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MINERS' CONVENTION.

It was expected at the date of our last issue that a preliminary meeting of the miners of Southern California would be held in the early part of March looking to the formation of a Southern California Branch of the California Miners' Association. But it being fully intended that there should be, and at this proposed preliminary convention, a representative from every mining district in Southern California, and finding the time named too soon to accomplish this, it was deemed best by the leading spirits of the movement to postpone the meeting to a later date.

Definite arrangements have been made for holding a general convention at the Los Angeles Chamber of Commerce on Saturday evening, April 29th, to which it is earnestly desired that every section should be represented.

It would be to the interest of the mining fraternity of Southern California for all districts and mining camps to hold meetings to elect and send delegates to the convention, which it is desired shall be as thoroughly representative of the mining interests of this section as possible.

This is the most opportune time for the delegates to the convention to come provided with characteristic specimens properly named and marked of the ores of their district, to be placed in the collection of the Chamber of Commerce of Los Angeles. It would then present an excellent means of advertising your mineral resources in the building where this and future meetings are likely to be held.

MILLING CUSTOM ORES.

This is a branch of the mining industry that requires regulating for, in most cases under the present system, no sampling is done before milling the ore so as to ascertain value. The ore is run through the mill and the owner has to take results as reported amount saved. The amount in the concentrates is not in all cases reported or paid for, and the amount lost in the tailings, be it large or small, is not reported at all. To the small mine owning only a limited amount of machinery and shipping to a custom mill a small amount of ore, to ascertain milling value or obtain a little funds to help out development, if the ore is in low grade the business is often sure to be less than was expected, even allowing for a return only of 85 per cent of its original value. On that account, the returns made by custom mills ought to show:

1st. Original value of ore as sampled before milling.

2nd. Amount of gold saved in battery and amount saved on plates.

3rd. Value and amount of concentrates, if any.

4th. Sampled value of tailings.

The above or similar form of returns ought to be furnished to mine owners patronizing custom mills. What is writing on this subject is the result of recent complaints from small mine owners who have had the above experience to discourage them. The milling business is one from small sources of ores, and prospects is at present conducted in an unsatisfactory and unbusinesslike manner, greatly to the injury of those who own the prospects or mines, and also to the manufacturers of milling machinery for such ores. It is better for mine owners to pay higher freight rates and ship their ore to such sampling and testing mills as make a specialty of such work. In regard to those operating custom mills ought to consult the wishes of owners in furnishing all data possible.

FOREIGN EXHIBITIONS.

The benefits to be derived from extended trade is the chief reason why such "World Fairs" as the Paris Exposition ought to be made the occasion of having the natural resources of our country well represented. As a means of attracting capital to invest in the mining industry, such an occasion cannot be neglected, or the State which does so will suffer a loss in consequence.

Recent events in the Orient and Pacific have opened up an outlet for trade in all Asia and Australasia. It is known that the trade center of the United States has already or will soon be located still further west. On this account the great natural resources of the Pacific Coast States have acquired an increased value and importance. The mining activity of the past year has received a competitor for distinction in trade expansion and industrial development of our neglected resources in the western coast States. The construction of new railway lines has already been commenced and will have to keep pace with the onward march of progress.

For these reasons, the Paris Exposition of 1900 offers the best opportunity for the Western States to present to the capital of the world seeking investment an exhibit which will command attention and admiration, and divert trade and capital to this section.

TRUSTS AND THEIR EFFECT.

There is a degree of prosperity in the country. The manufacture and sale of metallic products is unusually large. The increased demand for them is a result of a long period of depression, in which extreme economy was practiced in their consumption, and of the needs of the war in which the country has been engaged.

The healthfulness of our foreign commerce has also stimulated energy, and our financial condition has been strengthened by the favorable commerce of the years. The activity of trade has increased the earnings of the transportation companies, and the steadier markets and higher prices for agricultural products are making capital to farm. There has also been a lowering of interest rates which renders the burdens of debtors less onerous.

But concomitant with this is the threat to our monopoly and the domination of trusts, and through the byways of the United States has been created in the country, the idea of absorbing in the hands of mammoth combinations the production and distribution of the essentials of life has become dangerously prevalent. Assuming that through control of production and distribution large profits on investments will be certain, capitalizations and stock exchanges of plants and stocks of individuals are taken in at enormous over-valuation, and accounted as cash capital, in other words, trusts are loaded with nominal capital. The effect will necessarily be inflated expectations of profits.

Competition will not be encountered, for to destroy it is the object of trusts. Yet, inflated expectations and insatiable precursors of panic. The object being wicked, the management of trusts is likely to be extravagant and dishonest. When one of them goes down, its failure will have a far-reaching effect, as it will be contagious, facts and stocks of individuals are taken in at enormous over-valuation, and accounted as cash capital, in other words, trusts are loaded with nominal capital. The effect will necessarily be inflated expectations of profits.

It will be the first effort of trusts to create artificial prosperity—in order to enhance their earnings and the value of their stocks. But the evils which trusts will ever commit are bound to produce intense popular hostility, and, in consequence, their liability to fail will be immensely enhanced. Their methods will be resisted and their solvency questioned. In fact, it is quite impossible to create confidence in that which is based upon sordid motives. The most permanent of enterprises, industrial or mercantile, are those which are conducted upon fair and honest theories.
already control sixty-five per cent of the business of the country exclusive of agriculture and transportation, and they are still reaching out after more, and when they begin to fail, it will be like an immense earthquake. The depressions cannot continue in this enlightened country, the people are too spirited to submit to it.

REDUCED RAILWAY RATES.

The Santa Fe Railway has taken a wise step in the number of local trains that are daily exploring unknown sections of the desert. The Needle's sharp edges are indeed a nuisance to the coal and wood, and the deserts are more easily traversed by the railway than by the local trains. The Needle's severity is not as bad as it used to be, but it is still a thing of which to beware. The Needle's sharp edges are indeed a nuisance to the wood and coal, but the railways are more easily traversed by the railway than by the local trains. The Needle's severity is not as bad as it used to be, but it is still a thing of which to beware.

BLOW-PIPE ANALYSIS.

The ever-increasing development of the mineral resources of the States has naturally attracted a number of tourists who are daily exploring unknown ground in search of the precious metals. Many of them are old prospectors, but many more are enterprising adventurers, to whom the pleasures of discovery are more than a mere sport. The laws and simplest of appliances, to determine the presence or absence of ore under examination of gold, silver, copper and lead. He should also be able to determine by comparing the results of his assays with the whole amount tested, the comparative richness of the ore. He should remember, however, that for anything like exact quantitative work a blow-pipe, months of study and laboratory work are necessary.

The common blow-pipe is a curved conical tube of metal, usually brass, terminating in an orifice as large as a fine needle; simple as it is, it is made, it will be found to answer fairly well. The danger of moisture collecting in the ordinary tube and blown into the flame, as well as the danger of the flame being extinguished by the tube in two, about one-third the way from the small end, inserting an ordinary cork in the long end of the large piece, making a hole in the cork, and inserting the freshly-cut end of the small pipe in the cork. The chemical blow-pipe is similar to the common blow-pipe in principle, except that it has a chamber near the end, which collects the condensed moisture.

Where possible, one should have the chemical blow-pipe, but where it cannot be obtained, or becomes injured in any manner, a contributing the one above described, affords a fair substitute.

After obtaining a blow-pipe, the beginner must spend a few hours in learning the proper method of blowing. His object will be to maintain a steady, uninterrupted stream of air from the jet several minutes at a time. This is not so difficult as it would appear at first. Distract the cheeks and breathe slowly through the nose for some time, keeping the cheeks inflated all the time. When one can accomplish this readily, the mouthpiece may be applied to the lips, and the operation repeated without attempting to blow, or do more than keep the cheeks well filled with air. As the air is blown through the blow-pipe, the cheeks fall together and must be again distended, without interrupting the flow of air through the tube. To accomplish this, open the mouth between the mouth and lungs by the palate and inhale through the nose. No energy should be wasted in hard blowing, for the beginner will soon see that the stream of air may be maintained with scarcely more force than is supplied by the natural tendency of the inflated cheeks to collapse.

Where obtainable, gas is the most convenient combustible for the blow-pipe flame, but rape-seed oil in a lamp, with large round wick, is the best for general use, as it can be packed in small compass and weighs but little. Any other liquid, when no better material is at hand, and of these high-grade stearin are the best, for paraffin candles, although giving a higher heat, are apt to soften in warm weather. In some instances even tallow candles will answer, but they require constant snuffing.

In an ordinary flame, as from a lamp or candle, the combustion only takes place on the surface of the flame. But the stream of air which blows into it from the blow-pipe, however, the combustion that takes place in the interior is more complete, and an intense heat is produced. When the beginner can maintain a steady stream of air for several minutes, he should heat himself at a table with his arm resting on the edge, and the lamp lighted and trimmed, so as to produce a full, steady, but not a smoky flame, slightly to the left of his face. He should then hold the blow-pipe lightly between the thumb and first and second fingers of the right hand, and direct the jet or small end, to the edge of the flame. To regulate the blowing, a steady flame should be produced, which will be regular and conical, with the fire well shaped.

When the lamp burns, the oil sucked up by the wick is vaporized and mixed with the oxygen in the air and burn on the outer edge of the flame, forming a hot core. As the oxygen does not penetrate inside the coat, the vapor within are highly heated out of contact with the air, and any metallic oxide placed within it, will when hot tend to part with its oxygen to the carbon and hydroxide of the flame. This flame is known in blow-pipe work as "Reducing Flame," abbreviated to "R. F." By holding the blow-pipe just outside the flame, and deflecting the whole flame by a gentle blast, so regulated that it is a yellow color and is luminous, the reducing flame is succeeded by a blow-pipe. No soot should be deposited upon the assay, and only the extremity of the luminous part should envelop it.

The other blow-pipe analysis is the "oxidizing flame," abbreviated "O. F." and the manner of producing it with the blow-pipe is by inserting the jet somewhat into the flame, the blast made a little stronger and the carbon more completely consumed. The inner blue cone of the flame is sharply defined, and is surrounded by a nearly colorless envelope, at the extremity of which metal may be intensely heated in contact with the air, and rapidly oxidized. No luminous streaks should be allowed to appear in the flame, and assay should be kept as far as possible consistent with a temperature high enough for rapid oxidation.

Before passing from the subject of the flame it must be remembered that the heat is most intense at the tip of the blow-pipe and referred to, and this is used to test the fusibility of substances without regard to chemical action.

For the purpose of this article, but five methods of supporting the assay, or "supports," as they are technically termed, may be considered—charcoal, platinum, wire and forceps, open and closed glass tubes. Charcoal should be made from bass wood, pine or willow, and should be of even texture and cut into rectangular blocks from one to three inches in length, the same in thickness, and not exceed six inches in length. The assay should be placed either on a flat surface, or in a cavity prepared for it at right angles to the rings of growth.

When an excavation is made for the reception of the assay it should be cup shaped, shallow, smooth and regular. This may be effected by picking a hole in the charcoal with a knife and revolving it in the rounded end of the agate pestle.

Platinum wire is used for supporting beads made from fluxes. The size known as No. 27 Jeweler's hole 1/2" is best. It should be cut in pieces three inches long and a loop made in one end. Care should be taken that the loop is not too large, especially when a candle is used. After using the wire the looped end should be thrust in a bottle of sulphuric acid, and before using them should be rinsed with water, and then dried in a hood.

Platinum forceps can be readily made by any jeweler from elastic brass wire, the tips being made of platinum wire, welded on for holding splinters of substances in the flame and to avoid their fusion or in the length of the agate pestle.

Open Tubes—A piece of straight glass tube about three inches long, not exceeding a quarter of an inch in diameter and slightly rounded at one end. This slight angle help to prevent the assay from falling out.

Closed Tubes—A closed tube may be readily made by heating an open tube (six inches long) in the middle and drawing it out. Thus closed tubes three inches long are formed.

In addition to the above-named articles a certain amount of accessory apparatus is necessary, including an agate pestle and mortar to be used in reducing ores to a fine powder, but it should be used for grinding only, never for pounding hard bodied; a four-ounce hammer; a small rectangular block of hardened steel to be used as an anvil. On this, after first wrapping them in stout paper, the harder ores may be pounded into pieces of suitable size for grinding in the agate mortar; a dozen test tubes of hardened glass of standard size (six inches long); Substances used in the chemical changes in bodies by which they are recognized, are known as re-agents or fluxes. But small quantities are needed, and it is best to purchase them in small packets, so as to be sure of their purity. Those most commonly employed and the only one necessary to be mentioned in this article are sodium carbonate, hereafter spoken of as soda, bi-
borate of soda, or borax, and phosphate of soda, and ammonia, or microcosmic salt.

Two ounces of soda will be ample to have

on hand at a time, and it should be kept in a glass-stoppered bottle, so as not to absorb moisture from the air.

The same quantity of commercial borax is sufficient as is ordinarily pure enough, but it is always best to heat a loop of platinum wire, dip it in the borax and fuse it to a bead in a "R. F." and then heat it in the "O. F.", examine the bead when hot and when cold, after heating in each flame, and if the bead remains round, is colorless and transparent the borax is pure. Ammonia or microcosmic salts should be pure. One ounce is all that is necessary, and it, like borax and soda, should be kept in a tightly stoppered bottle and labeled.

Two ounces each of the following acids (all in glass stoppered bottles):

Concentrated sulphuric acid.

Concentrated hydrochloric acid.

Pure or "test" lead must also be purchased. Eight ounces will be sufficient. Two ounces of pure silver in a sheet is also necessary.

About eight ounces finely pulverized bone ash for making cups, as will be hereafter explained, must be bought.

(To be Continued.)

CORRESPONDENCE

ARIZONA.

(From our Special Correspondent.)

CHLORIDE, ARIZ., March 2, 1899.

A number of mining sales have been made in this district within the past few weeks, the principal one being the Mollie Gibson. The sale amounted to $8,000, and it is considered by all who know it to be many times less than its actual worth. The "Mollie" has considerable underground workings, and much high grade silver ore has been taken out of them, but the principal and most important discovery ever made upon it since its location was made only a few weeks ago. This was at the bottom of an eighty-foot shaft, when the workmen broke into a large body of native wire and ruby silver. The new discovery created a great sensation in the district and surrounding territory, and many flocked to see it. It was found to be fully as rich as reported, and the discovery has given a great stimulus to other mining and prospecting.

Another sale has been made of two claims belonging to J. C. Snickard and Chas. Gross. These were merely prospected, but showed up very well. One claim was sold for $2,000, and the other for $1,500. It is rather a bond and lease instead of a sale, but a large per cent of the purchase money, which was away up in the thousands, was paid down, and the impression prevails that the sale is as good as made.

Another sale is one which is favorable for a deal, the Golconda, belonging to E. F. Thompson, of Kingman, and Mrs. Mary B. Smith, of Morning Park. The mine is a gold producer, and a four-foot body of gold ore is shown in the breast of the 125-foot tunnel. Formerly the Golconda was a shipping mine, but some litigation in the matter of administration upon the death of Mr. Smith ensued, and the property lay idle for more than two years. Two months ago, however, matters were so nearly straightened out that a lease was given and some work done, which opened up this last fine body of ore. The property has never been handled by thorough and practical mining men, and now that a sale is about to be made, which, consummated, will place in large force of men at work, and this mine again become a steady producer and shipper.

Kean St. Charles, after six years of propelling the destinies of Our Mineral Wealth, at Kingman, has gone up the past pot and scissors to Mr. J. C. Doan, of Los Angeles, Cal., and substituted the hammer and drill for the shooting stick and mallet, and has recovered, and will from this midnight gold mine developed, looking to make it a steady and lasting producer. He has now, it is estimated, 1,500 tons of free-milling gold quartz on the dump, that averages $15 to the ton, it is for the driving of the tunnel straight into the mountain which, he believes, will strike or uncover some very high grade ore that Mr. St. Charles is after, all of the work of the valley is forced to the highest success.

Woolcombre is getting more plentiful, and the ensuing spring and summer promise much activity in all the working mines and known prospects.

JACOB MICHIE.

CALIFORNIA.

SOUTHERN CALIFORNIA MINERS' ASSOCIATION.

EDUCATION JOURNAL.-The movement which is at present so far southward as the Southern California Miners' Association, which is to be a branch of the State Association, is of the utmost importance. For many years the State Association has labored in the interests and general welfare of the mining world. The labor of revising our mining laws, the protection of mineral lands and watersheds, etc., has been borne by them, and we of the south, with the exception of a few individuals, have allowed them to do it, and have extended no aid to them in their efforts to build up the mining industry.

Miners who are concerned has now grown to such a magnitude that to protect our own interests and for the general welfare of our section it is now necessary to further advance mining by the formation of such an association, to be made up of a representative membership from all counties south of Tehachapi. Conditions are different here from those of the North, and unless we can make our wants known through such an organization, we cannot expect to be heard. We have the material upon which to build a large membership. Let those at all interested in mining join the Southern Miners Association, and when the call for a meeting shall have been made, let us hope every county will send a large number of representatives to attend and organize the Southern California Miners Association.

Very Truly,

L. E. AUBURY, E. M.

MASSACHUSETTS.

(From our Special Correspondent.)

BOSTON, March 4th, 1890.

EDITOR JOURNAL.-We have just received the last letter there has been something of a slump in the local market, but at the present writing the market shows great strength, and we believe the upward tendency in price will continue for months to come. At the same time we would urge conservatism in the investment of money in new enterprises unless it can be clearly demonstrated that these companies can produce copper at a profit at ten cents per pound. We believe they are applying the ruling price for copper inside one year. Investors should also note the amount of capital reserved for the treasury of these new companies, as it will be impossible to carry on successful copper mining in competition with the Standard Oil people without all modern improvements and the ability to go through lean periods without calling for assessments.

Among the stocks which we consider due for a rise in the near future are Centennial, Alouette, Rhode Island, Victoria, Santa Fe and Mass. Consolidated.

Of the new companies which are about to be floated in Boston, we recommend The Great Lakes Copper Company. We understand that this company will be incorporated under Michigan laws, with a capital of 100,000 shares, par value $25.00, and that the subscription price will be $10.00. An even million dollars will be placed in the treasury. This company owns about 2,000 acres of mineral land in the Prince of Ontario, about 35 miles N.E. of Sudbury. The camp is in the Wabanaite district, where the labradorite are operating on a large scale. The ore is a rich sulphide of copper carrying some gold and silver, and is of a rich smelting proposition.

ROBERT S. BICKFORD, Stock Broker,
60 State St., Boston.

THE DIAMOND DRILL AND ITS WORK.

The American Diamond Rock Drill Co. of New York have issued a catalogue entitled The Diamond Drill and Its Work. The book gives a general review of the work accomplished with a diamond drill, a general description of drills; the special features of their drills, etc., and contains a fund of valuable information. A copy of the work will be mailed to those interested upon application.

LINK BELT MACHINERY.

The Detroit Sprocket Chain Co. (Ltd.) of Detroit, Michigan, have just issued their Catalogue No. 3 of general chains, detachable linking belting and other elevating and conveying appliances. The pamphlet is well written and illustrated, and occupies 16 pages. A compilation of mechanical information accompanies the matter contained in the catalogue.

CALUMET & HEcla.

The report is current in the copper country that Calumet & Hecla are about to quit sinking and adding new levels and will confine its efforts to the stopping of ground already opened. As the report goes the company has enough ground opened to keep them busy for ten or twelve years, and they will rush production while copper is selling at high prices. The bulls probably have been far too enthusiastic in crediting the mine having enough territory opened, and within the last ten and twelve years without opening new ground. Calumet sends out not far from 2,000,000 tons of rock annually. Multiply this by 12 and it gives a total that amounts to a vertical distance of 192 cubic feet of ground. There is no question but that the company could increase its output considerable for the coming few years if it cared to do so, but its policy has generally been a conservative one.

From Ore.
THE MINING SECTIONS OF MONTANA.

Between the auriferous and argentiferous ore-bearing districts in Montana, one can travel from eighty to 100 miles in various directions and keep within the bounds of mineral belts. In consequence of the large area and the multitude of excellent prospects and mines worthy of mention, space forbids more than a brief review of the properties particularly notable on account of their output and showing.

Although the first explored in the state, Madison county's mines contain a wealth, at present the least developed, that will demand the brawn and brain of generation to come.

Granite county has been known for years as a silver producer, second to no other part of the earth,—the Granite Mountain Mining Co. alone having paid over $12,000,000 in dividends while the Bi-Metallic, Hope, Trout and many others have been successfully worked and paid handsome returns to their owners.

As rich a field for the legitimate exploration and development of the chief industry of the great Northwestern country as Jefferson county, is hard to find, especially in this true of the districts immediately surrounding the Little town of Basin. Late years have developed this county wonderfully, and a smile greets the visitor everywhere he may find himself within the county lines.

In a previous issue the Journal gave a short description of mines and mills working in Jefferson county, but nothing was said of the great Diamond Hill property in the St. Louis district. This great property was purchased by John S. Miller in 1895. There is but little history connected with the mine. As early as 1896 the placer ground at St. Louis and down Indian creek were discovered and worked for over twenty years yielding nearly $5,000,000 in gold. Indian creek heads in the Elkhorn range of the Rockies and flows into the Missouri near Townsend. Diamond Hill is about half a mile above St. Louis. Below that hill there was good placer ground until it was worked out, for some five miles down to the canyon of the creek; and below the canyon on the high plateau is an enormous stretch of placer ground which has been worked for over a quarter of a century and is still worked two or three months of the year, which as long as water can be had. Now there is no placer gold found above Diamond Hill in any of the gulches. This proves to the practical miner that the Diamond Hill veins are the mother lode from which the gold found along Indian Creek has been ground up and distributed in ancient geological times.

This Zone of precious metals now known to be from 200 to 300 feet in width and more than 2,000 feet long, containing several million tons of oxidized ore, the greater portion of which will pay a profit to mine and mill and a very large portion of which will average $10.00 per ton in free gold, besides the sulphur-ettes, that are contained in the ore. No one can say to what depth this oxidized ore may go.

A mill of 140 stamps was erected by Mr. Miller on the Diamond Hill property in 1895.
The plant is one of the most complete and perfect in that section of the country, is fitted with concentrators and other modern gold-saving devices. The mill has a working capacity of 3000 tons per day. Ore can be mined and milled for about $1.50. The power utilized to run the mill is water. All the improvements about the plant are most substantial and first-class. The property was equipped with a five-stamp mill, which did good service, until a 40 stamp battery was erected, proving the value of the ground, and causing the management to operate on a more extensive scale, by building the 140 stamp mill above referred to.

The mining sections of the county are in the Mechanics, Judith, and Belt ranges. The former two lying within ten miles of each other and the formation being similar in character. The ores vary considerably in both sections, there being free milling gold and silver ores, sulphides, lead, copper, iron and zinc. The general formation in the Judith and Mechanics is lime, porphyry, slate, quartzite, shale, massive granite, and gneiss. The principal leads so far discovered are contact veins with limestone footwalls and porphyry hanging walls, though some few free milling gold leads have been discovered between porphyry and blue quartzite. Blanket leads are common and characterize some of the best properties.

Although Cascade county is one of the small counties of the state, containing as it does only 2,500 square miles and a population not exceeding 25,000, it is nevertheless one of the most important. It certainly gives promise at some future date of containing one of the largest cities of the Northwest. The principal mining sections lie in the immediate vicinity of Belt and Sand Coulee. Though Belt was very little known prior to the spring of 1894, its coal banks had been worked more or less for nearly twenty years. The vein of coal now being worked is known to exist for a distance of forty miles.

In speaking of Lewis and Clarke county, the Helena Board of Trade had the following to say: "The statement that Helena is in the greatest mining bearing zone than any other city of Montana is easy of proof. Within a radius of 25 miles of Helena are some of the greatest gold and silver producers in the state. South of the city is the great gold bearing Unionville district, where is located the celebrated Whitlach-Union mine, which produced in the '70's several million dollars, and which is yet a great proposition. West of Helena is the town of Rimini, a silver camp almost exclusively, which has yielded millions of dollars in silver. Tributary to Rimini is the Cataract district, which has within its borders one of the richest mines in the state. In a previous article the Journal spoke of sections of this county and it is unnecessary to make any further remarks here.

Speaking generally, Flathead county is certain to rank as a mineral producing county. Along McDonald creek north and east of Mac Donald lake, veins of copper-silver ore have been discovered, which have attracted capital. Crossing northward to the North Fork of the Flathead river one may find scores of copper claim locations in the mountains that skirt that stream. To the west of Flathead valley, is the famous Montana-Kootenay region, in which considerable work has been accomplished.

Missoula county adjoining Idaho and especially that rich district known the world over, the Coeur d'Alene must of necessity contain much mineral, although as yet but little attention has been given to the mineral industry except in a few instances and it would seem that the success thus attained would have a stimulating influence on those interested in mining. The principal mining district of the county is the southwestern portion along the line of the Coeur d'Alene branch of railway. This county is the only county in the state producing antimony.

The principal business centre of Park county is Livingston, which is geographically located to command the trade of a rich territory immediately surrounding it. About 50 miles from Livingston is the Cooke City, which has been considered one of the most extensive mineral zones in the state, but progress has been retarded by the lack of any railway facilities by which to bring the ores to market.

One of the chief industries of Gallatin county is the coal measures found in 1867 near Bozeman and which have since developed into considerable magnitude. While it is a well-known fact, that gold, silver, iron and copper lie hidden beneath the surface in this county, but little has so far been done to open up the prospects already discovered. Whether from the fact that the lodes found are not valuable enough, or, that the finances of the prospector were inadequate to go ahead and work them the writer is unable to state.

Beaverhead county's principal industry is mining, which is carried on to a considerable extent. A good deal of attention is being given to the copper district east of Dillon. The Birch Creek Camp also near Dillon is a steady producer of gold, silver and copper. Nock which always has been a prosperous camp, was more active during the past year than for some time. Several large dredging plants were constructed to work the placers which proved to be a success, and gave satisfaction to those interested in work-
The mining and metallurgical journal

ing on such an extensive scale. Lessees are employing a large number of men working the quartz claims located in the vicinity of Dillon or, in fact, all over the county.

Deer Lodge county has been made famous the world over by having within its confines one of the largest smelting and copper refining plants in the world—the Anaconda, which consists of the Upper Works, Lower Works, converter, electrolytic refinery, foundry and brick yards. At the Upper Works between 700 and 800 men are employed, at the Lower Works 1400, at the converter plant 350; at the refinery 100; at the foundry 300;

tremely rich mines have been discovered and worked. The principal mining districts of Deer Lodge county are known as Granite, Butte, Poorman, Bald Butte, Elliston, Ontario, Elk Creek, Coloma, Gold Creek, Pioneer, Blue Eyed Nellie, Georgetown and Zozel.

In these districts there are stamp mills with batteries of from 250 to 300 stamps.

The remaining counties of Montana are Custer, Yellowstone, Valley, Ravalli, Carbon and Sweet Grass, with very little if any mineral developed within them.

Doubtless rich fields await the prospector in this great section of the state of Montana.

The discovery of immense bodies of low grade ore in Cripple Creek 7 years ago started a competition among metallurgists for cheaper processes, including cyanide and chlorination. Improved methods of concentration were also employed and the new Willey and Woodbury tables are the result.

Pyritic Smelting, while not particularly new, having been conducted with varying success for more than ten years past, has also been greatly improved over the original "Aus-

at the brick yards 60; making a grand total of between 2,900 and 3,000 men with a monthly pay roll of over $250,000. In the works throughout no expense has been spared in placing the most approved machinery and methods in operation, and the magnitude of the plant cannot by any possibility be realized by one who has not personally visited and spent at least a week in examining its wonders. Of the minerals of Deer Lodge county the chief is gold with copper closely following.

At the extreme north and south ends of the county gold is found in large and paying quantities. In the southern part some ex-

WARD SMELTER.

DENVER, COLO., Mar. 9, '99.

Ward district, Boulder county, Colorado, is one of the older mining sections of the state, the first discoveries of gold being in the early '60's. But the fact that only the surface was free milling stuff and that the oxidation ceased at a comparatively shallow depth varying from 20 to 50 feet and was succeeded by a sulphide that yielded scarcely any values in ordinary milling, caused most of the prospectors who drifted in to leave for other fields. The general grade of the ore in the district is tin' process. The modifications introduced by various metallurgists within the past 5 years have taken the system out of the realm of an experimental process and pyritic smelting, in its best phases is readily accepted as an economical dressing of low-grade ores carrying iron and copper particularly adapted to the class running high in sulphur, the combustible qualities of which are largely utilized in this concentration by fire.

The cut shown herewith illustrates the Ward Pyritic Smelting Co.'s plant, one of the newer modifications of this class of smelting. The matte is formed either on a 3 per cent,
copper base or iron as may be expedient accor-
ding to the character of the ore dressed. The inven-
tor of this process, Mr. J. S. Loder, has been a per-
sistent experimenter along these lines for many years.

The smelter differs materially from all others in mechanical construction. The heating chamber through which cold air is forced under high pressure and heated before entering the smelting furnace, is water jacketed and equipped with a system of fans to prevent the atmos-
phere from becoming too hot. The furnace contains a double layer of tuyeres and double issue portals on one side, out of which slag and matte begin to flow in a continuous stream, no pauses occurring within one and a half hours after charging.

The matte and slag flow together in water jacketed cars which remain stationary, the pure slag running off into a conduit leading into the creek. The matte containing the mineral values is drawn off into another car and cooled ready for shipment to the refinery. While it is not practical to give at this time a detailed description of the invention, it will be sufficient to say that it promises to be a most important discovery. The smelter has the advantage of affording ample room for the simultaneous operation of several furnaces. The metal is discharged hot to prevent any one of the furnaces being over run, and the sizes of furnaces are such as to provide ample capacity for the production of all the slag and matte required.

An examination of the view given of the smelter and site will show what is known locally as the iron mountain. The smelter was located late last fall at this particular point on account of the proximity of heavy mineral veins, which with development promise a heavy production.

About one-half mile east of the smelter, Col. Wesley Brainerd, local manager of the Chicago Colorado Mining Company, which has large holdings of mineral lands in the vicinity, has opened up a hill 300 feet in diameter as the Molteke lode from which very high grade silver ore has been shipped, but which closed down, when silver was demonetized. Several thousand feet of work have been done and a very strong vein exposed. West of the Molteke, the Leviathan tunnel now in about 200 feet has cut into the same formation, which at this point is intersected by Ajoalo belt, a mine of the same mineral content.

The railroad, as will be seen by reference to the illustration, cuts across the face of the hill and the line of the tunnel. In doing the grading for the construction of the road bed a heavy contract for several feet walking from $25 to $30 a ton, was cut, which will be taken by the Leviathan tunnel within the next 100 feet. A heavy net work of veins has been located on surface so that while the tunnel is a crosscut for about 150 feet a large amount of territory will be opened for exploitation with the progress of the work. The owners have been encouraged not only by the location and performance of the Molteke, but by the excellent grade of ore, to let some large contracts for development and believe they can market a grade of ore being a few dollars below the market that would otherwise could not be profitably produced. The smelter people have a parallel tunnel of which is practically the floor of the smelter which will cut the same vein system as the Leviathan. Across the gulch north they have also secured another property carrying a high per cent. of copper, but the smelter is still shut down, when the smelter is shut down on account of the snow blockade, which prevents the moving of ore from the mines. Surface of the water, less than a half mile from the Puzzler in a cross-cut 600 feet in from the portal of the tunnel. The ore running as high as 10 per cent. copper, has been mined in the Ward Rose shaft one-half mile southeast of this. Rose properties prove that with de-
velopment Puzzler and Saw Mill hill (in reality the same) will furnish higher grade ores than any other portion of Ward district. Owing to the heavy snows shortly after the smelter blew in but a short run was possible before the snow shut down all re-
computer for smelting of ore. With the opening of the new season however, the Colorado and North-
western Railway which is just emerging from its first snows of 9,000 feet and upwards, plans an extension of its line and in prospecting in the way of snow sheds and fences and will build switches to all of the producing mines so that an abundant supply of ore may be assured to the smelter when it again blows in. In addi-
tion to the smelter, there are several mills with concentrators in successful operation and from the present outlook Ward will in 1899 see preparations by the new millers and heavy production that has yet experienced. The great Adit tunnel which closes the Mammouth Dew Drop vein longitudinally for a distance of over 1,200 feet, 300 feet below surface, can also furnish to furnaces and transportation facilities are ample and low grade iron ore to keep the two millers in operation. With a single season's work to demonstrate beyond cavil the value of the Puzzler district and it is at least improbable that at least one more and of much larger capacity will be erected within the district.

The fact that the smelter buys ore on the same schedule that the smelters pay and can take small lots at a time if no more is offered will give a great stimulus to prospectors and small miners whose limited capital and meager development prevent large shipments. The treatment charge makes it possible to market certain classes of ore, whose gold and silver content does not exceed $6. The active de-
velopment in progress and projected all over Ward district within the past year is ample proof that the day of waiting for capital to come in and buy prospect holes has passed and the erstwhile prospector has under the stimulus of new economic methods of treatment become the practical operator who believes in developing his property as a business proposition.

P. A. LEONARD.

Miscellaneous Mining News

James A. Fleming, president of the Black Warrior Copper Company, has contracted with the Colorado Iron Works at Denver, to build all the machinery for a leaching plant of 200 tons of ore capacity per day. The machinery will weigh all told about 100 tons, says the Silver Age.

It consists partly of a 100 horse power Cor-
ligeng engine, two 500 horse power marine boilers, one large Blake crusher, two sets of rolls that weigh 16,000 pounds each, an air com-
pressor, a blower, and a large tank of tar containing eighteen tons of twelve-pound T. rails.

The leaching plant is designed throughout by Mr. Fleming and is unlike anything now building in this country and will be unique in operation with four men for 200 tons per day. Mr. Fleming has applied for a patent on his process.

On the Moore Claim, one of the claims owned by the Black Warrior Company, they have a depth of thirty-five feet of ore and have not struck the hanging wall yet. The ore is about 17 per cent. copper. This ore ledge at the surface, 300 feet above, is fifty feet wide, out of which 1000 tons have been shipped from the grass roots that aver-
aged over 14 per cent.

The Metallic Accident mine, Mohave Co., which was worked for its rich silver ores, is now found to carry thirty per cent of copper. The discovery was made this week and prepara-
tions are now being made to operate the mine on an extensive scale.

CALIFORNIA.

AMADOR COUNTY.

The Emerson shaft of the Wildman-Mahol-
ney properties at Sutter creek is now down a little over four hundred feet, with work pro-
gressing as rapidly as possible. The new reservoir is completed, and 4000 feet of water pipe is in completing their system for water power throughout the property. They are having trouble with water, however, for they are compelled to shut down part of their plant part of the time on account of its shortage.

About sixteen men are at work in the Esperanza, near Mokelumne Hill. At present operations are being confined to the 10,000-foot level, where drifting in the ledge is being prosecuted. The ledge matter is being tested in the mill, ten stamps of which are operated constantly. —Amador Ledger.

CALIFORNIA.

Grading for the new mill at the Gwin still con-
tinues. Two Burleigh machines are be-
ing used, and when the rock is broken it is moved by the hydraulic process, a sixteen-
inch pipe having been laid from the tank for that purpose.

J. Burton, representing eastern capital, who is at present operating the Green Mountain hydromine district in Chili gulch, has commenced operations on French Hill. A shaft has been sunk to a depth of some 300 feet from the bottom of which a drift has been run about fourteen feet and good gravel encountered.

EL DORADO COUNTY.

The German mine below El Dorado is now being rapidly developed. A five-stamp mill has been running for some time and the re-
results have been so encouraging that the com-
pany is now adding ten stamps to its crushing capacity.

The sluice boxes of the Blue Rock mine at Georgia Slide, owned by Raw, Frederick's and others, were recently robbed.

A five-stamp mill is being erected on the quartz mine operated by F. Thomas & Co., near Gold Hill.

INYO COUNTY.

The mines in Tuber canon in the Panamint country are proving their excellence. The Montegomerys have milled the dump, all that came out of two deep shafts, one of them nearly 400 feet in depth, and it all averaged $25 per ton. This is a wonderful showing. They are now milling the cappings, and it all pays. This mine will prove one of the best in the country. —Phoebe & Co., of San Francisco, who hold 1/10 of the property, will make the biggest mistake of their lives if they don’t take it in. —Inyo Register.

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THE MINING AND METALLURGICAL JOURNAL

KERN COUNTY.

The Randsburg Miner publishes an exhaustive and well-written article, February 18th, regarding the mill of the Yellow Aster Mining Co., at Randsburg, in which it says:

"The crowning feature of the whole is the steam power and electric plant. The two immense boilers are either of them capable of generating sufficient power to drive the whole plant, equipped with duplicate pumps, injectors and heaters, so as to prevent a possibility of an entire break down from that source. The fuel used is crude petroleum, which flows to the burners by gravity from a large 30,000 gallon tank above the mill. There are also duplicate pumps for feeding petroleum in case of heavier oils."

The St. Elmo.

This famous mine which created so much excitement in the early days of the camp, and from which so many fine specimens have been taken, is now being worked again. It has lain idle for a few months and the reason why is not clear. From its location, and the mine itself indicates it, if there is a mine in the camp that goes down it ought to be the St. Elmo.

The Johannesburg Reduction Works has taken a lease for one year on the mine and have put on the force of men under the management of Wythe Walker, and are taking out ore. It is stated that they require that they sink a number of feet each month in addition to drifting and stopping. The work will be carried forward carefully and systematically and the St. Elmo mine may yet justify the highest opinion once prevalent in this camp in regard to it.

LOS ANGELES COUNTY.

Work is steadily pushed on the Red Rover Mine at Acton. A $1,500 bar of gold bullion was brought into Los Angeles from a run of 125 tons of ore in January last, and shipments of a similar size have since been made. The one above mentioned was not the first cleanup made in January, but the third. The shaft is being straightened through, and the tire present depth and levels will be established every 100 feet; the shaft to be sunk to the 1000-foot mark. A new hoist is to be placed on the property and the mill enlarged to twenty-five stamps instead of ten.

The stockholders in the company are Senator Stephen M. White, Governor Gage, Judge Erskine M. Ross, Geo. J. Denis, E. B. Carpenter, E. B. Millar, Schroeder & Johnson and H. O. Collins, with George J. Denis president, and H. O. Collins secretary.

SAN BERNARDINO COUNTY.

The St. George mine at Vanderbilt is becoming one of the best gold mines on the desert. The property was falsely represented to the bonanza kings, Flood and Mackay, who bought it some years ago for $50,000, and dropped it after expending nearly as much more upon it. A. C. Campbell, the present owner, has developed a ten-foot vein of base ore running from $20 to $10 a ton at a depth of 175 feet.

TOLUCA MINE.

At the Mazepa mine, near Stent, the shaft is now down 185 feet and they continue to hoist ore, liberally sprinkled with free gold, from the bottom. At the annual meeting of this company, which was held in San Francisco, February 16th, some changes in the directors were made. C. R. Bishop, who is one of the sugar magnates of the Hawaiian Islands, was chosen a director and vice president of the company. Geo. L. Bishop was chosen a director and elected treasurer. Regarding the rumor current that a 10-stamp mill will be erected at once, Superintendent Penrose states that he has not heard of it. The company purposes opening up the property thoroughly first, necessary funds for this purpose having been provided.

At the Excelcior mine, above Confidence, three shafts are being worked. Development is being pushed day and night. Work on the new 20-stamp mill for the Brown Mining Co. at Tuttletown, is progressing rapidly and satisfactorily.

The additional ten stamps being put in at the Black Oak mill, Soulsbyville, are ready to commence operations. At this mine a canvas plant is now being erected.

Chas. E. Shaffer has sold his interest in the Crystaline group of mines located adjoining the Rawhides properties to a Scotch syndicate for $500,000. The property is well developed by tunnels and open cuts. Active work has been carried on for the past few years.

COLORADO.

Around Idaho Springs.

John Butts made a shipment of some good smelting ore from his Harrisburg mine near the Freeland, Idaho Springs, Clear Creek Co. Noble & Co. made a shipment of 125 sacks from the Lamartine.

A carload of six pipes for the Wilcox tunnel arrived. It is now being put in place and the work of driving the tunnel ahead will be prosecuted vigorously.

A. E. Simpson made a fine shipment from the Little Albert, close to the Donaldson, netting over $100. Value mostly in gold.

A strike of fine ore was made in the Main Trunk by A. C. Chiodi. Ten inches of solid iron and copper ore, besides a large streak of mill dirt.

A fine streak of good ore was opened up in the Gem Extension mine on the first level, the walls of the vein are now twenty feet apart and all the dirt taken from between goes to the mill except a streak of about one foot on the hanging wall, which is worth perhaps $100 per ton.

The Hudson mine in Virginia canyon is to be started up. A new shafthouse will be built and a new hoist machine will be put in place immediately. The mine nine years ago produced some very good ore. It is one of the group of the Idalia Tunnel Company which flourished here some years since. M. M. Pomroy as president. The tunnel was driven several hundred feet in and then abandoned, and for the last ten years has lain dormant. It is very gratifying to note the different old properties in this camp that are being started up this season. It surely indicates a season of prosperity for Idaho Springs.

Granite Active.

Work was temporarily suspended on the Belmont, at Granite City, preparatory to the deciding of where is the best point to sink and other matters which have to be taken into consideration before commencing aggressive development.

The Monte Cristo has about twenty feet of its upraise done, leaving forty feet more to be accomplished before connecting with the shaft. The face of the upraise shows a good body of about foot in thickness and streaked with several strings of hard ore. A shoot is being constructed and everything conducive to economical handling of ore is being carefully considered. Where the connections are made the shaft will be about 230 feet deep, and the present work will be the means of exposing a fair quantity of ore, as the shoot has been explored 100 feet east from the 170 foot level.

George Lewis and O. Johnson are still pegging away on the New Strike and are liable to strike a good body of ore at any time. The indications point that way and they have the positive knowledge that it is ahead of them, so that the question simply resolves itself into one of getting ahead as rapidly as possible.

One of the most important strikes made in Hinsdale county lately was made on the Clara L. A tunnel had been driven on a parallel with the vein, striking a barren spot. A shot being put into the vein to give more room for the car to pass, broke down the barren rock and disclosed mineral resembling the ore taken from the famous Golden Fleece. Specks of pyrite are sprinkled all through the vein, and sample assays run as high as 87 ounces in gold to the ton. The Clara L. is located on Buckley hill, directly opposite to the Golden Fleece mine. It is owned by O. B. Oliver, W. S. Cole and F. M. Miller. A few months ago Wm. Lawton, one of the owners of the Clara L. at that time, found it a very difficult matter to dispose of a half interest for $500.

The management of the Tom Thumb mine is now freighting out to Welcott, Colorado, a carload of good grade carbonate lead ore to be shipped to Denver.

The Elkhorn mine, in Whiskey Park, has been compelled to shut down, owing to the depth of snow rendering it impossible to get in wood for fuel for the engine. They have left exposed in their bottom drift a nice body of ore.

IDAHO.

At this season of the year we hear very little of placer mining and of the extensive work that will be done in the Florence basin next summer. The Florence Dredging company, with a capital of $50,000, divided into 1,000 shares of stock at $50 each, with R. Gordon Wood as secretary, are already making inquiries as to lumber for the coming season.

The officers of this company are: J. H. Myer, president; H. S. Hare, vice-president; W. H. Pickering, treasurer; R. Gordon Wood, secretary; R. C. Beard, superintendent.

This company has been formed and incorporate under the laws of the state of Idaho, for the purpose of mining for gold by the method of dredging, and the particular field of operation chosen is Florence, Idaho county, where thirty years ago large veins of gold ore were secured with comparatively little exertion. This camp is credited by the government reports with producing in the neighborhood of 5,000,000 worth of placer gold.
MICHIGAN.

Oscoda.

The Oscoda Consolidated Mining company produced 15,688,028 pounds of mineral during 1898, which would give about 13,000,000 pounds of copper. The total cost of producing copper, including construction, was $1,178,028 and the net earnings were $317,791. About $91,000 was spent in construction. The company has a balance of assets of $655,333.

Wolverine.

The Wolverine Copper Mining company has declared a dividend of $1.50 payable April 1st to holders of stock of March 21. The mine is producing from 215 to 219 tons of mineral running 77 per cent. of copper and is about to put in a new stamp mill, to be equipped with a 10-foot level and the present price of the metal it is making fine earnings. It is evidently building up a surplus with which to construct a new stamp mill, and is not remaining well at the present price of its shares. It is not capitalized as high as 40,000 shares as the new concerns it is well managed and has a rich lode. Copper producers predict $50 per share before next June.

MINNESOTA.

An announcement made early last week means much for Duluth in an industrial way. It is the fact that the blast furnace at West Duluth had been leased to a company that would open it up in the near future for the manufacture of pig iron, and it is said that the intention is to turn pig out to the full capacity of the furnace.

The institution is a 50-ton furnace, but it has been operated with a double shift, so that 110 tons have been turned out in the course of a day.

The plant passed into the hands of the bondholders last fall by an order from the United States court. For several years it has been idle, but it is known as an excellent furnace, and as soon as the lessees can get it in shape the work of converting ore from the Mesabi range in to Duluth will begin. The new company will be equipped with a new high-class furnaces and will be ready to start in a short time. It is a fact that many of Duluth's best friends have long claimed it could be successfully done here, and it is said that the people who have taken hold of this proposition are abundantly able to make a success of the venture.—Duluth News-Tribune.

Scramble Mine.

That the Risdon pump is a success is demonstrated beyond doubt February 20th. Supt. Kerwin and Manager McM. Ross descended to the 1700-foot level of the Gould & Curry shaft, and at about two p.m. water was turned into the pump. After getting the shaft in a minute and a half of time and putting it to work, it was lowered into the Sutro tunnel under a 900-pound pressure. The water was reduced in the shaft at the rate of a foot a minute, the stream running through the Sutro tunnel like a millrace. A steady pressure was maintained at the 1700-foot level. Not a leak was discovered in the entire pipe. Great enthusiasm prevails the success of the pumping plant and it is regarded as the turning point for a new era on the Comstock.

NEW MEXICO.

Output of Hillsboro Mines.

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Total output since January 1, 1899—2,255.

—Hillsboro Advocate.

OREGON.

Messen, Godfrey & Tabor, owners of the prolific Red Boy mine, have just brought in to the Baker City First National Bank a huge gold brick valued at about $25,000, the result of three weeks' work at the mine shaft, which has 20 stamps.

The Red Boy is one of the best properties in the famous Granite district, and the equipment of the 20-stamp mill and its accessories are considered to be the finest machinery of the kind in the northwest.

About three weeks ago the Red Boy sent in a gold brick worth $24,000, the result of a short run.—Democrat.

SOUTH DAKOTA.

Machinery has been purchased in Denver for a steam hoist to be erected by the Gold Coin Company over the shaft which has been started on ground near Custer.

A good body of ore, assaying upwards of $72, has been struck in a drift in the property of the Illinois Dakota Copper Company, in upper Strawberry. The number of producing mines in that vicinity is causing mining men to look upon that district as one of the most promising camps in the county.

A force of men was put to work recently on the new tunnel which is to be run by the Detroit & Ogdensburg syndicate on the copper property on City creek.—Black Hills Mining Review.

UTAH.

Daly West of Park City resumed operations on the first with 135 men on the payroll. Shipments of high grade ore will commence at once and be continued regularly, and the concentrating mill will be placed in commission to handle the low grade ore in a few days. A beam is predicted for the Dalton & Lark of Bingham as soon as some big deals are closed. The capacity of the mill at the Daisy mine of Mercur is being increased to 200 tons daily.

The Geiser-Marion of Mercur is reported in fine condition and improving as development progresses. It is reported there is a news strike of ore on the Galena of Fish Springs. A very fine grade of copper ore is being extracted from the Horn Silver mine of Frisco. The Northern Light mine is snowed up, and it is doubted if a road can be opened up before the first of May, but the process of backing the high grade ore goes on steadily, and the blocking out of very large bodies of milling ore continues without interruption. South Swansea of Silver City declared a dividend of five cents per share.

WASHINGTON.

Three cars of ore from the Second Relief, near Brie, B. C., have been received for treatment at the Northport smelter. The mine is owned by Finch & Campbell of Spokane, and the ore shipment had a customs valuation of $2,650, or $41.20 per ton.

The Republic Mining and Improvement Co. is working force of men on its group of claims adjoining the town of Republic. The group consists of the Jesse, Wasp and other claims and a shaft is being sunk on the
big quartz showing. Thos. Conlan, Capt. Miller and H. L. Lilienthal are heavily interested in the company.

The San Juan shaft is now down nearly 40 feet and the ore has widened so as to take in the entire shaft. Ore bins are being built to receive the assorted ore.—Miner and Electrician.

FOREIGN MINING NEWS

BRITISH COLUMBIA.

The recent strike in the True Blue has widened out until there is now three feet of ore in sight.

A fine chute of ore is said to have been uncovered in the lower tunnel of the Adams claim, one of the Canadian group just above the Ruth mine at Sandon last week.—Telegraphist.

MEXICO.

The fact of the anthracite coal fields being worked by the Southern Pacific Co., in Sonora, Mexico, 100 miles east of Ordis Station, in the western part of Altar district, points to the possibility of a new road for Sonora, and give the Pacific Coast a connection with points of Western Mexico other than by water.

Richard M. Rich recently found a valuable vein of four feet wide near the line of the Rio Grande, Sierra Madre and Pacific railroad. The ore runs 50 ounces of silver and 30 per cent copper to the ton.

It is reported that an English company has offered $3,000,000 gold for the Esperanza mine near El Oro.

Some rich veins of copper ore have been discovered near Carretas, not far from Chihuahua city. The ore assays 12 to 37 per cent copper.

Thirty bars of silver, valued at $30,000, arrived at Chihuahua from the Cusihuiriachi mines. The consignments of ore valued at $500 each ton at the station ready for shipment to the Juarez smelter.—Mexican Financier.

Pedro Prieto has leased for a term of years the Dolores mine in the Santa Eulalia district, to a Kansas City syndicate. The mine is producing a gross income of $40,000 worth of ore weekly, and Senor Prieto under the lease has a royalty of twenty per cent of the net profits.

The completion of the Chihuahua and Pacific railroad will give a renewed impetus to the development of the mines in the Guerrero district, many of which have for a long time been on a shipping basis, and many await the advent of better transportation facilities to get their product to the smelters.

The new owners of the La Reina mine, near Cusihuiriachic, are getting rich through the big shipments they are making from their property. It is said that the property has already produced a half a million dollars, and the ore bodies are scarcely reached.

Santa Eulalia Mines,

At the present time, the principal activities are in the vicinity of Santa Eulalia, one of the famous producing localities in Mexico.

In the early days the Spaniards worked the mines there and they have put up millions of dollars in large scale development. The mining tradition has it that the last piece of native silver ever taken from a mine was taken out in the Santa Eulalia mines. The mining, however, was at a standstill, but little more than surface work, very few shafts of depth having been sunk. To test the quality of the existence of ore bodies at greater depths the Chihuahua Mining Company has sunk a shaft to a depth of about 1,000 feet, opening up a large and fine body of ore running from 50 to 100 ounces silver, and from 10 to 15 per cent lead. The Kansas City Smelting Company is now making some development in this district, and renewed depth given to the workings of the original Santa Eulalia mine, has resulted in uncovering a vast body of fine smelting ore. Both of these companies are making regular shipments.—Chihuahua Enterprise.

latest Mining Decisions.


Gen. St. $2400, requiring the locutor to sink a discovery shaft on the ledge to show a well-defined crevice, does not require the walls of the veins to be exposed. Fleming et al. vs. Dally, 55 Pac. Rep. (Col.) 947.

Where, in a contest over conflicting mining claims, the evidence and arguments adduced to one or of the claimants, charge that, if neither was found to be entitled, neither could recover, was properly refused. Fleming et al. vs. Dally, 55 Pac. Rep. (Col.) 947.

A petition by a mine owner under division 5, Comp. St. 1887, for a right to construct a ditch over another's claim, must allege that plaintiff attempted to come to an agreement with the owner as required by section 1407, and failed. Glass et al. vs. Basin Mining & Concentrating Co., 55 Pac. Rep. (Mont.) 1047.

Where in contest over a mining claim, the jury was permitted to view the ground, so as to enable them to intelligently consider the evidence they had heard, a charge authorizing them to make independent investigation of their own was properly refused. Fleming et al. vs. Dally, 55 Pac. Rep. (Col.) 947.

Where the undisputed evidence shows that, if a vein was discovered at all, it was discovered in a discovery shaft sunk as required by Gen. St. $2400, the court need not on the issue of discovery confine the question to the discovery shaft, nor define a legal discovery. Fleming et al. vs. Dally, 55 Pac. Rep. (Col.) 947.

Evidence that a person who had negotiated the sale of a mining lease agreed to take an interest in it for the commission due him, not appearing what that interest was, and no part of the lease being assigned to him, is insufficient to show a legal assignment between the parties. Caley vs. Coggswell, 55 Pac. Rep. (Col.) 939.

Comp. St. 1887, div. 5, $1417, authorizing a mine owner to petition for a right to construct a ditch over another's claim if the right "shall not have been acquired by an agreement," requires the mine owner to make an unsuccessful attempt to acquire an interest before filing his petition. Glass et al. vs. Basin Mining & Concentrating Co., 55 Pac. Rep. (Mont.) 1047.

One agreeing to permit another to mine ore in a specified territory and to pay a certain sum per ton thereof, must permit the mining of ores remaining in the territory after delivery of large quantities of ore, which included ores taken outside the territory, amounting to more than the ores remaining in the territory. Worthington et al. vs. Given, 24 So. Rep. (Ala.) 739.

Evidence that a miner worked for a owner of a mining lease as a common miner, without exercising any authority or ownership, and without being consulted as to any operations; that the operations were carried on at a loss which the owner required the miner to share, is insufficient to establish a mining partnership between the lease owner and the miner. Caley vs. Coggswell, 55 Pac. Rep. (Col.) 937.

One who has located a claim, filed his notice, and procured a survey thereof by the United States deputy surveyor, as required by law, cannot be deprived of his property because the surveyor failed by mistake to include all that was covered by his location notice, where the mistake was cured by a resurvey under the orders of the interior department, and within a few days after the resurvey was completed. Basin Mining & Concentrating Co. vs. White, 55 Pac. Rep. (Mont.) 1049.

Under Rev. Stat. U. S. § 232, requiring a mining location to be distinctly marked on the ground, so that it can be readily traced, and all records to contain a description sufficient to identify it; and Pol. Code, §§ 3610, 3612, requiring the locutor to post a notice at the point of discovery, giving the length claimed along the vein each way, and its general course, as near as may be, and within ninety days thereafter to file a declaratory statement giving a description of the claim sufficient to identify it, the locutor, having posted the notice stating the general course of the vein, may swing his claim in any direction required to include the vein, within ninety days, and this though the notice laid the course to the points of the compass, no bad faith being shown. Saunders et al. vs. Noble et al., 55 Pac. Rep. (Mont.) 1037.

California Antimony.

The price of antimony has recently advanced, partly in sympathy with the general rise in the price of metallic minerals, and more live interest in the metal among prospectors and miners promises an increase in the California product. Last year but forty tons were produced in the State, while in former years the amount has been 150 tons. The metal cuts a small figure in the mineral industry of the State, but there is a good many interesting things to be known about it, says the San Francisco Call. One thing not generally known is that owing to the metallurgical difficulties of working antimony ores none of the big custom smelters anywhere capable of mining it, the market is one of San Francisco's unobserved industries. There is a little institution at Ninth and Division streets, operating secret processes and working twenty-four hours a day with twelve men divided into two shifts, charging $1.50, this smelter produced 300 tons of the commercial metal, the ore coming from Nevada, Utah, Idaho and elsewhere on the coast, California, contributing but forty tons. This product
represents the working of about 600 tons of ore. The ore is stibnite, or sulphide of antimony. About 60 per cent of the ore is stibnite, and the remainder is pyrite, which is found in the State, but especially in an eight-mile mineral belt in San Benito county, where it is predominantly in cinnabar, and in Kern county. A good deposit of cinnabar has been located, and there are many listed antimony mines in the State, but only two or three are producing, and that flintly. Many others are being brought to, exploited and offered for sale, but the peculiarities of antimony mining keep the mine owners from doing much business, however, they can't be made money.

Chemically pure selenium is worth $2 a pound, $50 a ton, but its production forms its price range from $5 to 40 cents. The common form of selenium has risen from $1.08 to $0.95 since December. The price is made by the Pacific Coast monopoly, the Chapman Smelting Works Company, which regulates its figures by New York and London prices. The Japanese product is the only one that is sold, and when shipments from Japan are risked prices are cut and it is announced that no Japanese selenium will be allowed to net anybody a dollar over here. Some time ago ten tons were imported from Japan, and again a ton was sold last week at $975. The Chapman Company succeeded three years ago to the plant and the business of the company now operating in New York. A number of interesting things were told about the business the other day by C. Solomon, Jr., the head of the Pacific Coast concern. The product of the Coast is yet small, he said, and the coast is quite a deal looks some for shipment East. San Francisco consumes about sixty tons a year. It is used by machine shops for Babbitt metal, for chilled shot, by type founders and stereotype and for the work of linotype machines. We shipped a carload of sixteen tons to St. Louis the other day, and have sent several carloads there in the past few months. California would and will produce a great deal more, but there is so much about the business that the miners don't understand. There are plenty of stibnite mines in the State, but only a few will pay to work, because the ore is not rich enough to be dug out that carries less than 40 per cent antimony. Pure stibnite carries 71.4 per cent of antimony and 28.6 of sulphur. Other metals are always in the ore, and working is a costly process. Only forty pounds of ore are used at a charge, and it goes through the fire three times. Our commercially pure product gives this analysis: Antimony, 43.9; arsenic, 4.9; lead, 0.42, copper, 0.15, and iron, 0.25, together with some other impurities. The smelting processes used are secret, and, of course, not patented. The metallurgical methods of refining antimony are found out by following the books the cost would be from $1 to $15 a pound. The improvements are kept as business secrets. We use the Hallett process used by one of the London smelters, and the Cookson process is used in New York and by the other London firm, the two American firms having secured pupils of the originators of the processes.

One feature of the business is that the antimony miners are always kicking and thinking they are not getting the going prices. They can't understand the business. They expect returns on the assay value of their ores as with other ores, but some of the antimony is always lost and antimony ores are always paid for by 'quality and produce only.' Another mystery is that they get nothing for the gold and silver in their ores. All the ore we get contains gold and silver contents, but it is disregarded and thrown away. The ore will carry from $2 to $60 a ton and from $20 to $50 a ton of silver, but it would cost from $200 to $300 a ton to get it out. I have heard so many kick about this that I wrote recently to Vivian, Younger & Bond of London to learn their practice, and here you see they say: 'We could not make any payment for gold and silver contents, for you are doubtless aware that the problem of separating the precious metals from antimony is one of the most difficult problems of the day and the investor of any cheap process of doing this would soon make a fortune.' Not long ago I offered ore carrying 200 ounces of silver and 40 per cent antimony to a big Denver smelting company and they would not give anything for it. You see, an assayer may give a prospector a wrong idea of the value of his claim. The assay may show 50 per cent antimony and $75 a ton in gold and silver, and he thinks he has a rich find. He gets paid for 5 to 8 per cent less antimony than the assay shows and nothing for his gold and silver and he curses the smelter.

"A California shipper gets about $12 less for his ore than he could get in New York, but this is the railroad charge to New York. The Kern county ore we get averages over 50 per cent of antimony. The miner would receive $3 per ton at San Francisco. If he has twenty miles from a railroad it will net him, say, $23 a ton at the mine, which is better than the average gold mine. There are many large claims that have from 15 to 25 per cent, but it does not pay now to work such ore. There is a good market for the ore and many claims need development more than they do a promoter."

That is the California antimony situation and these are the terms and conditions offered by the Pacific Coast monopoly. The leading mine now producing is about twenty miles from Mojave, with an 80-holt shaft, some drifts and 100 tons of ore on the dumps which the owner will not sell just now.

Mining and Prospectors' Guide.

The Los Angeles, Cal., assays were always considered as energetic and progressive, and have now demonstrated the above to be the fact. The printing and advertising done by them is something wonderful. The latest thing out in printed matter is the miner's and Prospectors' Guide, issued by James Irving & Co., the gold miners and assayers, located at 128 North Main street. It contains 150 pages, giving a synopsis of the United States mining laws and regulations thereunder; state and territorial mining laws of California and Arizona; valuable information regarding metals, also valuable information to the miner.mineral water, if it is well gathered and very concise. Send for one.

PERSONAL NEWS ITEMS

Governor Bray of Alaska has lately visited Washington, D. C., and in speaking of the boundary question, he has come out in favor of the rapprochement between the miners along the line.

C. B. Carter, a mining engineer of Chicago, is in Deadwood, S. Dak., where he will visit the different camps, as soon as the weather becomes settled.

A. C. Rounds has recently arrived in Peralta, New Mexico, from Denver, Colo.

H. B. Goodrich, M. E., has lately left Chinshinh Mine, for his home in Bonanza, N. Dak.

G. S. Shubert, of San Francisco, Cal., is in Chinshinh, where he expects to engage in mining.

E. B. Stanley, of H. D. Skinner Co., of Spokane, Wash., left for Sherman, Mich., a few days ago to look after some mining interests.

Raymond C. Cook, a wealthy Klondyke, spent a few days last week in Spokane. From there he went to Seattle.

Harry Shallenberger and J. F. Young have lately returned to Spokane, Wash., from a two weeks trip through the Boundary district.

E. G. Dennison, proprietor of Dennison's San Francisco office, was one of the visitors of the Journal the other day.

W. S. Webb, third Vice President of the New York Central, with a party of thirty-five is in Los Angeles, Cal.

O. A. Vandercook, of San Francisco, has gone to the mining mill at the Sheepriat mine, near Kingman, Ariz.

Sterling Mahon was lately appointed foreman of the Yellow Aster mine, Randolphia, Cal. He was for my foreman of the Creston mine, Mines Quiets, S. Ariz.

Felix C. Vogel, in company with his brother, has lately established a Technical Bureau in the City of Mexico, Mex.

C. L. Farquhar has lately been making an annual visit of inspection to the Santa Fe Mining Company's property in Lower California, of which he is director general.

W. H. Jeffers, the mining engineer of Rossland, B. C., has lately made an examination of the Rulhul- lulaire district, Boundary district, B. C.

J. Stanley Muns, formerly manager of the Gold and Silver Extraction Co. of America, Denver, Colo., has gone to examine some mining properties at Port lincoln, Charleston, W. Va.

C. T. Mixers, of Iapening, Mich., has lately returned to Boston from his third trip to Nicaragua. He expects to go to Joplin, Mo., in a few days.

Edward L. Dutroche of Aucott, Fram & Friel, mining engineers, has lately left New York for Peru and Bolivia. He expects to make an extended professional trip in these countries in the interests of a New York syndicate.

J. Scott Fessett, of New York, is in San Francisco on his way to Korea, with men and machinery to work the mining properties conveyed by the recent arrangements.

D. L. Parker has lately returned to Deadwood, S. D., from the East, where he went to see about his interest in some mining matters.

Henry Schmitt, who for a number of years conducted the assay office at Lead, S. Dak., has lately taken charge of the office again.

Professor Romberg and Spencer Phillips are in Deadwood looking at the pitch石ite prospects of the Black Hills, in which he is very much interested.

Mr. Barbier, chief assayer for the Galena Mining & Smelting Co., while engaged in crushing ore, was struck in the eye by a small bit of rock, totally destroying the sight.

J. F. Bridal, of Spokane, Wash., has returned from examining the Dora mine. He made five assays, ranging from $5 to $30 per ton.

H. M. Porter, owner of the Snake and Opportunity mines near Hillshoro, N. M., expects to erect another mill in a short time so as to handle the increased output of the mines.

T. D. Moone expects to pay a visit to his mines in the Clark mining district, Arizona, in a few days.

M. A. Becke, of Kaslo, B. C., has lately left to examine some mining property near Yellowstone Park, Montana.

D. W. King, ore buyer, arrived in Kaslo, B. C., a few days ago.

F. O. Hend and J. E. Ryan, mining men of Medford, Ore., are in Grant's Pass, Ore., for a few days.
THE MARKETS.

All quotations, financial reports and other statistical figures given under this head are New York quotations, unless otherwise stated in the text. These figures are carefully compiled and are considered to be a very accurate indication of the market situation.

New York, March 14, 1899.

The following are the Silver, Copper and Lead quotations for the last two weeks:

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<thead>
<tr>
<th>Date</th>
<th>Silver</th>
<th>Copper</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar. 14</td>
<td>1.25</td>
<td>13.30</td>
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<tr>
<td>Mar. 12</td>
<td>1.25</td>
<td>13.30</td>
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<td>Mar. 11</td>
<td>1.25</td>
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<td>Mar. 10</td>
<td>1.25</td>
<td>13.30</td>
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<tr>
<td>Mar. 6</td>
<td>1.25</td>
<td>13.30</td>
<td>12.30</td>
</tr>
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Silver.

The silver market has been quiet, with business done at slightly declining rates. It is to be noted, however, that the rates for spot and future have been converging in such a way that March silver has commanded a price only a little under metal for prompt shipment.

Copper.

The unusual demand for copper is continuing, and the price of copper on the London market is continuing to rise. The copper part of the market quotations were $14.50 per ton, and the latter part of last month the quotations were $15.25 per ton. Today, the quotations remain firm, and the market is expected to move higher.

Lead.

A steady increase in the demand for lead has raised the price to $4.35 per ton with a prospect of it going even higher. There have been considerable quantities of lead withdrawn from the market at a high price, and it is expected that this will be followed by a rise in the price of lead accordingly.

POTASSIUM CHLORIDE.

Purified 99.5 per cent, in cases of 120 lbs. at 32c. per lb, in 5, 10, 25 and 50 lbs. at 30c. per lb, in 50 lbs. ths at 28c. per lb.

Quick Silver.

The New York quotations are unchanged at 7.50 per lb, with 7.50 per lb. as a basis for second ends.

Quecksilver.

The New York quotations are unchanged at 7.50 per lb, with 7.50 per lb. as a basis for second ends.

Chemicals.

Carbonate of Potash.

Carbonate of Potash, 85 per cent., is quoted at 25c. per lb, with 25c. per lb. as a basis for second ends.

Petroleum Coke.

The trade in coke at St. Louis is reported very quiet, and the price is unchanged at 40c. per lb, with 40c. per lb. as a basis for second ends.

Sugar.

The sugar market is firm, with prices remaining steady at the current market price of 18.12c. per lb.

Platinum.

Prices are now quoted at $15 and $16 per oz, New York. The London quotations are $20 and $21 per oz. Supplies are not large and prices are firm. The market is considered firm, with prices ranging from $15 to $16 per oz.

Minerals Wanted.

Gold and Silver Quartz Specimens, Crystals, Opals, Turquoise, etc., etc.

Buy in any quantities—pay good prices—Cash.

E. C. Moller

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"The Miner's Friend"

Often Imitated—Never Equaled

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RECENT IMPORTANT IMPROVEMENTS

The Handiest, Strongest and Most Efficient Steam Pump for General Mining and Quarrying applications. Ranch, Irrigation, Drainage, Coal Washing, Tank Filling, and for Pumping Back Liquids and for using in connection with sediment. Muddy or gritty liquids handled without injury to the Pump.

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Portland, Oregon.

CATALOGUE ON ALLOCATION

CORRESPONDENCE SOLICITED

Pulsemeter Steam Pump Co.

130 Greenough Street, New York City
The MINING AND METALLURGICAL JOURNAL

FINANCIAL NOTES

Average Prices of Metals in New York per pound from January 1, 1898, to October 1898.

<table>
<thead>
<tr>
<th>Month</th>
<th>Average</th>
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<tbody>
<tr>
<td>January</td>
<td>79.37</td>
</tr>
<tr>
<td>February</td>
<td>79.37</td>
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<tr>
<td>March</td>
<td>80.58</td>
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<tr>
<td>April</td>
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<td>August</td>
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<tr>
<td>September</td>
<td>86.69</td>
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<tr>
<td>October</td>
<td>86.69</td>
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Average Monthly Prices of Silver.

<table>
<thead>
<tr>
<th>Month</th>
<th>Average</th>
</tr>
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<tbody>
<tr>
<td>January</td>
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<tr>
<td>September</td>
<td>86.69</td>
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<tr>
<td>October</td>
<td>86.69</td>
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Gold and Silver Imports and Exports. At all United States ports, October 1898, and year from January 1st, 1898, to October 1897.

<table>
<thead>
<tr>
<th>Month</th>
<th>Gold Imports</th>
<th>Gold Exports</th>
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<tbody>
<tr>
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<td>February</td>
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<tr>
<td>March</td>
<td>1,687,342</td>
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<td>1,752,341</td>
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<td>May</td>
<td>1,707,352</td>
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<td>June</td>
<td>1,802,353</td>
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<td>July</td>
<td>1,857,354</td>
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<tr>
<td>August</td>
<td>1,902,355</td>
<td>2,300,632</td>
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<tr>
<td>September</td>
<td>1,957,356</td>
<td>2,350,633</td>
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<tr>
<td>October</td>
<td>2,012,357</td>
<td>2,400,634</td>
</tr>
</tbody>
</table>

For Sale at a Bargain.

The Cleveland Mining and Stock Exchange Co.
New England Building, Cleveland, Ohio.

The Reliable Information Bureau for Miners and Investors to obtain FACTS Regarding Capital and Mines. Stocks and Mines listed. Send for prospectus.

James Irving & Co.
New England Building, Cleveland, Ohio.

JAMES IRVING & CO.
REFINERS
Largest and most complete equipment in Southern California. Cyanide and Mill Test.

All the mining camps of Utah and Colorado are located on or reached by the Rio Grande Western Ry.

The RIO GRANDE WESTERN RY.

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CRIPPLE CREEK:
The Greatest Gold Camp in the World, only six years old and two hundred shipping mines in the district.

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MACHINERY

John Wigmore & Sons Co.
MACHINERY

Leather, * Canvas, Rawhide, etc.

L. P. DEGEN, Manager

BELTING

Leather, * Cotton, Canvas, etc.

Johnie Wigmore & Sons Co.
MACHINERY

Leather, * Canvas, Rawhide, etc.

L. P. DEGEN, Manager

BELTING

Johnie Wigmore & Sons Co.
MACHINERY

Leather, * Canvas, Rawhide, etc.

L. P. DEGEN, Manager

BELTING

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Leather, * Canvas, Rawhide, etc.

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ORE TESTING

Complete mill for testing ores on practical scale by all processes to determine the best process to select when treating ore submitted. Process in use investigated to overcome unnecessary losses, etc.

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Metallurgists & Chemists.
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Successors to San Francisco Tool Co.'s Trench & Tung. Dept

MINING AND PUMPING MACHINERY.

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Serving the mining and mining community.

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AIR COMPRESSORS,
ROCK DRILLS,
Stone Channelers,
The Pohle Air Lift Pump,
Coal Cutters,
THE INGERSOLL-SEGERER DRILL COMPANY,
PARKE & LACY CO., AGENTS, SAN FRANCISCO, CAL.

LUMBER

FROM CRIPPLE CREEK

AIR COMPRESSORS,
ROCK DRILLS,
Stone Channelers,
The Pohle Air Lift Pump,
Coal Cutters,
THE INGERSOLL-SEGERER DRILL COMPANY,
PARKE & LACY CO., AGENTS, SAN FRANCISCO, CAL.

HAYEMEYER BUILD'G

NEW YORK

New Catalogue No. 32

New Catalogue No. 41

Catalogue No. 72

Special.

THE PORTLAND GOLD MINING CO.,
(STOCK TRANSFER OFFICE, Colorado Springs.)

Mines at Victor, Colorado. 

This was found to be too small for our needs after about a year's use, and is purchased from a single machine which is a perfect match for any machine we have ever seen, and this type is well worth the extra cost on account of the great permanent economy.

The Portland Gold Mining Co. is not employed exclusively with your drills and we have only the highest words of praise to give them.

Our very truly,
The Portland Gold Mining Co.
Jan. 23, 1883.

JAMES P. BURNS, P.E.T.

JOHN HAWAN, GEN. MAN.

J. H. CONRAD, ASST. MAN.

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The Portland Gold Mining Co.
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The Improved WONDER Irrigation Pump

We also Build Vertical Style for Mining Purposes. Write for full particulars and Catalogue.

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Randsburg
Gold Fields
REACHED VIA
Santa Fe Route

Leaves Los Angeles 10:30 a.m.
Leaves San Bernardino 11:30 A.M.
Arrives Barstow 2:15 P.M.
Leaves Barstow 4:45 P.M.
Arrives Bernardo 8:45 A.M.
Arrives Los Angeles 11:20 A.M.

Returning Trains
Leaves Barstow 11:00 A.M.
Leaves Bernardo 5:30 A.M.
Arrives Los Angeles 9:30 A.M.

A through passenger coach is run between Bernardo and San Bernardino.

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Stage leaves Randsburg for Barstow on Sunday and Thursdays at 7:30 a.m., returning arriving at Los Angeles on Saturdays and Sundays at 9:30 a.m.

SAN FRANCISCO OFFICE
628 MARKET ST.
LOS ANGELES OFFICE
100 S. SPRING ST.

Reliable Assays

<table>
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<th>Gold</th>
<th>50 Copper</th>
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<td>Silver</td>
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<tr>
<td>Gold &amp; Silver</td>
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Samples by mail receive prompt attention.

Ogden Assay Co.,
1429-16th Street,
Denver, Colo.

FOR SALE.

Two thirds interest in a well developed gold mine in Oma Ana County, New Mexico. A few miles from railroad. Property has not been worked in over 10 years. Claims are in the hands of the original owner who is an eastern man. Mine makes about one gallon of water in 24 hours--sufficient for working purposes. Has few development workings consisting of shafts and drifts. Wood costs 10 per cent. delivered; coke is to be had from 20 cents, which is also the nearest smelting point 30 miles distant. Formations are granite with sulphur and copper ore. Trees range from 25 to 25 feet wide. Pay streak 4 to 6 inches at the surface with value of $2.00, widening to a foot at bottom of 50 feet shaft having a value of $5.00. Ore taken unconnected, 400 to the ton while main workings 200 to 300 feet. Claims can be reached by two men in one month's time. A large tonnage of ore is now being shipped to St. Louis. The owner of the two thirds is desirous of selling his controlling interest, and arrangements can be made for the purchase or holding of the remaining third upon reasonable terms.

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A. W. HARREL, 604 N. M.

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Of Power Transmission, Apparatus, Patent cold rolled steel shafting Cast Iron Pulleys, Couplings, Ball and roller bearings, belting, sheaves, V belts, V belt pulleys, V belt sheaves, V belt drives. Also valuable notes on engineering.

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Catalogues mailed free to parties interested.

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WEBBER PATENT COMPRESSION GRIP

Bleichert Wire Rope Tramways,
AND OTHERS, MANUFACTURED BY
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TRENTON, NEW JERSEY.

ENGINEERS AND CONTRACTORS

No logs nor knots of any kind required on the traction rope, giving longer service, and saving in repairs.

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ARE SOLD BY
H. H. SHAW, BUCKLEY & CO.,
SAN FRANCISCO

MADISON LANE
NEW YORK

Importers of Carbon for Diamond Drills.
## INCORPORATED MINES PAYING DIVIDENDS

<table>
<thead>
<tr>
<th>NAMES OF MINES</th>
<th>LOCATION</th>
<th>No. of Shares</th>
<th>Capital Stock</th>
<th>Par Value of Dividend</th>
<th>Date of Last Dividend</th>
<th>Total Amount Paid in Dividends</th>
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N. B.—Companies not listed have not paid a dividend for the last twelve months.
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Car will DUMP in any Direction; automatic; has few parts and less liable to get out of Order than any of the patent cars for handling ore. Send for catalogue No. 3 describing cages, wips, buckets, wheels and axles.

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FOR PROSPECTING FOR and DEVELOPING MINERALS
Rock Drills for Sinking, Drifting and Stopping

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of British Columbia, which of late has been attracting considerable attention, is best reached by the Oregon Railroad and Navigation Co. The fact has recently been brought out that the Kootenai district contains within its borders more High Grade Silver and Lead Mines than any other part of the world. The recent discoveries of Rich Gold Lodes makes it the most attractive country for the Capitalist Miner and Prospector to visit in search of mines.

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Assaying of Ores, Furnace Products, etc.
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Assistant Chemist for the Watson Iron Furnace, Fort Gratz, N. J.
Chief Assayer for P. F. Case Smelting Works, P. F. Case, Texas.

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The JACKSON DRILL and M’F’G. CO.

PRACTICAL EXPERIENCE.

SAN DIEGO, CAL., NOV. 11, 1898
The JACKSON DRILL & MFG. CO.,
Denver, Colorado

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Rock Drills, which gave perfect satisfaction. One man
can do the work of three men, and with much less exer-
cition, thus making a great saving in expense. No mine
can well afford to be without them.
(Signed) W. A. PTOLEMY

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Dealer in
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Cable Address, "Jack Drill," New York
Write for Circulars and Testimonials
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The National
Feed Water Heater
Highest Premium at World’s Fair
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THE CYANIDE PROCESS.
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The Best for
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and Smelter
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