The Mining and Metallurgical Journal

Vol. XX. No. 11

Los Angeles, Cal., March 1, 1899

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See Page 23

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THE FINANCIAL SITUATION IN TWO ASPECTS.

The first and most serious aspect is that relating to the national expenditures and revenues. The tax laws external and internal are very searching. The imported articles in the free schedule are fewer than they have ever been, except during the civil war, and, consequently, the duties are more of the nature of taxes than a protection. As a result, the national revenue is higher than in any tariff ever enacted by Congress, except in the Act of 1841, and the laws enacted from 1860 to 1870.

Another feature affecting the customs revenue is the law under which the imports have been licensed, whereby it has been reduced. The latter has been successful in reducing the amount of revenue, but has failed in increasing the amount of duties collected.

Internal taxes are nearly as sweeping as during the civil war, and, as the population is much larger and consumption greater, they yield as much revenue as the internal war taxes; yet with all the revenues, the government is considered as overtaxed, and, with the national government, to be increased to the extent of 102,000 men, the deficit will be immense.

The present prospect is that the government will continue to entail an immense expense far in excess of the revenue that will be derived from the islands. The condition is such as to tax the genius of statesmen and financiers. This question is immensely more important than any revision of the monetary system, and especially on lines that will limit the money volume, so as to cripple the productive enterprises and trade of the country.

The balance of trade that has been in our favor in international commerce for the last eighteen months has had an immense influence upon the morals of the country. Our gold resources have been materially increased, but not in a sum equal to trade balances, for the reason that some of our securities held in foreign countries have been paid off or purchased by us. The balance on our side will continue to be problematical. Recent balances in the main have been caused by an unusual exportation of bread stuffs and agricultural products, on account of a short production in several agricultural countries; yet it is a fact that we are beginning to export more manufactures than we import. This condition has increased the energy of the gold standard men to revise the monetary system on their theory.

The Secretary of the Treasury and the Bankers' Alliance are pushing their scheme to retire the greenbacks, and substitute national bond notes, and finally the silver certificates and all silver money, except subsidiary coins, and to place the circulating medium upon the gold basis. This has been accomplished, this would leave gold the only legal tender money, for bank notes cannot be made legal tender, as they are obligations of private parties and not of the government which could cause them to be withdrawn.

Of course these propositions will be stubbornly fought by those who favor the double standard, and believe in government instead of banks creating the money. The question can be done in the present Congress for want of time and hesitation of the administrative party to take hold of the subject which will cause political agitation and probable disturbance to business.

Mr. Gage and his backers, however, will press their schemes upon the next Congress. It being republican in both branches, they hope to be successful.

RECORDING MINING PLANS.

As the mineral resources of any country are an asset of the State to which it is not possible that anything can be added in future years, as in the increase of flocks and herds and agricultural products, it is the duty of our State Governments to see that the industry of the State is conducted in a business-like, and safe manner. The investment of large amounts of foreign capital in our mines makes it necessary that due regard should be paid to the matter of the country cannot be robbed of its future mineral wealth by careless and improved ways of working.

Deep mining can only be practiced where the upper workings have been left safe with that in view. The object of the management of a mine may be solely to make large returns and a good revenue, especially when operated under a lease, with no regard for future operations, to a great depth. The owner of a mineral deposit is at most but life rented in it, hence the necessity for a due regard for the rights and safety of those who are to follow mining in future years. If it has been the misfortune of the reader to open an abandoned mine, without having a plan of the same, or one of the former workings of the mine, then he can appreciate the danger and the difficulty of such work. It is, therefore, of the greatest importance that those in mines should be platted on the underground plans and sections of the mine, and copies or tracings of the same deposited yearly in the State Mining Bureau, and with the County Recorder. In the event of the destruction of one by fire, the other will be available for future reference. In the western mining states, a prominent neglect is the absence of supervision which is shown for the future welfare of the industry in this respect; but with the increasing amount of outside capital which is being invested, the necessity of supervision with the recording of mining developments on the records of the county has become a greater necessity. In this matter the owners of adjoining claims have a special interest, for it is not the custom of all mine owners and managers to admit every one who may be interested to inspect or view the underground workings.

It is claimed that we live in the land of liberty and enjoy exclusive freedom, but the recording of annual progress in mines would in some cases prevent the liberty of making free with the minerals which by right belong to an adjoining claim, when such came under the eye of an inspector of mines or the injured owner. It would tend to prevent disputes and dishonesty, and make the work of the mining engineer a safer and less dangerous who undertake to open an abandoned mine. When it is necessary to record the surface plans and show the holdings of surface owners, it is essential to the future of the industry to keep a record of work in mine underground, which cannot be known when those who did that work have left the district.

THE MINERS' ASSOCIATION OF SOUTHERN CALIFORNIA.

One of the most important movements attendant in the south is that of the miners is the establishment of the Southern California branch of the California Miners' Association. In order to keep up the splendid work mapped out by the Association, it is necessary that the whole State should join hands and pull together. Southern California, with its young but rapidly-developing mining industry, should have its representatives present at the next annual convention of the California Miners' Association, which meets at a date between the second Monday in October and the second Monday of December, to be fixed by the Executive Committee.

Among the movements inaugurated by the California Miners' Association, which will place the mining industry of Southern California in an important and prominent position that it has heretofore occupied before the National Government, and which is already bearing fruit, is the section of the Census Bill, passed by the House, February 6th, providing for the taking of a complete census of the gold-mining industry. This is a step in the right direction, and will lead to the making a division of the Bureau of Mines under the Department of the Interior, which has been vigorously advocated by the California Miners' Association.

Attend the preliminary meeting of the Southern California Branch, to be held about the 10th or 12th instant, in the hall, corner First and Main streets, over the Orpheum Theatre. The date will be given out in the daily papers later.

INSPECTOR OF MINES AND MILLS.

As recommended in former issues of this Journal of recent date, a bill providing for an inspector of mines and mills has been introduced into the State Legislature at Sacra,
ment by Mr. Curtin, on the 8th of February.

This wise action, although coming late in the history of mining in California, is a step in the right direction. The careful selection and thoroughness of the mining engineer, or mine manager of long and varied experience, is necessary, to make the services of such an official a success and a lasting benefit to one of the State's chief industries. The position carries with it great responsibilities, and, under efficient and faithful discharge of duties pertaining to such an office, it is an estimable and instru-mental towards protecting against waste and loss of ore, of the State's future means of wealth, in enforcing proper mining methods, so as to render deep mining both safe to life employed in our mines, and profitable to capital invested therein. As a protection to the miners of this State, inspection and the enforcement of rules and laws for the safety of employees, requires the appointment of an experienced miner who possesses the determination to do his duty and do right, regardless of politics and personal consideration for those who violate the laws; and to such one we may look for a protection from the fear of political decapitation in the just discharge of his duties, can alone fill the position, and in many instances give advice and direction to the owners and operators of mines, in their underground operations and manner of working, as well as in the control and handling of employees. Hence the urgent necessity of such a person not appointed for his political qualifications.

NOTE.—It has since been ascertained that the precious lot of legislators, we were so unfortunate as to have represent the people, have knocked the measure in the head.

Railway Building in Mining Camps.

The conservatism which usually controls the building of railway lines cannot be safely consulted in reaching the mining districts. This work was illustrated six or seven years ago, in the incipience of the Creede boom, when the demand for an extension of the Rio Grande from Del Norte to Creede was very urgent. Owing to a fear that the output of the mines would not prove permanent, the company refused to build. D. H. Moffat and associates decided to build the line themselves, as they knew that the traffic might be exceed-ingly lucrative, and found it profitable to pay a handsome interest on the investment. The great rush to Creede gave a phenomenal passenger traffic, and this in turn, aside from the mineral output, which was already great, created a heavy freight movement. The result was that in a few months the Rio Grande was only too glad to buy the line.

The building of the Florence & Cripple Creek railway from Florence to Cripple Creek a year or so latter is another example of brilliant foresight and nerve. Mr. W. R. Johnson, the engineer, advantageously se-cured by a railway line to the great gold camp, endeavored to enlist Canyon City in the scheme, as that was a wealthy place and apparently the natural point from which to establish communication. In fact, the sleepy fast going Canyon City people were so in-duced with the importance of the natural advan-tages of the place that they turned a deaf ear to Mr. Johnson's representations and appeals for aid. When he then dropped down the river to Florence, fifteen miles, they were not less obstinate, and the road would never be built, or if built could not be made to pay. The Canyon City people had enjoyed the advantage of a branch line of road to Silver Cliff, that, having been washed out by floods three times, was finally abandoned after a struggle of several years to maintain it. After the Florence & Cripple Creek road had been completed and its operation suc-cessfully assured, a great milling and smelt-ing interest was developed at Florence. In so marked a way has this feature been devel-oped that already the ambitious young city enables to contest the title of "Smelter City" with Pueblo.

Mr. Johnson, having enlisted abundant ca-pacity to carry the scheme to a successful conclusion, has shown himself capable of the management of the Florence & Cripple Creek and organized the Florence and Southern Railway, a line projected to run from Florence to Silver Cliff. The panic and the numerous inciden-tally depressing sequel occurring, have pre-vented any aggressive moves towards the consummation of the project. Now, however, with the resumption of work on the Bassetk and a general revival of mining in the Silver Cliff district, it may be expected that the Southern Railway will become a factor in the new Custer county boom.—Ores and Metals.

CORRESPONDENCE.

CANADA.

Sharbot Lake District.

The district which is attracting the most attention at the present time is the Sharbot Lake District, between Toronto and Montreal, on the north of the Canadian Pacific in Clarendon township. The Boerth Mining Co., of Detroit, Michigan, are opening a series of veins near Ardoch, the district, and for the work accomplished they show some of the finest ore that can be found anywhere. Their veins run from one foot to eight feet wide, and their ore piles average from $101 to $400 from average tests made by crushing in a mill. Their shaft is down 52 feet, where they have a two foot vein which averages $54, and the next five feet of broken country rock and stringers of quartz averages $42. This, however, has not been corroborated as yet by deeper work in regard to the foot wall stringers, but selected pieces of the ore have continually assayed from $50 to $80, although they contain only a per-cautous sulphur and scarcely any visible gold. The sulphur and are rich and are for the most part iron pyrites with some little miss-pick. The ore also shows from traces of bismuth up to a considerable percentage in certain parts of the belt, and all ore showing bismuth carries a good percentage of gold.

This company, unfortunately, has been caught by the process man, and they are building a small mill of doubtful utility, but it can easily be converted into some simple mill to be used for testing in the course of the development.

The property was recently examined by Wm. M. Courtis, the mining engineer of Detroit, Mich., who recommended considerable development up the tunnel. The present mill will prove its ability to save the gold.

The immediate neighborhood are other large veins showing vein and its ultimate shale rock with considerable Bismuth. Only small pits have been sunk on these veins, hardly suffi-cient to test their width and permanency, but for the work we have had an excellent showing of the species of ribbon-rock in some parts of which free gold may be discovered.

The Boerth Mining Co. has obtained suffi-cient capital to finish the surface work and to sink three shafts, which are now going down. They are proposing to take a large amount of capital to thoroughly develop their Sheikh and build such a mill as they require, according to developments made. Their chances for suc-cess are remarkably good. The appearance of their ore is such as to promise a mine, and it would be like to have its first issue of gold at a ready $500,000 per ton, and not show a loss.

The property to the north of the Boerth mine is also being developed in a small way, and the ore as opened indicates a very promising location. It is in the northern part, with the disappearance of the snow, this district will commence active operations.

NEVADA.


EDITORIAL.—This town is very dull at present, but we expect S. R. Masson to be back from Chicago with C. Canda and Young Blair, of New York, and no doubt we will soon be in a boom again.

The big 70-foot ledge at the Drinkwater will not long idle, we think, the whole ledge averages about $15.00 per ton for gold. Before the striking of the big ledge, the mine was offered for sale for $500,000, but after they found this ledge, the company raised the price to $1,000,000, and if a buyer is not found willing to pay the price the company asks for the mine, they will work it themselves.

About five or six miles south of here are the Sand Hills, which are known to contain good gold, ranging from 50 cents to $2.25 per ton, and there are millions of tons of it. Some day, I believe, every ton of it will be worked at a profit.

A month or so ago, Ed. Drennis with an other fellow came here from Arizona. He was sent by a party of experts and mining men, he said, from Arizona, to get some of the sand and bring it to them, but we have nothing to bring them anything. The hills are open to location to anybody, as it takes capital to work them, and poor men have not got it.

Last week, L. E. Chiatowich went to his mines with Joe Prout and E. Dykes. A contract was let to Joe Prout to run a tunnel at the Black Snake mine until he strikes the ledge. Prout said he thinks he will strike it between 150 and 200 feet, and it will not take very long to run that distance as the rock is very soft.

There is talk that Henry Jagels will put up a 5-stamp mill himself. Sam Case has found some paying rock at last, and he has some of the $100 rock on the dump. He expects it will be worth something when the Blair's company starts the mill. There are quite a lot of prospects on the hills that go from $10 to $15 per ton in gold, but they don't pay much out. Of course if the owners had money to erect a little stamp mill all of them would be worked profitably, as the wood and water could be had very cheaply.

This district is coming well known, and attracting considerable capital from New York and other large and wealthy cities in the east, so we look forward to a prosperous year to follow the next twelve months. The outlook is brilliant and we are hopeful of better times.
MASSACHUSETTS.


The sensation of the week was furnished by Calumet & Hecla. The directors of this company declared a dividend of $15 per share, $10 regular and $5 extra. This is the 11th dividend declared by the company and makes a total disbursement of $59,850,000. Today's dividend is the fourth of the fiscal year, beginning Jan. 2nd and was declared at $9 per share in March last year. It has been the custom of Calumet & Hecla to make quarterly distributions of $6 per share. This was the case in 1897 and 1898. The company has been able to maintain its dividend in the face of a depression in the mining industry. The stock is selling at $12 per share, which is 45% above its par value of $8.

The copper market has been active and higher, and transactions on the Boston Exchange have been steady and greater than on any day for several weeks. $1000 per share is freely predicted for the next few months, and some well-informed people talk $2000, for this king of copper stocks. There has been much talk of a reaction in copper speculation but the demand for good mining stocks seems to be on the increase, and people who have speculated for years are coming into the market.

The much talked of consolidation of well-known mining companies by the Standard Oil people seems to be nearing a conclusion, and this has stirred up the price of the stocks which are supposed to be involved. We look to see a strong copper market for some time to come. The low-priced copper stocks offer the best inducements for those speculatively inclined and several new properties are soon to be brought out in Boston.

The outside market was firm with Santa Fe perhaps the most active, with sales at 2% lower. Copper Range sold at 35 and offered at this price.

Bingham sold at 15% lower, Victoria 10% lower, Michigan 10% lower, Mine sales at 44 and 45, Wyanet 10% lower, and Trimountain 10% lower.

Yours Truly,
ROBERT S. BICKFORD,
60 State St., Boston, Mass.

MEXICO.

La California Camp, Zacatecas district, High Walls, Yaqui River.

SONORA, MEXICO, Feb 15, 1899.

Our camps, after being quiet for several months, is on quite a boom, which may soon grow into one of the greatest that we have ever had. The rich strikes were made in all directions near our camp; within one mile from headquarters, half a dozen rich strikes are being located in the last few days; one new location, ledge 10 feet wide, assays from $40 to $500 in gold. A piece of ore from the ledge, large as a man's head, shows coarse free gold all over it. We can get the thousand. This ledge was located by the prospector the first day he prospected. The next day another prospector found and located another large ledge of sugar quartz and free gold in it. One of the oldest mining companies in the district has located two ledges near camps, both are rich in gold and silver. An extension of one of our claims was located a few months ago. The ledge is from 15 to 50 feet wide. Where it is 15 feet wide, it shows an average assay of $103 in gold.

M. D. Clark, Evans, and Stant, are pioneers of the camp and own La California and Pasadena, on which they have done considerable development work, besides owning other claims which promise equally well. La California and Pasadena are the two principal mines of the camp, showing average assays across the ledge from $30 to $50 per ton where the ledge is 20 feet wide. It is 60 feet wide in places. Many assays have been made from this ledge, showing from $50 to $200 per ton gold and $15 to $30 in silver.

In No. 1 tunnel in the California cross-cutting, the ledge is 15 feet wide, and the surface assayed from the surface of the ledge, 18 feet wide, averaged $76 in gold.

Mexicans located claims a few days ago and commenced shaft on each ledge. Assaying from the 20-foot ledge, 5 feet wide, gave $200 in gold and 195 ounces in silver. Half pound of ore from the other shaft showed fine gold all over each piece of ore, and the enclosed dollar-sized nuggets, to the ton, and is the richest ore yet found in the district. Two Mexican prospectors brought in samples from two new ledges to be assayed—one from a ledge 15 feet wide, showing in the horn spoon considerable gold, the other ledge was leased and could not be tested with the spoon. These are facts which a miner on camp will fully establish.

C. W. MITCHELL,

UTHA.

SALT LAKE CITY, Utah, Feb. 17, 1899.

EDITORIAL.—The Utah mining share market this week was fairly active, but with a few rare exceptions stock steadily declined. I expect this liquidating period to continue for a week or longer and then to see a recovery action take place. Stocks to a higher point than has yet been reached.

Immediately after the annual election and announcement of the new board of directors, which has been in mining affairs, Ajax stock made a strong advance and has held it. Alliance continues about the same. Anchor advanced a tripe in the bidding. Bullion Beck paid a dividend of 10 cents per share—or $10,000—on the 15th. The stock was higher and in better demand in consequence. Buckeye was stationary. Centennial Bunker paid its regular dividend of $15,000, on the 15th. The shares hang steadily about $40.00. Chloride Point was freely offered at the close. Apparently inside support has been withdrawn for the moment. I have every reason to believe, however, that the shares will advance later. Daly was off a tripe. The annual meeting will be held on the 28th. This week was rather in the matter of consolidation of the Daly-West concerns were filed for record, and all matter of the connection with the welding together of all conflicting interests will be completed at the next meeting of the stockholders.

The mine will start up on March 1st, and shipments commence forthwith. It is possible that considerable stock may appear for sale on the New York market not long hence. In the meantime, the present price is low and the stock is undervalued. We recommend to all our readers to buy the stock and hold it. The future is bright.

Albany Compound.

Engineers having in charge the management of large plants will be interested in a letter written by Adam Cook's Sons, 315 West Street, New York, manufacturers of the Albany Lubricating Compound, received from J. F. Wilson, chief engineer of the Equitable Building of New York. The letter asks the Albany for the past twenty years, and has also tried other greases on the market, but has found nothing that will equal the Albany. He says it is all the manufacturers claim for it, and more too, and it is a pleasure to recommend such an article.
Another Rich Strike.

The richest gold strike made for months is reported from McDonald Creek, Northwest Territory. The strike is close to the boundary between British Columbia and the Northwest Territory. The creek drains a natural basin that slopes down toward Lake Marsh and the Upper Yukon. The creek is five miles long.

Some gravel gave from $1 to $2 a pan. In the country adjacent to McDonald Creek, there are innumerable creeks not yet prospected. The gold is coarse and assays high.

ARIZONA.

The offices of the county recorder and territorial secretary are being flooded with articles of incorporations of copper companies, mostly eastern companies. This movement is due to the steady advance of copper without any signs of a recession. There were filed in the office of the county recorder articles of the Boulder & Texas Copper Mining Company. The incorporators are Rodman M. Price, Joseph Reall and Walter E. Berrien of New York. The capital stock is $2,500,000, the number of shares 1,000,000. Phoenix is to be the principal place of business, with branch offices at Wickenburg and Asher, Tex., New York, Boston, Harrisburg, and other places in Europe and America. The other company is the Mayme-Garbo Copper Mining Company. The incorporators are Charles Waite, John T. Clark and George B. Deming. The capital stock is $2,500,000, shares $1 each.

CALIFORNIA.

AMADOR COUNTY.

D. Adams, his brother and another man have been prospecting and pocket-hunting on the doctor's ranch, near Ione, for some time. A few weeks ago they struck it rich and have taken out about $7,000, and the pocket has not been emptied yet. This phenomenon excited many of the old-time pocket hunters and miners in and around Ione, and they are out on the hunt in many places.

The latest report from the Ochoco mine was that they were crossingcutting to strike the ledge at the 1700-foot level. They struck the vein at 135 feet from the shaft, and are now engaged in driving both north and south on the vein, the drift being in about sixty feet.—Amador Ledger.

CALVERAS COUNTY.

The mill in Angel's Camp, Calaveras Co., is dropping its full number of stamps. There is now enough water in the reservoirs to keep the mines running at full capacity until early fall. In all probability the mines of Angel's will not close down this year.

The new mill has been completed at the Thoro gold mine, near Fourth Crossing. The thirty stamps are dropping day and night. About 1,000 tons per day are going out. The superintendent of the mine, W. L. Honnall, reports the new concentrators satisfactory. The substantial backing of this enterprise gives it the advantage of having the public confidence.

EL DORADO COUNTY.

J. C. Haseld has commenced unwatering the old Montezuma at Nashville, preparatory to commencing development work on an extensive scale.

The Independence mine at Slate Mountain is holding its own. Drifts have been run both north and south from the point of intersection, showing a change in the grade of the ore, but proving beyond doubt that the ledge increases in width with depth—being twenty-four inches in the bottom of the drifts. The ore is sold to yield $50 to the ton.

PRESCOTT COUNTY.

The directors of the Placerville Gold Bug Mining Company, Cal., have organized, with Dr. A. J. Pedlar as president; O. L. Everts, vice-president; Dr. W. M. Muller, secretary; C. A. Shattuck, assistant and the Bank of Central California treasurer. Reports submitted showed that a portion of the machinery recently purchased has been delivered and the remainder will be shortly delivered. The work of sinking a double compartment shaft and the systematic development of the mine will be prosecuted.

YUMA COUNTY.

The Yellow Aztec people are going to put up a number of small houses for their employees. They have now ordered the lumber for four, to cost about $500 space. This is a good move, as there are few comfortable homes for rent here.

Horace Adams has a lease on the G. B. Mine, running for six months from December 1st last to June 1st of this year. He is taking out a good deal of ore, and last month milled 75 tons at the Red Dog mill in Jacksonville, which sold $12 a ton. The G. B. is a good low grade mine, and somebody will yet make a fortune in it.

In the Boston mine, near the G. B. they have an 8-foot vein of ore. It is low grade, but it has all the appearance of being the same mine. The new mill at the Black Hawk mine will enable them to work it at a low cost. This property is owned, as is the G. B., by McCormick, Powers and McComb. The shaft is only down about 40 feet, but the ore is there and getting better all the time.—Henderson Miner.

LOS ANGELES COUNTY.

The California Mining and Development Company, incorporated in California, is putting in the Rocky Mountains to transplant the latest and most modern mining implements to Lancaster, to be transported to the newly-discovered mines in the Lockwood Valley region. The owners of these mines expect to reap a rich reward in the near future.—Examiner.

RIVERSIDE COUNTY.

Deposit of Graphite.

A. Graham & Son, who are putting down the well for L. S. Mason at Willard, Riverside county, have gone through a stratum of sand rock, forty to fifty feet thick, highly impregnated with graphite. Tests of the substance have been made by experts in Los Angeles and San Francisco, and also by Prof. Hilgard, who pronounces it to be a find of rare occurrence and superior quality. San Bernardino County has recently made a rich strike in a mine owned by him near Menifee. Rock has been taken from the mine which has assayed as high as $200 a ton, and there is lots of rich ore in the ledge.

SAN BERNARDINO COUNTY.

The supervisors of San Bernardino county are having a well sunk near the summit on the road between Dale City mining district and Bagdad station on the Santa Fe Ry. It is now down 100 feet, and when water is found will aid the mining interests in that section and give better connection with the railway system. It is 51.5 miles by rail from Bagdad and 12 miles from Dale City, being a shorter distance than to the Southern Pacific.

The Slate Range Quartz Mining Company of Arizona had a lease and bond on the claims for ten inches of water for mining in the Crown Prince mine.

A prospector, grub staked by Mart McKinney, J. B. Parazette and James Ferguson, has lately reported a discovery of rich mineral. It is located in the Holcomb Valley Mining District, near the Black Hawk Mine, and the ledge, which is 80 feet wide, assays 11 per cent lead and $50 to the ton in gold. They have named it the Black Lead, and Messrs. McKinney, Parazette and Ferguson will lease San Bernardino in a few days with seven miners to run a shaft and open up the richest strike that has been made for years.

SAN DIEGO COUNTY.

Reports from San Diego show an unusually large number of mining claims being recorded. The locations are chiefly in the Julian and Banner districts, and some in the Ogilby district.

In the Cargo Muchacho district, San Diego county, E. Valdez made a strike near the Cargo Muchacho mine of a ledge two feet in width, and the ore runs $27.50 in gold per ton.

TOLYOUMNE COUNTY.

The Excelsior shaft is down 200 feet. Progress is necessitated slow, as the sinking is being done by hand drilling, while the rock is so extremely hard that not over four feet can be made per week of twenty-one shifts.

The Turner Flat gravel mine is reported as showing up richer than ever under the new management. A full force is employed.

Driving ahead of the tunnel on the North Star will be resumed, as under the present work of cross cutting and sinking holes at intervals of fifty feet along the vein from the surface is completed.—Sonora Union-Democrat.

COLORADO.

The Evening Star Leased.

The Evening Star mine, located on Sawmill Hill, in Ward, and owned by H. J. Ziem, has been leased and bonded to the Wentworth Gold Mining and Milling Company. The negotiations for the company were made by General Manager H. F. Sutton of Sunset, and the other parties to the transaction were Messrs. Vastine and Dunlap, who leased and bonded the property from the owner. The lease runs to December, 1900, and the amount of the bond is $8,000. The Wentworth Company has for a long time been trying to secure the Evening Star, as the claim runs into the group owned by the company. It is pronounced by experts one of the best properties on the hill, and Mr. Ziem has made it pay out a shoot of ore averaging better than $200 in gold per ton. There are several surface openings on the mine, all of which show ore. A crosscut tunnel has been driven 200 feet, at which point the vein and ore body was let by Mr. Sutton for driving the tunnel 100 feet further along the vein. The Wentworth crosscut tunnel will open the Evening
MICHIGAN.

A Copper Cave.

The Chicago mine at Wamberg started its pumps on February 16th. This mine has been idle six years, although it is known to have large body of high-grade ore. The mine is next to the Brotherhood, on the banks of the Sand Lake. Six years ago a shaft was driven several hundred feet under the lake, and an opening struck into quite an extensive cave. Strange to say, it was dry. Civil Engineer W. J. Oppen, of Bessemer, was sent for to make a survey of the cave. The next day the ore water came when he had measured the height at 100 feet, but had no time to do any more work. The opening was supposed to be from the lake, and the mine has been under water ever since. The cave will be explored as soon as the mine is cleared of water.—Hancock Copper Journal.

MINNESOTA.

A bill introduced in the Minnesota legislature for a bounty on every ton of pig iron manufactured in the State met with disaster. The bill had it passed would undoubtedly advance Minnesota’s position as an iron ore producer, and the pig iron producers would have been manufactured into pig within the borders of the State. As it is, Wisconsin and Michigan legislatures passing similar measures, pig iron from Minnesota will be sent outside the State to be made into pig, resulting in a loss to the people of the latter State.

MISSOURI.

Another big strike on the Kohinoor was made in a new shaft being sunk by Grounds and Irwin, W. S. Crane, F. Commons, C. W. McAbee and others. The lead was struck at 145 feet and comes out in large nuggets. A strike of this kind on the Kohinoor means a rich mine.

The big pumps on the Manhattan, formerly known as the Victor, were owned up by W. B. Kane, and the water was lowered several feet in a few days. As soon as the ground is drained a force of men will be put to work and the old Victor will again be in the statement of the weekly output once more. There is an immense ore body on this lease and three or four shafts down all in big ore. Green J. Young, of Joplin, was formerly superintendent of the Victor, which, under his management was one of the most prosperous properties in the district. The lead in from the Manhattan is taken from an old cave on the south of the Star lots on the Chatham, and three men in the ground clean up enough every week to more than pay the expenses of running the pumps.—Joplin Herald.

IDAHO.

Rich Strike at the Hiyu.

Two feet and a half of solid high grade ore has been encountered in the shaft at the Hiyu, near Florence, at a depth of between seventy and eighty feet below the first level. The shaft is going down at the rate of a set of timbers for every two shafts, and is now nearly one hundred feet below the first level. The work of sinking will continue to the depth of two hundred feet below the first level. The managers are highly pleased with the showing, as they did not expect to have any ore in the shaft at the depth attained.—Florence Miner.

KANSAS.

The Missouri and Kansas mill on the Martin group ran right along during the recent great cold spell, as they got their water to run their machinery from the pump shaft and managed to get it into the boiler before it froze. They have a big run of both lead and jack, and average about 50,000 pounds of zinc and 40,000 of lead weekly, and this week they will be busy at that, as they have been crowding things on account of the high price of ore.

MONTANA.

The officers of the United States land office in Butte have just received a decision of the United States Land Commissioner Hermann, that is of special interest to the residents of that section on account of the fact that the claimants in both parties. The decision denies the application of Margaret McCarr and Mary Sloan for a hearing to set aside the patent for the Brown Girl quartz mine. It appears that the mineral land in dispute was patented to claimants as placer diggings and was subsequently transferred to the Boston & Montana Consolidated Gold & Copper Mining Company. The contestants subsequently attempted to file an action in a court of law. The case has been heard in the courts for a long time and was finally decided by the supreme court against the contestants.

The Senate committee on mines and mining has recommended the passage of the Show- lin co-tenant bill. The bill as amended has already passed the house and if the senate adopts the report of the committee and concurs in the bill, nothing more than the signatures of Speaker Stiff, President Spriggs and Governor Smith will be required to make it a law.

Perhaps no bill before the Sixth legislative assembly has caused so much discussion as the Showlin, which was the first bill introduced in the house. The bill gives co-tenants the right to enter upon and operate property held in common and permits any small joint owners from being "frozen out" by corporations or individuals who hold the principal interest in a property. As amended the bill permits a joint owner according to the operation of a property to take his proportionate share of the ore mined by the working co-tenant or co-tenants or his share of the net milling proceeds as he may elect.—Helena Independent.

NEVADA.

Chas. H. Wilbur, superintendent of the Golden Eagle mine, near Winnemuca, Nev., won at Salt Lake, Utah, a property in most favorable shape. The outcrops from the mine during the past few weeks have been in wretched condition, says Mr. Wilbur, and during that period the haulage of the ore was simply impossible. However, the teams began hauling ores again and will continue delivering it as rapidly as possible. The mine has considerable shipping ore exposed, a rich ore of good quality has been followed all the way down the shaft. Mr. Wilbur says the proposition never looked so well. During the past nine days over 200 tons of good milling ore has been added to the large amount already on the different dumps.

NEW MEXICO.

A strike of very rich ore was made on the Union mine during the week, some of the ore showing native silver and also running high in gold. The width of the lead at the point where the rich ore was encountered, has not been ascertained, but enough is now in sight to place the Union in the front rank of Coochti mines. The lucky owners are George Hofheins, M. L. Cole and Ed Smith of Bland and Ed Lemble and H. B. Ferguson of Albuquerque.—Bland Herald.

Most of the men employed on the Copper Hill mine near Taos, have been laid off, awaiting the arrival of machinery. A hoisting plant with a gasoline engine has been ordered and will soon be in place. Work has been applied on the vein on both sides of the hill until the company is satisfied that the ore is there. Now they intend to sink an 8x15 foot shaft from the top, and crosscut to both sides. Work will start again in two or three weeks.
OREGON.

The Sale is Off.

It is authoritatively stated, in fact it is an open secret in the camp at Cornelup, that the deal for the purchase of the Cornucopia Mines of Oregon is in process of finalization under lease to Fink & Campbell, the Spokane brokers, to Youngstown, Ohio, capitalists, is off, and the management of the mines have in process of carrying out the improvements proposed by the Last Chance and Red Jacket mines, which, when matured will make these already good producers the largest paying mines in Oregon. It is proposed to put in a large electric plant on Pine creek, construct a huge tramway and run many hundreds of feet of tunnel, the estimated cost of which will aggregate $100,000—Baker City Democrat.

SOUTH DAKOTA.

The rich strike of ore in the Norwich claim, one of the properties of Joe King, located in the Strawberry district, is attracting considerable attention, and further work is being carried out. The richest ore comes from the pocket and it is estimated that the value of the ore is from $30 to $50 per ton.

WORK has been resumed again on the stop mill, which is being erected at Gayville by the Baltimore and Deadwood Co. The mill is nearly completed and it is thought that two more weeks will see everything in place.—Black Hills Mining Review.

UTAH.

The stockholders of the Daly-West Mining Co. met in annual session on the afternoon of Feb. 20th, and elected their directors for the ensuing year and adjourned, after the cheerful assurance that dividend No. 1 would be distributed among them in June next.

It was the first meeting since the harmonization of interests that were in bitter conflict for so long a time. The meeting was attended by the stockholders, and the adjournment was the result of the will of the members. The officers of the company were elected: John D. Daly, R. C. Chambers, Chas. Reed, Allen Fowler, and O. J. Salisbury, the board of directors going out to Directors Chambers and Reed as the representatives of the Haggin-Heast interest.

The latest cyanide shipment of the Geyer-Marion, at Mercur, netted the company $7,000.

The Mercur mill of Mercur was forced to close down for several days, owing to the deep snows and the inability of the railroad to deliver ore.

The annual meeting of stockholders of the Northern light was held on the 20th ult. A number of business was transacted, in the treasury of the company, and the superintendent's report was very encouraging.

Some fine shipments of high grade copper and gold ore are coming in from the Centennial-Eureka at Eureka.

The management of the Chloride Point, of Mercur, has been put to considerable trouble of late owing to the failure of the electric company to furnish power. There is a renewal of the rumor of a dividend.

WASHINGTON.

Free gold was struck last week in the Butte and Boston mines at Republic Camp, Wash. The whole drift is in rich ore. The strike was evidently made while drifting north on the new ore body at a depth of 200 feet toward the Jim Mine. J. H. Wilmot, vice president, gave the latest values taken from the face of this drift as $40. The San Poil mine, at Republic, never looked so good, as far as the appearance of the ore is concerned. We understand the company's office, and there is a string of daily assays there, covering two weeks' time, which is calculated to fill the hearts of the stockholders. Of course there is an occasional low assay, as is always the case, but the average is up to a comfortable sum, and day after day of late the assays have run $50 to $100 per ton and better, both in the winze, which is being sunk from the No. 1 to the No. 2 level, and in the raise.

At Republic, the Lone Pine ore chute running east and west has been proved to be fully 200 feet in length and 100 feet wide. Mr. Clark estimates the average value of all the ore in the chute at $40 per ton. The present values are running steadily between $40 and $50 per ton at the face of the drift, which is running east on one of the famous Lone Pine cross ledges. It is estimated that the Lone Pine will be ready for a mill as early as it can be installed in the spring. The development has proved the property one of the wonders of a good camp.

FOREIGN MINING NEWS

BRITISH COLUMBIA.

Ore has at last been struck in the lower tunnel of the True Blue. The property was bonded last fall to the Mall Mines, Limited, and ever since the company has been patiently exploiting the property, while residents of Kaslo, not so patiently, have been awaiting the result, which is as successful as a large mine at the very boundary of the corporate limits. This is, in fact, now an accomplished fact as twelve inches of clean ore was encountered in the lower tunnel. Mr. Steven son, who was one of the original investors of the property, is himself mining the mine, was in town and when questioned in regard to the rumor of a strike he confirmed it fully, giving the particulars. They are now sinking on the ore body, which is apparently solid and in place. The ore shoot is said to average from 6 to 15 per cent copper, beside small values in gold and silver, and if continuous will without a doubt prove the judgement of the company who have not yet been so well founded when gave a favorable report of the property.—Kootenayan.

LOWER CALIFORNIA.

J. W. Dawson, of Los Angeles, has just returned from the Cedros Island Mine, where he has been examining the property of the Cedros Island Mining Company, of which Otto Schuhlenburg, of St. Louis, Mo., H. A. Howard, of San Francisco, and others are the owners. Otto Schuhlenburg owns 51 per cent of the stock, and W. A. Clark, the copper miner of Montana and Arizona has practically agreed to purchase the balance of the stock, if the property is what it is represented to be. It is also understood that the rest of the stocks will be secured later. Mr. Dawson found a very rugged country and an immense body of ore, though low grade.

The opening of the California and Oriental Steamship line is expected to have a good effect on all facilities for filling orders. The deposit of iron, which is said to be capable of making the finest Bessemer steel, and is superior in quality to the ores used in the United States, is at San Isidro, within 600 miles of the sea, and many years have been spent on deep-sea vessels at a comparatively small outlay of expense. The ore is in great beds which crop out above the surface over a large area. Experts from Pennsylvania and other parts of the country to examine the ore have pronounced it very valuable, and experiments made in rolling mills have confirmed this opinion.

The deposits were discovered many years ago, but it remained for men of the present day to properly recover them and introduce its good qualities. The deposit is generally known as the Tepustete iron mines, but the Tepustete mine, which is owned by Gen. W. E. Webb of San Diego, comprises only a part of the great bed of iron. Adjacent to the Tepustete are the large iron deposits owned by Don Manuel Riveroll of San Diego, and which are officially known as the Jupiter, Prometoe, Marte and Mercado mines.

ONTARIO.

Find of gold are not the only fortune-makers these days. From B. W. Goodsell of the Goodsell Packing Company, Chicago, it is learned that of recent date one of the richest copper mines east of the Rocky Mountains has been opened in western Ontario. Mr. Goodsell is vice president of the mining company engaged in laying bare this great copper deposit, and he, with the other stockholders, firmly believes that millions of dollars may be made from the rich veins of human hands and machinery. The owners and incorporators of the company have named their corporation the Rock Lake Mining Company, Limited, the officers of which are: W. W. St. John, president; W. W. Fafalo; Vice president, B. W. Goodsell, Chicago; Treasurer, B. G. Coryell, Chesaning, Mich.; Secretary, L. C. Holton, Sault Ste. Marie; Superintendent, A. S. Burrows, Sault Ste. Marie, Ont.

The Rock Lake mine is situated southwest of Batchewang Bay on the north shore of Lake Superior, eleven miles north of Bruce mine, and not far north of the Rock Lake, from which it takes its name.

The vein now being opened is believed to be the mother vein of the copper belt of that district. This belt extends from Batchewang Bay on the north shore of the great lake to the north channel of Lake Huron, a distance of nearly 100 miles. In many localities the copper can be found still further in thickness and miles across the barren mountain range.

A careful assay of a ton of surface ore recently scooped up shows the following results:

Copper, 6.4 per cent.
Sulphur, 0.51 per cent.
Gold, $5.34 per ton.
Gold, $5.41 per ton.
Gold, $5.54 per ton.
Gold, $5.62 per ton.
inside the walls. It is stated that every foot of depth adds to the richness of the lode. The company understanding this, is bending every effort to acquire from the State a concession to work the mine. The Rock Lake Mine Company is capitalized at $1,000,000, in shares of $10 each. Since the mine has given signs of such exceptional richness the company has withheld its stock from the market until deeper ground has disclosed the real value. Compared with other copper mines it is claimed by the owners that in actual value their capital stock could be increased to $3,000,000, and would pay dividends on a much larger amount.

So sure of their property are its controllers that immense sums are soon to be expended in developing it. A charter for a railroad from the property to Lake Haron, and the Canadian Pacific system has been applied for. The railroad is to be built as soon as permission is granted by the Dominion government, which will not only furnish an outlet for the mining product, but will open up new sections of country well stocked with minerals and sprinkled thickly with rich and valuable veins.

Mr. Goodsell says his company has received the greatest consideration at the hands of Canadian government, it being evident enough that the Canadians are ever ready to welcome Yankee capital, energy and enterprise.

latest Mining Decisions


The owner of a patented placer claim, or another with his consent, can locate a lode claim within the boundaries of the placer claim. McCarthy vs. Speed, 77 N. W. Rep. (S. D.) 590.

One who performs labor on a mining shaft, tunnel, level, chute, stope, uprise, cross cut, or incline is entitled to a mechanic's lien on the mineral. Hinkle et al. vs. Miller et al., 55 Pac. Rep. (Cal.) 401.

Non-compliance with the miner's rules, or with the state or federal laws, regarding locations, works a forfeiture of the claim, whether such rules or laws so provide or not. Sissions et al. vs. Sommers, 55 Pac. Rep. (Nev.) 829.

Citizenship of one, and his rights to a mining claim dependent thereon cannot be questioned in an action between him and other individuals to determine adverse claims to mining rights. McCarthy vs. Speed, 77 N. W. Rep. (S. D.) 590.

Where an employee of a mine is injured by falling rock, his own negligence contributing to the injury, he cannot recover from his employer unless the latter was guilty of willful neglect, or failure to furnish props when requested to do so. Sugar Creek Coal Min. Co. vs. Peterson, 52 N. E. Rep. (Ill.) 475.

Persons who locate a lode claim, and record their location, are entitled as against one to whom they sell an interest in the claim after an examination of the records, to assert that there was no discovery to support the location. McCarthy vs. Speed, 77 N. W. Rep. (S. D.) 590.

The proof being sufficient to support the finding that the location of a certain mining claim was substantially in compliance with section 2324, Rev. St. U. S., conflicting, but subsequent location has no right to the ground in conflict. Argentine Mining Co. vs. Benedict, 55 Pac. Rep. (Utah) 559.

The fact that two claimants under oil leases, at whose instance a receiver had been appointed, fail to sustain their claims, will not necessarily require that the costs of the receivership shall be charged to them, rather than to the funds in court, which are part of the subject of the receivership. Elk Fork Oil & Gas Co. vs. Jennings, 90 Fed. Rep. 767.

St. 1897, p. 103, $2, requiring the locator of a mine, in order to hold his claim, to sink a discovery shaft, or make a cut of certain depth, within ninety days after location, is not in conflict with the act of congress which gives to locator one year to do the $200 worth of labor prescribed by congress as a condition of holding the claim. Sissions et al. vs. Sommers, 55 Pac. Rep. (Nev.) 829.

In an action for personal injury caused by coal falling from the roof of defendant's mine while plaintiff was working therein, the latter cannot show, for the purpose of showing that the defendant had notice of the dangerous condition of the roof, that previously, at another place in the roof and under different conditions coal had fallen. Sugar Creek Coal Mining Co. vs. Peterson, 52 N. E. Rep. (Ill.) 475.

The attempt of an agent employed to do the annual assessment mining claim, after failure to do the work, to relocate the claim is a fraud on his principal. When such attempted relocation was in the name of the company of which the agent was manager and superintendent, the company must be held to have had knowledge of the fraud. Argentine Mining Co. vs. Benedict, 55 Pac. Rep. (Utah) 559.

Under How. Ann. St. §8406, providing that laborers in mines shall have liens for wages due, which shall take precedence of other debts, liens or mortgages, and that such liens may be enforced in the same manner and under the same limitations and regulations as do liens of other liens, a labor lien is superior to a mortgage lien although the latter is prior in time. Atlantic Dynamite Co. et al. vs. Ropes Gold & Silver Mining Co., 77 N. W. Rep. (Mich.) 398.

Pending the determination of the title of certain oil lands, the court appointed a receiver to take charge of and develop the property, the necessary funds being furnished by the title claimants, with the understanding between them that they were to be refunded to them from the sales of oil, would the same be sufficient. Held that, the title to the land having been found to be in one claimant, the other was entitled to such reimbursement. Elk Fork Oil & Gas Co. vs. Jennings et al., 90 Fed. Rep. 767.

GENERAL NEWS

The American Impulse Wheel Company of New York report some very large Electric Transmission work in hand and most valuable results from all their installations. The Company is getting a large home and export trade, etc.

The Tenth Annual Report of the Inspection of Mines of the State of Montana, for the year ending November 25, 1898, has been issued by John Byrne, Inspector, embracing conditions of mines of Montana, and accidents in same; also the commendable report of Deputy Inspector Frank Hunter. The report contains many pages of valuable information for investors in Montana, and shows more and more the necessity of an inspector of mines for California.

The amount of "Rainbow Packing" made by the Peerless Rubber Manufacturing Co. of New York, sold to their customers, is estimated at over four hundred tons. Letters entirely unsolicited are almost daily received in which engineers who have used it commend it for its excellent qualities, and the fact that they have once used it, absolutely refuse to try any other is convincing proof of their faith in it. Testimonials from the users of the Peerless Rubber Manufacturing Co.'s goods, both at home and abroad, confirm the fact that "The Peerless line of packings are without equal."

Three of the most valuable technical works, books that could be added to any library have just been received at this office. Commercial Organization Analysis by M. F. C. F. C. S., $5.50. Physico Chemical Methods by Dr. J. Traube, Privatdocent in the technical high school of Berlin, translated by M. F. C. F. C. S., $6.50, and Introduction to Chemical-technical Analysis by Prof. F. Ulzer and Dr. A. Fraenkel, with appendix by the translator, Hermann Fleck, Nat. So. of Berlin, $6.25. Each work covers the subjects treated very exhaustively, no chemist can afford to be without them. P. Blakistons Son & Co., 1012 Walnut St., Philadelphia, Pa., will furnish full information.

Standardized Iron Drills.

Thos. D. West, Sharpsville, Pa., Chairman of the American Foundrymen's Association, has issued a standardizing drillings report that up to Feb. 1st there were 19 Blast Furnaces, 17 Steel and Iron Works, 13 Colleges, 11 Iron Foundries and 32 private laboratories using its standards, description of which appeared in the Journal, Feb. 1st, page 8, and also reports that he is in receipt of many letters praising the utility and excellence of the samples being sold to the trade and the greater confidence they render to laboratory work being uniform throughout the country.

Morgan-Watson Mining and Construction Company.

The firm of Morgan-Watson, of Cleveland, Ohio, are in a sense a new institution, having recently associated themselves together for the purpose of conducting a general mining and stock business handling nothing but that which they know are good securities. Mr. Francis Morgan of this firm is an old operator in mines and stocks, having been in the business for the past sixteen years, during which time he has mined in Mexico, the west, and the Lake of the Woods of Canada. One of the principal features of Morgan-Watson is that of developing first class prospects. Both of these gentlemen are members of the Cleveland Mining Exchange, and are the organizers of that institution. Mr. Morgan is also a member of the Cleve Chamber of Commerce.
The mining and metallurgical journal.

KANSAS LEAD AND ZINC.

(Continued from our issue of February 3, 1899.)

GEOLOGY OF THE ORE DEPOSIT FORMATIONS.

The lead and zinc ores of southeastern Kansas occur in the Mississippian or subcarboniferous formations, and lie in a wide exposure in southwestern Missouri, northwestern Arkansas, and southeastern Kansas. In Kansas, but a small area is covered, the ore is found in many places in the western part of the state, six miles wide at the base, along the north line and ten miles high along the east. The northwestern limit is approximately determined by the position of the Platte River, but not entirely so, as the formation is found in many different instances either at the surface or only a few feet beneath for a few miles to the west of Spring River. In Missouri, according to the geologic maps of that state, the subcarboniferous cover thousands of square miles in the southwest corner, and a narrow strip reaching to the northwest to the limits of the state. To the south of Missouri it covers a portion of northeastern Indian territory and a large part of northwestern Arkansas.

Lead and zinc ores have been found in greater or less extent in many places in southwestern Missouri, northwestern Arkansas, and northeastern Indian territory, but the heaviest ore deposits thus far discovered are connected with a small area lying in the vicinity of Carthage and Joplin in Missouri, and Galena in Kansas.

This particular geological horizon is different in many ways from any other known in the whole geologic column. It is essentially a limestone formation, but here and there, in many places throughout its vertical occurrence, a thin layer of sandstone is almost entirely replaced by flint rock, which forms extensive masses, sometimes measuring hundreds of feet in thickness. The flint seems to be primary in origin, the indications being that it formed at the same time as the limestone. It is frequently almost pure silica, often containing but a mere trace of foreign matter. Its general character has been described in various places, in which the details need not here be given. It does not exist in equal abundance uniformly throughout the subcarboniferous formations. In places it is a dominant feature of the terrane, while elsewhere the limestone is thinly and the flint is prominent.

Usually the ore is found entirely within the flint masses; that is, in openings surrounded by the flint beds. There is practically no instance known of the ore occurring in the limestone, as is so generally the case in other lead and zinc mining districts, such as southeastern Missouri, northeastern Iowa, and southwestern Wisconsin. The flint has been fractured to such an extent that it would be difficult to obtain a cube six inches across which did not have a number of fractures within it. Associated with the limestone as it is, large quantities of limestone may have been dissolved out, leaving the flint as the only material of the ore, and the flint is the more prominent. In some way, and by some processes, the openings, of almost infinite variety in shape and size, have been produced. The rock volume has been greatly contracted, either by the dissolving out of the limestone or other rock material, or in some other process, producing underground cavities, which is the flint rock only feet in extent; there is a seam unaccountably widened to six or twelve inches; here is a fracture line one-sixteenth to one-thirty-second of an inch in width—cavities of all descriptions and of all sizes. Such cavities are more or less filled with the lead ore and the zinc ore. No matter how irregular in size, shape or position, it has been deposited in them from watery solutions.

Along with the ore is a variety of siltacious material, secondary in origin, which has also been deposited in the mine, and constitutes the main mass of material in the dump piles, while elsewhere it is present to a much less extent. This material has been described by Winslow in his reports on the lead and zinc ores of Missouri. It is most intimately associated with the ores wherever it is found, the two apparently having been deposited at the same time.

The depth at which this ore is found varies exceedingly. In some places it is observed at or near the surface; elsewhere a shaft must be carried two feet or more to reach it; while in many places it would seem from the small amount of deep prospecting done that ores exist at a much greater depth—from 200 to 250 feet—with no apparent indications of the same near the surface. The instances are now known where a terrane once prospected to a considerable depth and abandoned as unproductive has since become a great producer by deeper mining. Provided of these, perhaps, is the North Empire territory. Here, in the little valley, many shafts were sunk in early days of mining, from 1877 to 1880. Almost no ore was found. After nearly fifteen years of waiting it was discovered that one of the richest bodies of ore ever yet reached lay but a few feet beneath the bottom of these old shafts. During the past eighteen months, however, the North Empire has produced more ore than has ever been taken from an equal area in a similar length of time, unless it should be the Short creek valley, where lead ore was first discovered.

There is no regular geological difference between rocks near the surface and those at a greater depth. It cannot, therefore, be determined why, in some cases, the ore is so near the surface, while in others it is found deeply beneath the ground. Occasionally a limestone mass is found before the shaft has reached a very great depth, and this must always be passed before ore in large quantities is found. In some places in the North Empire territory, the limestone has been drilled through and large ore bodies found immediately underneath. It seems that in some way the depth of the ore may possibly be dependent upon the water level in the ground. Where the conditions have been such that the water level was far from the surface, the ore is usually found likewise at a great depth. It will not do to pass judgment on this even by using the water levels as we now find them, for in some parts of the country, particularly on the land belonging to the South Side Company, large bodies of ore lie above the present water level and can be taken out without any difficulty from water in the mines.

Throughout the whole mining region of Galena and Joplin, there have been present among the miners that the ore rarely, if ever, occurs beneath a body of limestone. It is a common saying, even yet, that if limestone is reached in shafting, the ore shaft should be abandoned. This is generally done, but the parties do not have sufficient capital to carry the shaft a number of feet in limestone, for when the limestone bed will be from ten to twenty or even more feet in thickness, and the expense of sinking a shaft through such a formidable obstacle is greater than many of the prospectors are willing to bear. It has been proved in many places during the last year, however, that the mere cost of starting a bed of ore at any particular place practically argues nothing of the possibility of a large bed lying underneath. Wherever the shaft exists in limestone, and in the vicinity of which the water can pass, there one may expect to find the ore, entirely independent of the character of the material which exists twenty-five or fifty feet above.

PROCESS OF MILLING ORES.

By ALEXANDER H. OUTREIDGE.

(Continued from our issue of Nov. 15, 1897.)

The machine also requires the constant attention to supply the blanks or planchets, and frequent attention of the expert adjuster of balances. When the additional cost of steam power and wear and tear of the parts is considered, the original cost of the apparatus, its merit from an economical point of view is not so great as it would at first sight appear.

The next operation to which the blank planchet is subjected is the raising of the raised edge, technically called "milling." The machine used for this purpose is an American invention, and is admirable for its simplicity as well as for its rapidity with which it accomplishes the work.

The blanks are fed by an attendant into a tube, and are drawn horizontally, in single file, through a gradually narrowing channel formed by a groove in the periphery of a rapidly revolving disk on one side, and a stationary segment of corresponding curve on the other, keyed a little closer to the wheel at one end. The blanks are in this way compressed on the rim, acquiring the "milled edge." This machine is capable of milling as many as 1,200 pieces per minute.

The blanks are now taken to the picking vat, where they are immersed for a couple of minutes in weak sulphuric acid, for the purpose of removing the black oxide of copper, they are then washed in pure water and placed in a rotating captive filter. This rapidly dries the blanks, and when removed to the coining room they have acquired a fine surface.

The metal is then introduced into the die, which is composed of a Frenchman, known as the Frenchman, which has been further improved upon by the skill of a former coiner, the late Mr. Franklin Peale. This steel die is constructed on the mechanical principle of the "toggles" or "elbow-joint" (one of which the elbow-joint is a familiar example). It is con-
trolled by a lady who feeds it with the blanks which are vertical tules in the form of "feeders" catch the bottom piece and carry it forward, where it rests in the "collar" between the upper and lower dies; the lever is now pushed down, the lower die remains fixed; the pressure increases with perfect uniformity up to the maximum, which is equivalent to about 10 tons to the inch, 80 tons for the double eagle and 120 tons for the one and half dollar. The pressure gradually decreases again by reason of the relaxation of the upper joint, the lower die pushes the piece out of the collar into which it has expanded, and from which it acquired the "reeded edge." Meanwhile, the feeders have provided another blank, and as they bring it forward they push the coined piece into a channel, through which it slides into a box beneath the machine. The coins are then inspected by the foreman, and any cracked or defective pieces set aside.

The larger denominations of coin are counted by hand, and the smaller pieces, as well as the "brass" and "nickels," are numbered by means of a simple and ingenious arrangement called the counting board. After the coins have been counted and weighed, they are tied in linen bags and delivered to the treasurer in drafts of $5,000 each. The accuracy of the adjustment of the weights in the counting machine is rarely more than a deviation from the true standard weight of as much as one one-hundredth of an ounce in any delivery of either gold or silver coin.

As a final precaution, the assayer is required by law to select at random, one coin from every lot of $20,000; these are sealed in envelopes, numbered, and placed in a strong box provided with two locks; the key of one is kept by the treasurer and the other by the assayer. These sample pieces are called the "pyx." They remain sealed until the Commissioner appointed by the President assemble at the "annual assay" in February of each year to test their purity and weight, and it has rarely happened that any piece has been found to exceed the small limit of "tolerance." The manufacture of the dies for coin requires a high order of artistic and mechanical labor, involving the talent of the designer and the skill of the engraver and sculptor. A deal of experimenting and labor is involved and the work of the die cutter would necessarily extend this paper beyond the limits assigned to it. A brief outline must, therefore, suffice. The artist first makes a free sketch on paper, he then models his design in wax upon a glass plate, and it is probably five times the size intended for the coin; from this he takes a cast in plaster, which serves, when coated with plaster, as a matrix, from which an electrotype in copper is obtained. The electrotype, after being finished by hand, is used as the model from which the steel die is cut by means of a reducing machine, and the cutting machine is what similar to those used for reproducing designs for steel rolls used in making printed fabrics. A traveling pointer attached to the long arm of a lever is caused to move back and forth over all portions of the raised model, and a steel drill attached to the short arm is thus caused to cut the design in a block of steel. This is known as the "original" or "master die," but reduced to the proper diameter for the coin; the stars and lettering are now added, and the whole is finally touched up by the "copy." This design is called the "Hub" or "Master die," from it the coinings are made and reproduced in any number required.

A block of steel having been softened by annealing, striking the Hub, and by a succession of blows, followed by frequent annealings, the die from which the coin is to be made is produced.

It is the remaining value of the raw material to bring the processes involved in our gold and silver coinage to a perfection which would not, perhaps, be found practicable in any ordinary industry, in this fact, together with the national pride which is felt in the matter, should offer encouragement to the invention of all practicable methods of producing perfect work and preventing loss.

**PLACER MINING IN CALIFORNIA.**

*By Prof. Arthur Lakes.*

Mining for gold in California commenced, as elsewhere, by placer mining and then led up to vein mining. Now vein mining is in the ascendency, and for a time (it may be for years, for a time, the vast placer industries are very much in abeyance. How vast the placer resources were, and are, and what a huge amount of material has been moved by the miners in days gone by, is brought before us as he crosses the Sierras, or looks down into the wooded depths of the great canyons of the American and other rivers that cleave the Sierras from summit to bottom, as perhaps patches and white hummocks of abandoned placer ground. Or again, if he goes into the more northern sections of the state he sees the huge banks of gravel, hundreds of feet high, and the rusty old idle monitors pointed at the cliffs they have done so much to reduce, whilst miles upon miles of great furnaces and rusty pipes tell of the century which sought the water in enormous quantities and with mighty force from afar. We look upon a comparatively dead industry, yet we are impressed with the idea of how great it could be again, if it were one of the railways which at present arrest it.

The regular open hydraulic mining has practically ceased, but drift mining, as it is called is still maintained, the debris being not only valuable as a source of material for building purposes and agricultural interest, but also coming under the law as is the case with the regular open hydraulic.

Drift mining consists either of running a tunnel at bedrock or on an old river channel in a placer bank, with a lofty heavy body or cliff of placer material above of not so great value as that at bedrock; or it may be running a tunnel in under a sheet of lava which has filled up an old river channel, almost to bedrock, and extracting the pay ore between it and bedrock. Drift mining has been defined as the process of tunnelling and breasting, by which comparatively shallow strata of gravel are excavated without the removal of the deep top covering; indeed, the depth of the gravel is the breasting, the top six inches are taken out with the gravel. The depth of the pay gravel stratum is two to six feet. The mines attack the channels with bulldozers, or trucks, cutting down from the bottom thereof into the channel to avoid very long tunnels, and the cost of driving through excessively hard ground that would not meet with the success and the almost immediate dry bed. Angers are used to put down holes in preference to ordinary drilling. Three thousand feet of the Nevada City channel has required 3,000,000 dollars. The Harmony mine is said to run $10 to $12 per ton, when crushed in stamp mills. This channel is regularly blocked out, leaving a
pilbar between the rim and the channel extracted as the gravel welled rapidly, it is advisable to keep dead work just far enough ahead so as to have a new block ready when the old is finished. The timbers are considerably spread out with spreaders are rapidly broken. It is found better to let the floor rise and cut it down whenever necessary. The Harmony Drift gravel is an ancient river gravel, the channel, the gravels, the quartz pebbles and boulders lying on bedrock covered with pipe-clay, sand, and different gravels. The top of the deposit is surmounted by a capping of lava; the depth of quartz gravel is 300 feet, and bedrock is a decomposed granite containing hard boulders. Two channels exist in the upper portion of the ground, one turning east, the other northeast. The Harmony channel has a width of over 200 feet. The gravel is not tightly cemented, but contains a clay which renders washing in sluices very ineffectual. The gravel being composed of quartz containing gold. It was found that in washing, less than one half of the gold was recovered. On the West Harmony mine the depth of gravel is 2 to 5 feet. In the deep channel the gravel is uncremented. This appears to be the main channel.

Besides the Harmony mines, there are numerous others on this ancient river bed near Napa, viz., the Missouri, the Napa, the Yuba, the Olden, the Yosemite, the Fountain Head, Cold Spring, the Yuba Mesa, and others. Our road from Nevada City to visit the North Bloomfield placer district, went through the beautifully wooded region, clothed with black oak, sugar, and white pines. Then we drove down into the profound and wooded canyon of one of the canyons of the Yuba river and climbed the opposite bank. The rocks exposed on the side of the canyon appeared to be schists and serpentine. After reaching the summit we caught glimpses between the trees of snowy white, glittering in the sunshine, and soon were in the presence of a lofty precipice of 300 feet high forming the end of an amphitheatre to the north, and extending down the valley as far as the eye could reach.

The cliff of the well wooded, the timber and herbage concealing the lava cap, which forms deep grooves and canyons, is this mighty body of gravel and pebbles. The face of the cliff is beautifully sculptured, channelled, and fluted, like sculptured and channelled "potato" or "beaver" boulders of the celebrated "bad lands" of Dakots. Though the general color of the cliff of detritus is a dark grey or greyish white, there are shades and bands of color at intervals that add much to its picturesque aspect. Thus the upper portion has a reddish tinge from iron oxide, the middle is almost a chalky white from a thick belt of pipeclay, and the lower section has a leaden grey and somewhat mottled and rough appearance, containing the coarser and larger boulders of all sorts of rock but principally of dark volcanic sediments. This lower section showed among its boulders and large spherules are rapidly bedded and evidencing the strong currents and rapidly moving water by which these boulders and large spherules are rapidly bedded and evidencing the strong currents and rapidly moving water by which these boulders were transported. The gravel is accumulated at the base of the cliff on bedrock, and immediately above which the main hydraulic work has been and done, and down into which the gravel has been cut into the schist bedrock to accommodate the down grade of the flumes for carrying off the dirt, gold, and boulders thrown down by the giant nozzles. These ruches had wooden flumes 3 feet wide by 3 feet deep at the bottom paved with ripples of squared pine blocks from 13 to 22 inches in diameter. Broken sections of great wide mouthed water pipes, 22 to 27 inches in diameter, lay scattered around. These formerly line up to the reservoirs, 22 miles and distant, covering 1,600 acres, and connected with the great Yuba ditch 40 miles distant. Here and there forlorn looking monitors points their canons, and loud voice of the crowd, amounts of debris, reminding one of a fort that has been abandoned, and its guns spiked and left to rust and ruin.

Towards the entrance of the amphitheatre, leading down the immeasurable expanse, at its narrowest point, a dam of brush, stones, and trees fifty feet high is thrown across the ravine, and across the path of the main ditch flume, leaning upon this at a steep angle of 45°, was the hydraulic elevator, a wide open half section of a great metallic pipe, four feet wide by 28 inches deep; at the bottom of this in the flume two giant nozzles directed on either side of the elevator, hurled aloft sand and rocks as they came rolling down the flume to a height of over 100 feet, descending in the basin beyond in a deluge of water, mud, and boulders, thus contriving to fill the vug simultaneously with the water; and otherwise it would soon have choked up the workings. Underneath the dam and along the length of the basin beyond is a tunnel or waterway, carrying away the water from the dirt, and discharging at some point some distance down the ravine. Closed dams are located at convenient points along the line of this tunnel. The elevator was of enormous force, and would hurl aloft, like a baseball, any rock that was big enough to fill its ample trough.

Near here was formerly the location of the celebrated Malakoff and Derbee mines; the latter was a drift gravel mine, but lately closed down. The mine was worked to a depth of 500 feet through a vertical shaft and the gravel was about 11 feet at the bottom. This not being cemented was washed down in sluices and yielded an average of $2.47 per ton. This was the average for twelve years, and about 150,000 tons were extracted daily. The channel has been worked a distance of 4,000 feet in a straight line from the shaft. Over 50,000,000 gold was spent in the workings and quantities of gold were found. The mine has produced over $7,000,000 all told. The Malakoff was worked by the hydraulic process, being one of the largest hydraulic processes in the country. The elevator process was used to retain the debris. Over 50,000,000 were spent before it became a paying property, but it has since produced over $5,000,000. It is estimated that there still remains in the channel $25,000,000 yet to be extracted.

The North Bloomfield hydraulic mine is situated three-quarters of a mile southwest of the town of North Bloomfield. It is said to have been the largest hydraulic mine in the world, being a consolidation of many claims, aggregating 1,555 acres. One-fourth consists of gold-bearing gravel resting on an ancient river-channel; 11,100 feet of tunnels have been driven. Its water plant cost over $1,000,000, and is next in size to the plant of the South Yuba Water and Canal Co. Bowman's dam, to which this mine is attached, with other dams, will hold 450,000 miners inches of water. The main ditch is 55 miles long and has a capacity of 5,200 miners' inches. The pay dirt is 40 to 50 feet in the "blue gravel" 135 feet deep. Before the mine was closed down by litigation 150 to 200 men were employed. The mine has produced $6,000,000 and is capable, it is said, of producing $1,000,000 per annum when in full operation. At present only one small mine is at work drifting on one of the main channels.

The North Bloomfield gravel mine was not working at the time of our visit, but the following report will give an idea of how it was in 1896.

"Forty men are employed on a limited area, having complied with the requirements of the State and Federal laws. It is reported that the mine has drifted a shaft into the main outlet tunnel and dipping into the river. At present one monitor with a 6-inch nozzle is sending water under 300 feet pressure on a bank over 300 feet high, with 140 feet of solid gravel next to slate bedrock. At the point of operation the bedrock was wearing away, showing the presence of either a deeper basin or another channel under the deposit. The flume is 390 feet long. It is lined with 13½ inch pine blocks, costing 11 cents per foot are used in washing the gravel. After passing through the sluices the waste material drops into an open elevator box up which the gravel is pushed. The sluices are from two to three and a half inches wide, and the water is better than the white iron plates formerly used. The Giant works during the night shift. The day shift pick the ground and break up the pipe clay and gravel.

"A deep cut in the bedrock is carried up to the face of the present and to enable the bottoming of the deeper portion of the channel. The output is 2 cubic yards per miners' inch. A clean up is kept up monthly; the gold is worth $18 per ounce."

In working these cliffs of consolidated boulders and gravels great care has to be used when undercutting with the nozzles at "bedrock" not to bring the great nozzles too near the dam to account from the mining bureau and the cliff being liable to cave in without warning, and to fall. The north end of the amphitheatre illustrates this, for a quarter of a mile or more, the bottom of the amphitheatre is lined with a great landslide of rocks, trees, and blocks of ground and debris jumbled together, repreenting millions of tons of fallen matter.

Among the curiosities of this river gravel is the presence of beds of lignite and of stumps of carbonized and petrified trees, accumulated doubtless as driftwood. While the whole cliff, from top to bottom, carries a certain per cent of gold, the coarse blue boulder gravel for about 100 feet thick above bedrock is mainly worked and has produced the most gold. The bed of pipeclay in the middle of the cliff is the most barren, and is a hindrance from its tendency to clog the sluices. Though millions upon millions of gold were taken from these deposits in former days but few nuggets of any size were found, the gold being, as a rule, only moderately coarse.

Taking it all in all, the scene as we stood in that great amphitheatre, surrounded by its ghastly cliffs, with the relics strewn around of a once vigorous industry, was a gloomy and depressing one, and we gladly turned away for more active and cheerful surroundings.

These we found in the adjacent Placer county where there are excellent examples of active drift mining in hard cemented and lava-capped placers in the Forrest Hill region.
Dividends Paid by Mexican Mines.

The following table of dividends paid by mines in the Republic of Mexico in 1898, is taken from El Minero Mexicano.

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<td>Cia. Transmision Electrica de Potencia, Pachuca</td>
<td>2,500</td>
<td>2.00</td>
<td>5,000</td>
</tr>
<tr>
<td>Cia. Min. Sta. Fe, Matehualia</td>
<td>2,500</td>
<td>2.00</td>
<td>5,000</td>
</tr>
<tr>
<td>Nuevo Porvenir, Zacatecas</td>
<td>2,400</td>
<td>2.00</td>
<td>4,800</td>
</tr>
<tr>
<td>Nueva Quebradilla, aviator, Zacatecas</td>
<td>2,400</td>
<td>2.00</td>
<td>4,800</td>
</tr>
<tr>
<td>Cieno de las Pozos, Zacatecas</td>
<td>2,400</td>
<td>2.00</td>
<td>4,800</td>
</tr>
<tr>
<td>Sta. Anita Mining Co. Huatulco</td>
<td>4,000</td>
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<td>4,000</td>
</tr>
<tr>
<td>Hda. Benef. Bartolome Medina, Pachuca</td>
<td>3,000</td>
<td>1.00</td>
<td>3,000</td>
</tr>
<tr>
<td>Cia. Benef. San Luis, San Luis de la Paz</td>
<td>2,000</td>
<td>1.00</td>
<td>2,000</td>
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<tr>
<td>Guadalupe Encantada, Pachuca</td>
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<tr>
<td>San Felipe de Jesus, aviator, Pachuca</td>
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<td>1.00</td>
<td>1,000</td>
</tr>
<tr>
<td>Sorpresa, aviado, Pachuca</td>
<td>960</td>
<td>2.00</td>
<td>1,920</td>
</tr>
<tr>
<td>Hda. Benef. Purissima Grande, Pachuca</td>
<td>1,000</td>
<td>2.00</td>
<td>2,000</td>
</tr>
<tr>
<td>Iden San Agustin, Guanajuato</td>
<td>1,000</td>
<td>2.00</td>
<td>2,000</td>
</tr>
<tr>
<td>Sta. Gertrudis, aviado, Pachuca</td>
<td>960</td>
<td>2.00</td>
<td>1,920</td>
</tr>
</tbody>
</table>

Total in 1898: $5,224,070
Total in 1897: $5,079,100

This only includes the mines quoted on the mining Exchange in Mexico. There are many others which have paid well but of which there are no public records.

Several of the largest smelters throughout the country are reported about to consolidate with a capitalization of $50,000,000. It is understood that as between the combine and the smelting establishments not included therein, existing arrangements regarding interchange of business, etc., will not be disturbed. Among those specifically as being about to enter the combination none west of Utah are so far mentioned.

The total production of the Mexican silver mines for 1898 was calculated at a value of $57,000,000. This was 35 per cent of all the silver produced on the world last year, and four millions in excess of the amount produced by the United States. To show the great increase in silver mining in the republic it may be said that the total production of all the Mexican mines in the year 1878, or twenty years ago, was only a little in excess of $5,000,000.

One of the most important surveys made in Mexico for some time was just begun under the direction of the National School of Mines. The survey will be made entirely across the republic, in as straight a line as possible, from Vera Cruz on the Gulf coast to Acapulco on the Pacific.

The object of the work is to secure complete and correct data as to the geological formations of the country between the two coasts. The mineral veins discovered along the line of survey will be examined and developed sufficiently to determine their nature, and, in some measure, their extent. The information gained on this subject will be of great interest, and quite momentous.

One surveying expedition has already started from Vera Cruz and will be eventually met by another one, which will start from Acapulco within the next three or four weeks. Both expeditions will have a corps of skilled geology. The Mexican Government appreciates the value and importance of her mineral wealth, and sets a good example to the United States, in regard to energy.

PERSONAL NEWS ITEMS

S. J. Smith, the genial agent for the Lambert gasoline and distillate engine, also the Fulton power pump, has erected a pumping plant for J. P. Irwin, of Irwindale, Los Angeles county, Cal. It is composed of a 28-h.p. No. 3 Variable Motion Fulton pump, driven by a Lambert engine. Work performed by the plant is excellent. Forty inches of water is lifted 105 feet. Everything about the plant is first-class and speaks well for the machinery handled by Mr. Smith.

PROF. HERMAN RENBOLD, of Omaha, is in Cutter, South Dakota, looking after his mining interests.

JOHN LEACHMAN of San Francisco, Cal., has gone to New Mexico to open up some gold mines near Los Gatos.

SHERIFF O. L. SPARKER of Chouteau Co., Kansas, has lately set the contract for the erection of a 125-ton mill to be placed on the East Galena ground, at Galena, Mo.

DON ANTONIO PERAPIEL and CIVIL ENGINEER of the geological institute of the State of Hidalgo, Mexico, have been making an investigation of some rocks discovered at Irolo Hidalgo, which appear to contain fossilized animal remains.

STANFORD & GEORGE of Spokane, Wash., have taken over the Pullman train on Pichard creek, a little east of Murray, Idaho, it is reported, for $65,000,000.

J. CARMICHAEL has sold his quarter interest of the Nariah vineyard at Joplin, Mo., to A. J. MANNERS of Galena, for $1,600.

DON JOHN C. COON, the agent for the Compañía Industrial Mexicana, the mining machinery company, has recently returned home from a trip through the mining districts of Chihuahua, Mexico.

F. M. THOMASON contemplates putting up a mill at Pake City, Sierra County, Cal.

CAPT. JOHNSON, of Orange, Va., has purchased the Nariah vineyard in Collepepper Co., Va., for a reported price of $40,000, and expects to begin working the mine soon.

C. H. WATERHOUSE, president of the United States Steel Co. of Baltimore, Md., was a visitor at the Journal office the other day.

W. P. CUNNINGHAM, representing the Lewis Co., over turns of Mexico, reports mining prosperous in Parral, Chihuahua, Mexico.

JUDGE W. R. WALLACE of Vinales, Cal., has lately bought D. R. DALLARD'S interest in the Gravel Hill Hydraulic mine, in Nevada Co., Cal.

P. W. WALKER, engineer, at the Detroit & Dead-wood shaft, in Two Bit District, South Dakota, has gone to Michigan to accept a proposition of chief engineer in a beet sugar factory.

G. P. MACKER, the mining man from Parral, Chihuahua, Mexico, has recently purchased the machinery from the Minas del Amor and will remove it to Santa Barbara in the State of Chihuahua, where he will operate it as a custom mill.

The old Escondido mines near Acton have been purchased by Mr. D. P. KIRBY of Los Angeles mining man.

Geo. H. LOPER of Deadwood, S. D., has gone to Denver, Colorado on business. He will visit Philadelphia before returning to Deadwood.

MESSRS. J. W. EVERT and H. W. ALEXANDER are stopping in the City of Mexico, Mexico, prior to going to the United States, where they are erecting the DelMar water power plant, for the Western Electric Co. of Chicago, which is to supply light and power.

JOHN G. STEPHENS, a miner in the employ of the Yellow Aster Co. at Rondofield, fell from a ladder a few days ago and was seriously injured.

JOHN S. GEORGE of Milwaukie, who was in Dead-wood, South Dakota, for several days attending to a case in the U.S. court in which he and W. E. SPEED of Omaha are interested, has gone to Krypton, S.D., on a matter of business.

HENRY HANSON of Minus Pritius, has recently sold to Mrs. J. D. FRIED and JAMES PENMAN the Ar- tichoke mine in the Salinas district, Mexico.

C. J. BERRY, the successful Klondyker, with several others, are in Salt Lake negotiating for the lease of the Asphaltic Asphaltum beds.

C. C. DRAK, formerly of the Los Angeles Assay Office and Mining Exchange, has sold his office in Los Angeles and gone to the city of Chihuahua, Mexico, to engage in some business.

J. R. AMBROOKS, a prominent mining man of Parad-ral, Chihuahua, Mexico, has recently returned from a business trip to the City of Mexico.

F. M. Miner, superintendent of the Valparaiso mill, has left the town, Cal., lately left for Chi- cago, as the company he represents have given up their lease to the mine.

R. M. MALONEY of Deadwood, South Dakota, has lately closed a deal for the five claims west of the Holy Terror.
THE MARKETS.

All quotations, financial reports and other statistical figures given under this head are New York quotations, unless otherwise stated in each item. These figures are carefully revised each issue, and constitute a very accurate compilation of statistical matters.

New York, Jan. 30th, 1898.

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

<table>
<thead>
<tr>
<th>Date</th>
<th>Silver (varying)</th>
<th>Lead (varying)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 1</td>
<td>$0.91</td>
<td>$0.60</td>
</tr>
<tr>
<td>Jan 2</td>
<td>$0.92</td>
<td>$0.61</td>
</tr>
<tr>
<td>Jan 3</td>
<td>$0.93</td>
<td>$0.62</td>
</tr>
<tr>
<td>Jan 4</td>
<td>$0.94</td>
<td>$0.63</td>
</tr>
<tr>
<td>Jan 5</td>
<td>$0.95</td>
<td>$0.64</td>
</tr>
<tr>
<td>Jan 6</td>
<td>$0.96</td>
<td>$0.65</td>
</tr>
<tr>
<td>Jan 7</td>
<td>$0.97</td>
<td>$0.66</td>
</tr>
<tr>
<td>Jan 8</td>
<td>$0.98</td>
<td>$0.67</td>
</tr>
<tr>
<td>Jan 9</td>
<td>$0.99</td>
<td>$0.68</td>
</tr>
<tr>
<td>Jan 10</td>
<td>$1.00</td>
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</tr>
<tr>
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<td>$1.01</td>
<td>$0.70</td>
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<tr>
<td>Jan 12</td>
<td>$1.02</td>
<td>$0.71</td>
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<tr>
<td>Jan 13</td>
<td>$1.03</td>
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<tr>
<td>Jan 14</td>
<td>$1.04</td>
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</tr>
<tr>
<td>Jan 15</td>
<td>$1.05</td>
<td>$0.74</td>
</tr>
<tr>
<td>Jan 16</td>
<td>$1.06</td>
<td>$0.75</td>
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<tr>
<td>Jan 17</td>
<td>$1.07</td>
<td>$0.76</td>
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<tr>
<td>Jan 18</td>
<td>$1.08</td>
<td>$0.77</td>
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<tr>
<td>Jan 19</td>
<td>$1.09</td>
<td>$0.78</td>
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<tr>
<td>Jan 20</td>
<td>$1.10</td>
<td>$0.79</td>
</tr>
<tr>
<td>Jan 21</td>
<td>$1.11</td>
<td>$0.80</td>
</tr>
<tr>
<td>Jan 22</td>
<td>$1.12</td>
<td>$0.81</td>
</tr>
<tr>
<td>Jan 23</td>
<td>$1.13</td>
<td>$0.82</td>
</tr>
<tr>
<td>Jan 24</td>
<td>$1.14</td>
<td>$0.83</td>
</tr>
<tr>
<td>Jan 25</td>
<td>$1.15</td>
<td>$0.84</td>
</tr>
<tr>
<td>Jan 26</td>
<td>$1.16</td>
<td>$0.85</td>
</tr>
<tr>
<td>Jan 27</td>
<td>$1.17</td>
<td>$0.86</td>
</tr>
<tr>
<td>Jan 28</td>
<td>$1.18</td>
<td>$0.87</td>
</tr>
<tr>
<td>Jan 29</td>
<td>$1.19</td>
<td>$0.88</td>
</tr>
<tr>
<td>Jan 30</td>
<td>$1.20</td>
<td>$0.89</td>
</tr>
</tbody>
</table>

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 so that March silver has commanded a price only a little under metal for prompt shipment.

Copper.
The usual demand for copper is causing comment all over the world. The entire cut of last month the quotations were $12.50 while today they have reached the remarkable figure of 15.25. Buyers held off as long as possible and have utilized the stock on hand and now forced to buy copper needs, thereby causing the market to be bulled, and as a matter of consequence the price has gone up. We quote for Laker, $10.60 @ 16.25; electrolytic in cakes, wirebars and ingots, $15.75.@15.95, cathodes $15.50. With casting copper at 15.80 @16.00.

Lead.
A steady increase in the demand for lead has raised the price to $2.40 with the prospect of it going some higher. There have been considerable quantities of lead withheld from the market with the expectation of securing higher prices, and undoubtedly this will be thrown open, which will cause a reaction and fall in price.

We have to quote $4.275 @4.30 New York and $4.250 @4.285 for St. Louis.

ANTIMONY.
The demand continues fairly steady, but is no longer as brisk as it was during the few preceding months. There is a slight disposition on the part of sellers to meet the demand, the quotations being 2.050 @ 2.060 for St. Louis and 2.070 @ 2.080 at New York.

Antimony continues strong, and we quote Cookson's, 99c; Hallett's, U. S. Star and Japanese, 96c.

Nickel.
Business continues steady on unchanged lines and no alteration in prices can be reported. We quote for New York ton lots 35c., and 30c. per lb and for smaller orders 35c. and 38c.

Although the London cables reported a serious break at the beginning of the week, prices here have remained fairly steady on account of supplies being rather meager. We quote the metal at 122c. @ 125c.

Prako.
Prices are quoted $15 and $16 per ounce. Supplies are not large and prices are firm. Perchancel ware, best hammered metal. In lots of 250 grams or more, 56c. per gram; in lots of 100 grams or more, 57c. per gram; less than 100 grams, 58c. per gram; unmanufactured platinum will be supplied in same quantities at 2c. less per gram.

Silver.
The New York quotations are unchanged at 39.50. The London price is also unchanged at 75. 5g., per lb, with 75c. 4c. named for second hands.

Purified, 98.999 per cent, in cases of 120 lb, at 80c. per lb, in 5, 10, 25 and 50 cases at an advanced price.

POWDER.

F. o. b. San Francisco No. 1, 70 per cent. nitro-glycerine per lb, in cardboard lots, 15c. less than one ton, 17c. No. 1. 1c. per cent., cardboard lots, 19c. less than one ton, 21c. No. 1. 50 per cent., cardboard lots, 11c. less than one ton, 13c. No. 2. 40 per cent., cardboard lots, 10c. less than one ton, 12c. No. 2. 35 per cent., cardboard lots, 9c. less than one ton, 11c. Black blasting powder in cardboard lots, minimum cart, 2884.4.50 per keg; less, car lots, 3.50 per keg.

CORK.
The trade in cork at St. Louis is reported very quiet—condition not unusual as the year draws to a close.

CORK.
Connelleville red powder 72-hr. 4.85
New River...4.00 Pozohants...3.90
Gas works cork, lump, per bushel...10 10
BORAX.
The San Francisco market in Borax is firm with a good demand.

The market is quoted as follows:

Borax, refined, in car lots, in bags, Refined, in carded lots in sacks, Concentrated, in car lots.

THE MINOR METALS.

Quotations are given below for New York delivery:

<table>
<thead>
<tr>
<th>Metal</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>80c.</td>
</tr>
<tr>
<td>Nickel</td>
<td>60c.</td>
</tr>
<tr>
<td>Copper</td>
<td>85c.</td>
</tr>
<tr>
<td>Silver</td>
<td>3.75</td>
</tr>
<tr>
<td>Gold</td>
<td>100.00</td>
</tr>
</tbody>
</table>

CHEMICALS.

Deliveries on contract are good. New contracts have been taken, particularly for alkali. Much 1899 business has been done domestic caustic soda, and as low as $3.00 c. b. works is reported as the contract price.

CAUSTIC SODA.

Quotations for domestic caustic soda domestic high test is $1.40 @ 1.45 per hundred lbs.

ALKALI.

Domestic, 68 per cent., 56c. @ 55c., foreign 55c. @ 50c. from dock as to style of package.

CARBONATED SODA ASH.

58 per cent., 5c. and 5c. per lb. basis, 48 per cent.

PHOSPHATE OF BORAX.

Rich Phosphate, 80-82 per cent., 1.25 per lb. American, bulk, 1.30 @ 1.50 per lb. according to brand.

For domestic, 5c. per lb. less than foreign. English, 60-67.5 per lb. Concentrated salt-soda, 1.60 @ 1.85 per lb.

CHLORATE OF POTASH.

Chlorate of potash is quoted at $9.50 @ $9.75 per 100 lbs.

BELTS WILL SLIP - BUT

CLING-SURFACE

WILL STOP IT PERMANENTLY.

CLING-SURFACE is to be applied to the inside of a belt.

It has been so universally satisfactory for the past three years that we can safely guarantee that its use will not only stop all slipping, but that the belts will become soft and pliable, yet firm; if of leather, they will become as soft as calf skin, and also absolutely water-proof, and furthermore we guarantee that the belts can be re-used, and that the power will be increased so much that in a fair-sized plant the cost of the sample can be earned monthly.

This applies to all belts, leather, cotton, rubber or a rope drive, whether new, old, or oily. We will send you a sample for trial, or, if you prefer, we will advance you further as to its nature.

A Practical Test...

We asked a man the other day what he thought of our pumps.

"Well," said he, "I've used this pump for twenty years, and it's better than most pumps yet."

The best material, workmanship and patented construction—that's why our pumps wear.

Are you going to try—Write us for full information and catalogue. All free for the asking.

W. T. GARRATT & CO.,
Pump, Bell, Brass and Machine Works,
167-172 Virginia St., BUFFALO, N. Y.

RECENT IMPORTANT IMPROVEMENTS

The Handleless, Suction and Most Efficient Steam Pump for General Mining, Quarrying, Railroad, Irrigation, Drainage, Coal Washing, Tank-Filling and for Pumping Water, Farm, etc., has been greatly improved with sediment, muddy or gritty liquids handled without injury to the Pump.

PARK & LAY CO., A. M. HOLLER H Tr., MITCHELL & LEWIS & SIBBER CO.

Pulsometer Steam Pump Co.

123 Union Street, New York City
FINANCIAL NOTES.

AVERAGE MONTHLY PRICES OF SILVER.

<table>
<thead>
<tr>
<th>Month</th>
<th>Cents</th>
<th>Cents</th>
<th>Cents</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>50</td>
<td>49</td>
<td>50</td>
</tr>
<tr>
<td>February</td>
<td>48</td>
<td>47</td>
<td>48</td>
</tr>
<tr>
<td>March</td>
<td>46</td>
<td>44</td>
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</tr>
<tr>
<td>April</td>
<td>43</td>
<td>41</td>
<td>43</td>
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<tr>
<td>May</td>
<td>41</td>
<td>40</td>
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</tr>
<tr>
<td>June</td>
<td>39</td>
<td>38</td>
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</tr>
<tr>
<td>July</td>
<td>37</td>
<td>36</td>
<td>37</td>
</tr>
<tr>
<td>August</td>
<td>35</td>
<td>33</td>
<td>35</td>
</tr>
<tr>
<td>September</td>
<td>33</td>
<td>32</td>
<td>33</td>
</tr>
<tr>
<td>October</td>
<td>30</td>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>November</td>
<td>28</td>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>December</td>
<td>26</td>
<td>25</td>
<td>26</td>
</tr>
</tbody>
</table>

The statement of the United States Treasury, on Thursday, Feb. 16th, shows balances in excess of outstanding certificates as below, composition being made with the statement for the corresponding date last year.

<table>
<thead>
<tr>
<th>Month</th>
<th>Gold</th>
<th>Silver</th>
<th>Gold</th>
<th>Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>50.52</td>
<td>50.52</td>
<td>48.75</td>
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<tr>
<td>April</td>
<td>50.36</td>
<td>50.36</td>
<td>48.75</td>
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<tr>
<td>May</td>
<td>49.93</td>
<td>49.93</td>
<td>48.75</td>
<td>48.75</td>
</tr>
<tr>
<td>June</td>
<td>49.45</td>
<td>49.45</td>
<td>48.75</td>
<td>48.75</td>
</tr>
<tr>
<td>July</td>
<td>48.88</td>
<td>48.88</td>
<td>48.75</td>
<td>48.75</td>
</tr>
<tr>
<td>August</td>
<td>48.25</td>
<td>48.25</td>
<td>48.75</td>
<td>48.75</td>
</tr>
<tr>
<td>September</td>
<td>47.57</td>
<td>47.57</td>
<td>48.75</td>
<td>48.75</td>
</tr>
<tr>
<td>October</td>
<td>46.84</td>
<td>46.84</td>
<td>48.75</td>
<td>48.75</td>
</tr>
<tr>
<td>November</td>
<td>46.15</td>
<td>46.15</td>
<td>48.75</td>
<td>48.75</td>
</tr>
<tr>
<td>December</td>
<td>45.43</td>
<td>45.43</td>
<td>48.75</td>
<td>48.75</td>
</tr>
</tbody>
</table>

TWO-THIRDS interest in well-developed gold mine in Dona Ana County, N. M. see Ad page 77.

BELTING Leather, * Cotton, Rawhide, etc. ALSO Lace Leather

L. P. DEGEN, Manuf'r
Agent for Rubber Belting, Hose and Packing. 105 and 107 Mission Street, San Francisco, Cal.

John Wigmore & Sons Co.

MACHINERY
Mine and Mill Supplies, Iron and Steel

117 to 123 S. Los Angeles Street, LOS ANGELES, CAL.

CHLORIDE OF LIME.

English prime brands $1.60-$1.70, American, Continental F, $1.50-$1.60 per 100 lbs.

ACIDS.

Spot business is fair, while for future delivery a few more contracts have been closed. Oxalic acid has been reduced by the syndicate to 65c.; thus the jobbers charge, in some cases, heavily at 65c., are now in a predicament.

Quotations are per 100 lbs from New York and vicinity as follows: Acetic acid, commercial, No. 8, $1.00-$1.10; citric acid, 18°, $1.10-$1.25; 20°, $1.25-$1.50; 22°, $1.50-$1.75; according to quality and brand. Nitric acid, 36°, $3.00-$3.50; 38°, $3.50-$4.00. Sulphuric acid, 96°, $1.10 per drum and $1.15-$1.30 per carboy. Chamber acid 50°, in jobbing way, $1.50-$1.70; for FOB, $1.60-$1.80.

BRICKSTONE.

The market has closed off on the delivery of 2,500 tons, and spot business is very fair at about $2.50 per ton, with future business at about $3.00 per ton.

NITRATE OF SODA.

The market remains unchanged, the manufacturers of nitrate of soda are still holding to the asking price of $1.50 per 100 lbs, for the time being. We are informed that there will be a rise in the next few weeks.

The Cleveland Tinning and Stock Exchange Co.

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

F. A. WARDLESON, GENERAL PASSAGERS AGENCY

Salt Lake City, Utah

BELTING Leather, * Cotton, Rawhide, etc. ALSO Lace Leather

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Mine and Mill Supplies, Iron and Steel

117 to 123 S. Los Angeles Street, LOS ANGELES, CAL.

LARGEST GASOLINE PUMPING PLANT IN THE WORLD

The illustration shows the giant gasoline pumping plant recently built by the Mercury Gas Engine Works & Boiler Co., 2511 South 40th Street, Calimesa, Calif. The engine building, 600 feet long, has a capacity of 1,000,000 barrels of gasoline per day. The plant is equipped with 12 engines, each developing 500 hp., and 12 gasoline pumps, each rated at 2,000,000 gallons per day. The entire plant is controlled by a central control room, and all operations are automatic. The cost of the plant is estimated at $1,500,000. It is supplied with water from a large reservoir and is connected with the main pipelines of the Southern California Gas Company. The plant is ready for immediate operation and will be in full production soon. The pumping capacity is sufficient to supply the entire Southern California market for gasoline. The plant is designed with the latest machinery and equipment, and is expected to operate at maximum efficiency. The location of the plant in a strategic position makes it well suited for the transportation of large quantities of gasoline. The Mercury Gas Engine Works & Boiler Co. is a leading manufacturer of gasoline engines and pumps, and the new plant is a credit to the company. The plant is a fine example of modern engineering and represents the latest in gasoline production technology. The company is well known for its high-quality products, and the new plant is expected to further enhance its reputation in the industry.

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The Improved WONDER Irrigation Pump

The Wonder Pump Mfg Co., KANSAS CITY, Missouri,

Established 1887

Randsburg Gold Fields REACHED VIA Santa Fe Route

Leave Los Angeles 10:30 a.m.

Los Angeles 11:00 a.m.

Arrive Santa Barbara 12:19 p.m.

Santa Barbara 1:20 p.m.

Arrive San Bernadino 5:51 a.m.

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A through passenger coach is run between Randsburg and Johannesburg.

Through tickets are particular of any Santa Fe Route Agent.

Stage leaves Johannesburg for Ballarat on Sunday and Thursdays at 7 a.m.; returning from Johannesburg on Tuesdays and Saturdays at 8 p.m.

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LOS ANGELES OFFICE

629 S. SPRING ST.

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Silver 40

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Samples by mail receive prompt attention.

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I. C. YAWGER,

Agents for the

VICTOR BISHOP & CO.

FOR DIAMOND DRILLS

MADISON AVENUE

NEW YORK
**INTEGRATED MINES PAYING DIVIDENDS.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Mines</th>
<th>Location</th>
<th>No. of Shares</th>
<th>Capital Stock</th>
<th>Par Value</th>
<th>Amount of Dividends</th>
<th>Date of Last Dividend</th>
<th>Total Amount Paid in Dividends</th>
<th>Kind of Mineral Produced</th>
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<tr>
<td>1</td>
<td>Alta</td>
<td>California</td>
<td>100,000</td>
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<td>25</td>
<td>5 3/4</td>
<td>Dec 1898</td>
<td>$250,000</td>
<td>G, S, I.</td>
</tr>
</tbody>
</table>

*Note: Companies not listed have not paid a dividend for the last twelve months.*
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Modern hoisting plants from 15 to 1,000 horse power for steam, compressed air, or electric power. Boss hoist is guaranteed to sink 500 feet and raise 1200 lbs. 400 feet per minute. Equipped ready to run. Write for catalogue.

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Patented
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