort, \$7 to \$9 per ounce, was caused by the prevalence of silver in the bullion. It was not until silver mining became general that the Seaton was successfully worked, and that its yield was remarkable.

The Victor or "flat vein" crops out on the surface above the Seaton and overlaps it. Has produced considerable rich ore.

The Franklin has been worked quite extensively on the part owned by the Boston and Philadelphia company. A mill was built two miles below Idaho, whose machinery and process has been changed several times and at considerable expense. The vein of the lode is from six inches to two feet wide, and is usually of low grade, yielding from forty to fifty dollars per ton.

The Santa Fe is a gold and silver bearing lode and has been opened by a large number of shafts.

The Queen lode is owned by Wm. Queen, Hall and Morgan. The pay vein has generally a width of eight

inches, but has varied from a narrow seam up to fifteen inches. The ore has usually yielded \$100 per ton but often sells for more, one lot bringing \$340. Five thousand dollars was taken out in one winter, and thirty thousand up to 1873. The discovery shaft is two hundred and thirty-four feet deep. Work has been resumed in shaft number three, which is one hundred and five feet deep.

The Crown Point and Consolidated Virginia lode owned by the Martin brothers and J. V. Kimber, who have secured a government patent on the same, is located near the head of Virginia Cañon. The vein is five feet in width between walls, all "pay," and has yielded in stamp mills, from seven to twenty-two ounces of gold per cord, or from \$20 to \$65 per ton. This has been paying a profit of from \$20 to \$40 per day to each man employed. The main shaft is 127 feet deep, and the other shafts along the line of the lode are from 20 to 70 feet deep. A single load of refuse rock had not been raised from the mine at the point worked during the time that fifty cords of ore were taken out.

The Specie Payment, near the head of Virginia Cañon, is a profitable gold vein, and was bought by a company of Troy, New York, for \$12,500.

Cascade district is situated south of Spanish Bar, and on the head waters of South Clear creek. The Cascade lode is among the most promising in the county.

The gulch and bar diggings above and below Idaho

CHAPTER XXXVI

BOULDER COUNTY.

SILVER MINES OF CARIBOU DISTRICT.

How a big silver vein was found—Story of the Caribou mine—Hard money and plenty of it—A heavy sale—\$3,000,000 for a mine—Facts and figures regarding a Silver mill—The North Boulder Silver mill—the Native Silver—New reducing works—A network of silver veins.

No county has been more highly favored by nature than Boulder. It embraces that combination of mountain, valley and plain that reverts in the highest measure to the advantage of all. The entire section is well watered with beautiful streams, which afford ample power for milling and manufacturing purposes, at the same time that the fertile low lands reap the full benefit thereof for necessary irrigation. The county is about equally divided between mountain and plain. The mountains are wonderfully rich in auriferous and argentiferous deposits, and the latter in coal. Further than this, Colorado and the world possesses no better nor more bountiful lands than those in the charming valleys of the Boulder, the Big Thompson and Saint Vrain.

The mineral districts include the Caribou silver belt and that of Sugar Loaf and vicinity, while both metals are found abundantly in what is known as the Tellurium belt. The mines of Caribou will be the first to receive attention.

The veins that produce the largest quantities of silver, are mainly composed of low grade ore. A half

dozen mines, carrying low grade or medium ores, could be mentioned, any one of which yields more money than ten or twenty of its neighbors that produce five or eight hundred dollar ore, almost exclusively. Thus the Caribou mine, whose average yield in 1875, was only \$69.49 per ton, produced \$204,703, in that year, or more than all other Boulder silver veins combined. The Pelican and Dives, with a larger percentage of ores requiring concentration, produced more, and cleared more money, than large numbers of their neighbors. So it was with the Pocahontas, Hukill and others. The truth is, there is more money in immense quantities of ore paying a small profit per ton than in very small lots of ore paying large profits per ton.

In the upper and southwestern part of the county and closely bordering the bald and barren peaks of the Snowy Range is a cluster of forest clad hills. One of the "old time" prospectors and hunters had discovered a gold vein here in 1864, which he named the Congor, after himself. But as the locality was far distant from any settlement but little came of it. Years after, while at Cheyenne, Congor saw some silver ore from Nevada, and he was at once struck with its similarity to loose rock he had often stumbled over in his solitary hunting trips among the hills near Arapahoe Peak. On his return to Gilpin county, he induced two acquaintances, William Martin and George Lytle, to accompany him and prospect for the (to them) new mineral, silver ore. Three farmers, Hugh McCammon, S. Mishler and John Pickle, were also interested in the enterprise. On arriving at the park of the North Boulder, the party commenced ascending the hill, following the "blossom rock" after the manner of prospectors, until no more could be seen, when they began to dig for veins. Each "struck a crevice"

not far removed one from another. Having in mind his own financial condition, Congor very appropriately gave his the name of Poor Man, while Martin called his the Caribou, after a rich mining district in British Columbia. It was the last day of summer in 1869. Specimens of the ore were taken to Central and assayed, and were found to be enormously rich. With light hearts the prospectors returned with supplies to the newly found camp in the mountains, and worked away until they had a goodly supply of ore piled around their prospect hole. Then came the long and tedious task of cutting a road through the timber to the nearest ranch and road—miles away down on the Middle Boulder. A wagon load of ore was finally taken to the smelting works at Black Hawk and yielded hundreds of dollars. The fondest expectations of our silver hunters were realized, and, sleeping or waking, dreams of sudden wealth without doubt were with them. Previous to this time, Congor had exchanged his one-sixth interest in the Caribou for the entire right of his partners in the Poor Man. Both lodes have since proved good enough to keep. But winter soon came on, which at this mine, 10,000 feet above sea level, is long and severe, and almost one continuation of storms and snows, driven from the peaks above. Work was continued, however, in order to have a supply of ore ready for the smelter at the earliest approach of summer. Martin and his partners carried their winter's supplies in on their backs that season, and built a log cabin on the town site of Caribou. By the following June the "strike" of these pioneers had been noised abroad, and miners and prospectors began to flock in from the settlements in large numbers. In the meantime, the ore was kept rolling out of the Caribou, and in return, goodly rolls of bright, crisp greenbacks

found their way into the miners' pockets. Other discoveries followed, such as the Columbia, Spencer, Boulder County, Trojan and Sovereign People. In July and August of 1870, several hundred men had gathered in the valley just east of Caribou hill. They camped under trees, in brush houses and in tents until log cabins and frame buildings, stores and hotels had been erected, and the town of Caribou was fairly under way. At this time the hills were pretty well dug over in search of lodes. One party found remarkably rich ore on the surface, and in sinking a shaft twenty feet realized over \$6,000. This was done within a month's time. They called it the Idaho. The No Name and Seven-Thirty were also discovered at this time.

A. D. Breed, a wealthy capitalist of Cincinnati, who had become interested in silver mining and milling at Black Hawk, purchased the western half of the Caribou for \$50,000, September 21, 1870. Work was continued on both parts of the mine with great vigor; \$70,000 is said to have been taken out that season, and the shaft was two hundred feet deep in January. Up to October 1, 1872, or in one year, Breed had obtained 3,650 3-4 tons of ore, most of it paying good profits. This same year he built a large silver reducing mill one hundred and sixty-five feet by one hundred, on Middle Boulder creek, four miles distant. The original Caribou owners continued to realize largely on their part of the lode. In the spring of 1873, the entire mine and the mill were sold in Holland for \$3,000,000, one-half paid in stock and the remainder in money. It is understood that Breed received \$1,000,000, the first original Caribou owners about \$165,000, and Cutter, Anker, Shaffenburg and others the remainder. Too much money was paid for the property. The agents of the Mining Company Neder-

land, as the Holland organization was called, were Van Diest, then Anker and lastly Prince. From seventy to ninety men were usually employed. The yield of the mine for the year 1874 was given at 1,800 tons of ore and \$130,000. The yield for 1875 was \$204,703.71, and for 1876 up to November about \$25,000. The total yield of the mine since its discovery has exceeded \$775,000, and it is estimated that specimens have been carried off, by miners (for sale) and by visitors, that contained nearly \$75,000. Some of the ore is ribbed and spangled with streaks, masses and nuggets of pure silver. The disasters that have overtaken this company and mine were due to incompetency, dishonesty and internal dissensions. There was a large quantity of good ore in the mine when the Holland agent examined it before the sale. This Breed removed before the Hollanders took possession, so that instead of a mine full of ore to reap a profit from, they had one nearly empty and in bad condition. Money was wanted at once to sink the mine into another ore body. The company became involved at the start, quarreled among themselves, and was never out of trouble until the entire property was sold under the sheriff's hammer Sept. 15, 1876. Jerome B. Chaffee bid in the mine and mill for \$70,100. For nine months previous a force of men, to whom the Mining Company Nederland was in arrears, held the mine and were taking out their back pay. The mill was idle during that time. For several years the pay roll had called for from \$12,000 to \$15,000 per month. Eben Smith is now superintendent for the new purchasers and began the work of putting the mine in order in October. As it is in bad condition, with the ore bodies in the levels nearly exhausted, considerable dead work will be required. The shaft, now five hundred and twenty feet deep, will be deepened. The

mill will not be started up until the spring of 1877, by which time a plentiful supply of ore will have been secured.

The Nederland or Caribou mill was built at Nederland on the banks of Middle Boulder creek in 1871, four miles from Caribou, under the supervision of B. O. Cutter for A. D. Breed. It began operations about the close of that year with Charles E. Sherman as superintendent. It is one hundred and sixty-five feet by one hundred, has five terraces or floors, and was built to be run by steam. It contains a Blake crusher, three batteries of five stamps each, four Bruckner cylinders, and fourteen amalgamating pans, with settlers, agitators, etc. Pan amalgamation is where this mill differed from the Pelican.

Some interesting data will be found below regarding this mill and its operations for the year 1875, furnished by superintendent N. H. Cone.

The mill closed down just before the end of December. Charge of cylinders, usually 3,700 pounds, sometimes 3,500; time 8½ to 11 hours; amount of salt used 175 to 200 pounds; class of ores about 11 per cent. mineral, as follows: 5 per cent. galena, 4 of blende and 2 of copper pyrites; a few custom ores would rarely contain 30 to 40 cent. of mineral; assays made of the work of each man employed in mill and average recorded on the office book; 25 men employed.

Highest saving of precious metals contained in the ore 95.9 per cent.; lowest 85.5; average of months from 88 to 92.8; average assay value of ore for the year 48 7-12 ounces or \$60.17 coin value, or over \$69.49 currency; total number of tons of ore treated in 1875, 3,819.1; highest in a single month 393.9; fineness of bullion, 713 to 946, average between 800 and 900. Total number barrels of salt used 1,374; Expenses *per ton* of treating ore (currency value) were as follows:

Labor	\$6.18
Quicksilver . . . . .	.76
Salt	2.09
Wood	3.43
Oil, candles, etc . . . . .	.37
Repairs	1.68
	<hr/>
Total per ton	\$14.51

Here is Prince's statement of the operations of the mill for the month of September, 1875:

Mill in operation 21 days. Tons of ore treated; from Caribou mine 151 808-1000 tons of an average assay value of 43.6 oz.; from Caribou dump or waste pile 83.112 tons; av. assay 26.2 oz. Ores from other mines 13.08 tons; av. value 87.4 oz.; total number tons treated, 248. The ounce is reckoned at a coin value of \$1.24.

425 panfulls or charges produced	1,450 lbs. amalgam.
25 pans scraped	1,310 " "
Total put in retort	2,760 " "

Weight after refining six bricks, 9,260 ounces.

Average fineness bullion, 8,929.

Caribou mine produced	\$11,202.60
Custom ores "	621.00
Total currency value of six bricks	\$11,823.60

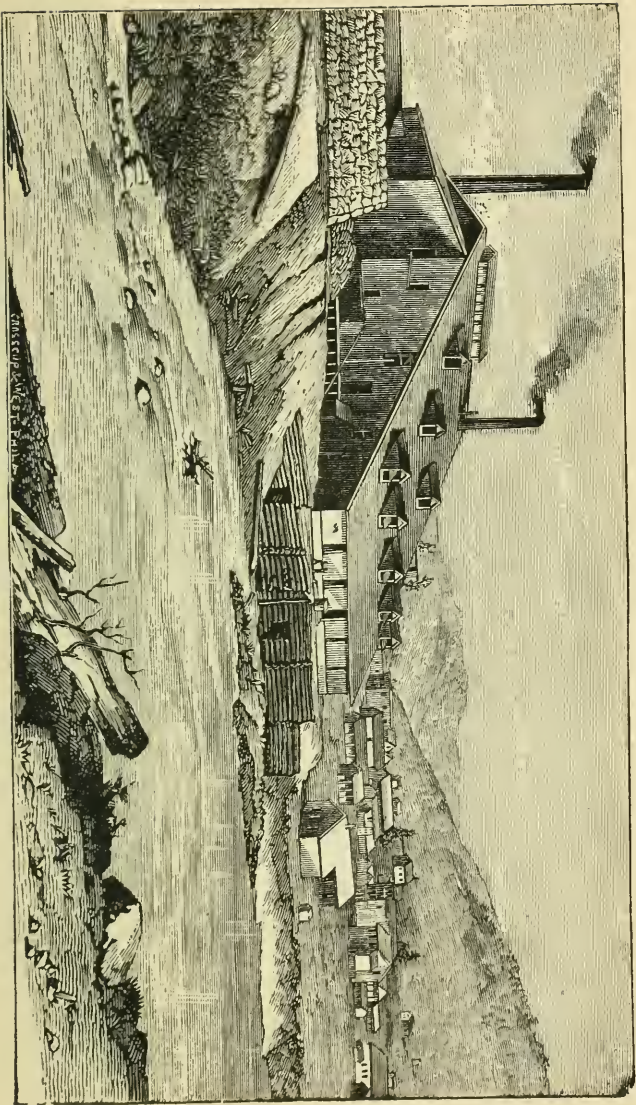
The working expenses of the mill were:

Pay roll	\$6,065.55
Apparent loss quicksilver .05 of a pound per ton of ore . . .	123.10
Salt, 27,440 lbs	583.10
Wood, 358 cords at \$3	1,074.00
Oil, etc	100.00

Total cost of running mill \$3,945.75

Average expense per ton of ore treated, \$14.90.

The Caribou mine is one of the seven mines of Colorado that produced over \$200,000 in 1875, Owing to the fact that the company treated their own ores, a very fair profit was made. The same was the case in 1871-2, and will be under the efficient management that will ensue. During most of the time since 1870 from eight to fifteen tons of ore were mined daily. The mill, with a capacity of fourteen to fifteen tons daily, treated but little from other mines; the Black Hawk smelting works, and the North Boulder mill getting most of it. Over 3,250 square fathoms of ground have been broken in the Caribou. The vein has varied in width from two to ten feet, and in production, from much that was thrown over the dump to that which would assay hundreds of dollars per ton. The most of the ore yielded from \$60 to \$80. In the centre of the lode but little barren ground was met with. A building of immense size covers a part



CARIBOU SILVER MILL AND NEDERLAND.

of the mine. This contains powerful hoisting machinery and engines, and is used for assorting and storing ore.

The Caribou belt is evidently a continuation of that at Sugar Loaf mountain. It extends westward over several hills from North Boulder on to and through the Snowy Range itself. The leading and best developed clusters of lodes are on Idaho and Caribou hills. A portion of the latter is one vast network of veins.

The following regarding this locality is from P. H. Van Diest, E. M.

The oldest formed and most important of these groups of veins comprise those running east and west; the veins bearing northwest and southwest are crossing veins and they fault more or less the lodes of the first group. The veins running east northeast, and west southwest, have a quartz ore gangue and many other points of great similarity with the east and west running veins. The vein matter of the northeast and southwest lodes is in general much softer and easier broken; it has in many places a bright red color, owing to the presence of oxide of iron; it contains also a good deal of calcspar, never yet found in any other group of veins. The ores in all these veins are in principal bi-sulphuret of silver, silver glance, stephanite, argentiferous galena and copper pyrites, generally rich in silver, often containing as much as eight per cent.

The veins on the Caribou hill can all be classed as true fissure veins, and have in general well defined walls. The ore is distributed principally in the east and west veins in chimneys, being ore streaks of the veins running nearly perpendicularly with a slight dip or inclination towards the east, widening and narrowing at different depths, but never giving out entirely. In these chimneys the ore accumulates in pockets. Between the pockets and within the boundaries of the chimneys the vein is sometimes poorer but never entirely without ore. Barren ground occurs between the ore chimneys. The value of a vein on the Caribou hill depends mostly on the extent of these barren parts.

A peculiar fact observed in many of the north-west and south-west veins is, that they are not so very rich in themselves, but when they cross east and west veins they impoverish them and carry the mineral for some distance themselves. This makes the north-east and south-west veins valuable, considering the many crossings. Besides, these veins have a soft crevice matter and are, consequently, easy mined.

A brief review only of this famous district and many of its prominent mines can be given, but will well repay perusal.

The Poorman lode is parallel with and just below and north of the Caribou, and thirty feet below the Sherman. Its western half is owned by Niel McKenzie and the remainder by Stebbins, Bingford & Co. The main shaft is 268 feet deep, and down to the Caribou tunnel which intersects this and neighboring lodes. Three levels have been run east and west of the shaft. But little work was done on the lode until Congor sold it. In 1874-5 it yielded 152 tons of ore for which \$21,504 were paid at Black Hawk, Golden and Nederland, with a profit of \$12,000. The



THE WOOD STEAM DRILL.

mine has not been worked regularly, but there is no reason why it should not be. In 1876 ore yielded from \$100 to \$300 per ton at North Boulder. The vein is usually from one to two feet wide.

The Sherman lode has produced some of the richest ore found on the hill. Its vein is usually from six to twelve inches wide; main shaft two hundred and sixty-

five feet deep, or forty feet deeper than the Caribou tunnel level. In 1876, three hundred tons of ore of the average value of \$270 was sold to the Boston and Colorado Smelting works.

The No Name mine has a north-easterly and south-westerly direction. It crosses the Caribou and Sherman—the former at or near the shaft and the latter some distance east. A depth of 360 feet is attained and “sinking” has lately been resumed. When owned by Donald, Shaw & Co., in 1871–2–3 it paid handsomely. Native silver was found in large quantities, and enormous assays were obtained. In three years, 340 tons of ore yielded at the rate of \$200 per ton and over, and some ore sold for over \$1,000. L. M. Bates bought the mine in 1874, for \$55,000 and other parties purchased the Sherman. The yield was afterwards from two to six tons daily. Bates built the North Boulder silver mill.

Less than a year ago both mines and the mill were purchased by Judge Wm. Fullerton, the eminent New York counsellor, and A. G. Dunn, of the mercantile agency of that city. M. A. Smith, who was also interested and had previously managed the property, was general agent. The two mines had produced up to that time, over \$250,000, the No Name being entitled to the largest half. The ore body had been mostly exhausted, and more development was required to obtain ore in desirable quantities. The mill was kept at work from December until July, most of the time on only one of the two furnaces. About half of its supply came from these mines. But poor ground had been reached, and so the mill was shut down to await an accumulation of ore. This will probably be obtained so as to resume operations at the mill this winter. H. Minkler, is now superintendant, and J. J. Ellingham has charge of the mines, where forty men are employed.

An Ingersol steam drill and air compressor of large size have been employed in the mine for months, and are found to save largely and to accomplish nearly twice the work of hand drills. The cost was \$4,200. A forty-horse power engine costing \$1500 is stationed in the large shaft and ore house of the No Name. A crosscut has been driven from the lower level a distance of thirty feet, to intersect the Sherman so that the hoisting for both mines can be done from one shaft. The entire property can be made a profitable one.

Three miles distant, in the valley of the North Boulder, the company have a well timbered mill site, and 1,600 acres of land. Here is the silver mill, 150 feet in length by fifty in breadth, and gaining two stories in height by the slope of the hill. The process is chlorination and lixiviation.

This mode of treatment has been very successful in Mexico and also at this mill. It is claimed to be cheaper than most others and the mill need cost originally but \$25,000. The method used at this mill is something as follows:

On the arrival of the ore at the mill the proper mixtures from different lodes are made. Crushing by Dodge crushers and Bolthoff pulverizers, and drying follows. The pulverized ore passes through a revolving 40 mesh screen into the reverberatory furnaces—each of $7\frac{1}{2}$ tons daily capacity—at the same time that 6 to 9 per cent of salt unites therewith. The ore is kept in motion while in the furnaces, and one third discharged every hour. It should be more carefully chloridized if possible, than for treatment with quicksilver. When thus prepared the ore is placed in large tubs or vats with false bottoms. The ore is then leached or lixiviated for a few hours to dissolve and carry off the soluble salt of the base metals. The salts of silver not

being soluble in water are not affected by this process. After the base metals are thus eliminated, the ore is leached with a solution of hyposulphite of soda, in which the silver is soluble. This lixiviation takes from seven to ten hours or even more, according to the richness of the ore and the strength of the solution. This solution passes to other vats below. It is transparent, and scarcely distinguished from common water, except by its taste. The silver thus obtained in solution is precipitated by a polysulphide of lime, which is prepared by boiling sulphur and lime, proportioned according to metals under treatment. A proportion of the sulphur and lime solution is then added to the hyposulphite of soda solution when the silver is at once precipitated as a black powder, which is sulphide of silver, S. A. G. After straining, this sulphide is roasted in a reverberatory furnace to expel the sulphur, during which process it granulates, assuming much the appearance of blasting powder. In this condition it will assay from five to six hundred fine. The clear liquid is siphoned off into a reservoir for further use, while the silver is filtered into canvass bags, dried, roasted and melted into bars, about 900 fine and worth \$1,000 more or less.

A force of ten men to the furnace is required. The average cost of treatment is \$13 per ton, although custom ores are of course purchased allowing for the usual charge. Ninety-five per cent of the assay value is claimed to be saved. About \$50,000 worth of bullion was exported during each of the periods of active operation. R. Cash and brother have had charge of the mill from its completion. They manufacture the precipitate for throwing down the silver, from sulphur and Boulder county lime. It is claimed that a great saving is effected over pan and barrel amalgamation, one of the main items being the saving of the wear and tear of machinery.

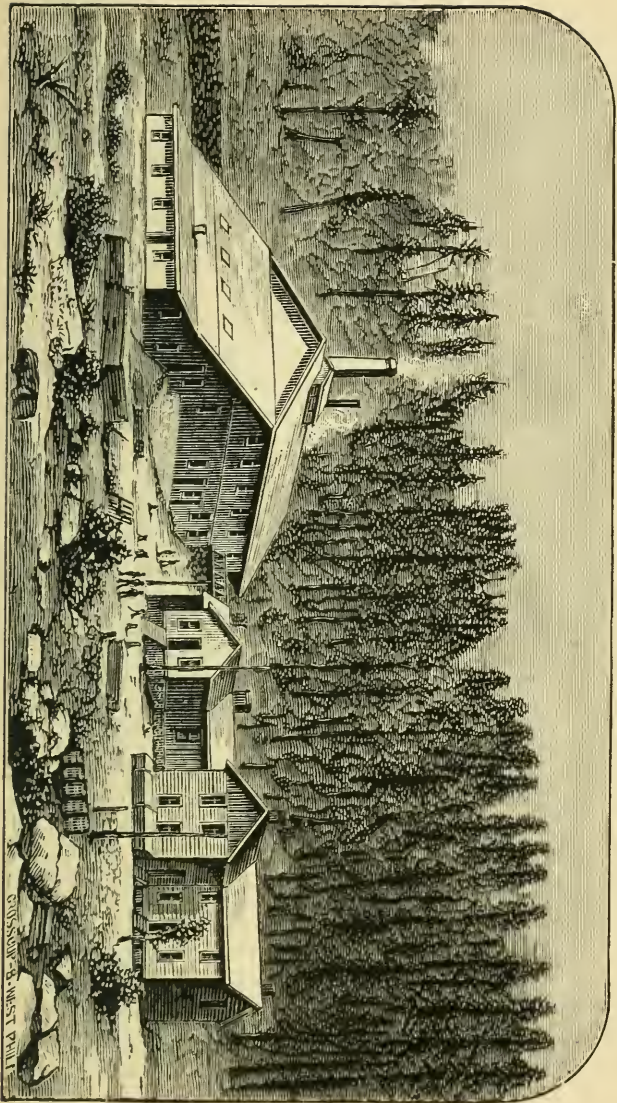
The Seven-Thirty has produced about \$14,000 altogether. Ore from \$60 to \$500 per ton. Opened by levels, and has a crevice two feet wide, easily worked. The Ten-Forty, has been worked at intervals. Near by are the Peabody, Amazon, Great Republic, Morning Star, Belcher and Magnolia.

The Native Silver has one of the richest veins in the camp. Deep shaft 286 feet, with several levels, one of them 220 feet long. The vein varies from 6 to 18 inches, broken at intervals by barren ground. Yield from \$60 to \$250. Some rich pockets are found. Much of the ore is of low grade. Nearly all of the ore between the levels is left standing awaiting the completion of the mill. This property was purchased in 1875 by ex-Governor Curtin of Pennsylvania, ex-Senator Cattell and brother of New Jersey, and others, forming the Mining Company of New Jersey. They have built a mill a hundred yards south of the leading street of Caribou, at an outlay of \$50,000, which is expected to begin work before the close of the year. It has the Hunt-Douglas-Stewart process. It is said this mill will be able to handle 15 tons of ore daily. It is supplied with water for power, by means of a ditch constructed from the park north of Caribou hill.

Above the Caribou lode are the Ontario and Arizona, both considerably developed and of good size.

Further west is the Leroy, owned by John Woodbury, and a very promising vein, from 6 to eight inches wide and contained in a four foot crevice. One lot of 5,320 pounds of ore sold for \$320.63 and still richer mineral is shown in the shaft.

The Brian Barou, has a vein from 6 to 18 inches wide. Two classes of ore contain 290 and 150 ounces of silver per ton.



NORTH BOULDER SILVER MILL.

CROSSING - B. WEST PHILL.

The Grand View mine is one of the valuable lodes of the hill, and has paid largely at times. A rich pocket was found near the surface. Nearly \$500 per ton were obtained from small quantities of ore and 140 tons produced at the rate of \$75. The walls are well defined and the crevice large. The shaft is 130 feet deep.

The Mount Vernon lode owned by Breed and Good, is a very large vein with about 10 feet of mineral bearing rock. Yield, \$50 to \$100 per ton during the past season.

Among the northeast and southwest veins, and near the No Name, are the Spencer, Columbia and Missouri Valley, all carrying more or less rich ore, and some of a low grade. The first has a twelve inch vein that yields from \$50 to \$500 per ton. The last named lode carries from 6 to 10 inches, and occasionally 2 feet of ore worth from \$40 to \$150 per ton. Both are paying well.

Among other promising properties are the Silver Point, Brick Pomeroy, Northwestern, Great Western, Centennial, Amanda and Watson; all more or less developed and giving evidence of worth. The First National, Boulder County and Trojan are located near Cardinal, and contain gold and silver.

Between the two main streets of Caribou is the Potosi lode and shaft house, supplied with steam hoisting works. There are two shafts 125 and seventy feet respectively. The ore vein is large and usually of fair grade, and capable of yielding a profit as soon as well developed. A company has recently operated the property with W. B. Jenness as superintendent. The crevice is from 7 to 12 feet wide, with from 12 to 20 inches of ore. Assays \$60 to \$169, insuring a profit over all expenses. Like other mines in this district much of the ore needs dressing. Concentration works should be established, when the chances for the miner would be much better.

The Idaho was discovered in 1870 and paid from the "grass roots" down for a long distance. Its ore once gave a higher average value than any other in the district. Over \$4,000 was cleared in sinking the first 30 feet, and within one month after the lode was found. Thirty-three tons yielded \$10,900. Then a sale was waited for. It has been worked at intervals since. The owners have not been able to agree in regard to its management. A few thousands of dollars have been turned out from this mine on several occasions since 1870. The main shaft is 163 feet deep with a number of levels. A large shaft house, with powerful hoisting works, covers the shaft. There is said to be a large quantity of ore standing in the mine. Like other valuable mines on Idaho hill such as the Monitor, much trouble is experienced in the early part of summer from water. A tunnel designed to cut the Idaho 350 feet deep, has been driven 400 feet.

The Fourth of July lode is an immense ore channel situated several miles west of Caribou and near Arapahoe Peak. This is from 50 to 100 feet wide, and has been traced and preempted for its entire course of three miles. It crosses the snowy range. This lode contains some very rich seams of ore but requires capital to open it into condition for advantageous mining. Two tunnels are being driven towards it from the headwaters of the Boulder.

The town of Caribou is well built, and is very prettily located in a valley sheltered by well timbered hills. To the east the mountains open in the direction of Boulder canon so as to permit of a charming view of the foot hills and great plains. A revival of business is expected when the Caribou, No Name, Native Silver, and other companies get fairly under way again.

Caribou is 20 miles from Central, 22 from Boulder and 60 from Denver. W. & L. Smith's stages afford communication with the former places, whence Denver is reached by rail.

The Consolidated Caribou Belt Mining Company, organized with a half million of capital, is driving a tunnel from the gulch, two miles below Caribou, under the mountain towards Cardinal. The tunnel is 7 feet high by 7 feet wide, is substantially constructed and is already 320 feet long. Sixteen men are employed and work goes on night and day. An advance of 30 to 50 feet per month was made by hand drills. Recently, Wood's patent steam drill and air compressor has been substituted, and notwithstanding the increased hardness of the rock the work is now progressing at the rate of 75 to 100 feet per month. It is thought the Boulder county and Trojan lodes will be cut within nine months. Several promising veins have already been passed, and beside blind lodes that may be discovered, twenty-six lodes owned by the company will be intersected at depths of from 70 to 1,000 feet. At the mouth of the tunnel is a fifteen-horse power engine, and not far distant is a fine mill site. W. H. J. Nichols, is president of the company and J. T. Huntington, secretary.

All Colorado mines operated on a large scale, which have been opened to depths of over 100 or 200 feet, are worked day and night. Different squads of men relieve one another. In some mines the force of men is worked twelve hours, in others ten, and in others eight, three reliefs in twenty-four hours being required for the latter system. Mills and smelting and reducing works are also operated day and night, usually with twelve hour "shifts."

The Washington Avenue mine is situated near North Boulder creek and five miles from Nederland. Albert Myles operates this with a force of twenty-eight men. It is a very large vein, but most of its contents are of low grade; not so low however but that the property is very valuable, for the deposits are of great extent. With a mill of its own, it could be operated very profitably. Some of the ore yields from \$100 to \$200 per ton. It is claimed that the ore "in sight" in this mine will produce \$150,000.

The Weare brothers are building a twenty-five stamp mill two miles above Nederland to work the ores from their gold lodes, the First National, Vulture, Lexington and Melvina, and from any other mines near by.

The mill at Nederland cost \$100,000. Much of the outlay was unnecessary. Works of equal capacity can now be built and furnished for about \$50,000.

The *Mining Review* gives the following statement of the average contents of the ores of Caribou district:

Silver, per cent . . . . .	.25 or 70 oz per ton
Gold, per cent . . . . .	.000,97 or $\frac{1}{4}$ oz per ton
Lead, per cent	6.
Copper, per cent	12.
Arsenic and Antimony, per cent	4.
Iron, per cent	7.
Quartz, per cent	61.
Sulphur,	9.
	100.

This is for all silver lodes opened, many of which are richer in silver than the amount given above while others are poorer.

The figures of mill returns for these mines are what are called the common yield. Small lots have been sold from a number of mines, for five, and even ten hundred dollars and over per ton. Specimen assays have been obtained, as among Georgetown mines, that returned at the rate of from one to twenty thousand dollars per ton but that class of ore can not be obtained in any considerable quantities.

CHAPTER XXXVII.

BOULDER COUNTY—TELLURIUM LAND—GOLD DISTRICTS.

BULLION PRODUCT—SMELTING WORKS.

Boulder City—The Telluride Discoveries—Rich Strikes—The luck of Gold Hunters—The American, Melvina, Cold Spring, John Jay, and Smuggler—Silver threads among the Gold—Fortunes in a single season—Sunshine, Sugar Loaf, Gold Hill, and Ward,

After the earlier years of gulch and of surface lode mining in Boulder County, but little bullion was produced until the commencement of silver mining in 1870. Probably \$750,000 would cover the total yield up to that year. The quantity of gold obtained was small up to 1875, when the tellurium mines began to get extensively developed. Still there was a perceptible increase in the two preceding years. The following estimates and figures cannot be far out of the way. The statements for 1873-4 are from Van Wagenan for Raymond's annual report. That for 1875 was furnished by the *Boulder News*:

Prior to 1870,	\$750,000
1870,	130,000
1871,	250,000
1872,	300,000
1873,	390,000
1874,	586,522
1875,	767,000
Total,	\$3,173,522.

During the year 1876 the silver yield has greatly decreased, owing to the shutting down of the Caribou and the lack of rich ores in some other mines. On the other hand the gold product has increased largely from the wonderful yield of some of the new as well as older tellurium discoveries. But little data are obtainable regarding the bullion yield of this county. There are several flour mills in this vicinity supplied with work from the grain fields of the adjacent valleys.

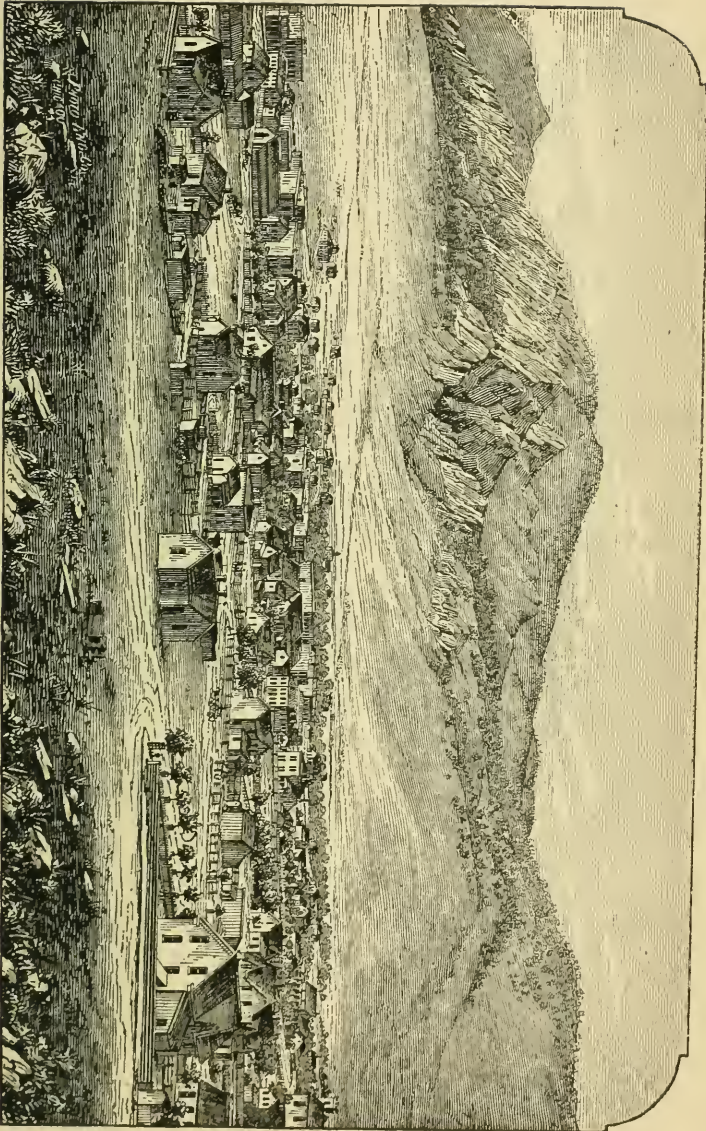
Boyd's smelting works are located at Boulder, near the mouth of the cañon. They were erected two years ago but did not do much work until last May. Since July they have been running almost constantly, drawing their supplies mainly from tellurides, although gold, silver and copper bearing ores are handled. About fifteen tons of ore are smelted every twenty-four hours and satisfactory results are attained on ores yielding from fifty dollars up to thousands. As the telluride ores cannot average much below \$100 per ton in value the bullion product of the works must be over \$1000 per diem. This would indicate a yield of \$80,000 or \$90,000 for the three months ending November 1st, 1876, principally of gold. The system employed at these works is smelting with lead—differing from other lead smelting works, and covered by a patent of Mr. Boyd, who operates the concern in person. Ores are bought and paid for as soon as the assays are taken to determine their value. Silver and gold ores are roasted in two cylinders, one for oxidation and the other for decomposing the sulphur. They are then smelted in a blast furnace. Telluride ores are not roasted but go to the smelter at once. What comes from the smelter is divided into "lead riches" and "slag," the latter is thrown away, while the former is cupelled in a furnace, where the gold and silver are separated from the lead and into bars. The bullion is sent east and the lead is retained to be used over again in the smelter. The ores treated vary in value from fifty dollars to hundreds and even thousands.

The Boston and Colorado works have established an agency in Boulder. It consists of sampling, assaying and ore buying departments, located in a large brick structure erected for the purpose.

Several mills and works have been built in the telluride camps but outside of one or two concentrating mills no successful work has been done. Large portions of the telluride ores are sent by rail to be smelted at Black Hawk, Golden or Omaha.

The rich "pay" of the Melvina is comprised in a soft "gangue," and is sacked as it is picked from the crevice or vein. It is too precious to be loosely shovelled about and too soft for blasting. The enclosing walls are hard.

BOULDER is located on the plain or valley at the mouth of Boulder cañon, being built principally on the right bank of the stream. It is the county seat and main business centre of Boulder county. Its sur-



BOULDER.

roundings are attractive and its location advantageous for trade and travel. To the east and north is the beautiful valley of Boulder creek thickly studded with well cultivated farms. To the west the bluffs and foot-hills, half encircle the place, with Left Hand and Sunshine valleys or ravines opening to the mines. Grander than all, the cañon of the Boulder forms a natural passage way through mountains of granite to the mines of Caribou, Sugar Loaf and Gold Hill. On every hand scenery, grand and magnificent greets the eye of the traveler. Boulder has attained its present dimensions and state of prosperity chiefly within the past three years, or since the development of the surrounding mining districts. This town being the natural outlet for the lands of tellurium and silver, its trade and growth has kept pace with theirs. The many attractions of the place, and of neighboring points in the mountains secure the presence of large numbers of tourists every summer. The business houses are large and substantial, and Boulder is considered the liveliest town in Colorado, Georgetown perhaps excepted. Boulder is connected with the city of Denver by two lines of railway, the Colorado Central and the Boulder Valley, affording direct communication with all important parts of the country, while Smith's stages furnish the necessary mountain transportation. There are two weekly newspapers, several churches and hotels and the usual school building, erected at a cost of \$15,000. Irrigation ditches convey water through the public streets, and efficient water works afford protection against fire. The State University is located here. It possesses imposing and substantial buildings, whose cost under ordinary circumstances would have exceeded \$100,000. Annual fairs are held here in the interest of the agricultural, stock growing and various industrial interests. The town has increased in population from three hundred and forty-three in 1870, to nearly three thousand in 1876. A quarter of a million dollars were expended in new buildings in 1875, and an equal amount during the present year.

Longmont is a prosperous town, located in the beautiful valley of the Saint Vrain, on the plains some distance from the foot hills and in the northeastern portion of Boulder county. It includes what was formerly the old village of Burlington. It is connected by the Colorado Central Railway with Boulder.

The tellurium discoveries have given Boulder county wonderful pro-

gress and prosperity, and have doubled the bullion product of that section. There was something alluring in mining where a few pounds of ore would pay the finder handsome wages. It was something entirely out of the usual order of things. Pieces of rock that had no appearance of containing the precious metals, were found to be so rich that roasting on the top of a common stove would bring out the pure gold in bubbles and nuggets. The remarkable products obtained from some of these telluride ores carried no little excitement among old gold and silver prospectors, and caused the rapid development of a previously unproductive section.

The Tellurium belt of Boulder county, as far as discoveries show, has a length of about twenty miles, and a width of about five miles. Its most northern district is that around the new mines of Ballarat, and on the south, it crosses Boulder creek and extends into the vicinity of Carl's ranch. Tellurium is a metal that is found in but three localities outside of Colorado, and until recently its existence was unknown in this region. It possesses no intrinsic value but combines with gold and silver. The amount of the precious metals contained in telluride ores causes them to be much sought after by the prospector.

Belts of gold and silver extend through portions of the tellurium region. The great Hoosier silver lode and the U. S. Bank are surrounded by gold bearing veins only. The former has seven feet of ore of an average value of \$40, and \$1,000 represents the value of the best ton of ore milled. In and between Ward and Sugar Loaf districts are scores of gold and silver bearing veins.

The Denver *Mining Review* recently published in tabular form the various combinations of tellurium, as given below.

"Tellurium is a metal. When pure it is tin-white in color, very brittle, about as easily scratched as soapstone, and melts at about the same temperature as lead, namely, 617°. It is *very rare* to find the native or pure metal."

NAME	COMPOSITION, PER CENT	APPEARANCE AND PHYSICAL PROPERTIES
Tetradymite [Telluride of Bismuth]	Tellurium 48, bismuth 52	Color, pale steel gray, and easily scratched by knife, but not by nail—metallic lustre leaves a mark on paper.
Altaite [Telluride of lead]	Tellurium 38, lead 62	Color, tin-white easily scratched by knife, but not by nail, tarnishes yellow. Usually massive structure - will cut smoothly.
Sylvanite [Telluride of gold and silver]	Tellurium 56, gold 28, silver 16.	Color, pure steel-gray, to silver-white, sometimes brass-yellow, can be almost scratched by nail, metallic lustre. Fracture uneven
Hessite [Telluride of silver]	Tellurium 37, silver 63	Color between lead and steel-gray, easily scratched by knife, metallic lustre. Even fracture. Will cut smoothly.
Petzite [Telluride of gold and silver]	Tellurium 35, silver 46, gold 18.	Color steel-gray to iron-black, brittle, easily scratched by knife
Naggagite [Black tellurium]	Tellurium 32, sulphur 3, lead 54, gold 9, silver 0.5, copper 1.3.	Color blackish lead-gray, cuts smoothly with knife. Metallic lustre.
Calaverite [Telluride of gold]	Tellurium 55, gold 45.	Color, bronze-yellow, brittle, massive structure. Uneven fracture

Tellurides are so different in appearance from the ordinary gold and silver ores that prospectors had passed over these lodes for years, never dreaming of the hidden wealth they contained. Miners had never seen ores of this description. The Red Cloud gold mine, on Gold Hill, discovered in May 1872, was found to contain mineral that could not be made to produce well in stamp mills but which would assay enormously. It attracted the attention of Schirmer and Davis, of the Denver Mint, and of J. Alden Smith. Specimens were sent, in 1873, to Dr. F. A. Genth, a professor of the University of Pennsylvania, for analysis. He pronounced it tellurium ore, and that this was the third

locality containing it in the known world. So rare was the mineral that he sent to Smith for more specimens. The Red Cloud was then mined vigorously. Between \$50,000 and \$100,000 came from it in two years, or before the deposits gave out. Like other tellurium veins the ore assayed from \$100 to \$100,000. A few hundred pounds were obtained that sold at the rate of thousands of dollars, but most of the ore ran down in the hundreds. It was the same here as in later tellurium discoveries, the "pay vein" was only from one or two inches wide. The rock required so much sorting that as many men were required to "hand dress" it as to work down in the mine. The mine is over four hundred feet deep. Other discoveries followed. The Cold Spring, is close by the Red Cloud, has been worked for nearly three years by its owner, Truman Whitcomb. He states that it has yielded altogether over \$50,000 with good profits. The product of last year was about \$15,000. One ton of ore selected is said to be worth \$10,000. But Whitcomb has been mainly operating the mine to develop it. What has been obtained came simply from shafts and levels. There may be a quarter of a million in the ore left standing above the lower workings. The shaft is three hundred feet deep and the vein has been very continuous. The shaft house was destroyed by fire last summer, but a new one has been built. The Slide lode on the northern slope of Gold Hill is another very rich tellurium vein. It pays largely. The Register, Columbia and Yankee Boy, owned by E. L. Salisbury, give large assays. On the same hill are the Cash, the Victoria and a great vein on which are the Horsfal and Golden Crown. The Horsfal is a gold lode and produced over \$200,000 in 1860-1-2, the ore being crushed in a stamp mill.

The Golden Crown, adjoining the Horsfal is owned and mined by a company of the same name, organized January 26th, 1876 on that mine, and the White Cloud, Keystone No. 2, Saint Joe, South Star, Todd and Ni Wot, all in the same locality. The capital stock is \$300,000 divided in 30,000 shares of \$10 each; \$75,000 working capital set aside; general office at Denver, where the President, D. F. Brown, and the Secretary, E. W. Pierce, reside. The Golden Crown and Saint Joe mines are producing ore in fair quantities. The first class sells at smelting works for \$1,000 and the second class for \$150 more or less. The property is already proving very remunerative, and

all of it is being developed. From Left Hand Gulch the Corning Tunnel has been driven into Gold Hill for a distance of over seven hundred feet.

The most prominent of the tellurium districts is Sunshine. This is most favorably located among the foot hills, and only six miles from Boulder and is 6,500 feet and less above sea level. Here are hundreds of tellurium lodes, many of them extremely rich. The first discoveries were made by D. C. Patterson, a prospector of twenty years experience in the far western territories. While hunting for deer early in 1874 he came upon an outcropping ledge that attracted his attention. He had some of the blossom rock assayed. It proved to be tellurium ore. It was the first found outside of Gold Hill, and created a rush of miners from all sections. Patterson recorded his lode as the Sunshine. The discoveries it led to have thrown many a ray of sunshine over the previously dark and clouded paths of prospectors and miners. A town sprang up on the green slopes and valleys of the grove covered hills. The Charcoal, Miami, Osceola, Dead Medicine, American and Bull o' the Woods were discovered, and began to show seams of ore that assayed way up in the thousands. Hundreds of people flocked to the place, and scores of frame and log buildings went up as if by magic, and soon well built streets, stores, hotels and a church, school and newspaper might be seen where one year before stood the lone cabin of the pioneer ranchman. A newspaper correspondent gives the following pen picture of Sunshine and its surroundings:

"It is built among the tall pines, which afford it shelter from the wintry blasts and shade from the summer suns. They delight, in the June day sun, the heart of the pleasure seeker, who cools his brow in the shade of matted boughs, and in all seasons of the year they form a scene of beauty. Here the mountain sides are of a gradual slope, and instead of the tiresome climbing on foot, which is so common among our mines, the ascent to the most prominent point, can be made in a conveyance of ordinary structure. The mountain range, west of Caribou, makes a plain and pleasant back-ground, with its lofty peaks, whose tops are in the clouds, enwrapped so cosily in the white mantles of snow that they care not to throw off save a short time each year. Look to the eastward, especially at sunrise, and before you lies one of the grandest views your eyes ever feasted upon. The plain spreads out

from beneath your feet as it were, and clustered on its bosom are scores of crystal lakes of so many different sizes of structure, glittering in the morning sun, or lying quietly under the haze of midday, a true picture of contentment. Seat the artist on a point near the Glendale or Grand View mines, and if he appreciates truly the works of nature, the hidden village of Sunshine, with its many contrasts in scenery from the same point, will to him stand a successful rival in beauty of any spot in the world. The mines here are many, the miners all millionaires. The wealthiest lot of people on the face of the earth are the people of this mining district."

Much difficulty is experienced in the reduction of telluride ore. At first the only works that handled them were those at Black Hawk, Golden and Omaha. The ores are somewhat deceptive in appearance to the uninitiated. Progress was somewhat slow and many devoted themselves more to the business of selling than to mining their properties. Still many proved very lucrative. Of these the American, Grand View, Phil Sheridan and White Crow were examples. The Grand View was sold to Ohio parties in 1875 for about \$50,000. They found the pay streak exhausted, but by sinking the shaft obtained better pay than ever, and continued to do so to depths of over two hundred feet.

The American has been the most productive lode yet discovered of the telluride variety. It was discovered in May, 1874, and some months afterwards was purchased by Hiram Hitchcock, an eastern capitalist. It had been paying well, but became wonderfully rich as depth was attained. It is said to have yielded a sum equal to the purchase money (\$17,000) in one or two months with only a dozen miners employed. The vein is very uniform and is about two feet thick, of which seven or eight inches and sometimes twelve constitutes the main pay streak. Regular shipments of ore have been made, the very valuable lots going to Omaha. The mine, which is now over two hundred and twenty feet deep, has never ceased to be profitable. Pieces of ore have assayed all the way from one to one hundred thousand dollars, often returning several dollars per pound. Five tons were sold to the Omaha Smelting Works for \$5,500 per ton. This lot had been obtained by selecting the richer portions of the ore for a long period of time. Large quantities have yielded hundreds of dollars per ton. J. Alden Smith, Territorial

Geologist, has superintended the mine and its entire business ever since the purchase by Hitchcock. A shaft house with steam hoisting works, railway and other well arranged conveniences cover the shaft. The mine is opened in first-class shape with levels running either way from the shaft. The lowest level is two hundred and twenty feet deep. The entire yield of the mine (actual time of work about twenty months) has been over \$135,000. It is in condition to yield more largely than ever. There is not far from \$20,000 worth of ore on hand. The ore is sorted in three classes. The very rich portions constitute about one ton in thirty of the ore; the second class, one ton in five of the vein material. There are twenty-eight names on the pay roll of the mine. Work is conducted in three reliefs or shifts, eight men working eight hours on each. Monthly pay roll and expenses exceed \$3,000. When stoping is done and large quantities of ore are raised, two ore sorters are required on the surface to three miners below. The ore is moved through the levels on cars, as in all well opened mines.

Sometimes the width between walls has been from five to fifteen feet, with ore seams of various thickness passing through it. The ore is in a hard flinty bluish quartz-gangue rock, much like that in Gilpin county. There is a very large amount of ore left standing in the levels. Had this been removed, the receipts would have been far greater. It is claimed by some to be the richest mine in the country. The Osceola has shown wire and free gold as well as telluride ore carrying gold and silver. The latter has assayed from \$500 to over \$300,000, the best being a rare specimen. Many tons of the first named value have been sold.

The Nil Desperandum is a mine of good repute and is producing some very high grade mineral.

Salina district borders on Four Mile creek and Gold Run. Here the towns of Salina and Camp Tellurium have maintained a healthy growth. Several mills are built and others partially completed. The latest, is one erected by an Atchison company, which is expected to begin operations in November 1876.

The richest and most famous mine in this locality is the Melvina, located on Melvina hill, between Gold Run and Four Mile. It is owned by Neikirk, Bailey, Kessler and two others, being divided

into eight shares. It was discovered in July 1875, or at least the first work was done upon it then. The first month gave a yield of about \$8,000, of which nearly \$8,000 was profit. It has been worked steadily, and has given the largest proportionate profit of any mine of which there is any record the wide world over. The yield of February last, was \$15,800 and the expenses about \$800. In nearly every monthly shipment, lots of ore have been sold to the amount of five hundred pounds that yielded at the rate of \$4,000 to \$14,000 and over, per ton! Altogether the mine produced up to October 1, 1876, ore that sold at the smelting works for \$84,600—this for a period of fifteen months, with a force of eight men. Only three men are employed beside the five proprietors. The average yield of all the ore sold has been 28 cts per pound, or \$560 and a fraction, per ton! There were 151 tons and 70 pounds. Much of the ore assays thousands of dollars per ton. The rich pay streak is soft material and about eight inches thick. It is so rich that a man can carry off many dollars worth of it in his pockets. Great care is taken to save all portions of this mineral as it is too precious to lose. The value varies greatly at different depths, having been richest near the fifty and two hundred foot levels. The mine is now over two hundred feet deep, and is one of the wonders even of this land of marvelous veins and golden pockets. The yield of October is said to have been better than any previous month and to have approached \$20,000. Only two of the present owners were the original discoverers. Henry Neikirk obtained an interest before it was known to be very valuable, in return for developing it. Thus it is to a great extent with mines and mining in Colorado. No one can tell what hidden wealth these gold, silver or telluride veins contain until they are developed.

The Salina Consolidated Mining Company, located at Salina, are the owners of the Salina, Kansas, Leora, Moonshine and C. T. H. lodes, two of which cross the celebrated Melvina. The Kansas is a mother vein of great width, mostly silver—The others are rich in sylvanite. These mines were the first taken up in this vicinity by the founder of the town of Salina, Judge O. P. Hamilton, deputy United States Surveyor. They have proved to be among the most valuable in the district.

Peter Winne is president of the company and E. W. Pierce, secretary, both of Denver. The stockholders intend to push the develop

ments so that the value of the stock will be largely increased. One fourth of the stock is set aside for working capital, none of which has been needed up to the present time.

South and west is the district of Sugar Loaf, named after a mountain whose peculiar shape gave it that appellation. The Lindley is the great vein here, and is generally considered the mother vein of this section and perhaps of the county. It can be traced by its outcroppings for miles away. It stands up from the mountain, over which it extends like a stone wall. This wall is eleven feet wide and often forty feet in height. Even after the presence of silver was known, little work was done upon it. The prospectors either had no money to expend or thought it would require more than could be obtained to develop it. In 1870, however, the Blake brothers with commendable faith and courage, began to "work it" and continued so to do whenever means would allow, down to the past season. Since then it has proved itself all that they had hoped for. At a depth of 110 feet in the main shaft, the lode is 28 feet wide and this is mainly composed of ore whose average assay is \$90 per ton! There can be little doubt that it will soon rank among the leading bullion producers of the country. These gentlemen own 3,000 feet. Levels run in at the base of the mountain would give a depth of over 1,200 feet. In addition to the above, a smaller portion of the lode is owned by M. R. Comfort and John Duncan. Very high assays, showing a large preponderance of gold, have been obtained. The great distance to reduction works has been one cause of the slow development.

The Blake Brothers also own the Crown Point which joins the Lindley, and are working it by means of a tunnel, driven through only half of the vein, which is twelve feet wide. Here are six feet of solid mineral. No better showing has been made than this for the amount of work done. The same parties own the Ogallalah mine, which they have opened in a very systematic manner. This is developed by a tunnel driven in on the vein for a distance of over three hundred and twenty feet. The shafts and levels already opened give a large amount of ore in reserve ready for stoping. The vein for a long distance has a width of two feet. Large quantities of ore have been sold at from \$216 to \$342 per ton. The mine is the best developed in the district and its production highly recommends this locality.

The Doss mine, one of the older discoveries, has been bought by Maj. Orris Blake, of Denver. Since the purchase the lode has been mined for the first time, has paid from the "grass roots," and at a depth of fifty feet has a fine vein of telluride ore. Governor Routt and Senator John A. Logan own and operate several mines not far away.

In Pennsylvania gulch, one mile east of the Washington Avenue mine are some east and west gold lodes, and a number of silver veins having a north and south course. The Weare Brothers & Co., of Lexington, Kentucky, have lately invested here, under the name of the Pennsylvania company. One of their purchases, the Dolly Varden, (1800 feet) is twenty-six feet between walls. A drift is being run on the pay vein which yields on the surface from 4 to 7 ounces per cord. The entire crevice seems to be one bed of quartz. It is rich in copper. The Sacramento yields very rich ore. A shaft will be sunk on the San Francisco, another gold lode. John H. Weare, the superintendent, has a Bolthoff pulverizer of twelve tons capacity, for treating ores, instead of a stamp mill.

John H. Pickel & Co. are working the Geneva, the west extension of the Dolly Varden. A Michigan company recently bought the Webster City for \$5,000.

In Sunbeam gulch are the Logan and Clipper lodes, owned by Hansbrough & Co. The Lewiston is a very promising lode, carrying tellurium and is four feet wide between walls. Owners: Henderson, Allard & Triplett.

The Comstock is a mammoth vein, carrying quartz and free gold. Near it is the Pickerel. Both are owned and worked by Gov. Routt.

On Four Mile Creek gulch mining has been carried on successfully for many years.

Ward district is situated high up toward the Snowy Range, near Left Hand creek and not far from Long's Peak. Gold mining has been conducted here since 1860, but the ores cannot be handled satisfactorily in stamp mills. Concentration and other processes have been tried and the former more or less successfully. There are signs of a revival from the long depression that has prevailed there. A Mr. Willard, of Boston, who was engaged in mining and milling enterprises at Jamestown, is putting a new process into his old mill which may be of great benefit to the mines of surrounding districts.

The Columbia is the most important lode of Ward district. It has a very large vein, often carrying seven feet of solid ore worth from \$15 to \$25 per ton. The Ni Wot and Boston or Baxter properties are opened to depths of four hundred and forty feet with seven feet of fifteen or twenty dollar ore in the bottom, and a twenty-stamp mill on the latter and fifty-stamp mill on the former. Beside other claims the Ni Wot has seven hundred feet on the lode; the French boys seven hundred feet; Halverson & Co. seven hundred feet, and the Boston or Baxter 1500 feet. E. K. Baxter is working the latter. The lode has produced altogether a large quantity of gold. The Ni Wot once owned by a company of the same name is now the property of Tobey, Davidson, Smith, Gill and others. H. M. Teller owns 800 feet.

Among other valuable lodes are the Stoughton and Celestial.

The Florence on Centennial Hill owned by Triplett and Watson shows an excellent vein. The Bronson and Black Cloud have been producing ore of the first quality.

Many years ago considerable gold was obtained on James creek, three miles west and north of Gold Hill. Mills and a process were introduced, but after a time work gradually ceased, and the miners sought more promising localities. In 1875, a few men began to prospect this section for telluride lodes. Among them was A. J. Vanderen, who had once been a wealthy citizen of Central, and Edward Fuller, a very lucky prospector, who had made half a dozen sales of his discoveries at different times. They found a lode on the 15th day of October, which Vanderen named the John Jay. It paid wonderfully from the "grass roots." They pre-empted 1,500 feet, as all discoverers are entitled to do by the laws of 1872. Vanderen bought Fuller's interest for \$10,000, and paid for it in two months from the prospect hole and open cut driven on the vein. The pay vein has been from two to three feet wide in some places. At others no ore was obtainable. There are well defined slickenside walls as far as workings extend—135 feet. The lots of ore sold have varied in value from \$110 up to \$1,800 per ton. What is remarkable, is the great size of the vein for a telluride lode. From six to sixteen men have been employed on the lode, and the total yield since its discovery, October 1875, is said to have been \$40,000. As the most of this is profit it makes a pretty good showing for a year's labor.

The Last Chance, owned by Harker, Marr & Co., is near the John Jay, and like it is making a fortune for its lucky finders. The mine has produced ore selling for from \$260 to \$650 per ton—with some small lots worth a dollar a pound. The total yield has been many thousands of dollars.

The old Willard mill on James creek is being remodelled for the purpose of treating telluride ores. Not far above are concentrating works.

At Springdale the Ellen, Gladiator and J. Alden Smith lodes are enriching their owners. The "rich strikes" made here and all over the tellurium belt mostly fall to the lot of those who have experienced every variety of fortune in other localities. Many fresh arrivals from the states as well as men who have had no experience in mining have also been among the favored ones. The prizes are equally welcome to all.

The Von Moltke and other mines on Left Hand are operated by Weiss, and some Chicago bankers.

The discovery of the John Jay, just before the first snows of winter started the prospectors into the region still further north. A. G. Raynor discovered the Cannon lode at Camp Enterprise which he owns and works with H. M. Teller, of Central.

In April, Charles Mullen, who had experienced all kinds of fortune in mining, and had once represented a southern county in the legislature, began to prospect near the northern limit of tellurium land. In miners' parlance he was "dead broke." He found a lode which he named the Smuggler, and the first assay, and the size of the vein caused him to believe it to be "the biggest thing in the mountains." He has not had reason to change his opinion since. While the ore compares in value with that of the best lodes, the vein is the largest yet found carrying telluride ores. Within a few months from the date of discovery, eighteen tons of ore were sold; two tons returning \$1,000.00 per ton, and eight tons \$650 per ton. The average was enormously high. No complete statement has been received of the mine's production, but it is said to be between \$30,000 and \$50,000. Gen. Lessig and W. A. Christian owns two fifths of the lode. In October, Mullen sold his three-fifths interest together with four neighboring veins to J. M. Freeman, the Greeley banker, for \$50,000, and started for the Centennial, well satisfied with the returns of a single season. The Revenue is the

eastern extension of the Smuggler and is claimed to be very valuable. Other lodes were found near by and the new town is called Ballarat. It is three miles north of Providence.

Magnolia is the southern end of the tellurium belt and bordering Boulder creek on the south. It did not claim especial attention until 1875. The most famous lodes are the Keystone, Mountain Lion and Dunraven. The two first named are on the same vein. The Keystone had yielded up to August, \$45,000. Ten months before both lodes could have been bought for \$1,000. The Mountain Lion afterwards sold for \$15,000. Now a quarter of a million would hardly buy them. Their owners have opened them until they know what they contain. The hoisting for both mines is done by steam power through one shaft. It is estimated that the mines can be made to yield \$500 a day, with an outlay of \$260 per day. Col. Strong & Co. own the Keystone and P. W. VerPlank of New York, the Mountain Lion. Both veins are well opened by shafts and levels.

The Magnolia, owned by Fullen, Stewart and Wilson, was the first discovery of the district, and is one of the best properties. The sales of ore range from \$300 to \$600 per ton, and select lots go still higher. Here are some of the assays; select ore, gold \$62.01, silver \$17,994.60; second assay, gold \$41 silver, \$561.60; third assay, gold \$20.67, silver \$2.60; last mill run, gold \$41.34, silver \$510.90.

The Little Dorrit, the Downs, Lady Franklin, and others have produced some exceedingly rich ore.

The Consolidated Tellurium Belt Mining Company is driving a tunnel from Boulder creek under Magnolia district and mountain, where it owns thirty-two lodes. The starting point is seven and a half miles from the city of Boulder. The stream affords ample water power for a mill, air compressor and drill. A depth of nearly 1400 feet will be attained on the Keystone and Mountain Lion lodes. Work is continued night and day under the superintendence of J. B. Rouilliard.

The farming district of Boulder returned bountiful harvests in the season of 1876. The wheat crop is said to have returned from twenty to thirty bushels to the acre. The barley crop was quite large. Less ground was sown in oats than usual.

The coal measures of Boulder county are of great extent and value. The principal collieries are situated on the plains, several miles east of

the base of the mountains. The most extensively developed and the most productive are those at Erie. These have caused the growth of a prosperous village, and the selection of the present route of the Boulder Valley Railway. The most famous coal bank is the Boulder Valley which has yielded over 350,000 tons in six years and a half. The vein, like others in this county, is horizontal or flat in direction, and from eight to fourteen feet thick. About one hundred miners are usually employed, who receive one dollar per ton for mining the coal. Sales are made to railway companies in large quantities at \$2 per ton, and \$2 50 to others at the banks, and at \$5 per ton by the car load and at \$5 50 in smaller lots at Black Hawk. The yield this season is about 80,000 tons. The mine has been opened for about three-fourths of a mile. There are several other productive collieries at Erie. The Davidson bank is located on the line of the Colorado Central, near the base of the mountains. The Rob Roy is a very productive bank. The Marshall banks are at a distance from the railway and do not now attempt to compete with those more favorably located. These measures comprise some very valuable veins and were the first and leading coal mines operated in Colorado. Twelve layers have been found. There are beds twelve feet in thickness of excellent lignite, which is the character of nearly all Colorado coal. The yield in fifteen years was 100,000 tons.

CHAPTER XXXVIII.

JEFFERSON COUNTY.

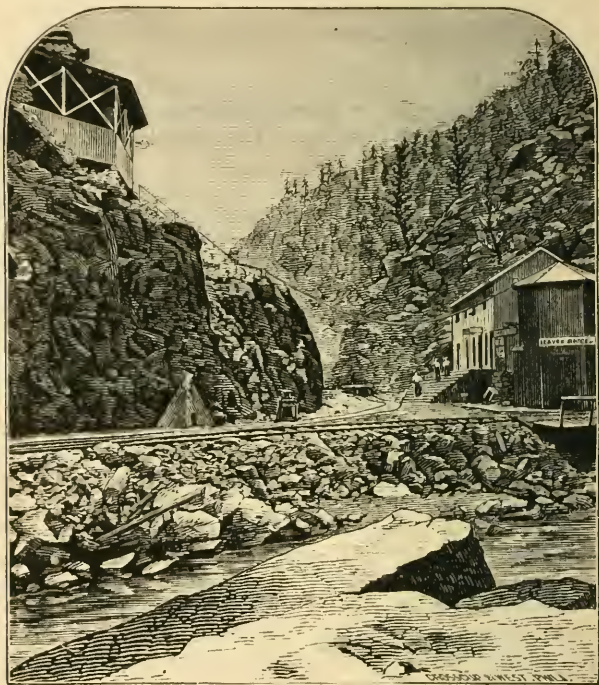
Its Manufactories and Coal Veins—Golden City—Facts and Figures from the Smelting Companies—Flour and Paper Mills and Collieries—The Murphy and Ralston Coal banks.

JEFFERSON county embraces a long narrow strip of country between Gilpin and Clear Creek counties on the west, an Arapahoe and Douglas on the east. On the north is Boulder county, and to the south, Park. East of the foot-hills are some of the best lands in the state. The average yield of wheat this season has been from twenty to thirty bushels per acre. The valleys of Clear creek and Ralston, and all of the intervening lands that have been irrigated, are filled with well-to-do farmers, who in a few short years have accumulated what they possess. In the mountains, the valley of Bear creek is studded with farms where plenty and prosperity are the portion of all.

Golden, the "Lowell of Colorado," is the main town and county seat of Jefferson. It is fifteen miles from Denver by rail and fourteen by wagon road, and twenty-two miles from Central. It is situated in a valley encircled by hills and mountains—Table mountain shutting out the view towards the plains. The town was laid out in 1859, and was at various periods the capital of the territory, until Denver became the permanent seat of government. Its leading men, such as Loveland, Welch and others for many years strove to make it the railroad centre of the territory. As it is they have secured for it a bright and prosperous future.

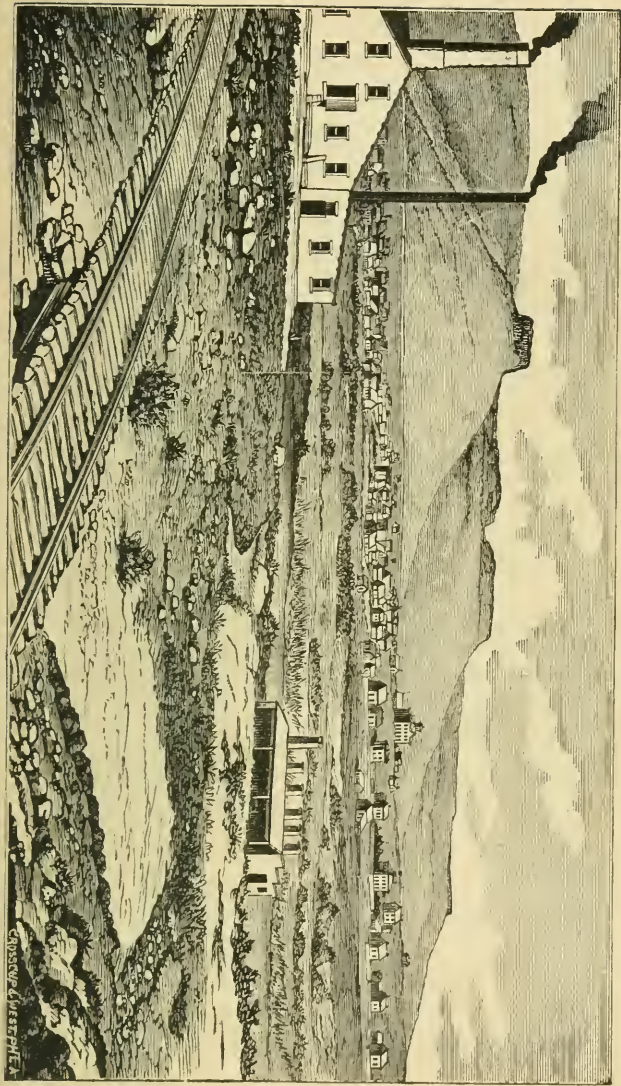
Golden is a place of no little importance. It is the headquarters of the Colorado Central broad and narrow guage railway. Here are the repair shops, car manufacturing shops and general offices of the road. There are two extensive smelting establishments to which ore is sent from the various mountain mining districts. There are three flour mills, supplied from the neighboring farming sections, which turn out annually

\$200,000 worth of flour. Two coal mines are worked and five miles distant are the Murphy and Ralston coal banks. There is also a paper mill and works for the manufacture of fire brick. The former, owned by G. D. Dickinson, turned out 125 tons of paper this season.



COLORADO CENTRAL RAILROAD—BEAVER BROOK.

The State School of Mines is located here of which a description is given in another chapter. Golden has a population of 2,000, two weekly newspapers, the *Transcript* and *Globe*, an elegant school house costing \$17,500 and attended by 300 pupils, and half a dozen churches. There are two bankers, (F. E. Everett and J. W. Smith) two hotels and a number of first-class business houses.



GROSSCUP & WESTGATE

The flour mills each have two run of stone. The Barnes mill, owned by J. Quaintance, is being enlarged and improved so as to increase its capacity, thereby enabling it to turn out 180 sacks of flour daily. Attached to the same building is a new kind of quartz mill, invented by the proprietor. Two stone wheels of four tons weight each, move about in a circular pan partly filled with ore. These do the crushing in lieu of stamps. The pulverized ore is washed through the screens forming the side of the pan into a second pan below, containing quicksilver. Iron arms keep the pulp in motion until amalgamation is completed, while the refuse is gradually carried over the rim of the pan to the creek.

The Rock mills owned by Barber and Brady, turn out 120 sacks or 12,000 pounds of flour in twenty-four hours. They are usually in operation nearly the entire year.

An abundance of water power for all future demands is afforded by Clear creek, which debouches from its mountain walled cañon at this point. It also supplies several irrigating ditches with water for the farming districts.

While the coal veins of Boulder and some other counties are usually flat, those of Jefferson are vertical or nearly so.

In 1872, what are known as the Golden Smelting works, were established by Bagley and son. Afterwards they became the property of the Golden Smelting Company. A blast furnace is used and gold, silver, copper and lead are saved. Wm. B. Young, is manager and Gregory Board, metallurgist. The works have been in successful operation the entire year, with the exception of intervals when stopped for repairs or improvements. The following is the statement of the operations of the works for nine months of 1876. Ores rich in lead are the classes desired.

	NUMBER TONS
Clear Creek county shipped	1,027½
Gilpin county shipped	685
Boulder county shipped	221¼
Fremont shipped	121¼
Total number	2,055

Daily average 7½ tons. Average value \$66 per ton.

Allowing the same value for the ores from each county, this would give a yield for

Clear Creek	\$67,815 00
Gilpin	45,210 00
Boulder	14,602 50
Fremont	8,002 50
Total	<u>\$135,630 00</u>

The works of the Colorado Dressing and Smelting Company, at Golden, began operations late in the spring of 1876. The process is that of Swansea, and of the Boston and Colorado Smelting works at Black Hawk and Alma. The valuable metals are not separated at the works, but are sent by rail in the form of *matte* to Black Hawk for separation. A furnace of fifteen tons daily capacity has been in successful operation for months, and has smelted from twelve to fifteen tons of ore daily. Another furnace of equal size is being constructed, so that within a few weeks the daily capacity will be thirty tons. Each furnace can produce two tons of *matte* daily.

John Collom, of many years experience in smelting and concentrating ores in Clear Creek and other counties, is general manager for the company and all of its establishments. He has individual charge at headquarters; that is at the smelting works at Golden. Coal is used as fuel and is considered much cheaper than wood, and equally effective.

Most of the ores treated here are sent from the large concentrating works of the company at Black Hawk. A quantity, however, has been furnished by works of similar character located one mile above Idaho Springs. The latter operate mainly on silver ores, and as they run by water power only, are now idle for the winter. Ores are also brought from other localities in large quantities, the American mine, of Sunshine contributing largely.

The Concentrating and Dressing establishment, at Black Hawk, occupies the great Keith Mill building on North Clear creek, which was enlarged for that purpose. This began operations in April last. Since then it has been subjected to a number of stoppages from a variety of causes, but from no defect of the works outside of trouble with screens.

Altogether very nearly 10,000 tons of ore were dressed at these works from Gilpin county mines during the seven months ending November 1st, 1876. These were usually concentrated into one-fourth

and often one-fifth of their former bulk and then sent to the smelter at Golden. Three tons per hour, or seventy-two tons in twenty-four hours can be dressed at this place. The ore is first crushed by crushers and rollers and then operated by machinery. A system of jigging is used for the coarser ores, while the finer material is handled on shaking tables. The system is that of wet concentration, and is the invention of John Collom. The waste or gangue rock and comparatively worthless ore is separated from the richer portion and the latter saved. By this means the values are condensed into less bulk, giving very nearly the entire quantity of gold, silver and copper in one ton, instead of in four or five.

Five tons of ore containing only \$15 per ton, or \$75 altogether would not pay the expense of smelting alone, not to speak of mining. But if this \$75 is separated from the poorer rock so as to be contained in one ton, good profits can be realized and liberal prices paid. That is why these works are proving of incalculable benefit to the miner. Ores of any description can be handled, but those rich in copper are preferred.

These works treat the same grade of ores handled by the stamp mills, and some that cannot be made to pay expenses there. The stamp mills save something over half the valuable contents of the ore, losing most all of the silver and copper. Their average returns were \$11 60 per ton in 1875, indicating the contents of the ore to be nearly \$20 per ton. The dressing works concentrate and then send the ores to Golden, when they are smelted, and ninety-seven per cent of the gold, silver and copper ore saved. Ores that are of too poor a quality to be mined and milled, are sold here at paying figures and then concentrated and smelted.

It is some satisfaction to know that nearly the entire value is saved, instead of forty per cent of it going down the creeks to irretrievable waste. While \$28,000,000 have been realized from the gold mines of Gilpin county since 1859, probably a still larger amount has been carried down North Clear Creek.

No statement has been received of the yield of these concentrated ores. About 10,000 tons have been handled. Allowing this quantity to contain the low average of less than \$18 per ton, it should have given a return of \$17 per ton, or when reduced in bulk of over \$70 per

ton. This would give a yield, in seven months, of \$170,000 from Gilpin county gold ores—mainly of a class that did not pay to mine and mill before these works were built. When fairly under way, another season, the showing will be far better. The above sum would represent only a part of the value of shipments obtained from all ores smelted by the company.

The Ralston and Murphy coal veins are located on Ralston creek, at the point of its issue from the mountains, fourteen miles from Denver and five north of Golden. There are two parallel veins of unequal size but similar character, extending through both properties. Unlike most other Colorado coal measures, these are vertical veins. Geo. C. Munson, Esq., of Denver, recently made an examination and gave this interesting report on them. "Coal of a merchantable quality was first mined in the Ralston colliery, at a depth of thirty-five feet. Here is the upper level which is eight hundred feet long. On this level from a space five hundred feet long, ten high, and fourteen wide, 5000 tons of coal were sold at Denver. Double tracks of iron rails are laid for carrying coal to the surface. The same incline that leads to the first level, passes down eighty feet beyond, where another level has been run in both directions, north and south. The incline is altogether one hundred and ten feet long, attains a vertical depth of one hundred and fifteen feet, and dips from thirty to thirty-five degrees.

One continuous vein of coal is developed above the "incline" making a vertical depth of coal below the upper level of eighty feet. A level, already one hundred and ten feet long, is being run at the bottom. Width of the vein from fourteen to fifteen feet, two inches. Coal clean, without faults, or foreign or worthless substance. Between the two coal veins is a splendid body of fire-clay, twenty-nine feet wide, and through this, a cross cut has been driven to connect them. The west or small vein for a length of thirty-five feet, or as far as opened, measures from five feet to six feet four inches in width. J. T. Hodge, of the Hayden survey, made the following analysis of Ralston and Murphy coal:

Specific Gravity,	1.345
Water,	13.80
Ash,	3.31
Volatile,	35.88
Fixed Carbon,	44.44

100.

The superior quality of these coals, as far as northern Colorado is concerned, ensures higher prices than most others. The main Ralston opening is covered by a building with engine, etc. Half a mile south and for a considerable distance north includes the remaining developments."

The Murphy property commences six hundred feet from the Ralston engine. Nine hundred feet beyond this is the main Murphy shaft. This is sunk one hundred and fifty feet on the vein, with the surface sixty feet below that of the Ralston works. Here the veins are a little wider than they appear in the Ralston. The large one increased from fourteen feet on the surface to fifteen feet below, and the small vein measures from six feet four inches to six feet eight inches. A branch railway will be constructed within a year connecting with the Colorado Central, on the Boulder division, or at Golden. More powerful hoisting machinery will soon be placed over the mines. Mr. Munson estimates the number of tons of coal "in sight" as follows: Murphy, large vein, 3,000,000; small vein, 1,000,000; Ralston, large vein, 1,500,000; small vein, 1,000,000. At both mines are engines for hoisting and screens for screening the coal. As the veins are vertical and show no signs of departing from their present direction, the amount of coal that lies beneath the lower workings cannot be estimated.

CHAPTER XXXIX.

PARK, LAKE AND SUMMIT COUNTIES.

The Silver Belt—Gold Lodes and Placers—The Mosquito Range—Mounts Lincoln and Bross—Mining above the Clouds—Eternal Frost and Snow—Bullion Products—Yield of the Placers of the Platte, Blue and Arkansas, Fremont County.

PARK County occupies the South Park region and portions of the surrounding ranges of mountains. It is east of Lake and Summit counties and west of the Snowy Range, south of Jefferson and Clear Creek Counties and west of the Pike's Peak section. The elevation of the park, which embraces nearly 1000 square miles, is 9000 to 10,000 feet above sea level. The outlying mountains rise some thousands of feet higher. The Mosquito range includes Mount Lincoln with an elevation of 14,145 feet above sea level, and in a spur of the range to the northward are Mounts Evans and Rosalie 14,330 and 14,340 respectively. The climate is cool but pleasant in summer, but the winters are long and severe, and continue into the spring months.

This region is rich in gold and silver. The placers have yielded largely and are again doing so but in a less degree. Up to the time of the silver discoveries in 1871 the gold lodes and placers had produced \$2,500,000, principally obtained prior to 1866. The silver deposits are however of vastly greater value and extent. They did not produce largely until 1872 or rather 1873, but have already yielded nearly \$3,000,000.

The argentiferous riches of the Mosquito range are found in limestone and sometimes porphyry formations—a different condition from that existing among the northern mining districts of Colorado. Instead of true fissure vein deposits, chambers and pockets of mineral are found belonging to a system of contact veins, or veins between two formations. These deposits carry galena, gray copper, zinc blende and a quartz gangue, when located in the higher sandstone, and galena, gray

copper and silver glance and usually a heavy spar gangue in the higher limestone of Mount Lincoln. The mineral bearing rock is often in the form of egg shaped deposits sometimes separated by the country rock and at times connected by narrow seams.

E. D. Peters, formerly Territorial Assayer, at Fairplay, refers to the geological formation of this section as follows :

“ From Fairplay to the base of the Mosquito range exist extensive gravel and drift deposits entirely covering the surface of the country. These are all more or less auriferous and include some of the best paying placers. The bed is a micaceous sand stone, containing much lime and alumina. The wash-boulders are mostly quartzite from the higher formations, plentiful but not large. From Horse-shoe district or further south to Ute or Hoosier Pass, the primitive rocks are overlaid by three distinct formations, two of which might be subdivided into an immense number of strata ; first, sand stone, second, limestone, third, porphyritic trap. In many of the deeper gulches, and on several of the lower mountains, one or all of these formations have been scoured away. On Mount Bross the geological formations can be plainly seen. On the primitive schistose rocks rests a layer of metamorphic sand stone 1,500 feet thick. This is overlaid by limestone 1,800 feet thick. These are the approximate figures.”

The principal gold lodes are found in the lower strata of sand stone and the silver veins in the other formations.

The first silver discovery in this section, was the Dwight, made in June 1869, by Plummer and Myres, although little interest was excited until the Moose was found in 1871 by Capt. Plummer. Other discoveries followed, and a stampede ensued from all quarters, succeeded by a grand rush in the spring and summer of 1872. These lodes are situated far up on the bleak and barren mountain peaks, forming the Mosquito Range. They are above timber line, and from 12,000 to 14,000 feet above sea level. Of course the climate is an extremely cold one, the summers are short and snow storms prevail at almost all seasons. On this account and because of the inaccessibility of the mineral belt, development was much slower than it would otherwise have been. Yet the county has produced about as follows :

1859 to 1871 inclusive	\$2,500,000
1872	250,000
1873	459,000
1874	96,392
1875	830,860
Total	<hr/> \$4,636,252

Up to the last year almost the entire yield was from the silver mines which were discovered too late in the season of 1871 to produce anything of importance. The yield of 1875 was mainly silver.

The rise and decline of gold mining, lode and placer, has been noted in the historical sketch of Park county. This industry is again reviving and the yield of the present year will be quite extensive. The main source of Park County's wealth and prosperity are the argentiferous riches in the limestone deposits of the Mosquito Range, and Buckskin and in the mines of Horseshoe and Hall Valley and Geneva districts. These are of immense extent and value, and notwithstanding their high altitude and unfavorable climate have produced immensely since mining began in 1871-2. These districts are all near or above timber line.

The mines on Mounts Lincoln and Bross are from 12,000 to 14,000 feet above sea level. Far above timber line and every species of vegetation, where snow covers the ground the greater portion of the year and falls at all seasons, mining is carried on winter and summer and with profit and success. From these lofty and barren peaks the miner and prospector looks over the clouds on a scene of grandeur and beauty such as few lands can boast of. Mountains, peaks and valleys greet the eye on every hand. But for the scattered tunnel houses, the noise of the pick and drill and of the ever recurring blast in the depths beneath, the picture would be one of utter desolation.

It is the land of eternal frost—for, while the days are often warm and pleasant and the mountain sides at times free from snow, the days are always chilly, water freezes every night of the year, and no matter how far the earth is penetrated the ore deposits and rock are always frozen. Supplies are taken on to the mountain tops for the winter, at which time the roads are usually impassable. Up in the clouds is the lone miners' town of Quartzville. Still higher are the mines., Van Wagenan reports the yield of the district, in 1874, to have been 3,000 tons of silver ore of an average value of \$140 per ton, or \$420,000 altogether, and \$50,000 worth of auriferous pyrites.

The Moose mine ranks first in size and production. It is located on the north-east face of Mount Bross, over 12,000 feet above sea level. Its ore bodies are nearly longitudinal in direction and are larger and more continuous than any of its neighbors. It is worked by levels and

tunnels. It was bought by Dudley & Co. soon after its discovery in 1871. Its yield is claimed to have equalled if not exceeded the following figures:

	NO. TONS ORE.	VALUE.	TOTAL.
1871	50	\$435	\$ 21,768 00
1872	300	375	105,000 00
1873	estimated		150,000 00
1874	do		100,000 00
1875-6	do		300,000 00
			<u>\$676,768 00</u>

There were also large quantities of low grade ore. It is estimated by some that the mine has yielded altogether \$750,000. The Dwight has also been a very productive mine.



GOING INTO THE MOUNTAINS—SOUTH PARK STAGE LINE.

The Park Pool Association was organized in 1871, by citizens of Gilpin County. The officers were N. P. Hill, president; H. R. Wolcott, secretary; J. A. Thatcher, treasurer, and J. V. Dexter, superintendent. The company's leading mine is the Hiawatha. It is opened by levels and has been very profitable. A dividend of fifty per cent. on the company's capital of \$40,000 was made in 1872, one of seventy per cent. in 1873, twenty-five per cent. in cash and fifty of stock in 1874, 25 per cent. cash in 1875. The Hiawatha has had a number of pockets and the yield is said to have been \$200,000.

In the same district are the Dolly Varden, Russia, Security, London, Ford, Rob Roy and Musk Ox. The first is owned by George Brunk & Co., who have realized a fortune therefrom. The Russia has paid largely since its purchase by Wm. Pogue of Indiana. Both are well developed with tunnels and have shown several immense pockets of high and low grade ore. The Present Help mine on Mount Lincoln is 14,000 feet above sea level. In Buckskin district are the Sweet Home, McGraw, Prosperity, Denver, Narrow Gauge, Ruby, Indian Boy, Fourth of July and John Dee lodes. Some of these carry lead and others galena, zinc blende, silver glance, etc.

The Phillips gold lode, mentioned in a preceding chapter, is again becoming famous. After being idle for years, recent developments show a rich vein of copper pyrites. A thin casing of hard rock had hidden the deposit, and a recent "blast" discovered it.

Mosquito district has some valuable gold mines, and others rich in lead and silver. The Orphan Boy is the most famous of the former, and the Eclipse is one of the best of the latter.

The branch smelting works of the Boston and Colorado Company are located at Alma, and have treated the larger portion of the ores mined in the above districts. They turned out \$678,000 in 1875. Of the latter amount \$41,000 was silver and \$19,000 copper. At Dudley, are the Dudley Smelting Works, owned by the parties operating the Moose mine, from which it obtains its supply of ore. Concentrating works were established at Alma last summer, and will be of great benefit in rendering the low grade ores available for the smelter.

Alma lies at the foot of Mount Cross, and is a flourishing town of 700 inhabitants. It is 10,044 feet above sea level, seven miles from Fairplay and 102 from Denver.

Fairplay is the county seat and is situated in the South Park, several miles east of the Mosquito range. The south Platte furnishes an immense amount of good gulch or placer diggings at and near this point. The Fairplay Placer Company, with \$1,000,000 of capital stock, mainly held by J. W. Smith and the estate of F. A. Clark, owns the gulch for four miles, including 1,100 acres of placer ground. E. L. Thayer leases this property and operates it very extensively. He subleases to Chinamen, of whom two hundred were employed last summer.

The Silver mines of Hall Valley are situated on the crest of the

Snowy Range, which forms a bend here on either side of the head of the valley in the shape of a horse-shoe. The Hall Valley Company, an English organization, expended large sums of money in the building and re-building of smelting works, constructing a tram railway from the works up to the mines, and in experimenting. They own the Leftwick and Whale mines here, and the Revenue and others at Geneva. They are all very rich. The works contain a blast smelter and have been operating successfully (for the first time) this season. Five tons of lead riches are shipped weekly and a calcining furnace of fifteen tons capacity was recently built.

The **Champion** is one of the main veins of this section. Ore, heavy spar, with gray copper and no zinc. It is on the crest of the range, which divides the counties of Park and Summit. Two tunnels or levels are being driven and twenty men are employed. Large stone buildings cover the mouth of the eighty-five foot shaft and the mouth of the one hundred and forty-five foot level. A contract has been let to drive a tunnel two hundred and fifty feet that will cut the vein at a depth of one hundred and sixty feet, where levels will be run each way. There is a vein three feet wide of ore worth from \$175 to \$220 per ton. This mine has but few equals anywhere and another year will see a large production.

Geneva district is situated on the range in Park and Summit counties and near the line of Clear Creek county. The most prominent lode is the Revenue, very rich in silver and carrying bismuth. The Treasure Vault and Glendale are exceedingly valuable veins, and so are the U. S. Treasury, Congress and Leviathan. Some of the ore goes to Georgetown on the backs of jacks and some to the Hall Valley Smelting works.

SUMMIT County extends from the crest of the Snowy Range west to Utah. It embraces a large amount of country adapted to agricultural and pastoral purposes and some gold and silver bearing districts of great extent. The belt of silver and of silver and lead bearing veins embraces many lodes of immense size and value. That great natural barrier, the Snowy Range, has prevented access and development.

The lodes in the range near Breckenridge and Lincoln are very rich in lead and might be called lead veins. Those in Snake River or Montezuma and Peru districts are rich in silver. Here are the huge Peruvian and Anglo Norman veins, the Comstock and others varying in width from ten to eighty feet.

The Boston Silver Mining Association has some of the best mines, and has

spent a half million here in ten years. This was the result of mismanagement, mistakes, experiments, etc., of its members. The finest tunnel in the state is that of this company, 1200 feet long and as true as a level. Three very valuable lodes have been intersected. This company have at last started the smelting works with a process that is likely to prove successful. The ores are first crushed and roasted and then smelted. The products of neighboring mines are purchased.

The Snake River mining region lies on the western slope of the dividing ridge of the Rocky Mountain range, from fifteen to twenty miles from Georgetown. The route from Georgetown lies over the Argentine Pass, 13,060 feet above sea level and a few miles south of Gray's Peak, and descends on the west side down a wagon road into the beautiful valley of the middle branch of Snake river, which latter is a tributary of the Blue. This forest clad valley is walled about on three sides with rugged craggy peaks and lofty mountains interspersed here and there with open grassy vales and undulating hills presenting a landscape, grand and enchanting. Still further down to the west and south are the beautiful valleys of the Blue and of Ten Mile.

North of Summit is the newly formed county of Grand, which embraces the Middle and North Parks, and the valleys of the Elk, Bear, Grand and Green. Here is some of the most attractive country the eye of man has ever rested on. The Ute Indian reservation occupies the western portions of Grand, Summit and Lake counties. In the western part of Grand are the Hahn's Peak mines, where one hundred and fifty men were at work last summer, principally in placer mining. The North Park also shows valuable placer ground. The mountains encircling Middle Park are rich in silver bearing lodes. The fame of the Rabbit Ear range is spreading abroad, and the rich silver deposits there will soon be producing largely. Markets and reducing works are too far away, at present, for any extensive operations, but this condition of affairs will not exist always.

South of Summit is Lake County. In the range near the borders of these counties is a new silver district, and not far away on the head waters of the Arkansas are the silver and lead mines, of which the Home-Stake is chief. California gulch with its gold lodes and gulches has long been famous. Reduction works, newly built, are in operation-near here.

The Lead mine in California gulch is perhaps the richest lead deposit in Colorado. Several tons can be mined daily per man.

The gold mines of Montgomery which have been idle for years, are again being worked. Long silent stamps once more begin to thunder and rattle at the base of the great mountain (Lincoln) and the old town is again on the road to prosperity. This place is in the valley at the foot of Hoosier or Ute Pass leading to Breckenridge.

The Malta Smelting works have run most of the summer and fall, on the silver mines of California, Chalk creek, the upper Arkansas, etc.; process, blast smelter—15 tons daily. Lewis and Sandels' Tarriff mine in Summit is very rich in silver.

The head waters of the Blue, Arkansas and Platte, take their rise in the springs and eternal snows of the Mosquito range. Those of the Blue and Platte start on their long journey to either ocean from opposite sides of Mount Lincoln. The beds and banks of these streams have yielded immensely in gold, and the auriferous deposits are by no means exhausted. The upper valleys of these streams are loca-

ted in different counties. In Summit, the Blue and its tributaries, Georgia, Illinois French, Gold Run and other gulches have been famous for years. Georgia, stood second only to California gulch in its wonderful yield of gold in the olden times. The *Mining Review* estimates the yield of the placers of these three counties at \$197,000 in 1875 and \$225,000 in 1876. It also publishes the following statement of the yield of the gulch, placer and creek diggings of Colorado in gold dust for four years.

	1872	1873	1874	1875
Four Mile	\$ 6,000	\$26,000	\$20,000	\$30,000
Clear Creek	25,000	38,000	42,500	80,000
Blue	60,000	75,000	70,000	72,000
Platte	30,000	68,000	70,000	80,000
Arkansas	40,000	42,000	35,000	35,000
Elsewhere	30,000	35,000	38,000	75,000
Total	\$191,000	\$284,000	\$275,000	\$372,000

Among the great enterprises now fairly under way are those of the Fuller company in Summit, of the Fairplay company in Park, and of the Oro Ditch company in Lake. These have expended large amounts of capital in constructing ditches for hydraulic mining, and have large districts at their command.

Raymond gives the yield of the mines of Park, Lake and Summit, for 1874 as below. This includes the mountain districts of these counties where they adjoin one another and also the placers of the streams and gulches which take their rise here. The districts are Snake river, Breckenridge, Hall and Geneva, Mosquito Range and Upper Arkansas.

Gold, gulch and bar	\$230,000
Gold, Stamp and an arastra	130,000
Silver	565,860
Lead	35,653
Copper	49,720
Total	\$1,011,233

The production of Park county in 1875, was as follows :

Boston and Colorado and Dudley Smelting works. Value of matte shipped to Black Hawk.

Silver	\$618,000
Gold	41,000
Copper	19,000
Value of ore shipped out of county	50,000
Hall Valley Smelting works	18,360
Gulch and placer mines	76,500
Other sources	8,000
Total	\$830,860

PREMONT COUNTY.

Fremont county situated south of Park and El Paso, and west of Pueblo, is fast becoming one of the prominent mining sections. Here are rich deposits of splendid coal, mines of iron and copper, and veins enormously rich in silver. The D. & R. G. Railway extends to the county seat, Canon city, a flourishing town of 1,200 people.

Rosita is the great mining town and contains 1,400 people, all attracted there within three or four years. This place is in the mountains and about thirty miles from Canon. Nothing was done to develop the silver mines of this place until the winter of 1872-3. The Senator and one or two others then attracted attention and the discoveries of the Pocahontas, Humboldt, Leviathan, Virginia and hundreds of veins followed. There was no ore market or reducing works nearer than Denver, or Golden, about 200 miles distant. Consequently only very rich ores would pay for transportation. Yet the yield of 1875 was \$342,000. Two sets of reducing works have recently been built. Those of Prof. Mallet, similar to the chlorination and lixiviation works of North Boulder, are now ready for work. These should be of vast benefit to the district.

The Pennsylvania reduction works of 10 tons capacity—roasting and amalgamation—Prof. Van Diest, manager—will soon be treating Humboldt and Virginia ores.

Richard Irwin was the leading pioneer of the district. The following are the depths of the leading mines: Humboldt, 370 feet; Pocahontas, 200 feet; Leviathan, 150 feet; Pioneer, 100 feet; Chieftain, 130; Senator, 70 feet; Cymbeline, 50 feet; Lucille, 50 feet. These lodes have a great quantity of ore already mined. The "country rock" is a kind of porphory.

The great vein of this district is that known for intervals under the names of Pocahontas, Humboldt, and Virginia. Most of the bullion of the district came from this vein, although there are many others of great value. It is said to have produced altogether \$350,000. The fall in silver and the want of reduction works has caused a falling off in the amount of work and production this year, but this will no longer be the case. Sinking will not be discontinued until a depth of 500 feet is attained. Three deep shafts are now being driven. That on the Humboldt is now over 370 feet deep. The time of actual mining on these lodes is less than two years. Besides the above, are the Senator, enormously rich, the Leviathan, Leavenworth and others.

South of Rosita and in the Sangre de Christo range, on the eastern rim of the great San Luis park is a belt of lode and gulch mines recently discovered, and which are already quite productive. Three stamp mills have been at work there this summer.

CHAPTER XL.

THE SAN JUAN COUNTRY.

Among the Great Southern Mines—Hinsdale—San Juan—La Plata—Rio Grande—San Luis Park—Mountains Ribbed with Gold and Silver—The Country of the Future.

THE San Juan Country embraces the south-western portion of Colorado and the counties of Rio Grande, Hinsdale, San Juan and La Plata. The San Luis Park region to the eastward is sometimes considered a portion of San Juan. The latter is traversed by a series of the loftiest and grandest mountain ranges in North America—a few solitary peaks in other sections excepted.

Here is said to be the grandest silver belt the world can produce. It is about twenty-five miles wide and perhaps one hundred long, or about as extensive as all the mineral belts of northern Colorado. Its production has been small owing to distance from reducing works and the almost inaccessible character of the country. But works are being supplied, and another year will witness the beginning of an outpouring of wealth from these treasure vaults of the Sierra Madre that will be counted by millions. The "country rock" is usually trachyte and granite.

HINSDALE COUNTY.

The Lake City mines are the most accessible of any leading silver district. This place has grown from a wilderness to a bustling town of 1400 people within a period of a little over two years. Its situation and surroundings are said to resemble those of Georgetown, except that the mountains that overshadow it are giants beside those of the Silver Queen of the north. Lake City is located at the junction of Henson creek and the Lake Fork of the Gunnison river.

*Pronounced San Juan.

During the past summer the Crooke brothers, who have become heavily interested in the mines, have erected concentrating works. These will be of untold benefit to the miner, for they are as necessary here as in the gold, silver or tellurium districts of northern Colorado. The process is Krom's dry separator. They ship to their works in New York.

The next grand move for the advancement and development of this section is the building of Van Gieson's chlorination and lixiviation mill, similar to the one at North Boulder, and of fifteen tons daily capacity. The miners now have home markets, which give an opportunity to turn their ore into silver and greenbacks instead of having almost no market at all as previous to the advent of these two enterprises. The mill will be ready for work in January 1877. The reports of the mines given below, it must be remembered, were made before the opening of this market.

On the mountains bordering Henson creek are hundreds of lodes many of them extremely valuable. Five miles above town is a strong vein, the Ute—said to have seven feet of solid mineral—ore, low grade. but its great quantity ensures a profit. Near by the Ute has a smaller vein but is very rich. The Ocean Wave and Wave of the Ocean, both on the same vein, are far up on the mountain and nine miles from Lake City. In one place there were eighteen inches of galena and gray copper. Four-fifths of these lodes were sold in August for \$80,000. They are being rapidly opened. Close by is the Red Rover, of the same character, and showing ore that assays \$900. On the opposite side of the stream is the Big Casino. There are many other lodes in this locality that may yet prove as valuable as the above named. In a short period of time two hundred tons of ore have been produced of a high grade. No other kind has paid to ship over these gigantic mountains to a market hundreds of miles away. If the low grade galena ores can be profitably worked the productions of these mines will be thousands of tons annually. Most lodes within fifteen miles of Lake City are worked. Galena and gray copper are found in most of these veins.

The mines on the Lake Fork of the Gunnison are admirably located near the valley, cutting the mountains at right angles, so that tunnels can be driven in on them. Thus expensive shafts and cross-cut

tunnels are unnecessary. On the west side of this stream and two miles from Lake is the Coin lode worked by one of Rand's steam drills. Further on is the celebrated Hotchkiss, showing a very bold out-crop from the mountain, visible for several miles. Two sacks (150 pounds) of tellurium ore from this mine brought at the rate of \$40,000 in San Francisco. The telluride ore is not continuous. A tunnel was run on the crevice one hundred and ten feet. A cross-cut shows no walls north for forty feet. Four feet south of the tunnel is a thirteen-foot vein—quartz and mineral mixed. On the "dump" were two hundred tons of fifty dollar ore ready to be concentrated.

On the opposite side of the river, are the Belle of the West and the Belle of the East—both on the same vein—strong and well defined, with six to eighteen inches of ore. Highest assays, \$425. The deepest shaft (fifty feet) is on the Belle of the West extension. Several short tunnels show plenty of ore that would pay with a home market. Nearer the town, on the same side, are the Cora, Dolphin and others with some very rich ores,



THE WOLVERINE.

Burrows Park, on the Gunnison, twenty miles from Lake City, has some fine looking lodes. Ores have been shipped from the Napoleon III—highest assay \$3,600. The Del Norte is of great size—vein four to six feet—solid ore, with large per centage of copper and iron pyrites. Assays 22 to 500 ounces silver, 1 oz gold. Shaft 20 feet deep, and 74 tons of ore out.

SAN JUAN COUNTY.

The Forks of the Animás is a point of considerable importance. Here are thirty houses, a post office and two mills. One of the latter belongs to the Dacotah and San Juan Mining Company, crushing capacity fifty tons per diem. The "Nevan" jig (thirty tons daily) is used

—will be enlarged in spring. This was operated one week this fall with excellent results. The superintendent, C. H. McIntire, expects to buy all the ores that are offered next summer. The San Juan Smelting and Refining Company, Prof. Foss, Supt., owns the other establishment. Some ores have been smelted and the purchase and reduction of ores will continue steadily from next spring.

Only a few of the best lodes can be mentioned. The Mountain Queen, three miles up the left fork and near the range, has six feet of ore in one place—heavy galena, some copper and iron pyrites and little or no zinc—average assay \$70 in silver.

Below in the Burrows, one of ten "locations" (15,000) on the same great ledge—out-crop large and visible for miles—eight feet of nearly solid mineral.

On the right fork is the Columbus half a mile from the town. This has an immense crevice with seven feet of mineral and gangue. Highest assays \$600. There are several "locations" on the vein. The Ulysses and Lucky are owned by the Graham S. M. Co., of Sioux City, Iowa.

Below the town are many good lodes. The Grub Stake has yielded \$370 per ton. The Eliza Jane and the Silver Wing, close together are very large—four feet of ore ten feet below the surface—galena, gray copper and copper pyrites—low grade but adapted to smelting.

Howardsville, is on the Animas eight miles below the "Forks" and in the center of a very good district. The Veta Madre, two and a half miles up Cunningham gulch, has a splendid six-foot vein yielding \$120 per ton. The Pride of the West, one-half a mile above, is one of the largest and best developed lodes—forty feet wide—can be seen for miles. Surface holes show low grade ore. A cross-cut tunnel one hundred and twenty-five feet long, shows at a depth of one hundred feet, two and one-half feet of coarse, heavy galena, worth \$50 to \$100 per ton. Twenty-five feet further across the crevice the tunnel cuts the main ore vein, four feet wide, galena, gray copper, zinc-blende, copper pyrites, with fifty per cent. of lead and very little zinc—highest assay of the gray copper \$9,500—assorted ore \$320 to \$400. To the south is the Philadelphia, small but very rich and producing handsomely.

On the opposite side of Cunningham Gulch are the Mountaineer, Highland Mary and others. The last named promises well, and is being rapidly opened by an Ingersol steam drill.

On Hazleton mountain, two miles below Howardsville, are the Aspen, Susquehanna, Prospector, and other noted mines. Those named are the best developed and produced largely in 1876—ore sold to Silverton smelters.

Below Silverton on Sultan mountain, are the Empire and Jennie Parker operated by Melville and Summerville, who are building reduction works there.

The Empire shows very good ore in its fifty-foot shaft. Green's smelting works were successfully operated last summer and are the only ore market at or near Silverton, Capacity twelve tons daily, ore roasted and smelted into lead bullion, which is sent east.

San Juan County is divided in two parts by a range from 13,000 to 14,000 feet in height. Silverton is the County Seat.

Mineral City is two and a half miles north of the Forks of the Animas. A few of the very prominent lodes will be noted.

Thunderbolt—four foot vein—can be seen for miles, great extent, several locations. Boston—tunnel one hundred feet long—one hundred foot shaft being sunk from tunnel; vein, four feet of galena and gray copper ore. Mastodon—on same vein as Thunderbolt—six feet of ore, sinking shaft one hundred feet. Del Norte—sinking shaft one hundred feet; the Red Cloud and Vermillion each eighty feet. The Red Cloud has four hundred ounce silver ore. The Bill Young runs \$500 in silver and \$100 in gold per ton. The Uncompahgre Chief is a noted vein. The Pride of Sysacuse has shipped ore to Crook's Lake City works during the entire season.

Down the Uncompahgre river and within five miles of Ouray is the Mother Cline lode. The vein is stripped for a distance of one hundred and eighty feet. The width of the vein is not known, but a cross-cut has been driven eighteen feet through almost solid mineral and the wall is not yet reached. Assays from the lode runs from \$120 to \$1000 per ton. This is one of the most noted mines in this section. Across the river is the Royal Albert, Duke of Edinburg and Royal Consort, in all 4,500 feet on one vein. Ore, galena and copper worth \$120 and over. South is the Mountain Monarch and north the Michael Breen assays \$600.

Cañon Creek comes into the Uncompahgre from the west at Ouray. The overhanging walls of granite nearly unite above it at one point.

Here is some of the grandest scenery in the universe. The mountains rise perpendicularly in benches one behind another to the height of thousands of feet above the Uncompahgre.

One mile away is the famous "Mineral Farm," or "Gus Begole's Patch," one of the wonders of the world. It comprises three parallel ridges of quartz and mineral each two hundred feet long, about three hundred feet apart. There are five locations—Nos. one, two, three, four and five covering forty-three acres of ground. The actual amount of ground covered by the *deposit* is twelve acres. There are fourteen different openings and all show mineral. A careful test gave an average assay of one hundred and seventy-five ounces of silver per ton.

Eight miles from Ouray, up Cañon creek is the Wheel of Fortune lode. It has eighteen inches of gray copper, galena and ruby silver ore. Mill returns six hundred and fifty ounces. Near by are the Grand Trunk, Mark Twain, Caribou, Seven-Thirty, Circassian, Ruby Silver and many others.

This is one of the best mining sections in the country. Coal is found in abundance on the Uncompahgre and Gunnison rivers. Ouray will soon be one of the most prosperous mining camps.

Thirty miles to the west of Ouray and near the Utah line is the new mining camp of San Miguel. Here are gold and silver mines, and placer diggings said to be exceedingly rich.

Near Ouray are the Trout and Fisherman lodes, at the mouth of Cañon Creek. They are in limestone country rock. The crevices are small but ore very rich. Just above the last named, on the north side of the creek is the Ophir lode. Like the latter it is a small vein but very rich.

In the neighborhood of Ouray are a number of hot springs, of great size. They will some day be very valuable. The river at Ouray does not freeze for a distance of four miles owing to the water from the hot springs.

LA PLATA COUNTY.

La Plata County occupies the south-western corner of the state, and Parrott City is the county seat. This town is on La Plata river, twelve miles from the Animas and has forty or fifty houses. Here are placer claims that may prove remunerative. Of the many mines but few can be mentioned.

The Comstock (gold lode) is two miles north of town, and some of its ore has yielded at the rate of \$40,000 per ton. It is claimed that this mine produces native amalgam. The Moroveratz has three feet of rich sulpherets of silver and carbonates of copper. The Bay City—eight feet of ore—samples milled at Denver, gave at the rate of \$800 per ton.

Starting west from Lake City, forty miles travel brings one to Silverton on the Animas river. Twelve miles above it are the Forks of the Animas, and two and one half miles above and higher up the range is Mineral City. In the opposite or south-eastern direction and over the La Plata range are Parrott City and Animas City, the former sixty miles further down the river than Silverton. This brings one in La Plata County. North-east of Silverton is the Gunnison and the town of Ouray. All of this country is one mass of rugged and almost impassable mountains traversed by a number of lofty ridges or divides and culminating in peaks. There are some fine farming lands on some of the river bottoms, especially the Gunnison and some of its tributaries.

The following is from an interesting report of the San Juan silver region from the pen of Thomas J. Campbell, of Georgetown, who made an extended examination during the summer. As the paper was prepared for parties who desired to ascertain the exact chances for investment, its tone is very guarded and nothing is stated but what was actually seen. The country is young yet but shows better prospects of future production than any other part of Colorado did at the same stage of development.

The principal point at present is Lake city, in Hinsdale county. From the Railroad at Canon City via Saguache the distance is 200 miles, from La Veta, the present end of the track via Del Norte the distance is 170 miles; by either route the road is naturally good and a railroad can be built without extra expense. The town is located at the junction of the Lake Fork of the Gunnison and Henson creek. The surrounding mountains rise to a height of from three to four thousand feet above the level of the valley, and are covered with a fair growth of timber, sufficient to supply the mines for a number of years to come. The lodes on Henson creek are generally quite accessible and roads can be made at a reasonable cost. A good road has already been constructed from Lake city some six miles up Henson creek and is being pushed further as fast as possible. The country rock is a kind of Porphyry, soft and easily decomposed by the action of the atmosphere, so that the mineral veins are generally exposed and easily found. They are as a rule large and well defined, but at present are slightly developed, the deepest shaft or drift, being not over fifty feet. The ore is of an auriferous character, being a mixture of galena

gray copper, copper pyrites and spar. It could be reduced by smelting and is easily concentrated. The best gray copper contains as high as 750 ounces per ton. The ore will carry before concentration, 50 ounces. I saw veins of solid clear ore 18 inches thick. The mines on Henson creek have already produced about 200 tons. If the large veins of low grade galena ore can be profitably worked, the production of that locality will soon be easily made to reach thousands of tons yearly.

The lodes on the Lake Fork of the Gunnison, are admirably located for economical working. The discovery shafts are in most cases located near the base of the mountain, where good wagon roads can be cheaply made, and as they cut the mountain at right angles, or nearly so, they can be cheaply worked by tunneling. They are large and well defined, being as a rule from 8 to 10 feet wide between the walls and showing veins of clear ore from four to eighteen inches in thickness. The ore is similar to that found on Henson creek, but carries more gray copper and copper pyrites. The deepest shaft I saw was 50 feet. The tunnel on the Hotchkiss 110 feet, is not run on the mineral vein.

From Lake City to Burrows Park, the distance is 20 miles. A good grade for a road can I think, be had, but at present the ascent is very steep, and the road very bad. The elevation of the Park is about 9,500 feet, the timber, similar to that usually found near timber line in Colorado. The mine having the most development was closed and the ore had been carried away. It is owned by Crook and is said to be very rich. The deepest hole I saw was twenty feet, the vein very large, over eight feet, but broken so badly that the true size of the vein could not be ascertained. I estimated the pile of ore at the mine at seventy-five tons, and found it equally divided, one-half being copper pyrites of a very fine quality, and the other, galena, with considerable zinc. The test made of the copper ore ran from twenty-two to sixty ounces silver per ton and one ounce of gold. The ore seems admirably suited for smelting, and the supply seems to be abundant. This lode is called the Del Norte, and is decidedly the most promising prospect I saw in the way of copper ore. The other lodes in that neighborhood all seem to carry considerable copper, but there is so little done that no satisfactory conclusion could be arrived at as to the amount of ore to be had or its value. Tests made of a number of copper specimens showed them to be low grade both in silver and gold. The gray-copper I found to contain not over 500 ounces.

From Burrows Park you cross the range by a very bad road which is built just at timber line, and arrive at the Forks of the Animas, thirty miles from Lake city. Two mills are in process of erection and expect to be completed this season. One a blast furnace, the other a concentrator, using the Nevan gig. The lodes in the neighborhood and those located above the town, are all monster veins, some of them over ten feet between walls. The ore is very uniform in appearance and in value also, if I may judge from what I saw and tested. It is a clear galena, mixed with spar, and as a rule, low grade. At this point, and around it are numerous veins which are being more energetically developed than any in the county. They bear the same general character and appearance but carry more gray copper and are richer in silver. The ore now being broken will be treated at the Forks and at Lake City to which latter place, it will be carried by a short cut down Henson creek, the distance being only eighteen miles. Three of the mines located in that neighborhood

have been furnishing Crook's works with twenty tons of ore per week for some time past. They are located near the top of the range. I believe that this ore is worth about 100 ounces, although picked specimens will go much higher.

Two miles and a half below the Forks of the Animas, I found a number of copper lodes which promise to be very productive, but as yet little or nothing has been or is being done. The veins are large and the ore well suited for smelting, but will not average very high in silver or gold.

At Howardsville, eight miles below the Forks, I found some very fine veins of galena and gray copper, and considerable good work is being done. The ore will average 100 ounces and is mostly smelting ore. A blast furnace has been in operation during the summer, and has been very successful, but the heavy freights make the business not very profitable. A Philadelphia company is now engaged in putting up what is known as the Syblong process and are also developing a number of lodes in that neighborhood.

I found large quantities of iron, lime-stone and marble in that part of the country. The timber is not very good or abundant, coal is said to exist at a point on Mineral creek eighteen miles away, and also forty-five miles down the river. The veins are said to be from two and one-half to eight feet thick, and the quality of coal very good.

This county is shut in by a mountain range on all sides but one, and there you find an impassable canon which descends 3,500 feet in the first eleven miles. As the range is impassable nearly six months in the year, they are striving for an outlet through this canon. This will bring them in contact with good agricultural country and give them a choice between several of the leading southern Colorado trading points. Until this is accomplished the country must remain at a great disadvantage and progress in mining must necessarily be slow.

Ouray, situated on the Uncompahgre, is thirty miles distant from Lake city by way of the Henson creek road and Judian Thief trail. By the wagon road it is eighty miles. It is the natural supply point of two large mineral districts, and has a good agricultural district in the valley of the river below, from which to obtain supplies. The climate is mild and the natural advantages equal to those of any other mining town in Colorado.

A description of the mines would necessarily prove uninteresting, from the fact that little or no development has yet been done. The mines at this time are all prospect holes and nothing more. The prospect is good, but it is impossible to calculate what is not yet in reach. The ore found is good, no trouble in finding rich specimens, which upon being tested proved to be rich in silver, gold, lead and copper. I believe in the future prosperity of that district more firmly than in any other in the San Juan country. Not to seem to slight this district, I will tell of one man's prospect which I thought a little remarkable. He has taken up five lodes side by side and claims forty-three acres. There are fourteen openings on the property, the deepest of which is fifteen feet. The surrounding country rock is limestone and the ore occurs in ordinary quartz or associated with it. In the deep hole the ore appears on all sides and in the bottom, and the hole is fully eight feet wide. At other holes the solid ore is ten and twelve feet wide. Where the surface dirt has merely been removed I have walked on solid galena ore for twenty feet, which

looked like a vein. I made tests from every hole and as good an average as I could and was satisfied that the ore was good. Very rich in lead and decidedly good in silver. Taking the fourteen holes all together, it is the most remarkable prospect I ever saw. It is not at all like anything in the surrounding districts. The timber in that neighborhood is of far better quality and much more abundant than any I saw in the San Juan country. It is tall and large. Oak brush is plenty. I measured one scrub oak that was eight inches through. Grass is very abundant and of the finest quality. Coal occurs at a point five miles below the town, but its character has not as yet been fairly tested. The vein is not very large. I heard of a large vein on the Indian reservation, but could obtain no reliable information concerning it. The people of Ouray seem inclined to favor the building of a railroad to Utah. A connection could be made with the Utah Central in about 350 miles, and the country traversed is said to be good for grass and general agriculture.

RIO GRANDE COUNTY

is mainly located south and west of the stream of the same name. It includes a little of the western portion of San Luis Park, the upper or mountain valley of the great river of the north and the Summit and adjoining mountains. It contains several gold and silver districts and some good agricultural and pastoral lands.

Del Norte is finely located in the delightful valley of the Rio Grande at the point where the stream leaves the mountains and enters the Park. The surroundings are grand and beautiful. Excellent farming lands enclose it and a large tract can be made available by irrigation. To the east lies the San Luis valley, as level as a floor, and on the eastern side of it, forty miles away, are the Sierra Blanco (white mountains) whose snow capped summits are 14,440 feet above the sea. Del Norte is a flourishing business mart, with stores that carry hundred thousand dollar stocks. There are two banks, a newspaper, public schools, churches, hotels, etc.

The richest gold district of Southern Colorado is that of South Mountain in the Summit Range, twenty-six miles south of Del Norte and 12,000 feet above sea level. The great drawbacks are a severe climate, heavy snows and the altitude—a divide of 13,000 feet must be crossed to reach Summit. The summers are short and the roads are almost impassable from snow or mud during most of the year. But the gold is there and that has built a town and attracted miners, capitalists and stamp mills.

In 1873 it began to be noised abroad that Peterson and Brandt had made a wonderful discovery in the far off southern mountains, and the

free gold quartz and nuggets they exhibited created no little excitement in Pueblo and Denver. In the short summers of 1874-5 hundreds of prospectors went there, and locations were made until the whole mountain was covered with pre-emptions—all in the endeavor to secure a piece, however small, of the precious ground. It appeared to be a vast mass of "float ore" or "slide," and for a time was considered one huge mountain of quartz. Subsequent developments show that there are five veins at least, and that it is not simply a deposit or a "blow out." The country rock is a kind of porphyry. The main lode or ledge runs diagonally across the mountain, south thirty degrees east, and numerous spurs and feeders put into it. The claims were generally located north and south—being made before the "slide" or float ore had been entered enough to determine the true course of the vein. The surface ore paid largely. All of the gold produced by the district comes from this main vein. The locations on it are those of the Little Annie, Odin, Golden Queen and San Juan Consolidated companies. Owing to the manner in which the pre-emptions were made—crossing where the vein has since been found to be—the Annie and Queen have each only about fifty feet, that being the width of their locations. The Odin has two hundred and seventy-five feet.

As usual with prospectors, Peterson and Brandt had no money to build stamp-mills, although they had what appeared to be a mountain of "free gold" quartz. In 1874 they transported sacks of ore on the backs of mules down to Del Norte, (there was no road then) and from there sent it by teams to Cañon and thence by rail to Golden, three hundred and fifty miles away. One lot of four tons sold for \$1,660. As soon as the snows had disappeared in (June) 1875, Dr. Adams built a five-stamp mill on Alamosa creek, by the side of South Mountain. Soon after W. H. Van Gieson brought in the ten-stamp Annie mill and thereby secured an interest in the Little Annie property. The Crooke brothers, of New York, then bought in and afterwards secured Van Gieson's interest. The mill ran but a short time and shut down as soon as the snows of October came, but \$30,000 were obtained. The Crooke brothers had secured a controlling interest in the Golden Queen and had put in a ten-stamp mill that turned out \$14,000.

The Little Annie, the best developed property on South Mountain, was opened by a long "cut" from thirty to fifty feet wide, which at

its head was fifty feet deep. The ground excavated was all quartz, averaging \$74 per ton! It penetrated the solid vein. Last summer a shaft was sunk thirty feet below the level of the cut, and the yield has been \$150 per ton! In a single week this mill turned out \$6,000. Peterson is the Superintendent, and Peterson, Brant, the Crooke brothers and Livingston form the company.

The Odin Company, of whose property (the Del Norte) Col. Thos. M. Bowen is one-fourth owner and general manager, is sinking a shaft (now fifty one feet deep) twenty-five feet south-east of the Annie shaft and just off that ground. Bowen owns the twenty-four-stamp mill erected by Cropsey last summer, and mines, hauls and mills the Odin ore at \$14 per ton on a contract for 20,000 tons.

The Golden Queen supplies its ten-stamp mill, which ran all summer. In a few weeks of 1875 it yielded \$14,000. The Golden Star and Adams mills have crushed ore for both the Queen and Annie.

The Golden Star Company (Morey and Sperry) own a property that has nearly the same direction as the Annie and comes near it on the northern side. The workings near the Annie have furnished quartz for a width of thirty feet, worth from \$15 to \$25 per ton. A ten-stamp mill was built last summer.

The San Juan Consolidated Company is the heaviest concern of all. Besides its part of the great vein (the Annie) it owns two hundred and fifty acres of ground which includes placer lands and the town site. Its officers are C. W. Tankersley, president, and Thos. M. Bowen, secretary, treasurer and manager. A thirty-stamp mill began to crush the company's ore in August, or about the time the Bowen and the Sperry mill started. A fifty-foot shaft is being sunk two hundred feet north-east of the Annie shaft, and shows as good ore as the latter did at the same depth.

Work closed in the district for the winter in October. Hereafter matters will be arranged so that work will continue the entire year, notwithstanding the severity of the winters. It is impossible to obtain the bullion product. Allowing twenty stamps to have run seventy-five days on Annie and Queen ore—twenty tons of quartz daily, yielding \$40 per ton—we have \$60,000. This estimate may be too high, but the entire district must have yielded nearly \$100,000 in the short time in 1875, when work was possible. The larger companies milled but

little over a month before winter set in. There are now six mills with eighty-nine stamps on the Alamosa, capable of crushing seventy-five tons of quartz daily. Next June they will all be at work and by the end of December will probably have exported \$500,000 worth of gold.

THE SAN JUAN COUNTRY.

Since the above went to the printer, further valuable information regarding the San Juan country has been obtained. San Juan and La Plata counties lie on the Pacific Slope of the mountains. The former is watered by the Animas and its branches, which pass south through La Plata county, and by the Uncompahgre, San Miguel and Dolores, which flow to the north west. The towns of San Juan county are Silverton, Howardsville, Eureka, Animas Forks, Mineral City, Ouray and San Miguel. Silverton, the county seat, registers six hundred voters and is growing rapidly. In 1876 Greene & Co.'s smelting works, at this place, produced over \$106,000 worth of bullion. Work continued from spring till the heavy snows of October. Another smelter will be added to them in the coming spring. Melville and Summerfield are building reduction works for the "Lightning Amalgamator." Brolaski & Co., of St. Louis, are putting up reduction works—thirty tons capacity—on Cement Creek, four miles from Silverton, and at Howardsville, four miles north, Edward Innis & Co., of New York, are building extensive works. J. F. Carter has established sampling works at Pueblo, for the purchase and shipment of San Juan ores. These notes are given to show the ore markets that this region will have hereafter.

Probably the best developed mine in the San Juan region is the Aspen, near Silverton. Its owners employ twenty men, and sold over \$40,000 worth of ore to Greene & Co. last season. The Yellow Mountain, Silver Storm and Silver Cloud lodes are new discoveries, with very rich mineral, giving large mill returns. The Yellow Mountain has a forty-foot tunnel on it and three twenty-foot shafts. Crevice seven and one-half feet wide. Pay vein eighteen to forty inches.

Wightman and Fay are building a road, at a cost of \$40,000, from Silverton down the Animas to the immense coal fields around Animas City, in La Plata County, thirty-five miles south. This coal is chiefly of the very best quality of "lignite," making fine coke. Specimens from

one deposit were analyzed and tested, in Chicago. They were decided to be anthracite coal. The great reduction works, destined to treat the bulk of the ores of the San Juan, will probably be located at Animas, which bids fare to be one of the leading towns of the State. It is equi-distant from the southern termini of the D. & R. G. and the Utah



BALANCING ROCK.

Southern Railways, and both companies contemplate building this way, where much lower mountains are encountered than further north—so that the coal as well as rich silver deposits may soon be utilized and opened to the world. The route from the Rio Grande road would swing around into the northern borders of New Mexico and then up

the San Juan and Animas Valleys. Twenty miles south of Silverton the main range turns eastward and breaks away into low mountains at the south. Here are the rich valleys of the Animas, La Plata, Mancas and San Juan, the lower portions of which flow through the Ute Indian Reservation and then into New Mexico and Arizona. These territories and Utah and Colorado come together at a point in the region of the dead cities of the ancient Aztecs. Already a heavy immigration, from both east and west, has set into the Animas country—eighty families arriving from the latter direction in October.

The production of the year to November 1st, was as follows; all the result of summer and fall work.

San Juan county, Green & Co shipped lead bullion valued at	\$106,000
Hinsdale county, Crook & Co. shipped silver ore, bought and concentrated	40,000
Gulch, bar and lode gold and other silver ores shipped, La Plata, etc.	15,000
Rio Grande county, Summit mines, stamp mill gold	65,000
Gold ores shipped	30,000
Saguache county, Sangre de Christo range stamp mill and gulch gold	10,000
	<hr/>
Total for the season	\$266,000
Probable production for remainder of the year	\$20,000
	<hr/>
Total for 1876	\$286,000

The silver bullion and gold, went east through the banks of San Juan, at Del Norte. The shipments from November till June will be small, and probably cease before January, owing to the snows. The product of 1875, was about \$55,000 in gold and \$50,000 in silver. When nearly \$300,000 can be produced in a few months by the limited reducing facilities of the past, it can at once be seen that many times as much will be exported, when all of the works noted in this chapter are in full blast, summer and winter, in 1877-8.

The Sangre de Christo gold mines are in Saguache county on the western side of this range and on the eastern rim of the San Luis Park.

The silver mines are mainly on the Pacific slope. And here we close our inadequate sketch of the San Juan country—a region that bids fair to surpass all others on the globe in enormous size and length of its silver bearing veins—a section that remained a *terra incognita* through all the years that other Colorado mining districts were discovered and developed.

CHAPTER XLI.

FARMING AND STOCK RAISING.

What is done by Irrigation—The Biggest Crops the World can Produce—Large Profits of Farming and Stock Raising—A Big Ranch—The San Carlos Estate—Some Heavy Stock Men.

IN the rush for gold but little attention was paid during the earlier years to agriculture. As time passed on it was found that the lands bordering the streams and foot hills were wonderfully productive. In time irrigating ditches were found to be a necessity, and these were constructed. Within the past few years large tracts of land, otherwise worthless, have been rendered available for farming purposes by irrigation by means of canals and ditches. In this way hundreds of thousands of acres are now producing crops calculated to astonish any Mississippi Valley farmer. Thus Denver, Longmont, Boulder, Fort Collins, Greeley and Pueblo have come to be surrounded with productive farms and gardens and their streets lined with ornamental shade trees. Rich waving fields of grain now greet the eye where once extended the barren and uninhabitable waste. It is an established fact that artificial irrigation produces better and more reliable crops than can be obtained in countries where the uncertain natural rainfall is depended on.

The average yield of wheat in Colorado is from twenty to twenty-five bushels per acre, but is often forty and over. This is about double the product obtained in Illinois and neighboring states. Colorado flour is the best in America. It finds a ready sale at superior prices wherever exported. Other small grains yield proportionately well. Corn thrives best in southern Colorado, where the nights are warmer than in the north. Fruit is gradually becoming cultivated. Vegetables of enormous proportions are raised. Farming has often been enormously remunerative. Instances are known where many thousands of dollars have been realized on a single crop, and of fortunes amassed in a very few years. The same is true in a greater

degree of stock growing. The farmer is to some degree independent of the disadvantages felt at the east. He finds an ever increasing ready cash market in the rapidly growing camps and mining towns of the mountains and business centres of the valleys. The demand is even greater than the supply—for Colorado does not produce farm products enough for the home consumption of the State. Only a small portion of the mountains are capable of cultivation, but irrigation is unnecessary there. There are numberless farms in these mountain valleys and on the hill sides between the mining towns that pay largely. One man near Central netted \$17,000 from a single crop. Although that was an exceptional case it is no uncommon thing to realize two or three thousand dollars over home expenses from small farms all over the country. Prices are always good and farmers on the plains, with fields of wheat containing hundreds of acres, have given much larger returns than the above. Statistics regarding the farm, dairy and stock could be given, but space forbids. One Boulder county farmer harvested three hundred and twenty acres of wheat—average yield twenty-eight bushels—price per bushel \$1 20—value of 8660 bushels \$10,752 00. Other crops raised paid for the entire farm expenses excepting \$700, leaving over \$10,000 as clear profit.

The following will show how profitable farming and stock growing is in Colorado, and the figures are below rather than above actual results. It represents the operations of an association combining intelligence, capital and a large amount of territory already well improved. This territory comprises 50,000 acres of splendid agricultural and grazing lands, and was formerly known as the Nolan Land Grant, bestowed by the Mexican Republic. It is called the San Carlos Estate. The figures and statements are condensed from a paper compiled by Col. Geo. N. Pratt, of the association owning the property.

The company have forty-four thousand acres of land surrounded by cedar post and four pole fence. The estate is watered by the Tuscoso and San Carlos rivers and a portion is well timbered. The improvements, including the home place, farm house, steam flour and grist mills, stables, granaries, shops, cabins, seven stone corrals barns, stone, cedar and wire fence, farm implements, wagons, reapers, mowers, threshing machines, etc., are valued at \$61,100.

The live stock comprises sheep, cattle and horses—the latter for general use only.

CATTLE. The company have on their "range" of pasturage 540 head of good average, American cattle. The cattle herd will be reduced to 300 choice milch

cows, adding thereto 100 or 200 head of "four year old" steers per annum,—all to be "stall fed." Such a quality of beef is scarce in Colorado, and by this method, increased weight and from 1 $\frac{1}{2}$ to 2 per cent. more per pound live weight, could be obtained.



CATTLE ON THE SAN CARLOS ESTATE.

SHEEP. On December 15, 1876, the company will start with 5,000 Mexican (white 1, 2 and 3 year old) ewes. These will be crossed for two years with choice Vermont Merino rams, to obtain "staple" or quality of wool, and in the third and

fourth years with Lincoln Leicestershire rams to give a mutton value, and size and length to staple.

Statement based on a "start" of 5,000 ewes at \$2.00 per head, \$10,000.

The lowest results, as proved by long experience in Colorado with allowance for losses etc. for five years, will be as follows:

First year—Original stock, ewes	5,000	
Increase 73 per cent	3,675	
	<hr/>	
Total number head	8,675	worth \$17,350
Value of wool sold from 5,000 ewes at 3 lbs each		
15,000 lbs, at 20 cts per pound		<hr/> 3,000
Total value		<hr/> \$20,350

The second year increases these 8,675 sheep 65 per cent., to 14,313 head, valued at \$28,626; wool crop 4 lbs per head 20 cts. per lb \$6,940; total, \$35,565.

Third year, Flock increase 58 per cent. gives 22,614 head, worth \$45,228; wool crop 4½ lbs per head, worth \$12,881; total. \$58,109.

Fourth year, Increase 56 per cent 35,277 head, worth \$70,554, Wool 5 lbs per head, \$22,614; total \$93,168.

Fifth year, Increase, 56 per cent. gives 55,032 head, worth \$110,064; wool crop 5 lbs per head \$35,276; total value, \$145,340, from which take the necessary expenses of five years, 18 cents per head, or \$15,457, leaves a profit of \$129,883.

This statement does not include cost of rams, which on account of their choice quality, are kept by the company in a separate herd, but it does include cost of shepherds, extra hands required at times, and all other current or incidental expenses. The increase is figured at very low rates; likewise the wool crop. Many Merino rams second cross, return a six-pound fleece.

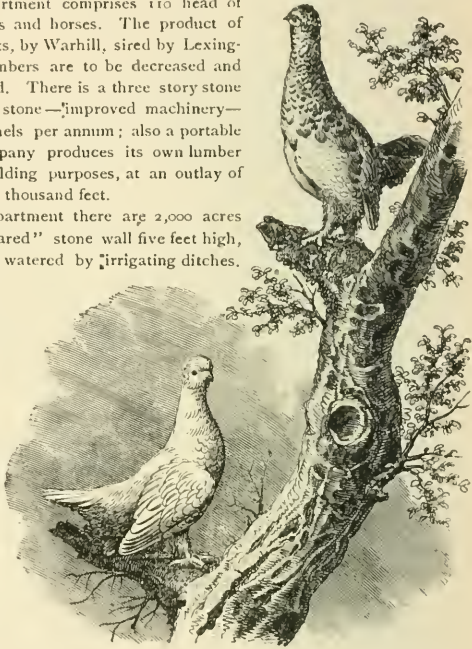
Examples are plenty of the large profits attending Colorado sheep culture. In 1864 Don Felipe Baca came to Trinidad with 1,000 ewes, and bought 800 more in 1865; cost of both flocks \$4,500. In eight years 1,600 sheep were consumed on the ranch, and 7,740 were sold for \$29,620. He had then on hand 14,800 head, worth \$44,400. He had realized \$74,020 in eight years on an original investment of \$4,500—with an increase of 1.240 per cent. on stock, and of 1,545 per cent. on capital invested, or 193 per cent per annum. In the meantime the price or value of the wool had increased, owing to its improved quality, from 11 cents to 32 cents per pound, and the wool crops paid for herders and all current expenses. This result was obtained by the promiscuous irregular system of sheep grazing without corrals, feed or protection against the disastrous storms of winter and spring. The San Carlos estate has all these advantages which Baca lacked and its 2,000 acres of cultivated land afford ample feed for stock at the short season of the year when needed. By so doing the "increase" will be greater both in number of sheep and weight of wool. On this estate four rams are allotted to 100 ewes, instead of one to forty as customary.

Hogs. There are 200 head of hogs, old and young, (Berkshire). This breed is somewhat scarce in Colorado. Mr. Dotson, the former owner, has turned out 700

head per annum, raised in the oak or acorn fields, of which there are 6,000 acres. About 1,200 head will be turned out per annum hereafter, of an average weight of 250 pounds.

The horse department comprises 110 head of fine American mares and horses. The product of 1876, is eighteen colts, by Warhill, sired by Lexington. Hereafter numbers are to be decreased and the quality improved. There is a three story stone mill—three run of stone—improved machinery—capacity 60,000 bushels per annum; also a portable saw mill. The company produces its own lumber for fencing and building purposes, at an outlay of about six dollars per thousand feet.

In the farm department there are 2,000 acres enclosed by a "squared" stone wall five feet high, all plowed land and watered by irrigating ditches. The latter at a cost of \$20,000.00. This land has been producing steadily for eleven years—and gives from 35 to 60 bushels of wheat to the acre; and without care and cultivation of the crop 35 bushels of corn are raised to the acre. Next season 1,000 acres will be put in wheat and 500 in corn. Wheat is worth \$2.50 per hundred, and flour \$3.75 at the mill. Corn is used for



ROCKY MOUNTAIN QUAIL—WINTER AND SUMMER PLUMAGE.

stock feeding purposes. As high as 16,000 bushels of wheat and 12,000 bushels of corn have been stored away in the granary for a season, when only 800 acres were cultivated. Mexican labor is employed, and twenty-five families have resided on the lands for years.

The company will inaugurate a trust department in January 1877. The plan is to receive funds in trust for five or more years, on such terms as may be agreed on, for which certificates of deposit will be issued. To those wishing to invest in live stock without personal care or attention, sure and rapid dividends are guaranteed. The same is the case, with those who desire to take up a residence on the estate. In such cases a cottage will be furnished at no expense, and supplies, comforts of a home and saddle horses at net cost of production. Those taking charge of their

individual investment will be allowed herders or flock-masters wages. Inviting terms are offered invalids or gentlemen's sons unable or disinclined to construct ditches for unoccupied lands, or attend to stock growing in person. Here are 50,000 acres of fine farming and grazing lands in one of the most beautiful valleys of the state, with unsurpassed climate, location and improvements. When under fair headway, the plan cannot but result far more beneficially to all concerned than even the lucrative individual efforts in these industries.

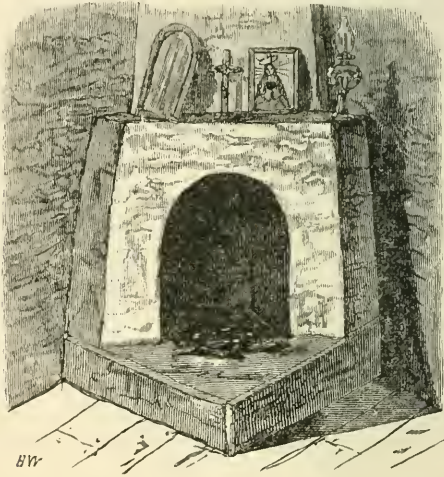
That garden and granary of western Kansas lies just east of Colorado and furnishes a never failing base of supplies. It is a reserve commissariat for the Rocky Mountain mining regions. What Colorado valleys and plains fail to produce can speedily be obtained there via the great railway lines. There is still much valuable land for pre-emption or reclamation in Colorado. Further proofs of the profitable character of farming and stock raising can be seen in the following.

There are some eight or ten millions of acres of land in Colorado that are, or can be made available for agriculture, of which about one-fourth is now under cultivation or is taxable. The Territorial Auditor's report gives the following numbers and values of assessable live stock, in Colorado, as rated some eighteen months ago. The actual value was of course nearly double these figures :

	NO. OF HEAD.	ASSESS VALUE.
Horned Cattle	375,215	\$4,973,469
Sheep	424,977	810,243
Horses	38,650	1,823,920
Mules	3,752	249,213
Swine	2,673	13,026
Other animals		62,883

This enumeration was probably somewhat incomplete and the total actual value exceeded \$14,000,000, as against \$2,245,000 in 1870. The ordinary annual increase—seventy per cent. for cattle and more than that for sheep, and allowing for live stock shipped east—increases the number to 500,000 head, and the sheep to 700,000, with a total value of \$8,000,000. The number of horses has also increased greatly, and much fine blooded stock is being imported. The same is true of dairy stock, and thousands of dollars are often expended in choice animals. Most farms comprise one hundred and sixty acres while others are many times that size. Lands have been paid for with the crop of a single season. The total farm products of Colorado in 1876 were over \$8,000,000 as against \$3,000,000 in 1870.

Stock growing in Colorado has ever been a sure and remunerative avocation. It has grown in proportions until hundreds of thousands of cattle and sheep are shipped eastward or to the mountains annually. But little care or expense is incurred in this business. The expense of shepherds is small as they are not required in winter. At that season stock are usually allowed to roam at will, on the vast pastoral lands of the plains, and thrive and grow fat on the nutritious grasses that there abound. The natural annual increase of cattle is claimed to be sev-



INTERIOR OF A MEXICAN DWELLING.

enty-five per cent. and of sheep eighty. But allowing these figures to be fifteen per cent. too high, the reader will see, that, with the small attendant expenses, the profits must be enormous. Men who started with a few hundred head five or ten years ago, now count their thousands. Iliff, Hitson the Wilsons and others, among cattle men, and McBride, Baca and others, among sheep growers, are examples. The first named has an immense range of country on the lower Platte, between Greeley and Julesburg, with headquarters, corrals, etc., forty miles from the latter places. He owns 30,000 cattle, worth on an

average, \$18 per head or \$540,000. Annual income seventy per cent.—sales last season 5,000 head. He started originally in a small way.

The wheat crop of Colorado for 1876 is worth millions of dollars. Even the scattered ranches that cling to the mountain sides or nestle in the valleys of Gilpin and Boulder, yield profits of hundreds of thousands of dollars annually. In the former, Henry Paul reaps bountiful harvests at an elevation of over 9,300 feet above sea level. The great parks as well as the plains are dotted with flocks and herds. San Luis Park is as large as the state of Connecticut—all arable and pastoral land—mainly the latter.

CHAPTER XLII.

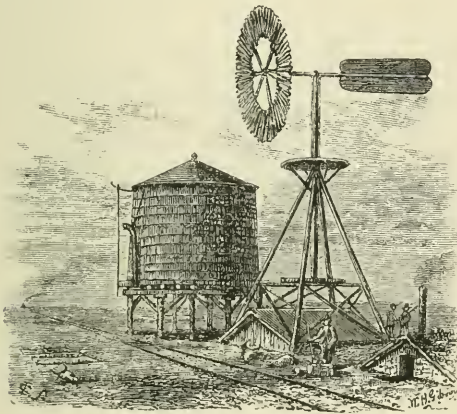
COLORADO AS A HEALTH AND PLEASURE RESORT.

Notes for the Tourist, Invalid and Sportsman—How to reach the Mountains of Colorado—Up the Arkansas Valley—The Atchison, Topeka and Santa Fe Railway—The Denver and Rio Grande Railway—The Grand Canon—Colorado Springs and Manitou—Pikes Peak and the Garden of the Gods—Denver—A trip to the Mountains—What can be seen there—Georgetown and Central and the Boulder Canon.—Colorado Central Railway.

The climate of Colorado is unrivalled. The main portion of the country is situated between elevations of 4,200 and 8,600 feet above sea level. Here the extremes of heat and cold are less than in eastern states of the same latitude. Such is the dry bracing character of the atmosphere that winter weather is not felt as severely as in the damp air of the low lands of the Mississippi valley or of the eastern seaboard. It carries healing in its wings and this is becoming so widely known that Colorado has been very justly termed the world's sanitarium. Men come here to live whose health will not permit them to remain elsewhere. Here in the midst of the finest scenery the world can produce, the invalid obtains a new lease of life, the tourist finds a world of attractions, and the sportsman a harvest no other land can furnish. As one writer puts it: "It is the only region that combines the sky and climate of Italy, the air and scenery of Switzerland, the water of Ems and the society of nature." Here is an entire country one mile (more or less) above the cold, damp airs of sea level, and the clear dry mountain air has an invigorating effect on the constitution such as no other land can produce.

But every variety of climate can be met with within fifty miles travel. After a certain elevation is reached the air grows colder and the snow falls heavier. This is especially true as one approaches the

summit of the Snowy Range, the backbone of the American Continent. Once above timber line (11,200 feet) the climate changes almost to that of the frigid zone. Above, winter reigns supreme, while far below the warm sunny valleys revel in an Italian clime. Thus a distance of a few miles from Central or Georgetown, or of fifty miles from Denver brings one to the regions of eternal snow, to be again succeeded by the genial atmosphere of the valleys of western Colorado. For the travelers' benefit some information regarding routes of travel may not be out of place.



WATER TANK ON THE A. T. & S. F. RAILWAY.

The most pleasant way to reach Colorado is over the Atchison, Topeka & Santa Fe Railway, starting at Atchison or Kansas City and passing through Lawrence and Topeka, thence southwesterly into the Arkansas Valley and up the same to Pueblo; thence to Denver. This new southern route is splendidly equipped with Palace Sleepers and all possible comforts. It strikes through the garden of America. Rolling prairies and rich bottom lands thickly dotted with fruitful farms and thriving villages, greet the eye of the traveler on either hand. Through this Arkansas Valley lies the old Santa Fe trail, over which the New Mexican caravans were accustomed to fight their way when

the red man alone held sway. The country gradually gains in elevation from the Missouri river to Pueblo, the western terminus of the road, and to which its western division was completed last winter. The main line is headed for Santa Fe.

Pueblo and South Pueblo, in reality one city, are on the Arkansas river, one hundred and twenty miles east of south of Denver. Here one can take either fork of the Rio Grande railway, as his inclinations lead him; to Trinidad on the south, Denver on the north, Cañon on the west or the San Juan on the south west, via rail to La Veta, and Barlow and Sanderson's stages to Del Norte. This railway center has had



WHAT THEY DO NOT BELIEVE EAST.

a mushroom growth, but can boast of the usual accompaniments of a growing city, and a daily and two weekly newspapers, a thirty thousand dollar school edifice and the finest court house in the State. The broad avenues of South Pueblo adorned with beautiful shade trees and handsome residences attest to its wealth and permanence.

To the south are the counties bordering on New Mexico and mainly peopled by Mexicans. These people were once an important factor in political matters, but since the vast influx of Americans into Colorado they count but a small proportion of the popular vote. Trinidad is the great town of this section. Around it is a fine sheep growing country, and one immensely rich in (coking) coal. The Raton Mountains

cross this region. Trinidad, and its port of entry and (D. & R. G.) railway terminus, El Moro are the shipping points south. Beyond this the freighter has not yet been superceded by the railway, and the "bull-whacker" still flourishes in all his pristine originality. In this



MEXICAN WHEELBARROW.

section, these "sailors of the plains" are mainly of Mexican nationality. This is the supply point for New Mexico and the southwestern military posts. It is a great wool shipping point, likewise of cattle, as are also Las Animas, La Junta and Deer Trail further north. El Moro will retain its immense forwarding houses until the "Iron Trail" pushes further

south towards the "Halls of the Montezumas," its ultimate destination.

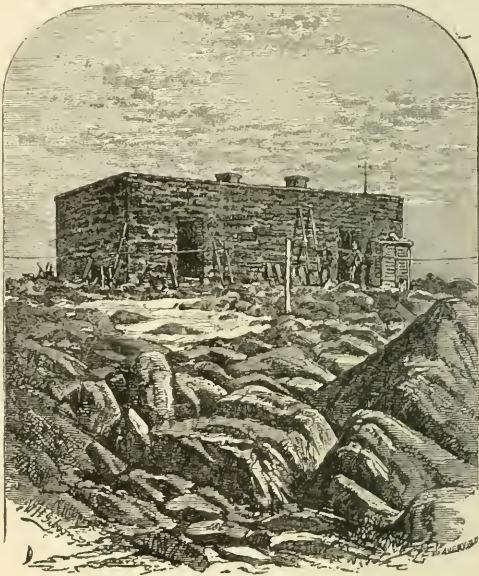
A trip to Cañon City and its mineral springs, forty-five miles west of Pueblo, also takes one to the Grand Cañon of the Arkansas. This



THE GREASER'S LEASURE.

is a masterpiece of nature's handiwork. Here the mountains rise abruptly from the plain to the height of thousands of feet. For miles the Arkansas dashes between perpendicular granite walls 2000 feet high, that shut out the sunlight completely, and at points, almost close

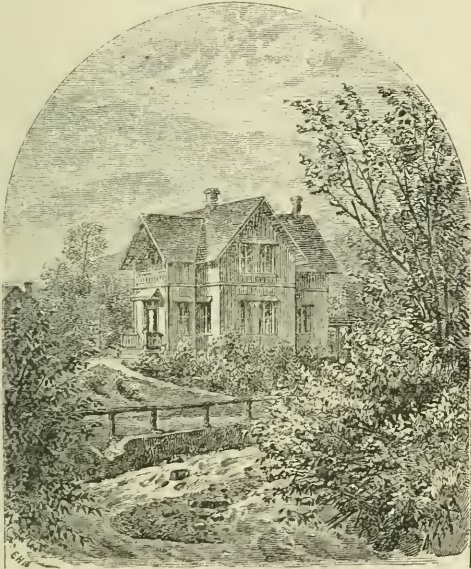
above it. The view down this enormous chasm is no where equalled except in the far away cañons of the Colorado and Gunnison. The Arkansas river rages and foams so far below, that from this dizzy height it resembles a tiny thread of silver. Although impassible, save when winter weaves its icen bands across the waters, the Arkansas Valley Company have taken advantage of that time to make a survey of this cañon for another Pacific railway. The brink of the cañon is reached by a winding road around the mountain sides.



ON THE MOUNTAIN TOP—U. S. SIGNAL STATION—PIKE'S PEAK.

Colorado Springs is considered the prettiest town in Colorado, standing as it does on an artificially watered plateau and embowered with countless thousands of shade trees—all planted since the birth of the town in 1871. But it can hardly be called a town, for it has risen to the dignity of an incorporated city, with newspapers, banks, churches and squares of business blocks in goodly numbers. It has one of the

finest public school buildings in the state. It is in full view of and but a few miles from the mountains. The Garden of the Gods sits enthroned just within the foot hills and is so deserving of its name that it alone is worth a trip across the plains to see. Above all, the cloud-capped summit of Pike's Peak towers in lonely grandeur, over a sea of plain and mountain, a mile and a half above the lovely valley of Manitou and 14,146 feet above sea level. The view from the moun-



GRACE GREENWOOD'S COTTAGE—MANITOU.

tain top amply repays one for the few miles of travel required to reach it. It is the nearest to the plains of any prominent peak, and can be seen for one hundred and fifty miles. The clearness of Colorado's atmosphere permits of an immense scope of vision—a fact that attracts the attention of every visitor from other climes. On the summit of Pike is a United States signal station connected with Colorado Springs

by telegraph—being the most elevated institutions of the kind in the world. Thus within a few miles, is experienced almost every known description of climate.

“ Behind, they saw the snow-cloud tossed
By many an icy horn ;
Before, warm valleys wood embossed,
And green with vines and corn.”

Around the enchanting vale of Manitou are a succession of beautiful parks, charming groves and glens, lofty cliffs, deep cut ravines and yawning chasms. Among the wonders that claim the attention of the visitor are the Garden of the Gods, Glen Eyrie, Cheyenne Cañon, Ute Pass and the Falls of the Fontaine. This Saratoga of the West has a number of first-class hotels that afford every accommodation known to eastern houses. Thousands of tourists and invalids visit these beautiful towns annually to partake of the health giving waters of Manitou, and to breathe that inspiring air that only Colorado can furnish. As one writer expresses it:

“ Here under the walls of Paradise, far from either ocean, the asthmatic feel the aerial influences at once. The debilitated are spurred by an invisible hand. There is no dew at night. The moon looks kindly down through a crystalline sky, and the sun shines with an Italian effulgence. The town lies under the mountains on a sunny plain. The ice-cold streams from the snow covered peaks bubble through the streets, and irrigate the fields. There is no winter as the dweller on the Atlantic coast has known it, and no summer as he has learned to dread it, but an equable, eternal spring. The mornings do not chill him, nor the evenings chase him with unkindly breath within doors. All the airy influences of Nature are beneficent and tender, and a new electrical stimulus spurs him into activity.”

It is so with all localities in Colorado, from Idaho Springs in the mountains, down to the cities of the plains.

The Denver and South Park Railway is in operation as far as Morrison, and just within the foot hills, and is being extended up Platte Cañon towards Fairplay. From Morrison, Cañon or Colorado Springs the South Park and the mines are reached by means of the South Park Stage lines of Spottswood & McClellan. These two lines are finely equipped, as are the various Barlow and Sanderson lines, which strike south and west from the three southern Rio Grande termini. They comprise the usually traveled routes to the San Juan region.

From the “Springs” this great north and south line takes up

over the "Divide" through El Paso and Douglas counties to Colorado's great commercial metropolis and railway centre, Denver. The hotels of Denver are of a character befitting a city which is visited by



GARDEN OF THE GODS.

the celebrities of all states and nations. The Grand Central wears an appearance of elegance and comfort that would do honor to an eastern metropolis. To the west a panoramic view of surpassing grandeur

unfolds itself in the two hundred miles of mountains surmounted by the snow white peaks of the snowy range.

No visit to Colorado is complete that does not take the mountains in its programme. As well might one make a tour of the sea board without seeing New York. This novel and interesting feature of the excursion can be made via the Colorado Central Railway. Sixteen miles brings one to Golden and the gate of the mountains. Here the road changes to narrow gauge and strikes through Clear Creek cañon among some of the grandest scenery of the mountains. Far above it the granite crags rise almost perpendicularly.

Up the steep grade of one hundred feet per mile and often more, the iron rails wind in and around the ragged, cragged cliffs, where it would seem almost an impossibility for a locomotive to go. Sharp curves and turns are of constant occurrence, and often the way seems walled up in front, so close and narrow is the defile.

Twenty-one miles over this road brings one to Black Hawk, 2,200 feet above the mouth of the cañon. In mountain defiles and above them, are the cities of Black Hawk and Central, and the great gold mines of Colorado. The first sight of these mountain towns is not easily forgotten. Far up the giddy slopes hang cottages seemingly ready to topple one upon another. In the ravines below are busy bustling streets, lined with quartz teams and all manner of vehicles. A main thoroughfare three miles in length winds among these granite hills, whose interiors are honeycombed with shafts, levels and tunnels. Beside the muddy, turbid stream, lofty chimneys of huge smelting works are always burning. Beyond are stamp mills, whose stamps thunder and rattle with never ceasing industry. Night and day the same work goes on unintermittingly, week after week, year after year. It is a novel sight, these cities built at the top of the shafts and mouths of the tunnels which lead to the treasures of the mines below and on either hand. Down in the depths, hundreds of feet from the sunlight, are other cities less habitable but equally active. Here by the dim candle light hundreds of men wield the drill, pick and shovel, delving for the hidden wealth of centuries. These mines beneath the city help to swell the millions that steadily find their way into the channels of commerce.

A first-class omnibus line transfers the passengers from the railway

station up through a mile of stores, dwellings, mills and mines to the business centre, and to one of the finest hotels in the west. From the Teller House one looks over a city whose growth is due entirely to its veins of gold, and whose prosperity is as enduring as the everlasting hills that surround it. From James and Buell's Peaks, ten miles away, a splendid view of nearly half of Colorado can be obtained.



MOUNTAIN BROOK.

Six miles south of Central is Idaho Springs, a lovely watering place and worthy of an extended visit. Georgetown is fourteen miles beyond. Its charming surroundings have been previously noted. Both places are reached by the Colorado Company's stages, which afford connection with Central, and also with the south branch of the Colorado Central railway, which leaves the Black Hawk line at the junction of North and

South Clear Creeks. Between these streams is a dividing ridge 2,500 feet in height, and crossed by a stage road through Virginia cañon. There are many points of interest about Georgetown, from the great silver mines, mills and tunnels to Green Lake and Gray's Peak. This majestic mountain "the Dome of the Continent," rises 14,341 feet above sea level, and affords a view of surpassing grandeur. To the east, below and beyond the foot hills, extend the plains, as level and as boundless as the ocean. North and south rise countless peaks, that rear their billowy crests like storm-tossed sea waves. Below and to the west are the elysiums Middle Park and the valleys of the Blue and Snake. Beyond all, and one hundred and fifty miles away, the blue outlines of the mountains of Utah are visible.

The tourist should in no event fail to make the circuit from Denver to Central or Georgetown and Boulder and return. This can be made by the rail and stage routes above enumerated, and then by stage across the mountains, or by taking the plains division of the Colorado Central to Boulder. From this enterprising city, which nestles at the foot of the mountains, the mines can be reached by W. & L. Smith's line of fine

Concord coaches. The main route extends through that grandest of all northern cañons, that of the Boulder, and thence to Caribou and Central. The beauty and grandeur of this wonderful creation of nature alone repays the expense and trouble of the entire trip.

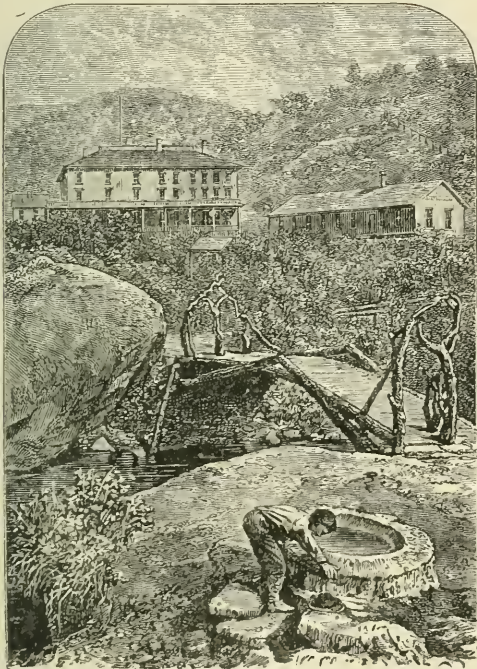
The Colorado Central Railway comprises eighty-nine miles of road, and branches will soon be extended to Georgetown and to Ralston. Its three termini are Black Hawk, Floyd Hill and Longmont. It enters the most productive mining districts of the mountains, and the fertile farming sections of Jefferson and Boulder counties. The officers of this very profitable enterprise are, President, W. A. H. Loveland; Superintendent, O. H. Henry; Assistant Superintendent, Chas. S. Abbott; Treasurer J. C. Hummell; Auditor, Foster Nichols; Secretary and Engineer, E. L. Berthoud; Cashier, Wm. Armor. H. M. Teller was president for five years, and W. A. H. Loveland, vice-president. They were the leading spirits in projecting and securing the construction of this great Colorado enterprise.

Among the charming retreats of the mountains are Fall River and the beautiful valley of South Boulder. At these places are good hotels, fine scenery and excellent hunting and fishing. There are over 600 acres of tillable and meadow land along the South Boulder, at and near Rollinsville. It is in the line of the Central and Caribou road, and the starting point of the Rollinsville and Middle Park wagon road.

Denver, the "Queen City of the Plains," and the state capital, is located on a plateau that inclines gradually towards the Platte River and the Mountains. It is the best built, and most attractive city between Saint Louis and San Francisco. It has grown, within a few years, from the wilderness to be the metropolis of one thousand miles of plain and mountain. There is a life and activity about its broad and handsome thoroughfares, that charms the stranger and convinces him that he is among an exceptionally wide-awake and enterprising people. Long streets and avenues, thickly bordered with beautiful shade trees and elegant residences, handsome gardens and pretty cottages, extend in all directions from the business centre.

The population of Denver is made up from all states, and almost every nation. It is claimed to be the fastest town in America. It is

the metropolis of a thriving state and of the great Rocky Mountain gold and silver mining region. It is the point of arrival and departure to and from northern and central Colorado. Consequently it is visited by thousands of people who come in search of business, health, pleasure or a fortune.



CLIFF HOUSE—MANITOU.

Six railroads centre here, connecting with stage lines to all important parts of the state that are devoid of railway facilities. Religious and educational institutions of every variety and of the first order are met with, and are endowed with greater liberality than in the east. Large numbers of wealthy men, from all sections, make this their home on

account of its many attractions, business opportunities or health-restoring climate. The population has increased from 4,759 in 1870 to over 21,000 in 1876. The actual property valuation shows an equal advancement and already approaches \$19,000,000. There are nine banks, four daily and five weekly newspapers, street railways, water-works, and the usual public library, fire department, fire alarm telegraph, gas works, excellent hotels and other conveniences and improvements of first-class cities. There are twenty churches, some of them elegant structures, worth altogether \$200,000. Five handsome school buildings, seating 2,500 pupils and valued at \$200,000—the High School alone costing \$80,000.

The Denver Board of Trade report for 1875, prepared by the secretary, Geo. T. Clark, has the following: “Banking capital \$1,135,000, bullion handled 5,000,000, deposits \$3,000,000. Business of the Denver Post Office \$1,083,408.93; value of money orders issued \$151,501.43. Lands entered under the homestead act in Denver land office 77,412 acres. Pre-emptions in 1875, 240,150 acres. Amount of real estate sales, \$3,122,429.11; manufactures \$2,535,652. Sales of the Denver Mining Stock Board, \$184,487.75. Number of passengers transported by Denver City (street) Railway, 540,000. Number cloudy days in the year, 19; of days when rain or snow fell, 100; total rain fall 17.24 inches.

A branch of the United States mint is located here, being practically a government assay office. An effort is being made to have it converted into a branch mint of coinage. The location is superior to all others. Denver is the direct port of entry to the rich mining districts of Colorado, and is more centrally located than any other for the immense region extending from British America to Mexico, and from Nevada to the Great Plains, and which produces nearly \$20,000,000 annually. The gold and silver regions of Montana, Wyoming, the Black Hills, Utah and New Mexico would be tributary to the institution, if located here. Prof. Schirmer, manager of the Denver mint, gives a statement of the business transacted from the beginning of 1864 to the close of 1875, which shows a total of \$8,426,015.82. Where only a small portion of the bullion produced in these mountains goes east through that quarter now, the entire amount would probably find its way there, if it became a mint of coinage.

There are more handsome and substantial business blocks, and attractive and costly private residences in Denver, than in any other city of its age and size east or west. The annual trade amounts to \$20,000,000 per annum. Over a million dollars have been invested in buildings in a single year. One wholesale grocery firm does a business of \$1,250,000 per annum, and there are two dry goods houses whose combined sales approach \$1,000,000. The Swansea Smelting works have been operated at intervals, this fall, by the Balbachs of eastern notoriety. The West Denver Dry Ore Reduction works, chlorination and lixiviation, are treating ores principally from Clear Creek County.

The immense region between the Missouri river and the Mountains rises toward the west at the rate of ten feet per mile. Kansas City is only 560 feet above the sea, while Pueblo is 4,400 and Denver 5,317. Kansas is 400 miles long. The eastern half is a magnificent farming country, composed of rolling prairie, low hills and river bottoms. Then comes 350 miles of Kansas and Colorado plains—dry and barren, except along the streams, but excellent grazing lands.

In Switzerland the regions of eternal snow begin at 6,500 feet above the sea; in Colorado at 10,000 or 11,000.

All of the Indians that formerly infested the plains of Colorado and Kansas are now moved to reservations in the distant Indian Territory. The Ute Indian tribe which has always been friendly with the whites, are located on a reservation in the far western part of Colorado, beyond the mountain ranges, and at a distance from the white settlements. They number altogether about 6,000 souls.

A sure omen of the future prosperity of Denver, is the fact that her citizens are taking a greater interest than ever before in the mines, and are using their best efforts to develop this important element of the wealth of the State. All wild-cat sales of mines are severely discountenanced, and active measures are in progress to restore the confidence of eastern capitalists, which was nearly or quite destroyed by the result of their early investments in Colorado. With the advent of the capital needed to open the mines to paying condition, Denver, which is the natural entrepot to all the mining districts in the State, as well as the most convenient market for the ores, cannot fail to be enriched from the wealth which lies at her doors.

An important outgrowth of this improved sentiment in regard to mining sales is the Equitable Mining Agency of Colorado, an institution inaugurated in 1875, by a number of leading citizens of Denver. This agency takes leases of selected mines with a bond for a deed at a fixed price, and by working the property under the lease, tests the feasibility of purchase at the bonded price. The patrons of the agency (generally residing at a distance from Colorado) furnish the funds for the work of development and for the purchase—the Agency reserving merely an interest in the lease and property for its commission and expenses. Beneficial results have already attended the efforts of the agency, and it is not difficult to predict for it a most important influence in effecting the public-spirited purposes for which it was established.

The sportsman finds his richest rewards on the high, level plateaus and among the Sierras, beyond the Mississippi. The mountains abound in deer, elk, mountain sheep and more dangerous game, in such quantities that the "best shots" from the east, and from over the water, come to tarry among them. On the plains the antelope is found, and immense herds of Buffalo roam from the Platte to the Arkansas. Splendid trout fishing is afforded, by the thousand clear and sparkling creeks and rivulets that thread their way through mountain, park and valley.

CHAPTER XLIII.

THE MINES OF COLORADO—RECORD OF FIVE YEARS.

COAL, SALT, IRON AND COPPER MINES.

Profits of Colorado Mining—Superior chances for Investment—Mining Compared with other Speculations—Bullion Yield of the Country—Colorado's Gold and Silver Product.

IT has been the design of this work to give a plain unvarnished statement of the varied resources of Colorado, and the opportunities that await the judicious investment of capital in this highly favored commonwealth. Errors have occasionally crept into these pages, but they are of a trifling character. Taken as a whole the facts and figures contained herein, and obtained with the expenditure of no little time, labor and money, are correct and reliable. They show what has already been accomplished, and what is morally sure to be effected hereafter. They show that Colorado mines offer surer and better returns for capital than the more favored classes of investments have ever done.

From first to last over seventy thousand miles of railway have been constructed within the United States. It is a well known fact that companies controlling nearly fifty thousand miles of these roads, are defaulters in payment of interest on their bonds. Furthermore, R. G. Dunn & Co.'s Mercantile Agency shows that the business failures in the United States have aggregated \$672,000,000, within the past three years. From this discouraging condition of affairs the reader's attention is called to the record of Colorado mines.

Gilpin county shows that the gold mines of that district gave a return equal to \$1,300 for every man employed therein or in any way connected therewith, during the year 1875. Mount Lincoln and Summit Mountain districts did even better. In the decade of silver mining about Georgetown and Idaho, the total amount of capital expended

in mills and machinery, valuable and worthless, in the purchase of mines and in development of all kinds, has not exceeded \$2,250,000. Add to this the total value of all labor, individual and of firms or companies, expended on mines and the result falls far short of \$5,000,000. Here are \$7,250,000 in capital and labor expended. The bullion reports show that these districts, or Clear Creek County, returned \$8,657,718.80 in the same period, of which nearly \$8,000,000 was obtained in the past five years. The work that has been done on the mines has developed them so that they can, at the lowest calculation, give a clear profit of 15 per cent. on the above expenditure, while the actual value, with mills and improvements, must exceed \$12,000,000. This shows a net gain over all expenditures of \$13,407,718.80. It must be remembered that these figures include worthless mines and expenditures. The better classes of property make a far better showing. It must also be remembered that the mines have just been brought into a fair condition for production so that their future records will usually be much better than those of the past. These facts are given to show how much better the laborer and capitalist is rewarded here than in the average avenues of speculation at the east. The better classes of mines usually pay at the rate of twenty per cent. per annum, more or less, on all moneys invested, and over all current expenses, and even fifty per cent. is occasionally reported. These facts go to show that mining, in Colorado, gives surer and better chances for the speedy accumulation of wealth than any calling at the east; and the same may be said in regard to farming and stock growing.

What follows should be carefully read as it comprises, in a condensed form, the yield of Colorado mines, for the past five years, as well as other valuable information.

The combined gold and silver product of the United States west of the Mississippi, together with British Columbia, has been reported by Wells, Fargo & Co.'s bullion superintendent as follows :

1869 Bullion product	\$61,500,000
1870	66,000,000
1871	66,653,000
1872	63,943,857
1873	71,642,523
1874	72,428,206
1875	80,889,037

Below is the same superintendent's (John J. Valentine,) report for 1875 by states and territories.

Nevada, (silver and gold,)	\$40,478,369
California, (gold,)	17,752,151
Colorado, (silver and gold,)	6,299,817
Utah, (silver,)	5,687,494
Montana, (nearly all gold,)	3,573,609
Mexico, (silver)	2,408,671
British Columbia	1,776,953
Idaho	1,554,902
Oregon	1,165,046
Arizona	109,093
Washington	81,932
Total	<u>\$80,889,037</u>

COLORADO'S BULLION PRODUCT FOR FIVE YEARS.

In 1875, Colorado ranked next after Nevada and California in the production of the precious metals. There is every reason to believe she will maintain this position up to the time when she surpasses her older sisters.

A statement is herewith given of the yield of the mines of Colorado, for the past five years. The figures for 1872-3-4 are from Raymond's annual reports; those for 1875, by the author—likewise the estimates of 1876, which are based on figures already received. Owing to the great fall in the price of silver in the first half of the year, and other causes in one or two districts, the silver yield of Colorado will be \$1,000,000 less for 1876, than it would have been, had silver maintained its former or even present value:

COUNTIES.	1872.	1873.	1874.	1875.	1876.
Gilpin,	1,389,289 00	1,530,000 00	1,631,863 00	1,763,985 48	2,240,000 00
Clear Creek,	1,503,391 43	1,259,761 06	2,203,947 97	2,064,863 00	1,900,000 00
Park, . . . . .	. . . . .	459,000 00	596,392 00	830,860 00	900,000 00
Boulder,	300,000 00	390,000 00	586,522 00	767,000 00	700,000 00
Fremont, . . . . .	. . . . .	. . . . .	23,516 00	342,000 00	100,000 00
Lake,	120,000 00	110,000 00	145,000 00	120,940 00	160,000 00
Summit,	125,000 00	125,000 00	126,188 00	142,000 00	160,000 00
San Juan region, . . . . .	. . . . .	. . . . .	25,383 00	105,000 00	286,000 00
Other sections,	1,223,784 57	346,501 94	23,512 03	163,168 52	150,000 00
Total,	<u>\$4,661,465 00</u>	<u>4,020,263 00</u>	<u>5,362,383 00</u>	<u>6,299,817 00</u>	<u>6,596,000 00</u>

The columns for 1872-3-4 represent coin value, that for 1875, currency value, with gold at \$1.16; that for 1876, currency value, with gold as \$1.10.

The yield of 1874 was as follows:

Silver, (with some gold in matte)	\$3,086,023
Gold	2,102,487
Copper	100,197
Lead	73,676
Total	<u>\$5,362,383</u>

Of the above gold, \$382,500, was from placer workings.

The yield for 1875, is estimated at \$3,200,000 in gold, \$3,250,000 in silver and not far from \$1,46,000 in copper and lead, or \$6,596,000 altogether.

The yield for 1875 was as follows ;

Silver	\$3,532,373
Gold	2,627,444
Copper, about	90,000
Lead about	50,000
Total	<u>\$6,299,817</u>

There is every prospect that the mines of Colorado will produce \$5,000,000 in silver, and \$4,000,000 in gold in the year 1877.

COAL.

The largest producing coal fields at present, are the Boulder Valley, Cañon City, Trinidad, Murphy, Ralston, Davidson, Rob Roy, Golden, and others. Nearly every county bordering the mountains has splendid coal deposits, many of them as large and valuable as these. The total coal production of Colorado has aggregated 1,000,000 tons or over, and for 1876 only, over 300,000 tons, worth \$750,000 at the mines, or \$1,200,000 in Denver. Estimated total production, in tons, of coal banks since opened; Boulder Valley (Eric) 340,000; Murphy, 150,000; Golden, Marshall and Arkansas each 100,000. There are many newly found coal veins.

Colorado coal is a superior quality of lignite, excepting a few veins on the Animas and Gunnison, which is anthracite, ninety-one per cent. carbon. There are fine coking coals at Trinidad, on White River and in San Juan. The Trinidad coal has from 57 to 64 per cent. of Carbon; White River, 85. Other coals have from 51 to 57 per cent. carbon. The coal mines were not generally worked until 1872-5.

SALT.

There is a rich salt mine that has been worked extensively, in the South Park.

IRON AND COPPER

Is found in various localities, but most extensively in Fremont County. Likewise petrolcum and marble.

NOTES FOR THE READER.

The figures given in this book, excepting estimates, can be depended on as accurate. In this they differ from most newspaper "mining items." Furthermore, *nothing* is claimed for one county that belongs to another. Great care has been taken in this respect regarding Gilpin, Clear Creek, Park and Boulder counties.

While the mines of Gilpin county produced only \$1,763,985, in 1875, the shipments were over \$3,800,000—the excess coming from ores of other counties sent to Black Hawk for smelting.

About 60,000 lodes have already been discovered in Colorado and probably as many more will yet be found. Of course only a small portion are well opened with deep shafts or tunnels. It is possible in this work to mention only those that are producing well just at this time, and not all those, even, are included. The bonanza or king lodes of Colorado, are possibly yet to be developed or discovered.

After the earlier years the mining laws of Congress and the territory were so changed as to allow a discoverer 1,400 feet on a vein with a width of surface ground of 25 feet on each side of the centre of the vein. For a short time the length was increased to 3,000; then the present rule was adopted, allowing the discoverer 1,500 feet in length on a vein—extensions taken up in the same manner. In 1874 the Colorado legislature increased the width of ground allowed, from the centre each side of the vein, to 150 feet, except in Boulder, Gilpin, Clear Creek, and Park counties, where it was restricted to 75 feet on each side. None of these laws affect, or can conflict with discoveries made prior to their adoption.

A ton of gold or silver contains 29.166⅔ ounces.(troy). Pure gold is worth \$20.67 (coin) an ounce, \$602,875 per ton. At the present time pure silver is worth \$1.16⅔ per ounce, or \$32.812.39 per ton, coin value. Colorado will have produced about 6 tons of pure gold and 90 tons of pure silver in 1876. The coin of commerce is composed of only nine-tenths of pure gold or silver.

The total valuation of real, and personal property in Colorado, exceeds \$75,000,000. This does not include mines which are worth as much more, and which the State Constitution protects from taxation for ten years.

In the first line of page 464 the figures 1875 should read 1876.

COLORADO'S GOLD AND SILVER YIELD.

The following is the bullion product of Colorado for the past seventeen years, or from the time of the first gold discoveries down to the years 1876-7:

	COIN VALUE.	CURRENCY VALUE.
1859	\$ 200,000	
1860	1,000,000	
1861	2,500,000	
1862	4,400,000	
1863	4,000,000	
1864	5,000,000	
1865	4,262,000	
1866	2,000,000	
1867	2,200,000	
1868	2,300,000	
1869	3,800,000	
1870	3,675,000	
1871	3,600,000	
1872	3,785,220	
1873	4,070,000	
1874	5,362,000	
1875	5,486,742	
Total,	\$57,641,345	\$64,846,513.66
1876, (estimated)	6,000,000	6,600,000,00
Grand Total,	\$63,641,345	\$71,592,422,74

The total yield of gold and silver, in Colorado, from the first discoveries, down to 1876, a period of 17 years, was \$57,641,345.48 coin value or \$64,846,513.66, at a currency value of \$1.12½. The year 1876, will add about \$6,000,000 to the coin value, or \$6,600,000 to the currency value of the above.

COLORADO RAILWAYS.

Kansas Pacific,	210
Arkansas Valley Branch, K. P. R. W.	76
Atchison, Topeka & Santa Fe,	150
Denver & Rio Grande,	269
Denver Pacific,	100
Colorado Central,	89
Boulder Valley,	39
Denver & South Park,	17
Total,	950

Two hundred miles of railway were constructed within the past year and as much more will be in 1877.

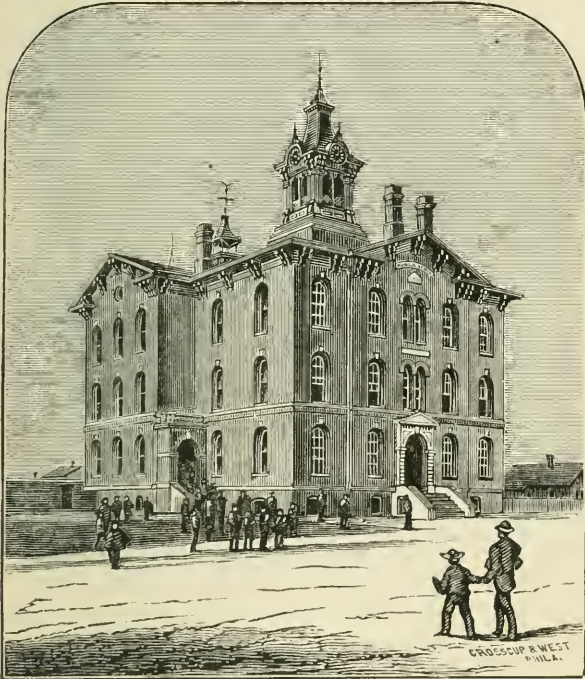
COLORADO.

Counties and county seats, and area of and estimated population of counties November, 1876.

COUNTIES	TOTAL VOTE OCT. 3 '76	AREA IN SQ MILES	ESTIMATED POPULATION	COUNTY SEAT
Arapahoe	3,968	4,800	24,000	Denver.
Bent	689	9,126	4,000	West Las Animas.
Boulder	2,635	792	10,000	Boulder.
Clear Creek	2,103	437	7,500	Georgetown.
Conejos	559	2,558	4,500	Guadalupe.
Costilla	524	1,685	3,500	San Luis.
Douglas	615	833	3,500	Castle Rock.
Elbert	201	6,030	1,500	Middle Kiowa.
El Paso	1,110	2,628	5,000	Colorado Springs.
Fremont	1,053	2,268	5,000	Canon City.
Gilpin	1,768	158	6,300	Central City.
Grand	220	10,381	500	Hot Sulphur Springs.
Hinsdale	820	1,404	2,500	Lake City.
Huerfano	1,024	1,584	5,000	Walsenburg.
Jefferson	1,134	792	5,000	Golden.
Lake	463	13,576	900	Granite.
Larimer	674	1,825	4,000	Fort Collins.
La Plata	158	1,755	1,500	Parrott City.
Las Animas	1,940	9,072	9,000	Trinidad.
Park	888	2,222	3,000	Fairplay,
Pueblo	1,282	2,412	9,000	Pueblo.
Rio Grande	726	1,332	4,000	Del Norte.
Saguache	495	3,312	3,000	Saguache.
San Juan	803	2,405	2,500	Silverton.
Summit	386	2,148	900	Breckenridge.
Weld	1,251	10,494	5,000	Evans.
		104,500	131,600	

EDUCATIONAL.

Owing to the transitory character of the population, the public schools did not receive as much attention in the decade prior to 1870, as they have since. Still they excelled those of most western territories, and were liberally endowed in the larger towns. Several excellent private academies and sectarian schools had been established however.



HIGH SCHOOL.—DENVER.

In 1871, there were 160 schools, 7,742 persons of school age, of whom 4,357 were enrolled, and 80 school houses, worth \$82,574, and \$44,148.95 were paid for teachers.

Great advancement was made from that time forward. Soon after, Professor H. M. Hale became Superintendent of public instruction in the territory. His soul was in his work, and his energy and abilities brought the system up to a high state

of efficiency. His report for 1875, shows that the receipts of the school funds were \$247,179, expenditures for buildings \$76,215, expenditures of all kinds, \$210,813,86; Number of school houses 178, value \$414,008; school population, 23,274, number of teachers, 377; average salary, males \$60 per month, females \$48; increase in per cent. of school houses 18, pupils 20; value of school property 21.

In 1876, Professor Hale induced the Territorial Legislature to pass a bill for a school law, modeled after the best systems of the east, and now Colorado is in no way behind any of her eastern sisters in this respect. The law is a very efficient one and provides for the best classes of teachers and every other requirement for public school instruction of the best character. No people east or west are so liberal in regard to public schools and the instruction of the young, as Colorado. There are graded schools in all the leading towns and cities, and high schools where the pupil can prepare for a collegiate course.

The people through their legislature have secured the establishment of a State University at Boulder, an Agricultural College at Fort Collins, a School of Mines at Golden, and a Deaf Mute Institute at Colorado Springs. The State University has the finest building and grounds in the State, ready for occupation,

There are several private and sectarian academies and seminaries at Denver, Central, Trinidad, Pueblo and elsewhere.

About 3,000 pupils are enrolled in the schools of Arapahoe county, of which nearly all are within the limits of Denver. In 1876, District Number One of this city had 1,988 pupils enrolled. Of these 1,013 were in the primary departments, 475 in the intermediate, 396 in the grammar, and 104 in the high school. Cost per capita of pupils enrolled, \$16.70. Cost per month of tuition, per capita, \$1.97.

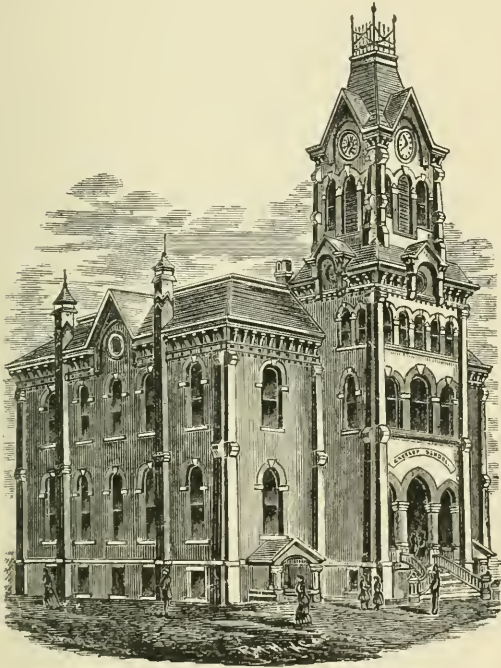
THE STATE SCHOOL OF MINES.

The State School of Mines is located at Golden. The legislature of 1870 appropriated \$3,872 towards erecting a building for this purpose, to be attached to the collegiate institution known as Jarvis Hall, and trustees were appointed to carry out the design. The building was completed in 1871. The following year Bishop Randall, who had charge of the adjoining school provided the necessary apparatus for the scientific, assaying and other departments. A legislative appropriation of \$5,000 was obtained in 1874—\$500 to be paid when Bishop Randall deeded the building with five acres of ground for a "campus"—after which the school should have the full benefit of the appropriation—to be open thereafter for liberal instruction in mining, engineering, assaying, metallurgy, chemistry, geology, mineralogy and natural philosophy. The bishop of the episcopal diocese then deeded the building to the state and C. C. Welch donated the requisite five acres of ground.

The legislature of 1876 appropriated \$3,500 for the maintenance of

the school, and to-day it is in successful operation, and provided in every way for instruction in the best methods of the above named branches of study.

Professor Gregory Board, Principal of the instructive department,



GREELEY PUBLIC SCHOOL.

is a thoroughly educated chemist and metallurgist, from the London School of Mines, and is aided by an efficient lady assistant. Twenty-one students have been receiving instruction besides a large class who have for two winters attended full courses of lectures in Chemistry, Geology, Blowpipe Analysis and Metallurgy.

BOARD OF TRUSTEES.

Hon. W. A. H. Loveland, Golden, Jefferson County; Hon. Alpheus Wright, Boulder, Boulder County; Hon. N. P. Hill, Black Hawk, Gilpin County; W. W. Ware, Georgetown, Clear Creek County; Hon. Adair Wilson, Del Norte, Rio Grande County; J. H. Yonley, Montezuma, Summit County; Capt. J. T. Smith, Denver, Arapahoe County.

EXECUTIVE COMMITTEE.

W. A. H. Loveland, Alpheus Wright, James T. Smith.

OFFICERS.

President, W. A. H. Loveland; Secretary, Ed. L. Berthoud.

FACULTY.

Prof. Gregory Board, E. M.; E. L. Berthoud, C. E.; Richard Pierce, F. G. S.; Theodore Van Wagenen, M. E.; James Teal, M. E.; Wm. West, E. J.; Rev. Thos. Bellam, A. M.; Wm. Kendrick, Instructor in Telegraphy.

COURSE OF STUDIES—FIRST TERM.

Chemistry, theoretical and practical; Blowpipe Analysis and Assaying; Mineralogy; Drawing; Civil Engineering.

SECOND TERM.

Metallurgy and applied Chemistry; Mining Engineering; Mineralogy; Geology; Drawing; Assaying.

In addition to the above, ample provision is made for field work, and for visiting mines and works for the treatment of ores.

APPENDIX.

COLORADO ELEVATIONS.

Elevations above sea level according to Hayden's last surveys.

PROMINENT MOUNTAINS.

CENTRAL COLORADO.			
Mount Harvard,	14,384	Mount Rosalie,	14,340
Massive,	14,368	Evans,	14,330
Mount Elbert,	14,326	Long's Peak,	14,271
Grizzly Peak,	14,317	SOUTHERN COLORADO.	
Lincoln,	14,296	*Mont Blanco,	14,440
Mount Nelson,	14,280	Spanish Peaks,	11,000
Antoro,	14,245	SAN JUAN COUNTRY.	
Sopris,	14,200	La Plata,	14,302
Princeton,	14,199	Uncompahgre,	14,255
Mount of the Holy Cross,	14,176	Sneffels,	14,158
Pike's Peak,	14,146	Pyramid,	14,146
Yale,	14,101	Castle Peak,	14,115
Shavano,	14,095	Pidgeon's,	14,054
Ouray,	14,043	Maroon,	14,003
NORTHERN COLORADO.		Capitol,	13,992
Gray's Peak,	14,341	Snow Mas,	13,961
Irwin's (Gray's),	14,336		

*Highest Mountain in Colorado.

DISTANCES FROM DENVER.

Denver to Fairplay via Denver & South Park Railway, to Morrison thence by South Park stage line, 95 miles; to Alma 102. Colorado Springs to Fairplay, 85 miles. Cañon to Fairplay, by South Park Stage, 77 miles. These are the roads to the silver mines of Lincoln and Bross, and the gold placers of Park, Lake and Summit counties.

Denver to Cheyenne on U. P. R. R., via Denver Pacific, 106 miles. Denver to Kansas City, via Kansas Pacific, 639 miles.

ELEVATIONS OF TOWNS AND OTHER LOCALITIES.

FROM HAYDEN'S SURVEYS.

Denver 5,317, Denver K. P. R. W. track 5,196, Rollinsville 8,323, Nederland 8,263, Gold Hill 8,463, Sugar Loaf Mountain 8,933,

Georgetown 8,530, Green Lake 10,000, Fall River 7,719, Stevens' mine 11,943, Snake River Pass 13,060, Berthoud Pass 11,462, Summit of Boulder Pass Road 11,613, Hot Sulphur Springs, Middle Park, 7,713, Grand Lake 8,153, Chief Mountain 11,833, Estes Park 7,528, North Park about 9,000.

Timber line 11,100 to 11,600, Hamilton Pass 12,500. Tennessee Pass 10,418, Alma 11,044, Oro 10,704, Granite 8,883, Twin Lakes 9,442, Divide, south of Denver, 7,554, Breckinridge 9,492, Montezuma 10,113, Saint John 10,625, South Park about 9,500, Salt Works (South Park) 8,826.

SOUTHERN AND SAN JUAN COUNTRY.

Poncho Pass 8,600, San Luis Valley 7,200 to 7,600, Sangre de Christo Pass (R. R.) 9,390, Raton Pass 5,896, Del Norte 7,200, Summit mines 12,000 to 13,000.

SAN JUAN COUNTRY.

Lake City 8,550, Silverton (Baker's Park) 9,400, Mineral City 11,500, Cunningham Pass 12,090, Howardsville 9,700, Animas Forks 11,200, Animas City 6,850, Ouray 6,000. Timber line between Gunnison and Rio Grande about 10,000, Los Pinos (Indian Agency) 9,270.

GRAND CANON OF THE GUNNISON.

Elevation above sea level in feet. Level of river at mouth of Mountain Creek 7,200 feet; top of plateau (or wall) on north side, 8,800—height of wall 1,600; height of wall at point below on east side, 1,900; west side, 1,800; height of cañon wall in gneiss rock 900; — miles below, river level, 6,800; top of plateau or wall, 9,800; height of wall in gneiss 1,800; height of cañon wall above river 3,000 feet. These walls border the river for miles, rising from 1,000 to 3,000 feet above it, and are composed of stratified rock. In places their level summits (plateaus) are surmounted by a second wall, forming a cañon within a cañon, rising like huge bastions and turrets, one above another. The width of the cañon is about 300 feet. Through this chasm dashes the river, its surface white with foam.

Distance from Pueblo to Kansas City, 618 miles; Las Animas, 93; La Veta, 72½; Fort Garland, 99½; Del Norte, 157½; Lake City,

241 ½; Silverton, 259 ½; Trinidad, 95. South Pueblo to Denver, 120; Colorado Springs, 44; Cañon, 40.

ELEVATIONS. RAILROAD FARES AND DISTANCES FROM DENVER.

TOWNS AND CITIES	ELEVATIONS	MILES	FARE
Black Hawk	7,875	38	\$ 3 75
Boulder	5,536	40	2 25
Canon City	4,700	160	15 00
Caribou	9,905	60	5 40
Central	8,300	39	4 25
Cheyenne	6,075	106	10 00
Colorado Springs	6,023	76	6 40
Evans		48	4 60
Fairplay	9,964	95	12 00
Georgetown	8,452	52	6 60
Golden	5,728	15	1 00
Greeley	4,779	52	5 00
Idaho Springs	7,535	38	4 60
Longmont		52	3 75
Manitou Springs	6,124	80	7 15
Pueblo	4,400	119	10 00
El Moro		206	18 90
Trinidad	5,800	210	19 90
Santa Fe		417	70 00
La Veta		192	17 50
Tucson			215 00
Boston		2,115	77 00
Chicago		1,127	52 20
Cincinnati		1,363	55 50
Indianapolis		1,158	54 00
Kansas City	570	639	35 00
Louisville		1,140	55 50
New York		1,977	73 00
New Orleans		1,606	69 00
Omaha		622	41 00
Philadelphia		1,888	71 00
St. Louis		914	46 00
San Francisco		1,500	110 00
Washington			69 25

COLORADO'S CONGRESSIONAL REPRESENTATION.

UNITED STATES SENATORS.

Jerome B. Chaffee, Henry M. Teller.

MEMBER OF CONGRESS.

James B. Belford.

The city of Central may almost claim to furnish Colorado's entire delegation in Congress. Henry M. Teller and James B. Belford are

both residents of that place, and Jerome B. Chaffee was a former citizen and still largely interested there.

The Legislative vote for Senators stood, fifty for both Chaffee and Teller and twenty-five for each of the democratic nominees, W. A. H. Loveland and Thomas Macon.

For this year only, the presidential electors for Colorado, were chosen by the legislature. They were Herman Beckurts, W. L. Hadley and Otto Mears.

The democratic legislative caucus nominees for electors were Adair Wilson, J. H. Jones and Miguel Otero.

STATE GOVERNMENT OF COLORADO.

EXECUTIVE DEPARTMENT.

The first State Government was inaugurated November 3rd, 1876. The following are its officers:

Governor, John L. Routt; Lieutenant-Governor, Lafayette Head; Secretary of State, William M. Clark; Auditor, D. C. Crawford; Treasurer, George C. Corning; Attorney General, A. J. Sampson; Supt. Public Instruction, J. C. Shattuck.

JUDICIAL.

Justices of the Supreme Court—Samuel H. Elbert, E. T. Wells, H. C. Thatcher, Chief Justice.

Judges of District Courts—First District, J. B. Beck; Second District, Victor A. Elliott; Third District, John W. Henry; Fourth District, Thos. M. Bowen.

District Attorneys—First District, E. O. Wolcott; Second District, D. B. Graham; Third District, John M. Waldron; Fourth District, C. W. Burris.

LEGISLATIVE DEPARTMENT.

The Senate consists of twenty-six members, of whom nineteen are republicans and seven democrats. The House comprises forty-nine members, thirty-one republicans and eighteen democrats.

SENATE.

First District, S. B. Haynes; Second, N. H. Meldrum; Third, T. O. Saunders and James P. Maxwell; Fourth, L. C. Rockwell; Fifth, W. W. Webster; Sixth, Albert Johnson and W. A. Hamill; Seventh,

*A. H. DeFrance; Eighth, J. E. Bates, H. P. Bennet, Alfred Butters and L. C. Ellsworth; Ninth, Eugene Gaussoin; Tenth, E. S. Randall; Eleventh, Jas. F. Gardner; Twelfth, James Moynahan; Thirteenth, J. B. Hall; Fourteenth, James Clelland; Fifteenth, J. W. Hill; Sixteenth, W. B. Hamilton; Seventeenth, D. L. Taylor; Eighteenth, W. H. Meyer; Nineteenth; J. F. Chacon; Twentieth, Henry Henson.

George T. Clark, Secretary.

*Contested by Jos. T. Boyd.

HOUSE.

Arapahoe County, J. C. Mayer, Adolph Schinner, A. C. Phelps, W. D. Anthony, Geo. C. Griffin, John McBroom and W. H. Pierce; Boulder, Isaac Canfield, George X. Young, Daniel Ransom and A. A. Smith; Bent, R. M. McMurray; Clear Creek, George A. Patten, T. J. Watts, T. F. Simmons and P. E. Morehouse; Conejos, A. M. Vigil; Costilla, M. Alberts; Conejos and Costilla, D. Archuleta; Douglas, Geo. A. Lord; Elbert, A. D. Wilson; El Paso, J. C. Helm and C. W. Kittredge; Fremont, Chas. R. Seiber and Richard Irwin; Grand, J. H. Stokes; Gilpin, A. C. Marshman, H. J. Kruse and H. W. Lake; Huerfano, J. R. Esquibel and J. T. Chavez; Hinsdale, W. H. Green; Jefferson, George Rand and M. V. Luther; Larimer, U. C. Alford; La Plata, John Moss; Las Animas, H. Chacon, M. Laragoite and D. F. Wilkins; Lake, J. W. McDermott; Pueblo, G. Langford and J. U. Carlile; Park, Z. Surlis; Rio Grande, Alva Adams; Summit, Geo. W. Wilson; Saguache, Isaac Gotthelf; San Juan, C. H. McIntire; Weld, D. F. Rainey and A. Leonard.

W. D. Anthony, Speaker; W. B. Felton, Chief Clerk.

REGENTS OF THE STATE UNIVERSITY.

F. J. Ebert, W. H. Van Gieson, L. W. Doloff, George Tritch, J. Berkley and C. Valdez.

TERRITORIAL OR STATE ASSAYERS.

L. Thompson, Boulder; G. H. Gray, Central; Otto Hartleben, Georgetown; J. H. Yonley, Montezuma; A. Reichencker, Fairplay; Maurice Hayes, Oro; W. McCree, Del Norte; Leon Eggers, Lake City; W. H. Nichols, Silverton; T. F. Braun, Rosita.

OFFICIAL RETURNS OF FIRST COLORADO STATE ELECTION.

Election held on October 3rd, 1876. "R" Republicans. "D" Democrats.

GOVERNOR.

John L. Routt, R	14,154
Bela M. Hughes, D	13,316
Scattering,	1
	<hr/>
Routt's Majority,	837

LIEUTENANT GOVERNOR.

Lafayette Head, R,	14,131
Michael Beshoar, D	13,093
	<hr/>
Head's Majority,	1,038

SECRETARY OF STATE.

Wm. M. Clark, R	14,582
James T. Smith, D	12,843
Scattering,	11
	<hr/>
Clark's Majority,	1,728

AUDITOR.

D. C. Crawford, R.	14,117
J. F. Benedict, D	13,229
Scattering,	26
	<hr/>
Crawford's Majority,	862

TREASURER.

Geo. C. Corning, R	14,038
Thos. M. Field, D	13,510
Scattering,	37
	<hr/>
Corning's Majority,	491

ATTORNEY GENERAL.

A. J. Sampson, R.	13,723
G. Q. Richmond, D	13,182
	<hr/>
Sampson's Majority,	541

SUPERINTENDENT PUBLIC INSTRUCTION.

J. C. Shattuck, R	14,304
J. B. Groesbeck, D	12,473
*Scattering,	508
	<hr/>
Shattuck's Majority,	1,323

*The substitution of Groesbeck for Carpenter, on the Democratic ticket, was not known in some of the distant San Juan counties.

HOUSE OF REPRESENTATIVES.

Total Republican Majorities,	2,878
Total Democratic Majorities,	<u>1,310</u>
Net Republican Majorities,	1,568

STATE SENATE.

Total Republican Majorities,	2,884
Total Democratic Majorities,	<u>938</u>
Net Republican Majorities,	1,946

SUPREME JUDGES.

Net Republican Majorities,	1,329
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REPRESENTATIVES IN CONGRESS.

*Republican Majority, 44th Congress,	998
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DISTRICT JUDGES.

First District, Republican Majority,	549
Second District, Republican Majority,	928
Fourth District, Republican Majority,	<u>1,455</u>
Total,	2,932
Third District, Democratic Majority,	<u>462</u>
Net Republican Majority,	2,470

DISTRICT ATTORNEYS.

First District, Republican Majority,	805
Second District, Republican Majority,	870
Fourth District, Republican Majority,	<u>354</u>
Total,	2,029
Third District, Democratic Majority,	<u>1,066</u>
Net Republican Majority,	963

*For votes of previous years see pages 125-6.

A contest or dispute has arisen in regard to congressman. The Territorial Secretary issued a call for an election for representative for the 44th Congress, to be held October 3rd, but none for the 45th for that time. Subsequently he ordered an election for the 45th Congress to be held November 7th. A vote was cast for a representative for

both congresses on the 3rd day of October; James B. Belford receiving a majority of 998 for the 44th and 854 votes for the 45th congress. Afterwards the Secretary withdrew his proclamation for an election to be held November 7th. An election was held, however, on that day, Patterson receiving nearly all the votes cast. The State Canvassing Board refused to count this vote, but did count the votes that were polled for both terms on the 3rd day of October.

The largest vote cast was that on state senators. Of this 15,213 were republican and 13,280 democratic—a republican majority of 1,933. Total vote 28,493.

REPUBLICAN MAJORITIES FOR GOVERNOR BY COUNTIES.

Arapahoe, 378; Boulder, 443; Costilla, 178; Conejos, 123; Clear Creek, 41; El Paso, 316; Gilpin, 242; Hinsdale, 38; Larimer, 74; Park 42; Rio Grande, 2; Saguache, 117; Summit, 16; Weld, 325.

DEMOCRATIC MAJORITIES.

Bent, 189; Douglas, 51; Elbert, 33; Fremont, 11; Grand, 74; Huerfano, 204; Jefferson, 60; Lake, 5; Las Animas, 602; La Plata, 58; Pueblo, 196; San Juan, 17. The Republican majorities were a little larger on nearly all other nominees.

The following are the Territorial and United States officials of Colorado from 1861 to 1876, inclusive:

GOVERNORS OF COLORADO.

Wm. Gilpin, qualified July 8, 1861; John Evans, April 11, 1862; Alexander Cummings, October 19, 1865; A. C. Hunt, May 27, 1867; E. M. McCook, June 15, 1869; S. H. Elbert, 1873; E. M. McCook, August, 1874; John L. Routt, March 29, 1875.

SECRETARIES OF STATE.

L. L. Weld, qualified July 8, 1861; S. H. Elbert, Apr. 19, 1862; Frank Hall, May 24, 1866; June 15, 1869; June 18, 1873; J. W. Jenkins, appointed February, 12, 1874; John Taffe, August 19, 1875.

TREASURERS.

Geo. T. Clark, qualified November 12, 1861; A. W. Atkins, March 17, 1864; A. C. Hunt, January 26, 1866; John Wanless, September 5, 1866; Columbus Nuckolls, December 16, 1867; re-appointed March 17, 1868; Geo. T. Clark, February 14, 1870; February 17, 1872; D. H. Moffatt, January 26, 1874; F. Z. Solomon; February 12, 1876.

AUDITORS.

M. M. Delano, qualified November 12, 1861; R. E. Whitsett, March 10, 1864, January 26, 1866; H. J. Graham, December 13, 1866; N. T. Cheesman, January 7, 1868; James B. Thompson, February 15, 1870; February 14, 1872; L. C. Charles, January 26, 1874; February 12, 1876.

SUPERINTENDENTS PUBLIC INSTRUCTION.

W. J. Curtis, 1862; W. S. Walker, 1863; A. W. Atkins, 1865; John Wanless, 1866; Columbus Nuckolls, 1868; W. C. Lothrop, 1870; H. M. Hale, 1873-6.

UNITED STATES ATTORNEYS.

J. E. Daliba, 1861; S. E. Browne, 1862; G. W. Chamberlain, 1865; L. C. Rockwell, 1870; H. C. Thatcher, 1872; H. C. Alleman, 1874; C. D. Bradley, 1875; W. H. Parker, acting Attorney, 1876.

ADJUTANT GENERALS.

D. H. Moffatt, 1862; L. N. Tappan, Hal Sayr, 1867; W. R. Thomas, 1874; C. Vaughn, 1874; R. S. Roe, 1875-6.

JUSTICES SUPREME COURT AND DISTRICT JUDGES.

B. F. Hall chief Justice, S. N. Pettis, Chas. Lee Armour, July 9, 1861; A. A. Bradford, July 5, 1862; S. S. Harding, C. J., September 17, 1863; C. F. Holly, January 22, 1866; W. M. Gale, February 10, 1866; Moses Hallett, C. J., June 19, 1866; W. R. Gorsline, June 21, 1866; C. S. Eyster, November 26, 1866; Moses Hallett, re-appointed, C. J., April 30, 1870; J. B. Belford, July 26, 1870; E. T. Wells, March 6, 1870; A. W. Stone, March 13, 1875; A. W. Brazee, 1875.

UNITED STATES MARSHALS.

C. Townsend, 1861; A. C. Hunt, 1862; U. B. Halloway, 1866; M. A. Shaffenburg, 1868; C. C. Tompkins, April, 1875.

INTERNAL REVENUE COLLECTORS.

G. W. Brown, 1861; J. H. Morrison, 1870; W. H. Parker, June 1, 1875; J. C. Wilson, June 1, 1876.

SURVEYOR GENERALS

F. M. Case, 1861; John Pierce, 1862; W. H. Lessig, — T. B. Searight 1874.

MANAGERS U. S. MINT.

Geo. W. Lane, 1863; J. F. L. Schirmer, 1869.

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