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DEVELOPMENT OF A PROSPECT.

In the event of the discovery of minerals of commercial value, the next move on the part of the prospector or mining engineer is to be to prove extent and value. The easiest and least expensive manner of proving quantity is by cutting trenches or "cutting in" across and along the outcropping of the mineral deposit. If the deposit is known to be of considerable extent, it is best to cut a trench a few feet wide and at least ten feet deep. This exposes the whole face of the deposit and makes it possible to determine its true dimensions. When the deposit is of a size that makes cutting trenches impractical, it is best to cut a soil trench and then to take a soil sample. The deposit is then exposed and its true extent can be determined.

The next operation involves the proving of value in depth, by sinking a shaft or shafts and driving tunnels where the ground has sufficient elevation to justify the expense. This is a more costly and time-consuming process than the previous operations, but it is necessary to determine the true value of the deposit.

The first fifty feet from the surface down, or the back of the vein, ought not to be worked or stope out, but should be left as a protection from the weather, and as a support to the surface wall rock, and to render the future operation of the mine in depth more secure against falls of wall rock. This is a point on which much stress cannot be put, as it is the prospectors' besetting sin to stope out surface ore. Many good miners have been made much more expensive to operate from this cause alone, especially where rain falls is heavy, and surface water and ice are caused to drain or gather in the workings. The first one half of the working should be left to be not less than fifty, or seventy-five, or, in some cases, one hundred feet from the surface. The surface ore, left untouched in the first fifty or more feet, forms an ore reserve (even those who were fortunate enough to get in ahead of the stampede and secure ground where they could make something) it has been clearly shown that we were right in our view of the beginning. If the herds of wholly unprepared tenderfeet had not rushed blindly ahead, but made a few observations of the country through which they were passing, a great deal of the hardship, which would have been averted, and a better showing of gold dust would have been made.

The second lesson is to avoid the temptation to rush blindly ahead without proper preparation. The experience of the Klondike has shown that the most successful operations are those that are carefully planned and executed. The success of the Klondike is due in no small part to the careful planning and execution of the operations. The Klondike is not just a wild and woolly place where anything goes. It is a place where careful planning and execution are essential.

WHERE THE ADVANTAGE LIES.

From the beginning of the famous Klondike excitement, when reports were daily received of fabulously rich finds (?) being made in the vicinity of Bonanza and Hunker Creeks, this Journal has been of the facts, figures and results too numerous to mention, why there were no chances for prospectors, from this country or elsewhere, of making even enough to pay their way thither, to say nothing of the supplies and outfits necessary for an expedition to that dark and benighted land of snow and ice.

From what miners say, who are returning and have returned to the land of the living (even those who were fortunate enough to get in ahead of the stampede and secure ground where they could make something), it has been clearly shown that we were right in our view of the beginning. If the herds of wholly unprepared tenderfeet had not rushed blindly ahead, but made a few observations of the country through which they were passing, a great deal of the hardship, which would have been averted, and a better showing of gold dust would have been made.

We were not alone, however, in our contention as numerous other journals, which had foresight enough to observe what the outcome would be, urged prospectors to look before they leaped, and gave timely advice; among them was the Alaska Mining Record, a journal published on the line of travel to the famous gold fields (?) We take the following from a recent issue of that estimable publication, which we heartily endorse.

"Last word goes forth without challenge that the facts are simply as this paper has long contended, and further that the American side of the boundary line holds far greater promise than the Klondike side. The incoming prospector dependent on his individual efforts for a competency, or a mere existence. If these facts can be impressed on those contemplating the journey to the interior, the effect will be to induce them to seek locations upon American soil at once, rather than to stop on the Canadian side, only to be driven by force of circumstance across the line, and thus exhaust their resources. In the United States, there is never been a time when, to the real prospector, the American side did not present greater inducements than did the Canadian, save possibly during the few hours succeeding the Klondike discovery, and preceding the location of the entire available pay ground. Since that time, of the thousands who have gone to Dawson have succeeded, while of those who have passed down the river the large majority have found no cause for complaint, provided always that their outfits had not been in a state of ruins lessening their effectiveness on the Canadian side. It is useless to recount the disadvantages under which the prospector on Canadian soil is forced to labor. The limitations, restrictions, taxation and royalties have been fully and freely put before us, and in some cases, one hundred feet from the surface. The surface ore, left untouched in the first fifty or more feet, forms an ore reserve (even those who were fortunate enough to get in ahead of the stampede and secure ground where they could make something), it has been clearly shown that we were right in our view of the beginning. If the herds of wholly unprepared tenderfeet had not rushed blindly ahead, but made a few observations of the country through which they were passing, a great deal of the hardship, which would have been averted, and a better showing of gold dust would have been made.

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States more rapidly than in any other nation. Trade and money are subjects to be considered conjointly, they are inseparable. Money is defined to be a tool of commerce, and, in order to facilitate it, there must be a supply of it. It is folly to talk about stimulating the increase of manual and mechanical labor in the field of production without first considering whether there are monetary implements with which to help this production on. Raw materials and labor are not more necessary in the productive industries and in commerce than money with which to pay for them and for labor.

The United States is more fortunately situated than almost any other country, particularly in respect to natural resources, in the variety of soil and climate, which enable our people to produce in wider range and greater abundance, food supplies and raw materials, in abundance for manufacturers. No people consume as much per capita as those of this country, who possess so much energy and skill in production as Americans. By reason of our varied resources and our ability to produce, and also because of our large national population, we have a volume of domestic trade very much greater than any other country in proportion to population. Increase of our foreign commerce necessarily adds to our volume of domestic trade.

Statesmen, therefore, must devise a system that will supply the monetary needs of our commerce, and failure of this will cause paralysis to seize upon our business energies.

WHY OUR TINES ARE NOT SOLD

One of the principal reasons that tin mining property does not change hands is the unreasonableness of so many owners. Capital is constantly seeking opportunities for investment; but, in a majority of instances, runs up against the snags which overbear so many possible sales, as they have who millions in prospective, but only hundreds in sight. Why a capitalist should take any more chances in mining than in any other line of business is hard to understand, harder, a claim, prospect, or mine is on the market today that is not placed high above its actual value, said a prominent buyer recently. He referred to services of the owner's ignorance of a mine's value. The slogan is understood that claims and prospects are not mines, and even where ore has been developed that investors will not generally pay more for than is in sight, the sooner will more transfers be made. This leads up to what is termed ore in sight, upon which point so many have little idea. Ask some miners what ore is in sight? and you will probably meet with the response—that they have a shaft down about 40 feet, and, as close as they can estimate, about 40,000 tons of ore in sight. Now, by what method of calculation this is arrived at is hard to determine. Another will claim to have seen, in figures, about $500,000 worth. Ask him what he will sell for? and he will tell you there is no doubt about the figures, which is true to China, and he thinks about $100,000 worth is the right figure. He gives no consideration to the fact that values contained in ore in a mine and but returns are matters to be considered. That it takes money to erect mills, develop water, build roads, etc. In other words, it takes money to mine.

While legitimate mining as a rule pays a better interest on the money invested than any other business, it is neither just nor right to expect impossibilities. Oftentimes a mine, from which every available pound of ore has been stipped, will be placed on the market at a high figure, and the bullion realized will be shown of past production. As well might a merchant pay a high figure for an empty store, simply because in days gone by it had done a good business. Let the mining public consider these matters. Let him be truthful of what he has to sell. For the investor will take an accurate account of stock, and if his shelves are not empty, and his price fair, he will not be likely to dispose of his property.

THE SMELTING VALUE OF ORES.

The small mine owner who has smelting ore or concentrates to sell should bear in mind that it is not always the percentage of metal the ore contains which fixes its value to the furnace owner. The chemical composition of the great majority of minerals in ore and any objectionable elements it may contain renders a careful and complete chemical analysis of the ore necessary to arrive at its true value. On this account an ore containing a high percentage of metal may be more valuable to the furnace owner than one containing a smaller amount, or say 55 per cent metal, on account of the former possessing constituents which go to form fluxing materials. In the smelting districts of the West the mine owners are not accustomed to close figuring on ore values as are the iron ore miners of the East, where competition and freight rates play a large part in the cost of operating a mine. Still the question of smelting value of the ore and its exact chemical composition are matters of such importance to the mine owner in the West that he in his own interests he ought to have a complete analysis of the ore he is shipping. Science in smelting has taken the place of the guess system of operating a furnace of a decade or two ago. It is no longer a question of mingling that one might buy or sell ore, but to know the chemical composition of the ore so that they may obtain from the furnace man the value the ore contains irrespective of its condition. The matter of complete analysis of the ore is one of the small details of the economy of operating the mine which will repay the careful mine owner.

HELP YOUR MINING DISTRICT.

In visiting some mining districts it is too often a matter of surprise and disgust to a stranger to observe the feeling of envy some mine owners display toward an obtaining mine owner. This is not as it should be in the interests of all concerned, for the prosperity which falls to the lot of one in a district, cannot but help the adjoining mines. A rich strike made in a mine in a district ought to be a matter of congratulation to all and not the cause of jealousy. Man must live in harmony with his environment to make a success, and to do so he is properly ought to be the policy of every mine owner. In an honest endeavor to speak well and help your neighbor along you are indirectly helping your own cause. Make the welfare of your district second only to your own interests, and do nothing or say nothing which will tend to retard its progress in the presence of strangers.
SIERRA MOJADA.

The famous camp of Sierra Mojada is located about 76 miles east of the station of Escalon on the Mexican Central Railroad.

The mines are connected with the Central Railway by a standard gauge road which passes over an almost level and desert country and there is no water on the line except that which is caught in dams and stored up for the use of the railroad. They are obliged to haul the water for the use of the employees on the line of the road.

The road also passes through a great salt lake at which hundreds of tons of salt are stored which is shipped to different parts of the country for mining purposes.

The mines of Sierra Mojada are in some respects similar to those of Mapimi, but different materially in other respects. They are situated along and near the base of a peculiar mountain which lies a few hundred feet back of the mines, and in a valley some two and a half miles in width with low rolling hills on the east of the valley.

The general formation is blue limestone the same age and grade as that of Mapimi. The ores are as a rule rather low grade, though they have taken out a great deal of ore ranging from 50 to 75 ounces to the ton in silver. They are carbonate ores and not very base and are good smelting ores. The peculiarity of this formation is that the foot wall is of limestone and that the hanging wall is of a coarse grade of conglomerate sandstone with a reddish color. The deposit pitches toward the valley. There have been no strata of ore found as yet in the lime stone. The vein matter and the hanging wall is of a coarse grade of conglomerate sandstone with a red dish color. The deposit pitches toward the valley. There have been no strata of ore found as yet in the lime stone. The vein matter and the hanging wall is of a coarse grade of conglomerate sandstone with a red color. The deposit pitches toward the valley. There have been no strata of ore found as yet in the lime stone. 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The ore toward the valley the mineral seems to give out. Probably at this point it was broken by the upheaval. It is believed it will yet be found beneath these mines lying horizontally. It was evidently deposited horizontally and afterwards covered up with the wash of the conglomerate sandstone and other matter.

This conglomerate and stone which overlies the mineral is from 200 to 2,500 feet thick and it is also found that the lime stone forms the bed of the mineral deposit. The mines are developed along the base of the mountain for a distance of about two and a half miles. The ores are practically the same and so far as developed all dip toward the valley at about the same degree. There have been a good many millions in value taken from this camp.

There was at one time a smelter erected here, but for some cause or other, it did not seem satisfactory or at least it is not running at the present time.

The railroad is owned by a company which has a monopoly on all the freight. Their charges for switching and hauling the ores 76 miles to the junction with the Mexican Central road is $8.25 per ton. This cost prohibits the shipment of great bodies of low grade ores which could be shipped out with a profit if they could obtain a reasonable rate of freight.

The mines are not now doing nearly as well as they have done in previous years but further developments will undoubtedly open up large bodies of ore in the camp and perhaps richer ores than have been taken out will be encountered, especially if they can find the deposit where it lies horizontal or nearly so. The raising and breaking up of a deposit of ore has a tendency to impoverish it as it gives the surface water a place to penetrate the deposit which is liable to dissolve a great deal of the mineral in solution, especially the silver which is chemically compounded with the lead.

It is certainly a very interesting mining district. It has produced a great amount of wealth and will continue to produce handsomely, for years to come. There are two mining towns about two miles apart.

Water is very scarce there, which fact belies the name of the place, there being some wells only at the lower camp near the center of the valley below. The mines are very dry and have to be timbered very carefully as the hanging wall is broken and loose and caves very easily.

They are shipping from 20 to 25 cars of ore daily. The principal mines are owned by different companies and are worked on a large scale.

The climate is very hot and dry and the railroad is very dirty and affords no accommodation for passengers.

The Parrot Company.

The Parrot Copper and Silver Mining Company Sept. 12th declared a dividend amounting to $69,000 and making a grand total of dividends paid by the company $2,069,855.
A GRAND ENTERPRISE.

The Basic Company, a Philadelphia organization, having for its object the purchase and exploitation of tracts of auriferous gravel land that will pay to operate with dredges and which has already floated two companies in the Boise Basin of Idaho for this purpose, to wit: the Red Rock Dredging Company at Placerville, and the Boise Dredging Company at Centerville, has been engaged during the past season under my superintendence in the installation of a water power plant on Grimes Creek, (which is the central stream of Boise Basin) to furnish electrically the power needed by the two dredging companies already organized and others contemplated in the vicinity.

The company has secured enough desirable territory to provide operating field for eight to ten modern elevator bucket machines built on the general plan (with, however, some great improvements) of those which have been successfully in operation for two years past at Bannack, Montana. Mr. S. S. Harper, the designer of one of the Bannack dredges, is the general manager of the Basic Company and of the two subsidiary companies just mentioned.

Boise Basin is a depression in the mountain mass between the valleys of the Boise and Payette rivers in southern Idaho, some twenty to twenty-five miles in diameter. Its average altitude in central parts may be stated at 4000 feet and on the rim at 8000 feet. The towns are Idaho City, Pioneerville, Centerville, Placerville and Quartaburg.

Perhaps in all the Rocky Mountain region no equal area has been so productive of placer gold as this. The flush years were from 1863 to 1870. In that period the yield was considerably over $100,000,000, while up to date it may be fairly stated at nearly $200,000,000. Gold was found not only in the channels of the streams but also in the soil on the low divides between them, and these latter were often so rich, so easily placed under water and so well furnished with dammage facilities that they constituted a favorite field for mining.

Thousands of acres were sluiced over, and as a consequence, the main creek channels at a very early period in the history of the district were buried in tailings to the depth of ten to forty feet, so that the rich gravel in their beds could not be worked. These furnish now the field for the dredge. The tailings themselves, it is thought, will at least pay for the expense of rehandling, while the unworked deposits below, it is known, constitute a source of wealth that has for a long time been overlooked.

The problems presented in the improvement of the water power of Grimes Creek may be stated as follows:

During the period of high water, from May 15th to June 15th, the stream carries at times as much as 20,000 inches of water, while in the term between August 15th and September 15th, the stream falls to 1500 to 2000 inches and perhaps as much as one-third of this travels on the bed rock. Centerville is located on Grimes creek and near the centre of Boise Basin. For a distance of three miles above and below the town the creek has a fall ranging from 20 to 25 feet per mile. Below it enters into a canyon where the grade ranges from 50 to 80 feet per mile.

In the twelve miles of comparatively flat valley the original channel of the stream is buried under debris from the bars on all sides to a depth from ten to forty feet, in accordance with the topographical features at each point, and whereas the original valley was not over 200 to 400 feet in width it is now in places 700 to 1200 feet wide, the deposits of tailings covering even the low bars on both sides. It is evident, therefore, that in the season especially, and to some extent all the year round, the water of Grimes creek is turbid and full of debris in suspension, which is ready to be deposited at the slightest opportunity afforded by a decreased grade.

The canal just completed commences about six miles below Centerville, where Grimes creek leaves the basin, and has a total length of 43,868 feet, terminating at a point about six miles below on the mountain side at a vertical elevation of about 300 feet above the stream. It is constructed on the eastern wall of the canyon which, in its upper part, is very steep and high, and in its lower part is cut by deep canyons coming in from the side, which add very materially to the necessary length of the canal.

Of the total length mentioned, 15,755½ feet are ditch and 28,102½ are flume. Of the latter measurement 4577½ feet are on trestle work and 16,537½ feet are in a tunnel. In accordance with topographical features encountered, sections of ditch and flume alternate from start to finish. The ditch is of uniform dimensions throughout, having a width at the bottom of sixty inches, at the top of 135 inches, a depth of 36 inches and sides sloping to the surface at a ratio of one to one. The grade is 5.28 feet to the mile.

The flume is of two sections, the large section having an inside of 54" and a depth of 27", and the small section a width of 48" and a depth also of 27". The small section is used it given a grade of 10.47 feet to the mile. The large section has the same grade as the ditch.

The tunnel is five feet in width at the bottom, four feet at the top and 6½ feet high, all these dimensions being inside of timbers.

The trestles are all of single deck work, the highest not exceeding 25 feet and the uniform span between bents being twelve feet.

A shelf seven feet in width of solid ground was cut out of the mountain side for the flume and this excavation in many places ran into bedrock and made blasting necessary. It was found that the average excavation, per running foot, of this grade was 17½ cubic feet. The total excavation exclusive of the tunnel, was 95,648 cubic yards.

The work began on April 21st and terminated August 19th, thus consuming 121 days for its execution. At the enterprise was carried on in an unincumbered part of the country, about fourteen miles of road had to be built to enable material and supplies to be carried in and shelter provided for the men engaged. During June and July, which was the most active period, nearly 150 men were employed.

The mountain slope upon which the canal was built was so uniformly steep that it was only possible to do 16½ days' work with one team with the plow and scraper; all the rest of the excavation was by pick, shovel and drill.

In the construction of the flume 776,900 feet of lumber, board measure, were used. This includes waste and a stock of about 10,000 feet still on hand at various parts of the structure for repair, when necessary: 24,700 pounds of nails were consumed, together with about 100 pounds of tacks and $100 worth of iron in the form of brackets for the end joints of each 12-foot section.

The style of flume built is shown by the accompanying tracing. As the grade was prepared, two continuous stringers of 2x8's were laid and upon these the sill and posts (previously framed) were set. The timber
Excavation, covering labor, coal, blasting powder, steel consumed, superintendence, depreciation and loss of tools, work, and the grabbing out of timber along the line, averaged a little less than twenty cents per cubic yard. As the route was quite heavily timbered and so steep that the surveying in places was a matter of considerable danger, it is believed this figure is unusually low and reflects great credit on Mr. Alexander Kerr, of Placerville, the foreman in charge of the grading crew.

The construction work, which covered all carpentering, labor, superintendence, and the wear and loss of tools furnished by the company, amounted to 44 1/2 cents per foot. It was under the immediate supervision of Mr. Chase Wilson, of Placerville, a flume-builder who is well known for his capability in this part of the west.

The consumption of lumber, per running foot, including waste, running board on the top, pressure-box and apparatus, and a telephone pole line on 2x4" scantling for some of the distance, amounted to 27 1/2 ft., board measure, and the cost of the lumber delivered at the point where it was placed in position, averaged 29 cents per linear foot of flume constructed.

The consumption of nails was a shade under a pound per linear foot, was 12 1/2 cents and of the ditch excavation, including everything necessary to permit the water to pass, was 94 1/2 cents.

The total cost of the flume constructed and in operation, per linear foot, and excluding bridge and trestle work carrying it over ravines, was ninety cents per running foot.

The general field management of the work was in the hands of Mr. Robert Dunn, of Montana, and to his executive ability and treatment of associates and men, was largely due the rapid, thorough execution of the work.

The scale of wages was as follows: Boys employed in passing lumber, $2 per day; all other labor, $3, including all the grading crew and two thirds of the construction crew; blacksmiths and carpenters, $3 50. A few carpenters of extra ability and experience in constructing and raising trestles were paid $4.

The lumber delivered aloft in the canal cost $10.64 per thousand feet, board measure. The engineering and surveying was in the used was cut all in the immediate vicinity. It has the reputation of standing (in contact with water and earth) for 15 to 20 years before showing much decay.

The lumber was delivered at an advantageous point near the head of the canal and was first transported in the completed ditch and flume on cars travelling upon wooden rails made of 2x4" scantling, but as soon as sufficient of the canal was constructed water was turned in at the head and from that time on the lumber was floated during the night and early morning to the nearest possible point at which construction was in progress and there piled up along the flume side to be carried forward in cars to the carpenters. As the work progressed, boys were employed with poles to keep the lumber moving until at the latter end of the work nearly fifteen were engaged in this occupation and six to eight hours were required to transport a stick from the head of the ditch to its foot. Nails were also carried to the workmen in the same way on floats. It was not found possible at any reasonable cost to build a road to any part of the canal, excepting near its head.

The details of cost have proved as follows:
CORRESPONDENCE

UTAH.

SALT LAKE CITY, Sept. 30, 1898.

EDITOR JOURNAL:—The Utah mining share market grows broader as each week passes. The business is becoming stronger that this market is an excellent one from an operator's standpoint, and the high interest returns now continue to invite investment capital. Admitting that investments in mining stocks are of a speculative character, yet it is becoming more evident in the East at four per cent, mining stocks that give returns of 20 per cent are undoubtedly attractive. I doubt greatly if the standard mining shares of this market will show wider fluctuations from one year's end to another than the industrial and railroad securities handled on the New York Stock Exchange, and the returns on the mining shares are fourfold greater.

Ajax is being quietly picked up. Anchor was in slight demand. Bullion-Beck continues to sag and but little interest is being given to quotations last week. Nevada-Eureka was uneventful. There is nothing new in the news on Chloride Point. The passivity of stockholders has displayed deserves a high reward for patience in awaiting returns.

Daisy was the heaviest seller of the week, and bids fair to prove a prime favorite. The sentiment, locally, in regard to the mine is entirely favorable. The developments continue to disclose bodies of good grade ore, and the mill is doing good close work. Dalton & Lark are increasing the force at the mine and some good ore is being shipped. Daly holds a steady. Daly West continues to be offered. Dugger carried out my predictions of last week and advanced strongly. There is much talk about higher prices to be recorded for this stock in the future. Eagle was stronger. It is stated that a good block of treasury stock has been placed.

Four Aces advanced a trifle on the report that Airis of the Mercur company has obtained control, and will push developments of the mine on small lot buying. The assessment of 10 cents per share becomes delinquent October 14th. Geyer-Maron eased off a trifle. The stock is being absorbed by people who believe in the future of the mine. Grand Central was strong around $7. It was bought heavily by an insider. Horn Silver declared its quarterly dividend of 1 cent per share, or $100,000, payable September 30th. Lower Mammouth shows elements of strength and weakness by turns.

Mammouth partly recovered its loss due to the passing of the September dividend. This was accounted for by the favorable showing on the 1700 foot level and the authorized statement that an option at $2.50 per share had been given on the control. There is no stock on the list that has the mercurial qualities of the Mammouth. The Mercur management announce that the present mill's capacity will be increased from 300 to 400 tons per day. This action has been anticipated and it is now strengthened for the stock as yet, it should and will. Northern Light was weak and low. Ontario was strong. The market seems barren of stock of any reasonable figure. Omala was the subject of a bear raid, but fully recovered.

Silver King's new mill will be completed December 1st. The output will be increased, but this does not necessarily mean increased dividends. Sacrament declared its regular dividend of $4000 on the 28th. This carries the dividends to $47,000. There is but little movement in the stock. Swasea was in good demand, and a regular dividend of $6000 was declared and will be paid October roth. The work in the lowest levels prove the ore vein to be continuous and going down good and strong. Swasea is a great little mine. South Swasea declared its regular dividend of 5 cents per share, payable October 4th. The mine is looking line and the shares were strong. Utah just held its own. Valeo was in good demand. Young America sold at last week's figures.

MISCELLANEOUS MINING NEWS.

ALASKA.

At Sunrise city, Cook Inlet, on California Creek, there are ten men working, doing fairly well.

On Cow Creek, Williamson & Co. are putting in hydraulic machinery. They have ten men at work, and ground averages 50 cents to the cubic yard.

Beedy Bros. have sold their Bear Creek hydraulic plant and mine to Mr. Sleeper of New York for $30,000.

On Elks Creek, near Quilchena, the discovery of Bear Creek placers, takes out all the way from $10 up wards a day to the man and employs three men.

HIGHWAY ROBBERY ON THE DALTON TRAIL.

It is not an uncommon occurrence for miners and prospectors coming out from Dawson over the Dalton Trail to be held up, and their hard-earned (very hard earned) savings swept away, just when they are looking forward to brighter days. Only the 18th of September, two miners, named A. H. Frazier and E. L. Tollmer, were held up by highwaymen, at a point about 60 miles from Haines Mission, and forced to surrender $2,600 in dust and currency. Another miner, Ike Martin, had a similar experience last week, and has not been heard from. The latter miners have advanced to start back to notify the police, and it is feared that he has been murdered.

ARIZONA.

Work began last week on the great stack designed to carry off the smoke from the furnaces at the United Verde works at Jerome. The stack is twenty-five feet in diameter at the base, and is to be 158 feet high. The smoke will hardly settle around the works after being carried to that height. Improvement upon improvement is being made and will continue to be made until Jerome is the greatest copper producing camp in the world.

CALIFORNIA.

AMADOR COUNTY.

The Kennedy people at Jackson are making preparations which will preclude the necessity of having to shut down at that property in case of future shortage of water. They have installed a steam plant at the north shaft—they have always had a steam plant at the south shaft—and are now at work putting engines and boilers in the mill, and in a few weeks will be equipped to run the entire property by steam power. —Amador Ledger.

CALAVERAS COUNTY.

The Nellie mine, about a mile south of Angels Camp, has installed new machinery and started to sink the shaft, which is now about sixty feet deep.

An exceedingly rich strike is reported at the Harris mine near Carson Hill, this county. Ore estimated at from $1500 to $2000 is reported to have been taken out.

The work of cleaning out the Lightner mine and freeing it from the mass of slush, water and debris that flowed into the works since the storm, and which, it is now, is now being prosecuted with all possible haste. The interior of the mine was considerably damaged by the goulge slide, but the management is of the opinion that the mine will be in running shape before the rains set in.

EL DORADO COUNTY.

John Melton is constructing a fifteen-stamp mill on the mining property he is operating north of the Gentle Annie mine. The stamps are from the Rosencranz mine, near Garden Valley, and five were built from the Bell mine, one of the properties owned by Mr. Melton in the Poverty Point group. This machinery will be erected on the Baltic mine, which lies considerably north of the Gentle Annie, toward the river. A tunnel is being extended into the Poverty Point mine, south of the Baltic, to tap an ore body about 800 feet deep on which a shaft has been sunk.

INYO COUNTY.

Robert F. Harrison, superintendent of the Rose mine, and Mr. Llewellyn, of Los Angeles, have taken a bond on the Radcliffe mine in Pleasant Canon, in the Panamint mountains, for 50 days. They have paid $2000 down and have shipped machinery to work it.
of forty horse power, as good as money can buy and of similar pattern to those on the Alameda and Tarantula mines. The boiler is sixty horse power.

**COLORADO.**

Tellurium ore has been struck in the Schultz Wonder below Apex, Gilpin county. It was found in driving a tunnel which is now in from its entrance 600 feet and which cuts the vein at a vertical depth of 300 feet. The ore is said to average $2.00 per ton. A shipment will shortly be made which will give more fully the exact value of the ore.

**More Luck for Stratton.**

It is more difficult to obtain information concerning the condition of W. S. Stratton's mines than any others in Cripple Creek, for he hates newspaper notoriety. But from general gossip it is gathered that this lucky miner has struck it again, this time in the John A. Logan. A level was run from the 150-foot station to cut the Gold Sovereign vein, and it is reported a body of ore has been encountered in this drift which is six feet wide and worth $60 to the ton. A shipment has been made from the strike and large ore bins are being erected, which warrants the belief that the strike is a genuine one and bids fair to last.

**A Grand Strike.**

The discovery of ore in the Chaffee Notaway, Russell Gulch, Gilpin county, is nothing short of a wonder, and it has produced a wild sort of a sensation in the mining district, for a shipment of a small lot last week returned 334 ounces to the ton, or nearly $7,000. The lessees claim to have four tons of ore of equal value to this. The ore is a sylvinite unlike almost any other ever found in this county, and it is peculiar because so unlike any other ore in the immediate neighborhood. Several shipments of thousand tons of ore have been made which return $1,000, and it is said to be the most flatter striking ore ever mined in Gilpin county. The streak from which the ore comes is of good size and shows fine gold as well as sylvanite and comes from a level at the depth of 140 feet. Shipments of the coming week are expected to return $20,000. The lessees were all poor men prior to making the strike, and they are more stunned by their stroke of luck than anybody else. The mine is owned in part by the wife of Ulysses S. Grant, Mr. M. C. Chaffee—Mining Reporter.

**Cripple Creek Items.**

During the month of September, the output from the Cripple Creek district amounted to $1,441,520. It will be readily seen by these figures that Cripple Creek is not only holding its own but making a gradual increase and that the past week, as the best of the month, must have been a busy one among the shippers.

Following are a few from among the many shipments made during the last week and month.

**RAVEN.**

An unusually heavy production was made from the Raven mine last week. Of late it has been running at from 50 to 60 tons every seven days, but the last report from the property is 150 tons. The ore is of various grades.

- **MONUMENT.**

Large shipments of high grade ore con... time to be sent out from the Monument mine on Battle Mountain. During the past month a total of over 177 tons with an average of $57.40, was sent out in nine carloads as follows:

- 44.580 pounds, at $52.40 per ton.
- 43.471 pounds, at $56.70 per ton.
- 31.783 pounds, at $57.20 per ton.
- 45.916 pounds, at $51.80 per ton.
- 28.597 pounds, at $56.60 per ton.
- 49.349 pounds, at $56.60 per ton.
- 21.913 pounds, at $57.90 per ton.
- 33.163 pounds, at $48.80 per ton.
- 55.913 pounds, at $56.30 per ton.

The property, which is about two acres in extent and is located between the Fortland and Granite mines, is being operated under lease by E. Everett. It is owned by a local syndicate as follows: E. Everett, Ira Williams, W. H. Evans, Mrs. E. E. McGovern, E. C. Bale, V. Z. Reed and A. F. Woodward.

**GEORGIA.**

The Cherokee Ochre and Barytes Company has just completed the erection of a large plant for manufacturing and preparing ochre for market on its property, near Cartersville, Bartow Co. The deposit is very extensive. The Barytes mine of Mr. Butler, Taylor Co., has been sold by J. C. Lamb to Earl Sloan, of Charleston, S. C. The mine, it is said, has contracts to furnish 100 tons a day to paper-makers—Engineering and Mining Journal.

**IDAHO.**

Coeur d'Alene Notes.

The Lucky Boy company will soon put up three stamp mills, equal in crushing capacity to the ordinary 10-stamp mill. They will run a pipe line from Lager Beer gulch to convey water to the mill. A force of men were put to work last week grading and digging a cut for the pipe line.

The lower tunnel of the Colwyn was in 150 feet last week.

Each bit of fresh intelligence from the Father lode is to the effect that it continues to improve.

The big mill level tunnel on the Bunker Hill and Sullivan is now going in a little over 10 feet a day.

The Amazon has shown a decided improvement in working the rock recently done on it. A couple of men will be employed there for a week or two yet and possibly longer.

**MICHIGAN.**

One of the most important copper mining properties in Ontonagon county has just passed into the control of Hon. T. B. Dunstan of Ishpeming. It embraces the Adventure, Hilton and Knowlton properties which lie in the vicinity of Greenland, and within sight of the Adventure. The Adventure comprises 780 acres, the Hilton 540 acres and are continuous properties, and the Knowlton 406 acres, about a mile distant, all lying on the mineral range. Besides this large area Mr. Dunstan also secured the surface right to 200 acres of other land in the vicinity which may be found advantageous to use at some time in the future.
MINNESOTA.

The Pioneer Mine.

At the Pioneer mine Vermilion Range, they are taking out the water, preparatory to active underground operations. They are employing two bailers, which are 3°8" x 5°x 1°1/2" long, each having a capacity of 1,000 gallons. They are V-shaped at the bottom to permit of ready entrance into the water and to force aside obstructions. The outlet valve is attached by chain to one end of a lever at top of bailer, while the other end, as bailer is hoisted, strikes a rack by which it is elevated so as to be movable vertically. This opens the outlet. The load on the rope is ten tons, but the engines are operated in balance so that it is not used to assist water and a portion of the rope. A boiler of water is delivered at surface every 1/2 minute from a depth of 600 feet. In addition to the bailers there are small pumps on the seventh level, throwing water to pump on third, and that lifting it to a surface. A big Prescott compound pump will soon be placed on the seventh level. To supply pump on seventh level they are using the Pole air lift. It is simply a 6-inch pipe open at bottom, dropped into the water with a 2-inch pipe dropped down inside. Compressed air is sent through the smaller and is discharged under the water, the buoyancy of air throwing up a large stream of water. It is simple, effective and requires no packing or attention.—

MISSOURI.

On the Leonard land, in Chitwood Hollow, H. C. Stotton & Co. have a rich prospect. At 75 ft. they went into ore, and in one shaft they took out of a small drift 8 tons of high grade zinc ore. The ore was carried a half mile on boulders, hoisted and put into the bins without washing. There was no water, and they do not need any at present. The strike is one of the richest made in Joplin for a long time.

MONTANA.

Articles of incorporation of the Johnstown Mining company have been filed with the secretary of the county clerk of Silver Bow county. The company is organized under the laws of the state of New York with a capital stock of $500,000, and the property to be operated is located in the Butte district. The company is ostensibly formed to operate a number of mining claims now held under option by the Heinze brothers of the M. P. & W. company. Options on a number of very promising, partially developed mining claims in this district will be turned over to the company, and it is reasonable to expect that another producing copper company will be formed. Carlos Warfield is the Montana agent.—Western Mining World.

The Ben Bolt, which is owned by the Mount Helena Mining & Investment company of which Maj. James Sheoemaker is president, L. W. Back, secretary, and F. W. Thomas, manager, shipped half a car from the property, which is situated in McClellan gulch, during the past week. The shaft has been sunk 80 feet and the drift has progressed 50 feet. The ore shipped was stoped out and five or six carloads are now ready to stop. The ore is sulphurite and runs in the neighborhood.of $30.

NEVADA.

New Smelting Plant.

The machinery for a water jacket furnace has been installed at the Union switch on the E. & P. railroad in Pine Valley. It is to be used in the copper properties until recently owned by T. R. Wahlen and J. B. Dougherty, situated in the Copper Basin, about twelve miles north of Mineral Hill. The mines are said to have been sold to California people, who propose entering upon active development work at once. They are believed to be located just over the line in Elko County, but the place selected for the erection of the furnace will probably be in Eureka County. The furnace is the latest improved water jacket pattern, and has a capacity of 50 tons in 24 hours. The machinery so far received, weighing 32,000 pounds, is said to have cost $10,000. Two experienced machinists are on the ground and will superintend the erection of the plant.

NEW MEXICO.

Output Hillboro Mines.

Output of Hillsboro gold mines for the week ending Thursday, Sept. 29th, 1898, as reported for The Advocate: 7088

<table>
<thead>
<tr>
<th>Mine</th>
<th>Gold (oz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wicks</td>
<td>25</td>
</tr>
<tr>
<td>K.</td>
<td>30</td>
</tr>
<tr>
<td>Rich mond</td>
<td>35</td>
</tr>
<tr>
<td>Snake Group</td>
<td>65</td>
</tr>
<tr>
<td>Opportunity</td>
<td>25</td>
</tr>
<tr>
<td>Sherman</td>
<td>5</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>75</td>
</tr>
<tr>
<td>Trippe</td>
<td>75</td>
</tr>
<tr>
<td>Rex (silver-lead)</td>
<td>280</td>
</tr>
</tbody>
</table>

Total: 280 total output since January 1, 1898—$3,370.

OREGON.

Southern Oregon Mines.

At Mount Reuben, Josephine county, Senator Jones, of Nevada, has 80 men developing a promising quartz ledge, and on Gragg creek, near, by miles and miles of new hydraulic pipe is being put in to carry water for washing placer mines as soon as the fall rains set in.

On the Alt House, near the California line, where thousands of miners made fortunes 40 years ago, new and extensive plants have been set up to extract the gold by modern methods.

At Ashland, four rich ledges are being worked, and these all prove that Southern Oregon quartz mines are not mere "pockets" as has been supposed.

For, Taylor & Co., whose mine is located on Powell creek, report having their ditch completed, and also the new house to replace the burnt cabin.

SOUTH DAKOTA.

Black Hills Notes.

A well has been sunk to bed-rock at the Pluma Chlorination Works to furnish more water. A tunnel extends across the gulch and the well is sunk midway across.

Burns & Little are making preparations to commence work on their property in Garden City camp. They own several claims, all of which show good bodies of ore. They will furnish the new cyanide plant with ore.

A remarkably rich strike of free-milling ore was made on Victoria creek, about 12 miles southeast of Rapid City. A rancher named Henry Muscogee on his claim sank a shaft 25 feet, the last ten feet being in bedrock. At that depth he struck rock which is very rich with free gold.

The Alexander-Dotson cyanide plant will be ready to receive ore about the first of the month. When the work was commenced on the plant, it was estimated that two months would be required to place it in running order. The work has progressed very satisfactorily and it will be running about as soon as was expected.—Black Hills Mining Review.

UTAH.

Of the Utah mines, we find the outlook very bright. Ajax, of Mammoth, is steadily pushing development, and expectations run high at the present time.

There is a report current that the Alliance, of Park City, will resume operations. A considerable sum of money is in the treasury of the company and can be utilized for development purposes.

Chloride Point, near Mercur Camp, Floyd District, has been making some cyanide shipments lately that have proven satisfactory to the management.

The Daisy Company of Mercur, is increasing its milling capacity, and it is expected that from 150 to 200 tons of ore will be handled daily before the first of the coming year. Dividend payments are to be inaugurated in January.

The mill at the Dalton mines, near Marysville, is being put in shape to handle a large body of low grade ore recently uncovered in the mine.

Geyer-Marion, of Mercur, continues to ship cyanides, and the last shipment amounted to $6,000.

Grand Central Mining Company of Mammoth, declared its regular dividend of 12½ cents per share, payable on the 10th of Oct. The new hoist has been ordered and will be in position as soon as possible. The company has at present under consideration the building of a tramway to connect the mine with the railroad, which will greatly lessen the cost of transportation.

WASHINGTON.

The Republic Mining Company has declared a dividend of 3 cents a share, or $30,000, payable on Oct. 10. This is the first dividend to be declared since the sale, and it will be followed by many others. A year and a half ago stock in the company was selling at 10 cents a share, but the development of the mine has been very rapid since that time. A large mill has been erected and paid for and much preparatory work has been done in the mine. Good judgment and careful management has characterized the work of the men who have handled the affairs of the mine, and it is something remarkable that dividends should be in order so soon after development commenced. The Republic mine is a great property, and it is to be hoped it may long remain in the list of dividend payers.
FOREIGN MINING NEWS

BRITISH COLUMBIA.

Taseda Island.
A large force of men are at work at the Van Anda, and the shaft is rapidly gaining depth. Ralph Blewett is pushing the work in a manner that does credit to his bringing up. One hundred tons of hand-sorted ore is being sacked by shipmen of the Island & coastal, the ore having been purchased for that famous Welsh firm by P. Harvey of Vancouver. The ore will probably net $10 per ton for the copper, and is 90% lead, apart from the gold of which some assays have gone as high as $50. The mine looks extremely promising.

The Marble Point and Raven claims, both on the Van Anda belt, also promise to be rich producers. The company have 25 claims crown granted along this ledge.

The Victoria mine, owned by the Kirk Lake Mining Co., is now idle, but work is expected to begin again shortly.—B. C. Mining Critic.

ORE SHIPMENTS.

The shipments of ore over the Kaslo & Slocan railways for the week ending Sept. 25th as reported for The Kootenay were as follows:

<table>
<thead>
<tr>
<th>Mine</th>
<th>Destination</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payne</td>
<td>Pueblo</td>
<td>200,000</td>
</tr>
<tr>
<td>Ruth</td>
<td>Pueblo</td>
<td>90,000</td>
</tr>
<tr>
<td>Ruth</td>
<td>Everett</td>
<td>90,000</td>
</tr>
<tr>
<td>Montezuma</td>
<td>Kaslo</td>
<td>12,000</td>
</tr>
</tbody>
</table>

Total, 392,000 pounds, or 196 tons.

LOWER CALIFORNIA.

The Cyanide Process.

The fact that representatives of the Rose Cyanide Company, who operate an extensive plant on the well known Rose mine, at Victor, California, are visiting Alamo, in Mexican Gulch, Lower California, may prove more significant than it first appears. During the past decade a vast quantity of tailings has accumulated at the various mines in that district which it is possible may be profitably treated. Besides there are certain refractory ores in that district, and particularly in the Magdalan district, of the character that the Vizmagnia mine has recently taken in its lower levels, which may also find a solution by this process. Mr. Flayet, the secretary of the company also visited Cedros Island and was much impressed by the magnitude of the ore bodies found there. His stay, however, was too brief to reach any definite conclusion.—Lower Californian.

MEXICO.

President Diaz in his message to the Mexican Congress, which convened Sept. 16th, 1898, said:

"The development of the mining industry is further evidenced by the increase in the exportation of ore that has been observable for some time past. According to data published by the Finance Department with respect to the last fiscal year, the value of all products of all kinds passing through the custom house was $1,215,000 in round numbers, showing an increase of $50,000,000 over the value of similar products exported in the previous year. Silver figures among said products to the value of $5,000,000; gold to the value of $16,000,000, silver valuation; copper, $4,700,000; lead, $3,000,000, and on a smaller scale, antimony, zinc, molybdenum, tin, tungsten, chromite, asbestos, coal, and some other building materials.

NEW SULPHUR COMPANY.

H. J. Rubio, of the City of Mexico, recently returned from a trip to the top of Mt. Citlaltopan, mountain, where he went in company with his father and Engineer Webber to examine the rich sulphur deposits which they propose to develop. The mountain is about 17,372 feet high and is a veritable column of pure sulphur. The company proposes to begin work on the crater this winter. Several sacks of sulphur were brought back, which appears to be perfectly pure.

The mines at El Chorro in Guanajuato, are doing well; they are of gold and silver and of such undisputed richness as to warrant the owners in contemplating a narrow gauge railroad from Mariano to the mines, a distance of thirty kilometers. The petition of the parties for permission to build the railroad is now before the Mexican authorities.

Mr. Furrer, the new-buying concern, has acquired mines at San Luis de la Paz concerning which he spoke with some enthusiasm, as yielding now a dividend.

SOUTH AFRICA.

SHAFT SINKING AT THE NIGEL DEEP MINE.

(District Heidelberg S. A. R.)

The near approach at this mine of the end of the sinking stage of development has been made the occasion of extraordinary efforts on the part of the mine staff and of the contractors, to show what they could do if put to it. The result has been the astonishing depth of 260 feet sunk on the incline within the last calendar month—a performance which puts anything else that we can learn about far into the shade. There is probably little doubt that this is a world's record; and how long it remains so, perhaps depends—more than anything else—upon the opportunity of getting the same management and the same workers together again. To Mr. E. H. Garthwaite, the general manager, who is from San Francisco, California; Mr. F. C. Roberts, the under manager, and to the other strenuous workers engaged, are these results due.

The following is an account of this feat:

From July 1st to August 1st D Incline Shaft was sunk from 946 feet to 1,206 feet—a total of 260 feet. This shaft is 1,447 clear. The vertical depth of same is 975 feet. The sinking was done by two 3½' Ingersoll-Sergeant drills, working two men per shift; there has been absolutely no change of ground for the past 900 feet, since leaving the dyke at the second level. Another dyke was encountered at 1,190 feet.

From April 1st, 1898, to August 1st, 1898, this shaft has been sunk a total distance of 695 feet, or an average of 175½ feet per month. The incline shaft is equipped with a double drum 7x12 underground engine, and besides handling the six tons of rock from the sinking (amounting to 60-70 tons daily) it also handled the rock from six drives with their respective winzes and rises. After leaving the incline the rock is hoisted up a 700-foot vertical shaft. Four of the drives advanced a total of 573 feet during July, or an average of 128 feet per month.

There still remains a distance of 60 feet to be sunk in the incline before drive toward C shaft. The drive from C shaft has advanced 776 feet, leaving about 1,300 feet to connect with D shaft; it is expected that the connection will be made about January 1st, 1899. The mine foreman under whom this excellent work is being done is Mr. F. C. Roberts, who is also a Californian. A 20-stamp mill stamps 1,250 lbs. Sandycroft has been ordered and is now arriving on the property. The mill excavations are well under way and the erection of the battery, cyanide and slime plants will be started shortly.

GENERAL NEWS.

RECENT ADVANCES IN METHODS OF CONCENTRATION.

W. J. W. SNELL, OF STE. 

[Concluded from issue of October 1, 1898.]

These are some of the thoughts I wish to present in a general line. The ordinary process of wet concentration is, as I have said before, an ore dressing, and the material which is usually produced is sent to some smelting works for its further treatment.

There are many kinds of ore which are apparently not fitted at all for concentration. The Ticuca district of Utah is one of these.

The ores from the Elura hill from the "Mammoth," "Sionch," and others to my observation did not seem to be in the least suited to concentration. Yet, at the present time there are in operation in Ticuca three very large mills, one of one hundred, one of sixty and one of forty stamps, which are successfully operated today upon the ores of Ticuca, and not by concentration alone, but include both the improved method of concentration which we know locally as the combination process and the other. By this method the ore is stamped, passed over to the amalgamator, and the amalgamator passes the pulp through the vanners where a percentage of the values is saved in the shape of concentrates; the pulp is passed from those vanners into the tailing pits where it is accumulated. The pulp from these it amalgamated; the values, or as much as possible of the values saved by raw amalgamation and the tailings are then passed out.

The first mill that I know of that was built on this plan was built in 1861—I think that is the date; the process was brought more prominently to notice in the workings of the Montana Company's mine and the Drum Lumber, and was finally tested through the vanners where a percentage of the values is saved in the shape of concentrates; the pulp is passed from those vanners into the tailing pits where it is accumulated. The pulp from these is amalgamated; the values, or as much as possible of the values saved by raw amalgamation and the tailings are then passed out.

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smelters of Colorado, and the cost of marketed
bullion in this way is one dollar a ton
on the crude ore. The mills are handling
their material at a cost of two dollars and
a half to three dollars and a half per ton
on the ore, which added to the cost of
the ore of fifteen dollars per ton, which otherwise
would be of no value whatsoever to them—as the
cost of milling and freight to the Tintic
mines is very high. These gentlemen
bring a revenue to the companies that is
undoubtedly sufficient to pay for the extraction
of the high-grade ore which goes to market.
This is a process which embodies concentra-
tion of ore dressing with the actual recovery
of silver in bullion values.
I would like to call your attention to an-
other method, another combination of pro-
cesses which, while it is not in commercial use
as this process is at Tintic, is yet of sufficient
interest to you all to deserve a brief mention;
and that is the process or method for treating
mixed ores, pyrite and copper pyrites, all the sulphides
of the metals which are now so valuable to us here in
Utah. This character of ore is most common
and best known to us in Utah as occurring in
Bingham. If we have a satisfactory wet concentration
of this ore we give a concentrate carrying, we
will say, on an average of twenty per cent. of
lead, five to fifteen of zinc, twenty per cent. of
iron and a few per cent, of silica. This material
is of course bought by the smelters.
If there is any copper contained in the pyrites
associated with this galena, that copper enters
the copper price from the local habits have
always heretofore been that both the associated
lead are not paid for in the same ore. There-
fore, either the copper or the lead is lost, or
one only paid for at a very largely reduced
price.
The method which I am going to describe
to you was invented and has been developed
by myself quite largely. It consists in taking the
ore, it is the most efficient, subjecting it to a roasting or heating process.
This roasting or heating operation, after
the ore of course has been crushed) is only
extended to the stage where the free sulphur
and the pyrites have been reduced, and the sulphur
has been burnt off. That stage is very readily
recognized as the sulphur burns with a blue
flame and gives us sufficient heat to carry on
the operation in nearly all the Bingham ores,
and when this flame has disappeared the ore
is a deep red color, and the operation is
finished. If the ore is withdrawn from the
furnace at this stage and tested it will be found
that the material which has hereafter been,
non-magnetic now contains the iron in a mag-
netized condition. It can, therefore, be sepa-
rated from the other minerals, the lead, zinc,
copper, and sulphur. This operation, therefore, gives us at
the start, iron concentrates of high grade, carrying very little lead, zinc, copper, and sulphur. The tail-
ings from that operation contain the lead and
copper. They are now in an admirable con-
dition to be separated by ordinary methods of
wet concentration. The iron is in an admir-
able condition for the magnetic process, and the
saving in freight and smelting charges on this material is in most cases sufficient to pay for
the operation of roasting. I have samples of this material which I intended to
bring up with me, but were
unfortunately not able to speak to them. I have seen the material which I intended
bring up with me, but were
called upon unexpectedly to speak, I have not seen the material, and am very sorry I could not
have seen it here. It is needless to go into
detail. I would simply state by this method
I have handled copper ores turning out tail-
ings which run a trace of silver and gold and
less than two tenths of one per cent. copper.
I have made separations between bleached and
also iron pyrites by which forty-seven per cent.
concentrates have been turned out in the first
operation. This would illustrate the matter.
I notice that the prolonged contact of these
gentlemen in the region of this arid west to
the advantages which this process would give
in districts where water is scarce. The consid-
eration of the available water is, of course,
applied to the ores carrying gold and other
metals that are contained in the pyrites,
the saving is only to that extent afore men-
tioned; but it leaves the material left behind
in an admirable condition for amalgamation
or for cyaniding.
These, then, would be steps in concentra-
tion suggested. The concentration by fire,
known to most of us as pyritic smelting, deserves in Utah more attention than it has
received. Particularly is this method adapted
to the treatment of Tintic ores which are
characterized by containing copper, iron,
and many others which are not being treated at
all. By this method the ore is treated in many places in the state. It is in use in Tas-
mania and five hundred tons a day are being
processed on that method. And in this method concentra-
tion can be effected in accordance with the
degree of silver contained in the ore at
the start. In other words, in the ores that are
heavy with silver, it is needless to point out the
advantages of this method. The costs of
plant are less by nearly half than for the
large combination mills that would handle
the same kind of ore. The cost of treatment will
not exceed those of the combination mill
more than a couple of dollars a ton.
In other words, I think there are many
gentlemen present who will undertake to erect
mills which handle one hundred and fifty tons
and do it at a cost not to exceed five dollars a ton. It figures itself down, therefore, into a
proposition of this kind—ninety-five per cent.
of say fifteen dollars, less five dollars for the
smelting, or say fifteen dollars, by seventy per cent., or eighty
per cent. of the value of the mill; take from this
of the same process, cost of handling and
cooking, and it will soon figure itself out
which process will give the most money in a
case of this kind.
There are today in Tintic many thousands
of tons of low-grade ore of fifteen dollars and
less in value which is waiting to be shipped
and realized from. At the same time there
are awaiting the same treatment in Tintic and
in Bingham thousands and thousands of tons
of pyritic copper ore which would act as fuel and
fuel for these separations. They are waiting for
the brains and the dash combined to act
upon them.
Those of you who go on the excursion to
Bingham will see that the pyrites treatment
is complete. Those of you who go to Tintic will
probably be informed by those posted in that
district that there is a zone in the mountains
from nine to twelve hundred feet wide which
practically extends the way across ores in value of nine dollars. Of course there are places that do not carry it,
but that is probably an average at any rate of
that vast territory to such an extent that if all
this ore were to be handled and added to the
large amount of ore now handled the ex-
pansion of our Utah industries would be a
very pleasing thing to us to witness.
I have no notes with me, and I fear I have
exhausted your patience and I will draw to a
close. I am much obliged for your time and
attention.
Mr. Christy (California): I would like
to ask what the cost is per ton for treating
tailings by the Peck process.
Mr. Nielson: My own experience of the Peck process is that it can be done at a cost of
two dollars. Of course the exact cost cannot be ascertained. I would say from what I have
heard that the need would be about five dollars.
It has averaged between eighty-five and nine-
ty-five cents, under certain conditions
Mr. Cuttng (Nebraska): I can say some-
thing about the Peck process. In one mill
where the Peck process was worked, they
saved less than fifty per cent. There was
new machinery put in, and on the tailings
where the Peck process was a failure they
are now working those tailings with the old
pan mill process and also the cyanide process.
So I can hardly agree with the gentleman
that the Peck process of concentration is a
step in advance.
Mr. Esser: I would say that I am from
Montana where they put in a Peck mill that
resulted by experiment in about one hundred
tons capacity per hour. They did not find
that at first being one hundred ton capacity,
they are now putting a mill of five hundred
ton capacity. It has been a perfect and
great success there.

THE ELECTRO-CHEMICAL AND ELECTRICAL METALLURGICAL INDUSTRIES OF EUROPE.8
BY JOHN B. C. KERSHAW, F. I. C.
In this article it is proposed to give some
account of the processes that have been used,
or are now being used, for the production
upon an industrial scale of the four metals,
viz., antimony, chromium, magnesium and
nickel.
Only two of these metals—antimony and
nickel—are of much commercial importance,
and in the case of the other two, one manu-
factory could easily supply the present world's
demand, viz., the electrolytic methods for the
production of these metals are still of inter-
est as exemplifying the point that it is
the greater convenience and purity of the pro-
duction, rather than their greater economy, that
has caused them in many cases to supersede the older
methods.
Owing to the secrecy which is always ob-
served when a process is worked in one or
two places only, and to the absence of all
incidence to publish details of the apparatus
or procedure used, the facts given will necessi-
tally be less full and complete than they
might otherwise be.
Antimony.—One of the earliest attempts
to separate this metal from a solution of one of
its salts by electrolysis was made by Gore in
Bologna in 1830. The solution contained antimony tri-
chloride containing excess of hydrochloric acid was used as the electrolyte, with a cath-
ode of copper and an anode of antimony. In
place of the metallic deposit which he ex-
pected the compound of antimony and antimony trichloride, known as "explosive
antimony" on account of its property of
decomposing with explosive force when
exposed to air, was formed. It was thought
maintained in abeyance for many years after this
date, and it is only recently that the appear-
ance upon the market of thin plates of the metal of extreme density has proved that

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*Electricity.
some of the difficulties in the production of metallic antimony by electrolytic methods have been overcome. These plates, according to Borchers, have been made by the Austrian branch of Siemens & Halske; but no details of the place of production, or the quantity produced, are given in the brief account of it may therefore be given.

The process depends upon the solubility of antimony sulphide in solution of sodium or potassium hydroxide, and the use of the electric current in depositing the antimony as metal from such solutions.

The chemical and electrolytic reactions which occur as follows:

1. \( Sb_2S_3 + 4NaOH = 2Na_2S + 3HSb\)
2. \( Na_2S + 2NH_3 = 2NaNH_2 + S\)
3. \( 6NaOH + Sb_2S_3 = 2Na_2S + 3H_2S + 3H_2O\)
4. \( 3HSb + 3OH^- = Sb_2O_3 + 3H_2O\)

The solution of the antimony sulphide by the solvent, represented by equation (1) takes place in a leaching vats, in which the crushed ore is treated with the solution of sodium hydroxide.

The solution is then separated from the residuum in a filtering vat, and is run into the electrolyzing vat where it is subjected to electrolysis.

Equation (2) shows the direct products of the electrolysis, while equations (3), (4) and (5) show the secondary reactions which immediately follow and produce as a final result—an antimony at the cathode and sodium hydroxide at the anode. If desired, the electrolyte can be collected with a solution of sodium chloride in the anode chamber of the depositing cell. In this case the solution will be obtained at the anode, and by suitable arrangements it can be collected and used for opening up refractory ores.

Borchers, who has designed an apparatus for depositing antimony from the same solution, states that an emf. of between 2 and 2.5 volts is sufficient to give a current density of from 4 to 5 amperes per square foot.

The great advantage of these ores can easily dealt with by the present furnace methods of reduction, and it is only in connection with refractory ores, or with furnace matts, that the electrolytic method is likely to develop. At the present time it is hardly in any industrial importance; and it has only received mention because electrolytic antimony has been put upon the market in Europe.

Chromium.—This metal was first obtained by electrolytic methods by Bunsen in the year 1854. He used a solution containing both chromic and chromate, and was surprised to find that by varying the current density employed, he could obtain either hydrogen, chromic, sesquioxide, chromic trioxide, or metallic chromium at the cathode. This interesting discovery showed the important part played by the current density in determining the final products of the electrolysis. More recently Moissan, the distinguished French chemist, has discovered antimony by a method that is purely chemical in character, though electricity has been used to produce the heat required. Moissan heated antimony with carbon, in a hot electric furnace, and in this way obtained a reduction of the oxide by the carbon, and the production of metallic antimony.

The metal is now produced commercially by the "Elektro-Chemische Werke," Bitterfeld, but no details of the process or apparatus used have been published. The writer believes, however, that it is produced by a method based upon that of Moissan, though doubtless the details of the process and of the furnace for direct fusion have been obtained by Moissan himself. It may be added that the honor of the discovery of the fact that all oxides could be reduced by carbon at the temperature of the electric furnace is shared with Moissan by Borchers, though it was Moissan alone who systematically investigated electro furnace reactions.

Chromium is of importance, not only as the metal but also as a metal and molybdenum. The point, (it cannot be fused in the oxy-hydrogen flame) but also because it confers great hardness upon metals with which it is alloyed. Though an electrolytic method of depositing chromium from mixed solutions of its sulphate and potassium sulphate has been patented by MM. Placet & Bonet (U.S. patent, No. 535,114) it is probable that the development of this art will be wholly met by the electro-metallurgical method that has been described.

Magnesium.—In the year 1852 Buerker, one of the three great chemists of our day, in the laboratory of Siegen, Germany, but also in America the "Oxford Copper Company" and the "Canadian Copper Company" are both producing nickel by electrolytic methods. In all these cases, the principle of the process used is the same. A matte or regula containing copper and nickel produced by ordinary metallurgical methods is used as anode, and a deposition of the one metal is effected while the other remains in solution. At Siegen, the writer understands that they are using a regulus containing 40 per cent copper and 30 per cent nickel, and the electrolyte is believed to be a solution of copper or nickel sulphate. If acid, copper alone is deposited, while if the solution is neutral, the nickel will be deposited also. This difference has been made the basis of a separate electrolytic process of the extraction of copper and nickel, so its effectiveness for obtaining a separation of the two metals upon an industrial scale is assured. Nickel is one of those metals which for a time is found in the arts, and since the separation of copper and nickel is not easily effected by furnace methods of procedure, there would appear to be a highly successful future for the electrolytic nickel industry.

Wm. T. Smith & Co., composed of the well-known William T. Smith and E. A. Anderson, assayers and refiners and purchasers of gold and silver bullion, placer and retort gold of all kinds, ores and concentrates, at their new and commodious quarters at 145 N. Main street, Los Angeles, Cal.

The firm of Wm. T. Smith & Co., gold and silver refiners and assayers was established in 1845. In 1854 by the father of the present Wm. T. Smith, who later associated his son with him.

The Los Angeles firm was established in 1895. The company proposes to act as consulting metallurgists, mining experts and contracting engineers.

*The historical notes in this article have been taken from Abens "Handbuch der Elektrochemie." Stuttgart, 1890.*

*Lupke, "Grundriss der Elektrochemie," 1890, p. 310.*
Cost of Ore Treatment in Colorado.

For quartz or silicious ore averaging 50 per cent excess in silica the smelters pay 95 per cent for the silver (New York quotations) $2.10 to $2.50, depending on grade of ore, and when it contains from 0.05 to 2.00 ounces per ton. Some smelters pay for gold when present in ores in amounts of one tenth of an ounce or more; other smelters accept only 10 cents per ounce. The treatment cost runs from $7.50 to $12.00, treatment on this class of ore depending upon the grade and desirability of the ore at the time of treatment. Silicious ores under $10 per ton generally get an extra treatment charge, and in special cases as low as $5. High grade silicious ores must meet charges of $12, and if they contain tellurium, antimony and arsenic, the charges sometimes run as high as $18 per ton. Cripple Creek ores being silicious, generally command a fixed rate of $10 for treatment and $30 an ounce paid for gold. Import lead ores from Idaho, British Columbia, Mexico and Utah are paid for at the rate of 90 per cent of the lead values (with exceptions in special cases) or $5.50 per ton or over values, with treatment charges from nothing to $8. If an ore carries less than 5 per cent lead it is classed as a dry ore and the lead is not paid for. Most local lead ores are purchased by the smelter at a sliding scale of so much per ton, based on a price of $3 per 100 pounds. The more lead an ore contains, the better price per ton it commands. An ore carrying say ten per cent lead, would today be worth $3 per ton for the lead contents, while if it contained 50 per cent lead it would be worth close to $50 per ton. Sulphide iron ores are generally sold on a neutral basis. A neutral base ore contains approximately equal amounts of iron and silica. The smelters will make a fixed charge for this ore, ranging from $3 to $7 per ton, according to grade of ore. If the ore contains excess of silica over iron they charge 15 cents per ton for each unit of excess, and vice versa, allowing 15 cents per ton for each unit of excess of iron over silica. Therefore, if one has an ore on which the smelters only take their smelting charge of $5 per ton, and this ore shows 20 per cent excess iron, the sum of $3 (20x$0.15) is deducted from the neutral charge of $5, making the actual cost of smelting 50 cents per ton. On the other hand, if this same ore carries 20 per cent excess silica, the total smelting charge will be $5 plus $3, or $8 per ton.

The smelters pay for copper ore on a sliding scale.

Questions and Answers.

Q. Please answer through the Mining Law column of the Journal whether or not the notice herewith is legal and if it would hold a claim.

J. W. W.

NOTICE OF LOCATION.

Notice is hereby given that in compliance with the revised Statutes of the United States, we have this day located the following mining claim as a quartz mining ground.

James Irving and C. H. Schwettman, and will conduct an establishment for the refining and assaying of gold and silver and for chemical determinations, at 128 N. Main St., Los Angeles, Cal., under the firm name of James Irving & Co. They will also examine, report on and purchase mining properties; and will act as consulting metallurgists. The highest cash price will be paid for old gold and silver, placer and retort gold ores, etc. Returns on bullion will be made by this firm within four hours after receipt.

MINING LAW.

For the copy of the location certificate is not sufficient to stand, as it does not describe the claim 'with reference to natural objects or permanent monuments in such a way as shall identify the claim with reasonable certainty.'

The courts have held that the location certificate must describe the land in such manner that a man of fair intelligence can take the certificate and further aid find the claim and all the ground segregated by it from the public domain.

This certificate should be measured by the law as it existed before the 1879 law was passed, and is wholly insufficient under either the old law or the new.

OBITUARY.

Dr. W. G. Brown, the well known Silver Peak, Nev., mining engineer, has passed away while on vacation last week. The deceased young man had been in poor health for over a year. Several weeks ago, according to one of his friends, Dr. Brown, who was an expert in mining, had decided to take a trip to Silver Peak, some internal tissue seemed to give way and since then he was in a hospital near Silver Peak. Dr. Brown was a native of Germany but came to this country in early childhood. For the past few years he has been mining in southern Idaho county.
CIVIL ENGINEERING.

Javacule weights as taken at port of shipment per ton of 2,240 lbs. testing 12.4 percent actual protein, equivalent to 29 percent, sulfate of potash, 58.85; 68.8 for New York and Boston; $9.00 for Norfolk, and Philadelphia, and $9.25 for St. Louis for Charleston, Savannah, Wilmington, N.C., and New Orleans.

SUCROSE OF SUGAR.

Spot nitrate is in ample supply and buyers and sellers have the upper hand for the present. We have again to quote a lower price. $1,000 for $1 for spot. The same figures are quoted for futures, in view of the quantities known to be allowed for Nov. 30.

FINANCIAL NOTES.

The statement of the United States Treasury, on Thursday, Sept. 21, shows balance in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

<table>
<thead>
<tr>
<th>Date</th>
<th>Change</th>
<th>Balance</th>
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<tr>
<td>Sept. 21</td>
<td>+60,556</td>
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<tr>
<td>Sept. 22</td>
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<tr>
<td>Sept. 24</td>
<td>+60,556</td>
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</table>

Treasury deposits with national banks amounted to $1,740,466, an increase of $3,392,284 during the week.

AVERAGE PRICES OF METALS.

New York per pound from January 1, 1898:

<table>
<thead>
<tr>
<th>Month</th>
<th>Copper</th>
<th>Lead</th>
<th>Zine</th>
<th>Silver</th>
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<tr>
<td>Jan.</td>
<td>16.50</td>
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NATIONAL IRON WORKS.

Iron & Steel
Water Pipe & Well Casing

Manufacturers of the
National Steel Ore Truck
and Steel for every description.

Dividend Paying and Investment Mining Stock

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Mines Examined and Reported on.
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ORE TESTING
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Metallurgists & Chemists
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Krogh Manufacturing Company
Successor to San Francisco Tool Co’s Machine & Tool Dept.

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ROCK DRILLS,
Stone Channelers,
The Pohle Air Lift Pump,
Coal Cutters,
The Ingersoll-Sergeant Drill Co.,

HAVEMEYER BUILDING,
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JAMES F. BURNS, Pres’L
HAROLD PARKER, Asst. Sec’y
THE PORTLAND GOLD MINING CO.
(Stock Transfer Office, Colorado Springs)

THE Ingersoll-Sergeant Drill Co.

THE Leggerot-Sargent Drill Co.

THE Portland Gold Mining Co.

Colo., May 19, 1910.

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Our mine is equipped exclusively with your drills and we believe this is the highest workmanship that can be obtained. Yours very truly, The Portland Gold Mining Co.

James A. Burns, President.
## INCORPORATED MINES PAYING DIVIDENDS.

<table>
<thead>
<tr>
<th>No. of Shares</th>
<th>Capital Stock</th>
<th>Par Value</th>
<th>Amount of Dividend</th>
<th>Date of Last Dividend</th>
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Patented

This illustration shows the edge flanging or corrugation as it passes over the pulley. This relieves the strain from the top and bottom edge by directing the strain automatically to the inside face surface of the edge. Therefore all belts have been so constructed that when they pass over the pulley or rolls, a direct strain comes upon the top or at the base of the edges, causing the edges to break away from the body of the belt in a very short time. We avoid this mechanical defect by our Spadone Concentrator Belts, which are made to fit any machine, and are 4, 6 and 8 feet wide. Prices and samples on application.

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