The Mining and Metallurgical Journal

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LOS ANGELES, CAL.,
June 1, 1899,
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THE MINING AND METALLURGICAL JOURNAL

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AS CHOICE MILES DARLING.

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THE CALIFORNIA MINERS’ ASSOCIATION.

The invitations extended to the miners in the southern counties, printed in our last issue, to become members of the Southern California Branch of this influential and useful organization, has met with hearty response from all directions, and the membership list is rapidly increasing in consequence. As in the case of the American Institute of Mining Engineers, this Branch has been held in San Francisco in October next, when they are to be received as the guests of the California Miners’ Association. This always interesting gathering of the best talent in the mining world, offers a special inducement to the miners of the Southern counties to enroll their names as members with the secretary pro tem until his successor is nominated, O. S. Brees, Room 420 Stimson Block, Los Angeles, Cal. The entrance fee is two dollars, which entitles them to membership and privileges for one year. All those interested in the several branches of the industry are invited to become members, and further the importance of mining in this section, as well as their own personal interests and duty in doing so.

THE BAKER-CLARK GOLD PROCESS.

The Baker-Clark gold extraction process for which a patent has been applied for by Deadwood, South Dakota, prospectors, W. H. Baker is the inventor and J. T. Gillmore is the interested. The process is simple in the experimental stage so far, and is outlined as intended to dissolve the gold and silver in ore by the use of boiling hot alkaline cyanide of potassium solutions under pressure, and recovering an equivalent of the metals from the solution by the same energy at a much more economical rate than by the cyanide process or other precipitating agencies. A weekly newspaper of Deadwood in which the process is described says:

“To carry the process into effect the ore is finely pulverized and run into vats. These vats are made of wrought iron and are six feet long and two feet high, oval at the bottom and fitted with perforated panels that run lengthwise. This is half full of pulp, and a cubic foot of solution is added for every cubic feet of pulp. The mechanical stirring apparatus, calculated to keep the solution agitated, is kept in steam, and as soon as the steam from the boilers is turned on, and the boiling and agitation are continued for three hours. The evaporation is done in a manner to reach the amount of water in the vats, but the inventor manages to keep the solution of uniform strength, which is a very important item.

“After three hours’ agitation the vats are detached, pushed out of the way, and another set of vats is taken up. The solutions from the first set are drawn off and returned to the tanks, where it is allowed to settle, the solutions being returned to the boilers. The tailings are pumped into the brook, water is added, and equal to the amount of solution drawn off, and the agitation is kept up for nine hours. The solution is then drawn off, and the water is added and drawn off, and these, containing the gold and silver recovered from the tailings, are added to the new charge of ore. The cyanide solution is added until the solution contains from seven to ten pounds of free cyanide to every 2500 pounds of the solution, which makes it ready for use on the fresh pulp. The values in the solutions, added to the amount recovered in three hours’ treatment and drawn off, equal the full values recovered in the pulp, and average about 80 per cent of the values in the ore treated.

“When the solutions in the boilers become heavily charged with the metals they are evaporated to complete dryness, the residue fused at a red heat, then allowed to cool; the salmi mass is dissolved with water and the gold and silver are recovered in metallic form. The water may contain a little gold and silver, and is added to fresh pulp, for further treatment.

“By actual tests, conducted in Deadwood, over 90 per cent of the values have been obtained by the method, it is said, Mr. Baker recovered 92 per cent of the fire assay.”

As no estimate of the fuel used in proportion to the ton of ore treated is given, it is not shown if the cost of fuel exceeded the amount of gold obtained. The cost of fuel is an important item in such a process.

TRADE UNIONS.

In these days when capital and labor are each organizing into trusts, combines and syndicates, membership in such associations, (for it matters not under what names they are called) for the mutual benefit of the members joining such social or trade organizations we find trouble emanating. The right to do so is one of individual choice or duty, when the members so combined unite to regulate their own actions and operations, but when any class or society attempts to regulate the conduct of individual outside of their own organization, they are taking to themselves power which only belongs to the legally elected representatives of the community, according to which is illegal in attempting to force an outside party to do certain acts against his will. The recent labor trouble and destruction of property, by the union miners at the Bunker Hill and Sullivan mines in Idaho, which was given in detail in the daily press, is a case in point. It must be remembered, however, that it is capital that is trying to control labor without being himself biassed or one in a measure forced to do so. The miners’ union has, however, carried lawful actions and disorder into almost every district in which it has made its appearance. The chief object of such a union is claimed to be the protection of the rights of its individual members, which is a good object, but the first acts seem always to be the illegal one of seeking to control the liberty of those outside and differing from them, and, failing in that point, they resort to physical force and the destruction of life and property. Riot, bloodshed and fire have been proved by history to follow as a result the misunderstood object of union and ill-advised counsel on the part of the leaders.

The loss to a district or state where such trouble arises cannot be estimated at the amount of property destroyed or lives lost, but is another blow to the future of investment of capital than to let it be known that the miners’ union is in force, and attempts to dictate terms to the owners and their non-union fellow miners to be the illegal and such methods of action, the labor element which contains the largest number suffers the greatest loss, for their own actions strike back with greatest force and effect against themselves.

MINING CLAIM SIDE LINES.

“British Columbia, it appears, has had just enough experience with the American "system" to have the law quite well worked out. The trouble is that there are very few legal problems, which are heightened by the complex geographical features of that country,” says the Mining and Scientific Press of 8th ult.

The facts of the case are that the legislators of British Columbia were wrongly induced a few years ago, by a minority of the miners of the country, to change the law in respect to the side line boundaries of mining claims, from the just principle to the miner to capital invested in mines, of following the dip of the vein or deposit, to the unison side line of which is wholly independent of the square location, with vertical side lines for all boundaries of the claim.

As the majority of the veins or deposits in British Columbia, it is said, do not dip in a vertical direction, the farmers’ square location and vertical side line boundaries are proving a delusion and a snare, for, after the mine is opened, it is discovered that it dips under an adjoining claim owned by another party. They must either quit work or buy that party out. This is where the trouble arises of applying surface laws and customary methods as under certain conditions which are not made on the vertical plan—descending from heaven to the center of the earth. It is mineral the miner and capital are after, the best and fairest boundary is the just and sensible American Western plan, of following the dip of the same vein or deposit, in the interest of capital and the deep mining. To stop a mine from being operated when the vein and the workings reach an imaginary surface line, is to impose an unjust restriction on the industry.

As is the Columbia, the mining from an epidemic of two much dip under an unjust boundary, as the result of having departed from a just American custom. There are a few inexperienced theorists who desire to impose on
the American mining industry the same hindrance to deep mining and injustice to capital as has been practiced in British Columbia, because unavailability of water power for underground work. Keep legal problems away from geological conditions, and arbitration among miners and suppliers and the use of a better tool than lawyers in courts of law, whose interest is to carry on the fight.

WIND AS A MOTIVE POWER.

During the last century, the advance made in obtaining power made from the agency of the wind has not kept pace with steam or electricity. Before the advent of coal mining and the steam engine, the windmill was the chief source of mechanical power in many parts of the world. With the exception of the large and efficient use to which compressed air is put, the windmills of today are hardly a step in advance of a hundred years ago, except in the use of iron or steel in their construction. They are still placed in these instances, they are seldom more efficient. In the arid sections of the southwest, where water and fuel are scarce, this source of possible power supply offers a large field for the invention genius in pneumatic machines of all kinds. The application of the windmill to compressing air, or generating electricity for power, heat or light, should be a sufficient field to exhaust the inventive capacity of all of that description. In the mountain and desert sections, there is great necessity for such improved machinery.

If the same energy was employed in inventing a better windmill that is wasted on flying machines, it might accomplish some good purpose. The use and cheapened production of aluminum, especially in the form of sheets, ought to make a light and durable material in the construction of such a class of machinery and give it a larger industrial application.

It has been found that a windmill and dynamo storage battery plant, for the generation and storage of electricity for household use, costs in the neighborhood of $4,000, which places beyond the means of the majority of those who live outside a town or city and require such a plant. With a cheap and powerful windmill and plant for producing electricity, which has not yet been introduced, the winds of winter could be turned to the useful purpose of comfort, which high cost makes impossible. With efficient means of getting power from this source, there are large districts where mines could be operated at a profit. There is no branch of the mechanical industry which has been so much neglected, and which offers such good inducements as this subject presents, and in which there is such a large market ready to purchase the plant, when produced at a cost low enough to be within the reach of those of limited means.

POWER FOR UNDERGROUND WORK.

A few years ago steam was the chief means of obtaining power for underground work, but the introduction of compressed air and electricity soon made use of the most expensive. Steam had the great objection that it increases and increases the amount of air in the mine, and affected the health of the miners where it was used. Compressed air and electricity have succeeded it, and are equal competitors for favor, with the advantage in favor of compressed air, as it purifies the air of the mine and cools it to a small extent. As the mine increases in size and depth, so does the necessity arise for power for underground work and increased supply of fresh air, which compressed air supplies. Another advantage possessed by it, that about the same amount of air as is necessary to carry underground and increased supply of fresh air, which compressed air supplies. Another advantage possessed by it, that about the same amount of air as is necessary to carry on operations is obtained from it underground, as there is indicated at the air receiver on the surface. In a northern climate where the atmosphere is moist and cold, the air is not eliminated from it by the heat produced in the act of compressing it, but to diminish that moisture, it is aspirable to pass the air pipe leading from the cylinder of the pump or engine, is decreased so as at times to lessen the necessity of keeping a torch burning at that part to keep it from freezing up.

The circumstances of Dewar and others in the direction of the higher compression and formation of liquefied air, may not yield all the seemingly impossible claims of economy and increase in the manufacturing of it which is received with such cheap cost of producing, it will have an important effect on mining operations in future.

Electric transmission of power, where water is not available, has the great advantage of being used for hoisting purposes, as well as heating and lighting, and the line is easily constructed and takes up very little space underground in narrow workings. As experience is gained, time will decrease the cost of this class of machinery, as the whole tendency is to make deep mining less expensive.

GOLD FINDS.

The marvelous has ever been attractive to mankind in all ages and countries, and of notable things there are some things of an unusual or unusual form that find believers. There are but few persons compared with the many, who have not been imposed on through their credulity. When in the line of their interests people are easily led to believe what is contrary to the ordinary laws of nature and of common experience.

Nothing of a material character has been so exaggerated as the richness of gold discoverers, and people generally are disposed to regard every new report as veritable. If all the gold finds which have been reported within the last few years had turned out to be one-tenth as rich as was first estimated, the great want today would have been for storage room for gold products. Indeed, gold would have become so abundant that long ago the Rothschilds and their satellites would have had it denominated. To have had the usual percentage coined would have made money too plentiful and cheap to suit the views of the money changers.

In pursuit of deposits of the precious metals, gold in particular, the imagination is apt to outrun the judgment. It has been so always, and it is presumable that it will continue to be so. Our estimates without number do not seem to create a keg-poise of the two elements of the human mind, Gold bears a conspicuous place in nations of which there is any authentic history, and has been a stimulus to more reckless and persistent endeavor than any other motive has been.,

Created gold has a limit, and, so far as known, the process of creation has been in disuse and idle since the first preserved record of its discovery. While the gold fields of Ophir, Ormuz and of all Asia and Europe have been practically exhausted. The gold fields of Ophir have been largely exploited and many of the mines have been abandoned. With the energy, science, and skill now employed in extracting gold from the earth, it cannot be long before all that is practically attainable will have been procured. It is likely that there are fields that have not yet been thoroughly explored but they are comparatively limited in area, and there will be new finds repeatedly promulgated with the usual exaggerations.

Of all the gold produced from the earliest historical date, but $1,000,000,000 exist in coin and bullion devoted to monetary uses, according to accredited statisticians. How much is in the form of jewelry and other goods, no statistician seems to have undertaken to find out. Its consumption is immense in the arts and manufactures, dentistry alone consuming 33 million dollars in quantity, and the rest is lost through wear, land on the sea and in the desert.

A high value is put upon gold and maintained by coinage laws and the compulsion placed upon the Bank of England by act of Parliament, to purchase all gold offered to it at a price closely corresponding to its coinage value, relieves it from the fluctuations attending every other commodity, and clothes it with an unusual attractiveness, and causes pursuit of it with restless and persistent energy. It will hold sway over all other commodities so long as the exclusive privileges conferred upon it enable it to yield a margin above the cost of production. And so long as this continues there will be finds of imaginary richness, and people will believe what is reported and be victimized through their credulity.

The same energy would be displayed in silver mining were silver given the same privileges as are accorded to gold in mintage. Silver is put to larger uses in the arts and manufactures than gold, but it exists in larger quantities, and for that reason is a less price through the operation of the law of supply and demand. Being of less value and not so highly esteemed, reports of rich discoveries are not so exciting.

Very particular engineers, annoyed by using oil for lubricating purposes will find a welcome change in the engine room if they apply Albany Grease, and will send to Adam Cook's Sons, 313 West street, New York, for a sample can and try it on the crank pins of the engine or engine. The firm make a standing offer to furnish a small quantity of their compound and an Albany Grease Cup free of charge or expense to all engineers who desire to test the matter. Aside from the change of lubricating oil, the use of this standard lubricant, the saving in dollars and cents in the oil bill is a substantial one, and well worthy of investigation.

The Allis Co. have received an order for a two stamp mill complete from T. F. Walsh, through the Beaver Agency, to be built in Ouray, Colo.

This Company has also received an order for a ten stamp mill, with concentrators, from the Fisher Creek Mining Co., which will be built in Libby Creek district, Montana.
A TEST ON CLING SURFACE.

Sibley College, Cornell University.
Department of Mechanical Engineering.
Ithaca, N.Y., April 17, '99.

Cling Surface Mfg. Co., Buffalo, N.Y.

DEAR SIR:—I beg leave to report that the Laboratory force of Sibley College have, under my directions tested the effect of applying Cling Surface to belting.

The tests were made in every case on the belt testing machine owned by Sibley College; this is constructed so that the belt can be tested under ordinary running conditions and measurements can be made for determining the power supplied, the power delivered, the tension on the belt, the arc of contact on either pulley and the slip. This machine has been used in extensive investigations for determining the efficiency of belting and is described in Vol. XV. Transactions American Society of Mechanical Engineers. Three belts have been tested each before and after treating with Cling Surface and each under various conditions of loading. In tests made a considerable number of observations have been repeated in order to check the accuracy of the results.

The belts before testing were in every case clean and in good condition and running under rather better than average conditions. The Cling Surface was applied on several successive days and in small quantities in accordance with the directions supplied by the manufacturers before commencing the test. The material was almost wholly absorbed at the time of starting the test, and none has since been applied. The material made the belt soft and pliable and gave it an inner surface somewhat resembling patent leather. The surface was only in the least degree sticky to the touch.

The general results of the tests with Cling Surface show an increased transmitting power as compared with the same belt in an untreated condition; it also shows an increased arc of contact, and very much less slip. It shows a very high transmitting power when the belt is run extremely loose or with very little tension on the pulleys, the reverse of which is true with the untreated belt. It is shown by the report that the greatest transmission capacity for the belt treated with Cling Surface was found when there was the least possible tension on the belt and when the belt was running so slack that the sides nearly touched. It will be noted also that as the tension of the belt was increased the transmitting capacity diminished until a tension of about 20 pounds per inch of width of belt was reached, after which the transmitting capacity commenced to increase and from that point continued to increase with increase of tension.

In the test of the same belt not treated with Cling Surface the results were quite different inasmuch as the capacity with very light tensions was practically nothing and the capacity increased as the tension increased; at no point, however, did the untreated belt have even approximately the same capacity as the treated belt with the same tension, and...
moreover the treated belt transmitted much more power with a very light tension than the untreated belt with a heavy tension. The test with the belts treated and untreated running on wooden pulleys showed especially the same characteristics. The general effect of the Cling-Surface appears to be to cause the belt to transmit a power equal to its entire capacity without producing heavy stresses on the driving pulleys, and in other words it doubles the full capacity of the belt to be obtained for transmitting power when the belt is so loose that the sides nearly touch.

The general results of the tests of the untreated and treated belts when running on iron pulleys is shown in the accompanying diagrams. In upper diagram the horizontal distances show the tension on the belt in pounds per inch of width, the vertical distances show the horse power transmitted per inch of width of belt for a speed of 4500 ft per minute. The lower line represents the results obtained with the untreated belt, the upper line the results obtained with the treated belt. It will be noted that the lower line continually rises, showing an increase in capacity with an increase in tension, the upper line descends at first, showing a decrease in capacity with increase in tension, and later rises. In no place does the transmitting capacity of the treated belt fall below that of the untreated belt. In comparing the respective results it will be noted that the treated belt has a carrying capacity of 15.8 horse power when the tension per inch of width is 5 pounds, while for the same conditions the untreated belt has no carrying capacity; furthermore, it is noted that the carrying capacity of the treated belt at this low tension, is nearly 40 per cent higher than that of the untreated belt even when the tension has been increased to 60 pounds per inch of width of belt. The lower plate shows the arc of contact and the maximum percentage of slip for belts run both in the treated and untreated condition with different tensions and iron pulleys. From this it is seen that the slip of a treated belt is much less and the arc of contact nearly 50 per cent total tension than with the untreated belt.

The falling off in carrying capacity with increase of belt tension for treated belt is doubtless due to the rapid change in the arc of contact, which diminishes with increase of tension. This causes a diminution in the transmitting power which is greater than that produced by the increase of pressure due to the increased tension on the belt. With the untreated belt such change is very slight, and consequently a falling off in carrying capacity for light tension takes place.

In regard to the question raised as to the preservative qualities of Cling-Surface and to the permanency of the effect produced by its application the writer would say that our tests have of necessity been of too short duration to give conclusive answers. The general effect of the Cling-Surface is to soften the belt and to put it apparently in the best condition for transmitting power and retaining its good quality. The surface produced by the Cling-Surface remains apparently unchanged after several weeks of use, and the inference to be drawn is that the material has an effect which continues permanent for some time at least.

A fuller report containing the complete data of all the tests will be sent to you as soon as the entire results obtained have been computed.

Very respectfully,

R. C. Carpenter,
Prof. of Experimental Engineering.

GAS ENGINE USING BLAST FURNACE GASES.

In our issue of November 1st and November 15th, 1898, we published articles on Blast Furnace Gas and the uses to which this gas could be put.

Efforts to use this gas date back only a few years, but is at the same time attracting much attention of scientists and owners of blast furnaces. It was first used for fuel under steam boilers, but experiments with small gas engines showed the possibility of running gas engines with a capacity equal to that of steam engines. When a blast furnace is run in connection with a mine producing iron ore, the coal gas could be made to generate power to run an air compressor, thereby operating the compressed air drills in the mine, as well as furnishing power to the hoisting machinery to deliver ore to surface. This economical use of a formerly wasted by product in smelting iron ore has been adopted on a larger scale than is now apparent in the United States.

In France blast furnace gases are becoming more generally used, and recent experiments, carried on by authorities on the subject, have brought out numerous important items of interest and special features in gas engines. The experiments of Mr. Witz, as described in L'Éducation Electrique, are of interest, and the figures given by him show a good insight into the enormous waste of this gas at the present time.

A hundred ton furnace, for instance, wastes about 2000 b. h. p. in the gases, part of which is used for auxiliary steam; however, an enormous amount which is absolutely wasted and could be utilized. Furnaces of 150 to 200 tons capacity are not rare, there being one in the Allegheny district even 700 tons in capacity, in which the material for combustion is reduced to three quarters of a ton per ton of iron. A thermal balance sheet is given in which the heat units for 24 hours have been worked out, which shows that the charge of about 92,000 kg. of coke contains 629 million heat units, to which must be added 416 million which is recovered from the re-heaters, making a total of 1045 million. That consumed by the chemical reactions in the furnace amounts to 822 million; that utilized for re-heating 473 million; that utilized for the production of steam 50 million; leaving 442 million calories for half that in the coke, as waste energy escaping with the gases. The portion which develops steam for the engines is utilized very uneconomically at the rate of 6000 m. of gas per indicated h. p. hour, which is at the rate of only about 3 per cent efficiency. With the aid of gas engines only about 3500 m. of these gases is required per h. p. hour, and at this rate, if the gases now used in the boilers are consumed in gas engines instead, the horse power obtained would be 2380, instead of 350, as at present with steam engines. This would involve the use of very large gas engines, which have heretofore been considered impracticable, but these are now being built for 200 and even 500 h. p., the latter with double cylinders being readily increased to 1000 h. p. An engine for 1500 h. p. at 77 per cent ignitions is shown in the adjoining illustration, which will give idea of the size.

The diameter is 800 mm., the stroke one meter, and the speecl 100 revolutions. It appears that there is one ignition for every four movements of the piston. It has run continuously for 120 hours without a single premature ignition. The tests made were made by that writer himself, who is an authority. It is proposed to use the remaining 1500 h. p. from a hundred ton furnace to operate the dynamo of a central station for distributing the power. A group of such furnaces is therefore quite as valuable a source of power as a large waterfall. It is even argued that when these gases are utilized the iron produced by the furnaces may be considered as a mere by-product.

The greatly extended use of compressed air appliances has created a positive demand for efficiency and maximum economy in the design and operation of air compressing machinery, among the manufacturers of which the Clayton Air Compressor Works, with offices at 26 Cortland street, New York City, N. Y., rank with the first. This company have recently issued their new Catalogue, containing seventy pages, and printed on heavy callendered half-tone paper. The catalogue contains much useful information regarding air compressors, together with numerous tables as to the transmission and capacity of air pressures lost by air compressors in operation at different altitudes above sea level.
ANTHRACITE COAL IN PERU.

By William Griffith, C. E., Scranton, Pa.

(Continued from the issue of May 15th, 1896.)

COAL FIELDS.

The formation containing the coal beds which occur in this territory is the one described above as a light gray altered sandstone, to be found 1,000 or 2,000 feet under the limestone referred to before. We would therefore expect to find outcrops of coal where the antimonials or sables are of sufficient prominence to raise this formation to the surface, and the coal beds to be in condition for economical mining where the volcanic action was so slight that the stratification is not too much distorted or broken, thus allowing the coal beds to exist in a normal condition, free from the faulting and crushing which would result from fierce volcanic disturbance.

There were two principal regions examined. The one which we shall, for the purposes of this paper, call the Northern or Tucu Field, is located in the northern part of the Department of Cajamarca, about fifty miles north of the ancient Incan city of the same name. The other, about 100 miles south of the first, in the Department of Libertad, which we will denominate the Southern or Chincamana Field. To reach the northern field we start from the port of Pacasmayo, on the Pacific coast, with half a dozen saddle mules and a dozen pack donkeys laden with our provisions, tents, tools, etc., and travel inland about 100 miles, ascending and crossing the Andean plateau and continental divide at an elevation of 13,000 feet to the town of Huálgayoc, which is located in the bottom of a deep valley about six miles to the eastward of the crest of the divide. This town, an ancient and curious one, is the center of a large mining district, and the valley is watered by a small mountain torrent flowing eventually to the Amazon, and is enclosed on one side by a high, precipitous mountains of beautifully stratified, fossiliferous sandstone of recent age, containing numerous fossil oyster or other recent shells. The eastward dipping oyster of this limestone was crossed by the trail several miles before the summit of the divide was reached. The other side of the valley is formed by two large mountains of trachyte, which compose part of an immense upheaval or dike of volcanic rock which extends 20 or 30 miles and forms the Huálgayoc mineral belt, from which silver, copper and other metals have been mined for years by the present inhabitants and their ancestors of the Incan race. From Huálgayoc, we traveled northward down the valley of the river in which we entered Rio Llancon, a branch of the Marañon, which latter forms the source of the main trunk of the Amazon River system. We continue down the Llancon for about 30 miles, the main trail leading now along the bottom of the narrow valley, and now winding over or round the precipitous mountain ledge. After leaving the igneous rocks of Huálgayoc, our trail traversed almost the whole distance over the recent limestone formation previously mentioned, which dips southwestward at an inclination of about 25°, and is evidently of enormous thickness. We, however, eventually, pass below it and our route extends over several miles of the red and buff shales and gray sandstone with an occasional seam of black fire clay or slate, all dipping southwestward conformably with the limestone. We now find ourselves high on the precipitous mountain side above the river, and we descend by a steep and dangerous trail about 3,000 feet to the bottom of the valley. While passing down we note that the mountain sides are now composed of a fine grain light gray fine sandstone or quartzite, very hard and very regularly stratified, all dipping about 20° southwesterly. It is near the base of this mountain, about 600 feet above the stream, that we find exposed in the cliffs three beds of fine anthracite coal. This locality is known locally as Los Banos, on account of the warm or hot alum springs which are found at the base of the mountain, formerly doubled up as a bathing spring. The coal beds are about 50 feet apart and are respectively 5%, 3 and 6% thick in inches, having about the same proportion of slate and interstratified refuse as is common in our Pennsylvania anthracite. The sections of these seams, as measured in some old openings cut in the seam years ago, which are still accessible, are shown in the Plate No. 4.

Other exposures were subsequently noted in the cliffs across the river, a mile distant, which were also measured and are represented in Plate No. 1. They are doubtless continuations of the same bed. The coal can only be seen where naturally exposed in the nearly vertical cliffs or washouts along the stream, since the tropical foliage is very dense, and no attempt at prospecting has ever been made. An examination of the topography and geology of the vicinity resulted in the following facts:

About two miles further down the Llancon River, another stream, known as the Balchamba, unites with it, flowing in from the southeastward through a deep valley. The mountains on each side of these two valleys are formed by the thick sandstones of the coal measures, causing high, precipitous cliffs. All the measures to the southward are noted to dip to the southeast, while those forming the northward side of the Balchamba Valley dip to the northeast, thus disclosing the fact that the valley of the Balchamba now follows the axis of an immense antiminal, the crest of which has been eroded so that the bottom of the valley is now composed of a series of softer red and buff shales and broken sandstone which underlie the quartzite containing the coal. While these coal-bearing sandstones on either side of the anticlines seem to be very regularly disposed as to strike, dip, stratification, and not much disturbed by volcanic influences, the softer measures underlying them along the anticline appear to be disrupted, upturned and much more contorted, which would seem to point to the anticlinal valley of the Balchamba as the center line of greatest disturbance in this immediate vicinity. Standing on a prominence in the valley, the beautifully stratified and regularly dipping rocks of the coal measures may be seen forming the cliffs and mountain tops as far as the eye can reach on either side. We followed the trail leading up the valley of the Balchamba for 1/2 miles or thereabout, passing eventfully above the sandstone of the coal measures to the rocks of the overlying limestone. Other exposures of coal were noted along the trail; those near to the center of the antiminal being much disrupted and crushed, while those located further away from the line of disturbance were in much better condition, the coal apparently being of good quality and the bedding regular. It must be evident that these coal beds are as continuous in the measures of the Andes Mountains as coal seams usually are in other
parts of the world, that here is a vast coal field with outcrops flanking the mountains for 15 or 20 miles or more on both sides of the Allegheny and Maroon Rivers, as well as extending westwardly in the direction of the Allegheny or across the Maron River. So far, our investigation has discovered that this coal field would be composed of two parallel basins extending northwest and southeast, separated by the anticline of the Allegheny and Maron Rivers. The one basin dipping to the northeast for an unknown distance under the hill, while the other is perhaps thrown out upon its northern margin somewhat near the junction of the Allegheny and Maron Rivers. The other basin dipping to the southwest under the limits of the land beyond the line between Hugheyac and the town of Chota. Future explorations may discover its southwestern or 20 miles or more distant on the Pacific slope near the headwaters of the Rio Chancay. In some parts of this latter outcrop, however, fierce volcanic action has prevailed which would tend to seriously affect the economic value of the coal seams.

So far as we know at the present time, no economic coal beds have been uncovered as yet on the Pacific slope in this northern field. At the southernmost point, where our trail crossed on the north side of the Pacific range, indications of coal were prospected, but just as the region was much disturbed by the eruptive movements, the chances of the discovery of coal were considered remote.

As before stated, the coal-bearing quartzite at Los Banos are about 3,000 feet thick, whereas the coal bed is here covered with 1,000 feet of overlaying rock. The coal was examined, and found to be homogeneous and of good quality. A sample of the coal was sent to the Bureau of Mines, and was found to be high in rank and free from impurities. A specimen of the coal was also sent to the United States Geological Survey, and was found to be of excellent quality.

As to the quality of the coal in this northern region, we refer to the Analysis No. 1 below, which is the aggregate analysis of a number of samples from all the openings in Vena Nos. 1, 2, and 3 at Los Banos. These were the only ones which furnished a coal for analysis, and while we had no opportunity to make a proper sample from the total thickness of the seam, this analysis will probably furnish a fair criterion to which to judge the quality of this coal.

**Analysis No. 1**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>1450</td>
</tr>
<tr>
<td>Volatile matter</td>
<td>6.63</td>
</tr>
<tr>
<td>Fixed matter</td>
<td>93.62</td>
</tr>
<tr>
<td>Sulphur</td>
<td>5.87</td>
</tr>
<tr>
<td>Ash</td>
<td>84.73</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1000/62</td>
</tr>
</tbody>
</table>

We would call attention to the high specific gravity of the coal, which may be noted from the fact that the specific gravity of the coal from the Wyoming and Lackawanna valleys in Pennsylvania would average about 1.5 specific gravity, whereas, this coal, as determined by Mr. Mo, ranges from 1.62 to 1.65 specific gravity. This is a very good feature, indeed. We regard the anthracite of this northern coal field, as

far as we have been able to judge, equal to the average anthracite of Pennsylvania, as will be shown by analysis No. 2 by Mr. McCrea of Harrisburg.

To be Continued.

**CORRESPONDENCE**

**MASSACHUSETTS.**

(From Our Special Correspondent.)

BOSTON, May 20, 1899.

**EDITORIAL:** After several weeks of lassitude, culminating in a severe drop in prices, on the announcement of Ex-Governor Flower's death, the stock market has again taken on an upward swing. During this period of falling prices in the New York and Boston markets, copper stocks have held stronger than any other securities, although the trading in these stocks has been light. The financing of the American Company stocks seemed to bring speculation in either securities to a standstill, but now that the New York banks have announced that their lines of credit are well established and collateral, the tone of the whole copper share market has been changed. We look for a very active and rising copper market this summer, and believe that the price will advance in London the Boston will take a stronger interest in this metal than ever before. A good deal of trading is being done in copper shares in New York and to some extent also in Philadelphia. Boston has a new favorite in the shape of Missouri and Kansas Lead and Zinc mines, and a good deal of money has been invested in these securities.

The Baldwin Mining Company of Montana, the stock of which is held largely in Boston, has just declared its regular monthly dividend of 3 per cent and an extra dividend of 5 per cent. This makes the thirteenth dividend in five months, or 22 per cent on the entire capital stock in that period. The writer is well acquainted with the owners and managers of this wonderful little gold property, and is familiar with the history of the company. The management is extremely conservative, and is largely responsible for the wonderful success of the company. The company is capitalized in modest, consisting of only 250,000 shares, having a par value of $1. During the last seven years, the surprising total of $700,000 in dividends has been declared. The company is constantly kept in the market, and three years ahead of the capacity of the twenty stamp mill. Nothing succeeds like success.

**ROBERT S. BICKFORD.**

Stock Broker, 60 State street.

**Works of C. L. Berger & Son.**

BOSTON, May 4, 1899.

**EDITORIAL:** It was recently my good fortune to inspect the works of C. L. Berger & Son, successors to Buff & Berger, instrument-makers of Boston. Upon the senior member of the firm as a guide. The Boston boom in mining properties has taxed their facilities, ample though they are, to the utmost.

One of the most interesting exhibits in the whole establishment is the juxtaposition of two such celebrated instruments as the Temple and Crossan. The Temple is a highly automatic circle-dividing engine, each of which has an equal, has no superior in this country or in the world. Each instrument, built by a master-
June 1rst, in which event a great shipping record may be looked for. The stock was only fairly active, at last week's figures. There seems to be nothing in the market presenting greater possibilities than Daly West. Dalton & Lark was fairly active at slightly better figures. This stock should see higher quotations during the course of the year. The first clean up under the new management is just being made at the Daisy mill, but it will be two weeks yet before any accurate report of conditions as they now exist can be prepared. Expenses are being greatly reduced and it is to be hoped that the company will soon be placed upon a much improved footing. The old management left the company in debt $6,000, which stood at about last week's figures. It is reported that insiders were among the purchasers. One director has 10,000 shares which cost him 62½ cents per share. Eagle & Blue Bell was again lower. The recently encountered seam of $100 ore has not yet widened out, but development work is progressing steadily. On reports about work upon them when he was stopped by some parties who had adverse claims against the property. The group has been tied up ever since by litigation, and nothing has been done in the way of developing the claims. A decision in favor of Mr. Hendey has been rendered and the property will soon be in operation again.

The Copper Chief is situated about five miles from Jerome, where the great United Verde group of mines are located. Not much development work has been done upon them, except fissures cut for anything, the property will return large profits to the happy owner, who is a thorough mining man and has the backing of some of Colorado's best known capitalists.

Some of the finest specimens of copper ore ever brought in from the Dragong was recently brought to the office of the Copper King Co. This ore carries a high grade of copper the azurite and malachite incrustations, with deep blue and green native carbonates of copper are shown. The ore comes from the company's mines at Barrett and is much sought after as cabinet specimens. The company apparently have plenty of it, as the extent of the recent strike has not yet been determined. —Tombstone Prospector.

Three shafts are sinking the Tennessee shaft three feet per day. They are now at the 300-foot level, and drift both ways on the ore at that level has commenced. Everything is ore and its size is not known. The new drift is to be run in above the mill, and after it is in place the Tennessee will run night and day. —Our Mineral Wealth.

A preliminary mining deal of unusual interest and magnitude has just been initiated on a valuable and well known group of copper properties on Pinto creek, belonging to W. T. McNelly, Cen Crowley, Al Sicher and Dan R. Williamson. The properties embrace seven claims and are bonded to eastern parties for a fair price says the Prescott Herald.

Under the terms of the bond development work must commence within thirty days, and the first payment on the property is to be made within four months. There is good prospect for not only a bond, but a satisfaction energetically and the deal closed as contemplated in the bond, in which event another magnificent producer will be thrown open to the world.

CALIFORNIA.

AMADOR COUNTY.

The Spagnoli mine at Clinton is running in earnest. The hoisting capacity of the mine is 1200 tons of ore per day and is forty feet high. The perpendicular two-compartment shaft is already down forty feet and eight sets of timbers are already in place. The timber used is 14 x 14 x 14 inches, with eight-inch corner blocks.

S. E. Thornton, who has charge of the working of the old dumps on the Empire mine, had leased a mine on the ranch of George Easton and is erecting a hoist and such other machinery as is necessary for the thorough prospecting of the property.

Report has it that some rich ore has been encountered in the north drift on the 100-foot level of the Allison mine.—Leder.

CALAVERAS COUNTY.

A mining deal has been consummated in San Andreas during the week that has attracted more than usual attention. It involves the reorganization of the Pellowcraft mine, sometimes known as the Lively mine, near town. Persons who sought to know consider the Pellowcraft a rich property with an assured future, and considerable work has been done and a ten-stamp mill is completed.

On account of a singular accident to the hoisting engine at the Utica mine in the early part of May operations at the mine were suspended for a couple of weeks. The skip became jammed when being lowered upon the hoist, necessitating a new hoist, which will be put in place as soon as possible. The loss to the Utica Company will amount to a large sum, considering the cost of repairs and loss resulting from the inability to operate the mill.

EL DORADO COUNTY.

An Eastern firm has purchased the interest of Colonel F. A. Head in the Blue Gown mine, and it is the intention of the new company to commence active operations on the property immediately. The first work to be done will be the driving of a new tunnel, considerably lower and farther to the north than the present developments. Should the ore pay and continue to this level, as they are contumacious, they will erect a five-stamp mill for prospecting only, after which a mill commensurate with this immense body of ore will be erected. Edward Bird, who is superintendent of work on the two improvements is the new company, is the new company, and has the backing of some of Colorado's best known capitalists.

KERN COUNTY.

The purchase was completed May 23rd by which the Little Butte Co. of Randsburg, Cal., secured control of the Butte mine for $50,000. They have also under bond the Jomo-

hansberg Water Co.'s plant. It is their intention to erect a 20-stamp mill immediately. The Butte mine has produced about $100,000 in the past year, so that the purchase is considered a bargain.

Business is active on the Summer oil wells. In the past two weeks another well has been sunk to a depth of 700 feet. This touches the oil stratum.

Investments are that a few feet farther and a bountiful flow will be reached. The flowing well struck some time ago continues its good work without showing the least sign of weakening. Good news comes in from other fields where operations are going on.

The Kern county oil fields are beginning to attract wide attention.

The Buckboard mine, owned by Donovan, Matteson and Adams, is showing up in great shape. The ledge reaches a width of fifteen feet at places and all horizons. The deepest shaft is 155 feet and drifts are shown on each side. The boys have considerable ore on the dump and are developing all the time. They think a little of putting in a mill of their own, if further development maintains the present favorable outlook.

TIOGUIN COUNTY.

Mr. Longway is down 70 feet on his ledge at Upper Goler, with fair prospects and good ore.

Hall and Tittle are down almost 100 feet in their Sand Canyon ledge and will soon be feeding their cyanide plant on that kind of material.

P. Cudahy and several others are doing good work with dry washing at Mesa Springs.

Andy Bland has bought the Spangler Bros. mill at Garlock and moved it to Garden Station, to use for custom work.

O. Castro will move to Kane Springs this week, where he has a good placer mine.

The Lee copper mines have been sold to S. Sweyser and Mr. Harker for a nominal price.

LOS ANGELES COUNTY.

Mr. Geo. Rubich is putting up a cyanide plant on Arrasta creek on the Melrose ranch near Acton.

A San Francisco company is going to reopen the old copper mine at Acton. In 1865 some very rich copper ore was taken out of this mine, and there was nearly $2,000,000 worth of fine machinery put in the bottom that is there yet, covered up with about 150 feet of water.

The following delegates were elected to represent the Cedar mining district at the Miners' Convention, which was held in the Chamber of Commerce in Los Angeles on the 29th of April. Hon. Henry T. Gage, Hon. S. S. White, Hon. George J. Denis, Dr. G. Gehring, N. M. Melrose, R. E. Nickel and Ed. Lyons.—Arion Register.

MARIPOSA COUNTY.

Articles of incorporation of the Quail Mining and Milling Company have been filed with the Secretary of State. The Board of Directors consists of N. F. Pickle, Read McCreary, A. Colby, J. C. Bonner and C. H. Pease. The company is located in Mariposa county, and was secured from J. M. and C. P. Whitney.
for the present to this shaft, which will be sunk to a depth of 500 feet before any further drifting is done. The station will be put in at a depth of 100 is passed. The vein so far has carried an average width of 12 feet, and the ore is reported as particularly good.

Returns from the shipment of rock, 16 tons, which was sent to Selby’s last week from the Vine Spring mine, have been received, showing that the ore went a trifle over $4 per ton.—Union Democrat.

COLORADO.

The Alunite mine, near Georgetown, is rapidly coming to the front, and promises to again take its place among our greatest producers.

The strikes made some time ago in the 850 and 1000 levels have been followed by a still richer strike in the 750 level. Ore was encountered in this level the past week that reminded one of the bonanza days of the Colorado Central mine, so rich is it to the eye of the miner. Specimens of the ore at the company’s office show it to be a solid streak six to eight feet wide, and composed of a pure, intimate mixture of brown zinc blende, rare silver, gray copper, and pyrite, and galena. It contains enough of the rich silver minerals to make a thousand thousand ounces to the ton. As the ore has but just been encountered, its extent is not known.

Mr. Maxwell had a mill run from the Frostburg, near Georgetown, Colorado, a short time ago, of 24 tons of ore in two classes, which netted $2,432.60.

A half-dozen assays were made of ore and rock from the Oza Belle lode, Argentine district, which returned from four to eight ozs. gold, and from 70 to 140 ozs. silver.

GEORGIA.

The Dahlona Corn Gold Mining Company, Dahlona, Ga., have given the Edward P. Allis Co. an order for a 120-stamp mill, each stamp 850 pounds weight. The mill is provided with hydraulic classifiers and thirty-six Reliance classifiers, so that the pulp after passing over three sections of copper plates, is sized in the classifiers and concentrated on the conveyors.

One large Gates crusher crushes all the ore from 120 stamps, which is distributed to the various bins by belt conveyors.

The power for the mill is derived from two 6 horse-power Water Wheels, and the conveyors are driven by Pelton Water Motors. The concentrator will be convoyed by an electric trolley road to the chlorination plant, the order for which was also given to the Allis Company.

This plant is equipped with a Holthoff-Wethy Roasting Furnace 10’x10’, having a cooling floor attached for cooling the ore after roasting and before chlorination takes place. There are two five-ton chlorinating furnaces and the necessary tanks, etc., in the chlorination plant, which will treat at least thirty tons of ore in twenty-four hours.

The Allis Company were given an order for a twelve-drill capacity air compressor, with all the necessary drills, tools, etc., belonging thereto. This compressor will be located in the power room of the stamp mill.

The chlorination plant is also driven by a Pelton Water Wheel.

It is expected that the two plants will be in operation by September 1st of this year.

IDAHO.

The air compressor for temporary use at the Last Chance is now on the ground, having reached Wardner last week. It is a second hand one bought in Spokane, and will be used until the large new one, recently ordered, is ready to run.

The old air compressor which went through the Gold Hunter fire has been thoroughly overhauled and put in place. As soon as a few missing parts arrive it will be ready to run. The shaft is down about 35 feet, and some remarkably fine ore has been found in it.

A new double-decked Willey table is being put into the Morning mill, near Wallace, Idaho, the first one in this district, if not in the world.—Wallace Press.

MICHIGAN.

The Ropes gold mine has ceased working, and Michigan’s last gold mine has gone out of business.

The transfer of the Lake Superior Iron Company of its mines and property in Ishpeming and vicinity to the Olver Mining Company was made in Boston recently. By this transaction the corporation acquired one of the finest properties producing iron ore in the Michigan fields. From Ore.

MINNESOTA.

The Fall Lake Land Company, which controls the Copper Creek mines, which in the early days were developed by the American Fur Company, has procured a pump and other necessary tools needed for that work and will start at once to pump out the deepest shaft on the property.

It has been years since work was done there by the Astors, and the workmen that were then employed there do not have a distinct recollection of the shaft. The depth is supposed to be in the neighborhood of 130 feet, and it is known that about 200 feet of drifting was done, but at what depth is uncertain, although it was probably as far as 500 feet or more. The men that helped do the work say that they recollect cutting across masses of rock that was copper bearing, but as the owners were then looking for mass copper, no attention was paid to rock that would now be considered worth mining. In those days the company had figured on carrying the copper in wagons to the Nemadji river, ferrying it across, and then having it loaded on boats and taken East.

The Superior and Boston Company, owner of the Fond du Lac mine, has begun work on that property doing actual development work. A great deal of blasting has been done, and some fine samples have been procured. From the indications it would seem that the vein is carried along the surface for a considerable distance, some of the best specimens Capt. Thomas has yet seen in having been procured west of the Stuart shaft. The camps are all erected for the accommodation of 25 or 30 men, and the company has sent to Michigan for a number of experienced miners as aids to the development work.

The Percival Copper Mining Company will put in steam drills at the Percival mine as soon as the machinery can be procured and placed. With this improvement, the sinking of the shaft will be reduced to about twice as fast as at present. The shaft is now 60 feet deep, and drifting is going on.—Duluth News-Tribune.

About 75 to 80 cars of ore is now mine and shipped daily from the Consolidated mines near Hibbing, Minn. These mines are employing about 300 men and could furnish employment to nearly as many more.

An advance of 10 per cent. was recently made in the pay of the surface men employed by the Consolidated Mining Company.

Four drill crews are at work on the Sherid- dian’s Arromont property, at Hibbing, on which John Jones holds an option.

MISSOURI.

An output of 122 tons of Jack was made from the Prosperity mine, and 100 tons from the Tuttle & Company mine, both on the Minor & Rogers land near Auburn, Mo.

County Collector Emery was displaying some very rich ore which was taken fourteen feet below grass roots from forty acres of land owned by the Emery estate. The land adjoins the Cholwell land on the south and is just a quarter of a mile from the city limits.

The lead strike made by H. B. T. & Sons, on the Shool Creek Mining Company’s lease on Silver Creek is proving extra rich. A. P. Clark, one of the owners of the lease, says that from a bit that started recently on the sixty-foot level 5,000 pounds of lead was taken out in the afternoon. The mineral is found in great bunches, and some miners who have seen the Wonderful Eight mine at Shoulw, say the Shool Creek company is richer than that wonderful producer.—Joplin Sunday Herald.

MONTANA.

A deal was closed this week whereby M. J. Garrity and Charles Barthof gave a bond to a Chicago syndicate on their properties near Homestake for $10,000. The property is one on which the owners have done considerable work and from which some good ore has been shipped. In the generally increased inquiry for mining properties, the Homestake range is attracting a share of attention, as it certainly deserves to do. There are several active development propositions now being successfully worked in that range. The Chicago parties, represented by Mr. Highland, have taken hold with a vim. Mr. Tremain, the inventor of the Tremain mill, is said to be demonstrating the statement that his mill is especially adapted to the treatment of the ore of the Homestake district.

The Minnesota Standard Mining Company, operating at Marysville, has let a contract to Butte parties for a 300-foot extension of the tunnel in the Omaha lode. This tunnel is being run on a ledge, improving as depth is attained, and the company is confident the completion of this work will furnish a paying mine.

A rich strike is reported on the 50-foot level of the Bamboo Chief mine, one mile west of Virginia. Over 1600 pounds were extracted from a vein varying in width from 15 to 20 inches shows returns of $1.50 per ton. The lessees, John Devlin and Charles Grove, intend to utilize the Largey mill, located a short distance from this mine, for the purpose of working the ore.—Helena Independent.

NEVADA.

The Green plant is running on tailings from the Wide West mill at Aurora, Nevada, which are quite rich.

Mr. Champion, Vice President of the Vulcan Company, says that the strike here is much richer than the strike at Aurora, and as a result, the mill is going to be run six months longer. The company will make an effort to get all the ore out that is in the mill, and the plant will be operated as long as possible. The company is also going to make improvements on the mill, including the installation of new machinery and the construction of new buildings. The company is also going to expand its operations by purchasing more ore and by extending its mining activities. The company is also going to make efforts to improve the quality of its ore and to increase its production. The company is also going to make efforts to reduce its costs and to increase its efficiency. The company is also going to make efforts to improve its relations with its employees and to increase its profits. The company is also going to make efforts to improve its relations with its investors and to increase its stock value.
SOUTH DAKOTA.

Shipments of ore will commence soon from the Cherri Gable Lode, near Nevada, S. Dak., by the Jesseys, D. C. Boley, W. M. Barker and associates. A shaft has been put down about 175 feet, and about 250 feet of drift, but the workings have been slow. There has been ore in one of the shafts for some time, and the best of it has been mined and stored ready for shipment. It was at first believed the best ore shaft in the mine was a continuation of the Ben Hur ore body, but a survey shows the latter shoot to be farther to the east. A very neat hoisting plant is being used at the shaft.

The water has been pumped out of the J. J. R. shaft, and it is the intention of Mr. Crocker to commence sinking.

The water is all out of the Golden Slipper shaft, and the boys have commenced work in the mine.

An eight-foot gold-bearing ledge has been uncovered in the shaft from the 400-foot level in the Sunnynside mine.

R. M. Maloney has taken an option on the Crane group of claims in Friday gulch from Joe Sharp, Byers and Pettit.

Several carpenters are at work in the Bismarck mill, and it is expected that the plant will be ready to commence crushing ore next week.

Del and Bill Canfield, who are at work on the Black Jack claim in the Burnt Fork district, have struck free gold-bearing quartz in their shaft at a depth of 40 feet.—Black Hills Mining Review.

OREGON.

E. Ridgeway, a pine creek rancher, owns the White Lily, Gold Standard, War Eagle and Oregon, about eight miles north of Ballard's Landing, all of which are splendid copper prospects, excepting the White Lily, a free milling gold proposition showing values as high as $42.20 per ton. In bar placer mining men are making as high as $3 per day with crude rockers on Snake River.

It is reliably reported that Robt. Fullerton has struck a rich 16-foot ledge in the Virtue district, near Baker City, Ore.; that great excitement prevails and a big rush of prospectors is headed that way.—Baker City Democrat.

WASHINGTON.

The Republic Giant tunnel was driven about 45 feet last month, and a shaft started above it, but depth has easily been a vein of solid quartz, fully five feet across. Work is being pushed on both tunnel and shaft.

In the North San Poit shaft the 100-foot level has been reached and drifts started both north and south in ore that will average above $8. With the exception of a dump below the drift level, sinking will be discontinued for the present.

The Surprise is attracting the camp's attention. The average of a number of samples taken from open cut No. 3 was $39.00.

Work has not yet commenced on the new Mountain Lion shaft, but a whim is being installed at the old shaft, which is to be sunk to the tunnel level.

The steam pump is in operation on the Bodie, and the shaft will be cleared of water in a day or two. The shaft is down 115 feet, and will be sunk at once to the 100-foot level, and the vein croissant.

The Sunnyside is a claim situated on the east bank of the San Pool river and owned by the Sunnyside Gold Mining Co., a local organization. A six-foot ledge of good looking quartz crops on the claim, and ore from the ten-foot shaft assays $7 in gold. A contract was recently let for a fifty-foot croissant tunnel, and upon its results will depend the future exploitation of the company.—Miner and Electrician.

FOREIGN MINING NEWS

BRITISH COLUMBIA.

Herewith we present our readers with the figures of the output for April. It exceeds that of April, 1898, by 1,829,134 pounds. The shipments via Nanaimo have fallen off to a considerable extent owing to bad roads and the extension of development work on the Slocan and other properties, the prosecution of which naturally curtails the output of ore, says the Kelowna Daily News.

Below is a list of the mines which shipped over the Kisko & Slocan Railway during the month, together with their respective amounts:

<table>
<thead>
<tr>
<th></th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payne</td>
<td>2,795,000</td>
</tr>
<tr>
<td>Last Chance</td>
<td>960,000</td>
</tr>
<tr>
<td>Whitewater</td>
<td>525,000</td>
</tr>
<tr>
<td>Slocan Star</td>
<td>1,050,000</td>
</tr>
<tr>
<td>Jackson</td>
<td>218,000</td>
</tr>
<tr>
<td>Rambler</td>
<td>202,000</td>
</tr>
<tr>
<td>Dardanelles</td>
<td>40,000</td>
</tr>
<tr>
<td>Ivanhoe</td>
<td>38,000</td>
</tr>
<tr>
<td>Total</td>
<td>4,033,000</td>
</tr>
</tbody>
</table>

This was distributed among the different smelters and ore buyers as follows:

<table>
<thead>
<tr>
<th></th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omni</td>
<td>2,511,000</td>
</tr>
<tr>
<td>Kootenay Ore Co., Kisko</td>
<td>732,000</td>
</tr>
<tr>
<td>Everett</td>
<td>555,000</td>
</tr>
<tr>
<td>Aurora</td>
<td>552,000</td>
</tr>
<tr>
<td>Great Falls</td>
<td>314,000</td>
</tr>
<tr>
<td>San Francisco</td>
<td>240,000</td>
</tr>
<tr>
<td>Total</td>
<td>4,332,000</td>
</tr>
</tbody>
</table>

The total clearances of the Kisko port on ore for April were:

<table>
<thead>
<tr>
<th></th>
<th>Gross lbs. ore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payne</td>
<td>4,296,800</td>
</tr>
<tr>
<td>Last Chance</td>
<td>2,074,384</td>
</tr>
<tr>
<td>Whitewater</td>
<td>227,800</td>
</tr>
<tr>
<td>Total</td>
<td>6,189,100</td>
</tr>
</tbody>
</table>

Of this amount the following is reported from the sub-port of Kisko:

<table>
<thead>
<tr>
<th></th>
<th>Pounds ore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golds</td>
<td>120,800</td>
</tr>
<tr>
<td>Pounds lead, contents</td>
<td>46,764</td>
</tr>
<tr>
<td>Ounces silver</td>
<td>6,680</td>
</tr>
<tr>
<td>Value</td>
<td>$3,852</td>
</tr>
</tbody>
</table>

The duty paid the United States Government on this amount is $51,115.76.

Development work on the Union Jack, located four miles west of Cranbrook near the rail line, is making a satisfactory showing. A shaft ten feet deep shows a conjunction of three leads, and the owners, Messrs. Love,
The MINING AND METALLURGICAL JOURNAL

MONTANA'S MINERAL PRODUCTION

From Eugene B. Braden's report of the metals produced in Montana for the calendar year of 1898, we take the following, copper and lead being figured from the average price of those metals during the year; copper $1,2, lead $3.78.

<table>
<thead>
<tr>
<th>COUNTRIES</th>
<th>Fine ounces</th>
<th>Value</th>
<th>Fine ounces</th>
<th>Value</th>
<th>Fine ounces</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaverhead</td>
<td>9,919,673 $ 189,217.50</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Broadwater</td>
<td>10,652,021 $ 218,529.50</td>
<td></td>
<td></td>
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<tr>
<td>Carbon</td>
<td>2,600,000  $ 199,000.00</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Cascade</td>
<td>1,069,506  $ 20,255.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Custer</td>
<td>2,000,000  $ 198,000.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Deer Lodge</td>
<td>23,604,806 $ 489,889.33</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Jefferson</td>
<td>12,000,000 $ 240,000.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lewis &amp; Clark</td>
<td>43,808,555 $ 1,097,845.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Madison</td>
<td>24,700,000 $ 476,560.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meagher</td>
<td>2,208,000  $ 220,800.00</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Missoula</td>
<td>58,000,000 $ 116,000,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Park</td>
<td>48,000,000 $ 96,000,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ravalli</td>
<td>60,000,000 $ 1,200,000.00</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Silver Bow</td>
<td>55,345,000 $ 1,100,000.00</td>
<td></td>
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<td></td>
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<tr>
<td>Teton</td>
<td>55,483,000 $ 1,180,000.00</td>
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</tr>
</tbody>
</table>

Total: 253,357,787 $5,247,012.01

Hoggarth, Usher and Ryan, are feeling jubilant over the prospects of rapid progress, as in a few feet show $25 in gold, 50 ounces silver, and values in copper ranging from 17 to 77 per cent.

The Minehaha in Camp McKinley, B. C., is to be at once equipped with a ten-stamp mill, and is expected to be ready to operate some time in July.

Work continues on the main adit at the Vellet mine, which is to tap the ledge at a depth of 320 feet. This adit has now been driven for a distance of over 200 feet. It is expected that it will tap the ledge when it is in 400 feet. The crosscut which was recently commenced on the 250-foot level is making good progress. There is no work in progress on the 100-foot level.

LOWER CALIFORNIA.

More Placer Strikes.

Marvelous rich placer have been discovered at a place known as Santa Clara, on the peninsula of Lower California, about 700 miles from the boundary line between the United States and Mexico. Dry washers are used in the extraction of the gold, water being scarce, and about $150,000 taken out in this way was sent to merchants at Guaymas, Sonora. As usual, when rich strikes in placer gold are found, many people rush to the point indicated, some of whom could not sell gold from mine, unless it was coined in money. This new field is reported to be twenty-eight miles long by fifteen wide.

MEXICO.

President Diaz in his message says:—

The mining industry is that which affords most evident signs of progress, as in the periods covered by this report 1,911,000 titule deeds, covering 11,498 "pertenencias" of one hectare, have been issued. The total number of such deeds issued, subject to the new legislation of January 2, 1893, is 3,553, covering 77,774 "pertenencias" of one hectare each.

The exportation of ore has also increased to a noteworthy degree. Taking the figures recently published by the department of finance, for the seven months, July to January of this year, it appears that the value of exportation of mineral products, metallic and non-metallic, was $5,411,000 in round figures, showing a decrease of $1,431,000 over the value of the same products exported in the corresponding period of the previous year.

As an important event in the mining industry, I will state that the Adventurer tunnel at Batopillo, which is nearly three kilometers in length, which has been fifteen years under construction, and has cost millions of dollars, has just struck the principal lodes of the camp.

The new machinery for the Prietas mine at Parral, which has shut down for some time, is being taken up out of the mountains and will shortly be put in place, and work will be started on this valuable property.

Two new smelters are to be put up at Santa Barbara, Chihuahua.

The Tecolote mine at Santa Barbara, Chihuahua, has been lighted by electricity.

O. C. Wheeler has opened a three foot vein of ore with the new shaft on the Santa Rosalia, which runs 50 inches in silver and a strong trace in gold. The Santa Rosalia is in the outskirts of Parral and was worked by the Spaniards, but has been idle since the slump in silver.—Chihuahua Enterprise.

**GENERAL NEWS**

Catalogue No. 14 of the Weber Gas and Gasoline Engine Co. of 434 S. W. Boulevard, Kansas City, Mo., has been received by this office. The pamphlet is published for the purpose of expounding the merits of the Weber Gas and Gasoline Engine and equipments which are so well known that mention here is unnecessary.

The Chicago Pneumatic Tool Co. has purchased the patents formerly owned by the Consolidated Pneumatic Tool Co., now defunct. These patents include all the Keler and Wolstenholt type of tool construction and in addition several new applications which have not yet been taken out. These patents originally cost the Consolidated Pneumatic Tool Co. about $40,000.

British Columbia's Mineral Production.

Below we publish extracts from the annual Report of the Provincial Minister of Mines for the year ending December 31st, 1898.

The output of ore for the year has been considerably higher than that of the previous year. The amount of ore for which the smelter or mill returns have been received during the year. This system does not give the exact output of the mine, but rather the amounts credited to the mine on the company's books during the year.

The ore shipped in December, the smelter returns are not likely to be received until February, or later, of the new year, and have, consequently, to be carried over to the credit of such new year.

In the lead mine tables, the amount of the shipments is obtained from certified returns received from the various mines. In calculating the values of the products, the average price for the year of the New York Metal Market has been used as a basis in all cases. For silver 85 per cent and for lead 90 per cent of such market price has been taken. Treatment and other charges have not been deducted.

The total production for all years up to and including 1898 is:

- Gold, placer... $ 9,960,819
- Gold, lode... 6,501,060
- Silver.... 6,575,901
- Lead.... 4,049,199
- Copper.... 5,135,841
- Coal and coke... 45,956,160
- Building stone, bricks, etc... 1,500,000
- Other minerals... 26,000

Total... $123,417,326

The production for each year, from 1890 to 1898 inclusive, was:

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1890</td>
<td>$ 2,958,903</td>
</tr>
<tr>
<td>1891</td>
<td>3,521,093</td>
</tr>
<tr>
<td>1892</td>
<td>2,978,250</td>
</tr>
<tr>
<td>1893</td>
<td>3,896,013</td>
</tr>
<tr>
<td>1894</td>
<td>4,257,717</td>
</tr>
<tr>
<td>1895</td>
<td>5,643,042</td>
</tr>
<tr>
<td>1896</td>
<td>7,907,955</td>
</tr>
<tr>
<td>1897</td>
<td>10,455,668</td>
</tr>
<tr>
<td>1898</td>
<td>12,567,884</td>
</tr>
</tbody>
</table>

The table below gives a statement in detail of the amount and value of the mineral prod-
DIE GOLD PLACERS.

By Prof. Geo. H. Stone
(Begun in our issue of May 1, 1899)

At San Pedro the lower slopes of the mountains are covered with a talus or drift composed of the rocks exposed on the mountain sides. The fragments are of all sizes, from the finest dust up to boulders. All are somewhat smoothed and rounded at the angles, but no more so than would result from their being washed down the slopes. The places between the large fragments are filled with a fine earthly matter that contains some lime and iron oxides and hydrites. When dry it forms a compact cement; when wet it disintegrates somewhat readily. The gold is found at one or more levels, sometimes at or near the bedrock, at other times many feet above it. It occurs in pay streaks which are usually less than a foot or two in thickness. They are narrow and seldom more than a few feet or rods in length. The drift from the mountains is of various depths up to 70 feet or more. Mining is conducted by sinking shafts about 30 feet apart (50 feet is a Mexican claim) and hoisting the dirt in a bucket. As needed, some of the dirt is dried by fire and sampled by 'dry panning.' When a pay streak is found it is followed by tunnels and mined out like coal. Only the pay streak is hoisted after the shaft and tunnels are opened. The pay dirt is spread on the ground, dried, and then treated with a 'dry washer.' The dirt is then screened to remove the coarser gravel. The finer dirt is then made to slide in a thin sheet over a fine inclined screen. As it passes over the screen a current of air is forced up through it by a blower. The rising air causes a boiling motion in the sliding dirt, the gold settles on the screen where it is caught by the sluices that slope away, and the coarser matter slides on to the tailings. In the tailings we find many pieces composed of sand grains cemented by the earthy matter. These cemented grains will yield gold repeatedly after lying a while in the sun and rain. The earthy cement must be thoroughly disintegrated before we can get all the gold. The process is further explained by the fact that the shafts and tunnels are never timbered yet will remain for years before they collapse. It is hard and slow work to loosen the cement gravel with a pick and the force required to do it will not dry very long. Those who plan to excavate it boldly by steam shovel have proposed to first loosen the waste by blasting. There is loose gravel in the beds of the streams but it was worked out years ago. At San Pedro the Mexicans will at any time work for others at $1 a day rather than dry placer for themselves. It may take a month to find a pay streak and that is too slow. The populations that depend on dry placers are poor.

At the Jicarillas the conditions do not differ greatly from those at San Pedro. There is a larger rainfall and more placering is done by the use of water in pans, rockers, etc. The loose gravel in the gulch channels was worked out long ago. Good gravel is found far up some of the small valleys near the outcrop of veins. The lower portions of the larger gulches towards the plains are covered with broken sheets of gravel 70 or more feet thick, containing several pay streaks at various levels. An interesting class of auriferous gravel is found alongside or near the outcrop of copper ore. Placer deposits are grouped by low ridges or flat deposits composed of fragments of the same rock as the dike, all somewhat smoothed and worn at the angles. The gold occurs as nuggets (a little rounded at the angles) on the flanks of the dikes, accompanied by many fragments of iron oxides, some of large size. This is the coarsest and heaviest gold found in the camp. Both the pay channel and the fragmentary conglomerate that covers the adjacent dikes are saturated, so to speak, with a very adhesive red earthy matter which does not disintegrate when wet except after a long and central action. We do not follow the gulches but they do the dikes.

The above facts show that in order to work the pay placers without the use of water and hydraulic grates, there is required the following:

1. To find the pay streak if it is proposed to work only the richer portions. This will require the sinking of shafts and driving of tunnels. If it is proposed to work the whole mass of gravel we will have to handle much gravel that runs little or nothing.

2. To cheaply excavate the gravel. A man who can shovel ten cubic yards of loose gravel in a day can dig and hoist to the surface by windless a ton or less. No way is known of excavating the pay streaks in the tunnels by machinery, though the hoisting might be done by power. The cost of excavating the gravel dry will always be one of the largest items of the cost of working. The cement must be broken, then dried, and its resistance to pressure (as of a dredge or steam shovel) would be very great.

3. To transport the excavated gravel and properly feed it to the separating apparatus. Only when the gravel is separated grade by grade is the enclosed gold released, especially in case of the layers containing the most cement. Much gold is gathered along to the larger stones unless the cement is thoroughly pulverized. We do not need to crush the grains of sand and gravel, for these seldom contain gold that is wanted to separate the fragments one from the other. Disintegration is a part of the process neglected by most inventors. Most inventors have mixed hopeless notions of how to separate the gravel and fillings and when they have invented a machine that would recover this gold dry, they fondly imagined they could work the dry placers of the future. In fact, the Mexicans have always been a favorite field for the exploits of the mining Annans. The outside world hears of the gold, but little or nothing of the earthy cement.

4. To separate the gold from the iron oxides. Sometimes these oxides contain gold and no one is at a loss.

It is not the writer's purpose in the present paper to discuss the means of separating the gold from the gravel by dry processes, but to point out the difficulties to be overcome.

Official Delegates Invited

Through the State Department at Washington, one hundred and fifteen different countries great and small, have been invited to send one delegate each to the International Commercial Congress to be held in Philadelphia in October, in connection with the National Exposition of American Manufacturers for the Expansion of Export Trade. The invitations have been sent out by the Philadelphia Commercial Museum, under the auspices of which, jointly with the Franklin Institute, the Exposition will be given.

The invitations include the list of forty-eight mother countries, eight self-governing colonies, including Canada and the colonies of Australia; fifteen other colonies, dependencies, protectorates, and the four new possessions of the United States. In the latter instances the invitations were sent to the Military Governors.

The Lee-Penberthy Injector Mfg. Co., of Detroit, Mich., sends us the following, which is self-explanatory:

IMPORTANT AND FINAL NOTICE

In those years by the Penberthy Company to restrain us from using the name 'Penberthy' in our incorporative name, and on our 'Lee' injector describing Mr. Penberthy's patent, the Supreme Court of Michigan has decided for the complainant and ordered us to discontinue the use of the name 'Penberthy,' which order we will fully comply with, not using it in our corporate name, the Lee Injector Mfg. Co. In future our incorporative name will be 'Lee Injector Mfg. Co.'

This decision and change of name will not change the policy of our future business. Nor interfere with the manufacture and sale of our 'Lee' injector and other goods manufactured by us; neither will said decision interfere with or have any reference financially to any party or parties who have purchased our 'Lee' injector or transacted business with the 'Lee' Penberthy Mfg. Co. in the past, who may purchase 'Lee' injectors or other goods made under the name of the 'Lee Injector Mfg. Co.' in the future.

The decree of the Court has no bearing on the use of the name 'Penberthy' by us in the past, or any use that we must not use it in any form in the future.

We shall push our business and the sale of
our "Lee" injector in the future as we have in the past, and trust we will have and maintain the hearty co-operation of all.

VON BERNHARDT MFG. CO.

William O. Lee, Sec'y and Manager, Successor to Lee-Bernhardt Mfg. Co. Thos. J. Sweeney, V. P., Mechanical Expert, inventor and perfection of the Penberthy Injector.

Detroit, Mich., May 12, 1889

Tuolumne county called a convention of miners on the 20th of May. The purpose of the convention was to organize a Tuolumne branch of the California Miners' Association. A delegation from the State Association was present, among whom were President Jacob H. Neff, Tirey L. Ford, W. C. Ralston, Chas. G. Yale, J. F. Davis, John M. Wright, and Edward H. Benjamin.

The good that the California Miners' Association has done for the industry in the past, cannot be overestimated, and the benefit to be derived from a branch of that organization in this county is plainly evident, says the Sonora Independent. The chief industry of Tolumne is mining, and it is conceded to be the richest mineral region in the State, and by an association of this character much can be accomplished by united effort that would otherwise be impossible.

Silver-Plated Amalgamating Plates.

The plates made by E. G. Donnison of Denniston's San Francisco Plating works, 53 and 55 Montgomery street, San Francisco, Calif., are world-renowned, and have received 26 silver medals. Only the best Lake Superior copper and refined silver are used in their manufacture, the larger quantity in any size, plain or corrugated. Mr. Denniston is the pioneer in the business, having been established for 35 years, and has made a great success, which is due to his thorough knowledge of the business, and the possession of the best facilities, also by depositing full weight of silver on every order.

The greatly increasing demand for these plates by gold miners has demonstrated their superiority over all other methods for saving gold, in quartz or placer mining, particularly fine or float gold. These plates are in great demand among the coast mining regions from Alaska to South America, the Rocky Mountain mining States and Australia.

The work done at Denniston's San Francisco works is of gold, silver, platinum, nickel, brass, copper, and bronze plating on every description of metal work. The work done is first class, and done at lowest possible prices.

THE REDUCTION OF ORES.

BY C. E. ROBERICK, OF SEATTLE.

(Began on our issue of May 18th.)

In making up his mix, the metallurgist adds a certain per cent of galena for a carrier to save the gold and silver. About 12 per cent is used now.

Most of the iron occurs in the ores and sulphur. The sulphur in a lead smelter is out of place and must be eliminated by roasting. Lead takes matte sulfide out of the converter to do man accomplishes in a few hours. When she finishes, there is left the red streak of iron stone on the mountain side, by which the prospectors recognize the ledge.

All parts of the charge, ore, flux and fuel, which is usually coke, are weighed and fed in regularly at the top of the furnace, a force draft being put up the combustion. The process is continuous, the slag being drawn off from one point at regular intervals, while the lead is taken out at a lower point when necessary. In January, it stops not, except for an accident, which, if it stops the furnace, is quite expensive. The lead bullion is now ready for the refinery, where the gold, silver and lead are separated.

When there is copper in an ore that goes to a lead smelter, sufficient sulphur is left in the charge to form copper sulphide or matte and the copper-saver in the same form as in copper smelting. As all lead smelters buy ores carrying more or less copper, they save it in this way, putting them in the regular ores, but ores without copper are preferred. This matte is drawn out with the slag, from which it separates on standing, for being heavier, it settles to the bottom, and when cold it is broken off and saved.

In smelting there is a small loss in the slag, from volatilization and in the dust. The last is mostly regained when good dust chambers are used, but the first and second, especially when the copper is the superiminent to make as long as possible. They vary with the fluxing and the manipulation of the furnace.

One method of refining the lead bullion will be given. It is melted in a large iron kettle with a certain percentage of zinc, the zinc having a greater affinity for the gold and silver than the lead. They liqute on cooling. The zinc with the gold and silver is taken off by a certain treatment. When the lead has given up all the precious metal, it will contain some zinc, from which it is freed in a cupel furnace by distillation and oxidation. The zinc is placed in a sulphuric acid bath and heated, the silver passes into solution as silver sulphate, while the gold remains unalloyed.

The silver solution is decanted, the gold washed, dried, melted and cast into bars. Pure copper sheets are suspended in the silver sulphate and by means we obtain metallic silver and copper sulphate. When all of the silver is deposited it is washed, dried and melted and run into bars. The sulphate of copper solution is evaporated and crystallized. This is a large source of the blue vitriol of commerce.

The other forms of smelting are copper smelting and pyritic, alike in their products, both being mallets, a sulphide product having the precious metals dissolved in them. In consequence of the use of a subsequent treatment to yield a finished product, they vary from one another, varying from a matte high in copper with but little iron, to one mostly iron and a small amount of copper. A strictly iron matte can be made and is made at Deadwood, North Dakota, but as a rule a small amount of copper is desirable.

Pyritic smelting is designed to concentrate the value of pyritic or sulphide ores by heat, using the sulphur as a part, if not all, of the fuel, flowing away the gangue and the metals of no value. The iron forms a sulphide, making with the copper the matte carrying the gold and silver with them. The process is in successful operation at a number of places, but it is not an easy plant to construct. The charge is greater than in lead smelting and theoretically it is quite simple, but practically it takes an experienced man to obtain good results. No preliminary roasting is needed, as the sulphur is used for the fuel.

The matte produced will yield its value by three different treatments. A straight iron matte can be roasted and pan amalgamated the same as gold sulphures are often treated. When there is sufficient copper to pay to save it is shipped to a lead smelter, roasted and treated the same as a sulphure ore, the iron acting as a flux. The copper forms a copper matte, while the gold and silver are taken up by the lead. The arsenic and antimony are made use of in pyritic smelting, whereas the lead and copper smelting they are almost useless. They pass into the iron matte forming arsenides, antimonides, sulpharsenides and sulphantimonides. With the addition of so much sulphur which may be used for fuel.

To be Continued.

LATEST MINING DECISIONS.


Where the owner of lands leased for mining purposes is in possession, no surrender on forfeiture of the lease is required. Island Coal Co. vs. Combs et al., 53 N. E. Rep. (Ind.) 452.

Forfeiture of a mining lease for failure to develop the property within the time specified is not waived by the owner's mere silent acquiescence. Island Coal Co. vs. Combs et al., 53 N. E. Rep. (Ind.) 452.

A lease of coal lands, reserving a royalty on the product, does not put as rent, the rent and the lease, under a penalty of forfeiture, within a specified time to commence the work of developing the coal interest in the lands, by opening the shafts through which the coal can be mined and removed, and by opening mines so that coal can be mined and transported to the market, requires actual mining operations to be commenced within the time specified, and the mere equipment of shafts and mines by which coal might be mined was insufficient. Island Coal Co. vs. Combs et al., 53 N. E. Rep. (Ind.) 452.

PERSONAL NEWS ITEMS.

J. E. BURDICK of Hazelton, Pa., is to succeed ROBERT BROWNLEY as Chief of the Pennsylvania Bureau of Mines.

H. J. STEVENS left Salt Lake, Texas, last week for Sonora, Mexico, where he is interested in the North Star mines.

ARTHUR MURPHY, manager of the Copper Ranch mine, in Rocky district, Beaver county, Utah, recently left Salt Lake City for the property. A new shaft will be sunk and it is expected that a smelter will be erected before receiving winter weather 3 months next winter.

THOS. M. BUZZO, manager of the Alice mine, Walkerville, Montana, spent a few days recently in Salt Lake City.

A. W. GIFFORD, a mining man from Jardillas, Texas, is spending a few days in El Paso, Texas.

Geo. O. Bradley of Salt Lake City, has recently returned from Bisbee, Arizona, where he has been inspecting the smelter and reduction works formerly designed by him.

R. W. BALLARD, who was recently in the employ of the Union Hill Co., near Deadwood, S. Dak., has left for Eastern Oregon, to examine a mining property in the interest of St. Louis capitalists.
THE MARKETS.

All quotations, financial reports and other statistical figures in this and all previous issues of the New York Journal, unless otherwise stated in each issue, are based on the actual figures published in the New York Journal and constitute a complete and accurate synopsis of the market prices and quotations.

New York, March 29, 1899.

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

<table>
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<th>Metal</th>
<th>Quotation</th>
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<td></td>
<td>39.24</td>
<td>May 30</td>
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</table>

Silver has not maintained the high level of April's closing figures. The excitement induced by speculation has subsided. Prices have, however, held up over 50¢, owing to limited offerings. The East has not been a buyer.

Copper.

The market has been fairly firm, but very little business has been transacted. The only important change during the week has been a disposition to meet buyers of Lake at a somewhat lower price than that ruling during the preceding few weeks. We quote Lake 100(199¢), electrolytic, in cases, bars or ingots; 13¢, 121¢, electrolytic cathodes, 10¢/17¢; and casting copper, 15¢.

LEAD

The improved condition continues to prevail, but prices have not advanced. Any further, the quotations being $1.45. Spanish lead has changed for the better, the price now being $14.60-$15.40 per ton, 3d., while for English it is $14.74-6d. per ton.

SULFUR.

Spelter is unchanged at $6.65-$6.90 at New York, and $6.65-$6.95 at St. Louis.

Foreign quotations also remain unchanged at $2.10 per lb. for ordnance, and $2.10-$2.15 for special.

ANTIMONY.

Antimony continues in good demand, with prices unchanged at 10¢ per lb. for Cockson's, 10¢, for Hallett's, 5¢, for U.S. Star and Hungarian.

NIKE.

Nickel.

Nickel remains unchanged, and no alinement of prices can be reported. We quote for tons 360¢-380¢ per ton, and for smaller orders 350¢-355¢ per ton. London prices are 140¢-160¢ per lb., according to size of order.

TIN.

Tin has experienced a further decline from the highest prices recently reached, having advanced to 25¢, with the effect of a continued neglect. The happenings at this end have been merely a reflection of the events in the London market, which is quoted in closing at £115 5s. for spot, £117 for three months.

The demand for Platinum is extremely active, and prices continue high. We quote for New York $12.50-12.75 per ounce for large and $10.00-10.50 for small orders. London is 62¢-

BELTS WILL SLIP — BUT

CLING-SURFACE

WILL STOP IT PERMANENTLY.

CLING-SURFACE MFG. CO.,
167-172 VIRGINIA ST., BUFFALO, N. Y.,
REPRESENTED IN SALT LAKE BY THE UTAH RUBBER & MFG. CO.

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 buy? Write us for full information and catalogue. All free for the asking.

W. T. GARRATT & CO.,
Pump, Bell, Brass and Machine Works,
134-142 Fremont St., San Francisco, Cal.

MINERALS WANTED

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


E. C. MOLLER,
538 EAST 86TH STREET,
NEW YORK

The Pulsmeter Steam Pump

"THE MINOR'S FRIEND"

Often imitated—Never Equaled

Over 20,000 In Use

RECENT IMPORTANT IMPROVEMENTS

The Steel Impeller and Most Modern Construction. General Mining, Quarrying, Railroad, Irrigation, Drainage, Coal Washing, Tank-Filling and for Pumping Back Lakes. Made in two sizes to suit 3, 4 or 6 horse power engines. Completely impregnated with or without fluid. Liberal terms.

PARK & LACY CO., A. M. HOLEY & CO., MELVIN & SULLIVAN CO., PULSMETER STEAM PUMP CO.,
San Francisco, Calif., Helena, Mont., Portland, Ore.

Pulsmeter Steam Pump Co.,
125 Greenpoint Ave., New York City

1941 PER CENT IS THE ACTUAL GAIN

ON THIS BELT 
BY USING 
CLING-SURFACE

CHLORIDE OF LIME

English prime brands $1.00-$1.25
American $1.70-$1.80
Continental $1.50-$1.80

The Pulsmeter Steam Pump

THE MINOR'S FRIEND

Often imitated—Never Equaled

Over 20,000 In Use

RECENT IMPORTANT IMPROVEMENTS

The Strongest Impeller and Most Modern Construction. General Mining, Quarrying, Railroad, Irrigation, Drainage, Coal Washing, Tank-Filling and for Pumping Back Lakes. Made in two sizes to suit 3, 4 or 6 horse power engines. Completely impregnated with or without fluid. Liberal terms.

PARK & LACY CO., A. M. HOLEY & CO., MELVIN & SULLIVAN CO., PULSMETER STEAM PUMP CO.,
San Francisco, Calif., Helena, Mont., Portland, Ore.

Pulsmeter Steam Pump Co.,
125 Greenpoint Ave., New York City
The Cleveland Mining and Stock Exchange Co.

New England Building, Cleveland, Ohio.

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

Morgan-Watson Mining and Construction Co.

Squy New England Building, Cleveland, Ohio.

We Buy, Buy, Sell, Locate and Record Mines of all kinds.

This statement includes the exports and imports at the United States ports, the figures being furnished by the Bureau of the Treasury Department.

Golds and Silver Exports and Imports.

At the United States ports, for the month of March, 1899, and year from January 1st, 1898, and 1899.

Golds—126.

Exports... $735,837
Imports... $7,438,067
Excess... $7,573,473
Silver—552.

Exports... $91,855
Imports... $91,375
Excess... $480

WANTS

Advertisements of this class containing not more than five lines will be inserted for one day's publication at 10c a line.

COFFER MINE. State full particulars in regard to development work location, distance from water, price of fuel, character of ore and returns from shipments. Have at least 1500 feet of development work. Send all information.

Address: JAMES HOWARD, Care Journal Office, 150 Nassau St., New York, N. Y.

GOLD mine anywhere in United States, must have at least 1000 feet of development; where coal is over $6.00 per ton and 400 red delivered; plenty of water, no objection to low grade ore if profit can be made by having large plant to amalgamate and concentrate; want 6 months working bond; no property considered unless owners are prepared to deposit 30 or 50 check to be held in escrow for expenses of engineer if property is in good condition. Address with price and full particulars.


Watch this space for

Want Ad next issue

ORE TESTING

Complete mill for testing ore on practical scale by all processes to determine the best process adopted in treating any ore submitted. Processes in use investigated to overcome unnecessary losses, etc.

RICKETS & BANKS,
Metallurgists & Chemists
NEW YORK CITY

See Tinning Stock Quotations Page 21

John Wigmore & Sons Co.
MACHINERY
Mine and Mill Supplies, Iron and Steel

117 to 123 S. Los Angeles Street, LOS ANGELES, CAL.
## INCORPORATED MINES PAYING DIVIDENDS

<table>
<thead>
<tr>
<th>Names of Mines</th>
<th>Location</th>
<th>No. of Shares</th>
<th>Capital Stock</th>
<th>Par Value</th>
<th>Amount of last Dividend</th>
<th>Date of last Dividend</th>
<th>Total Amount Paid in Dividends</th>
<th>Kind of Mineral Produced</th>
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<td>6. American Lead</td>
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