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The extended use of Aluminum on a large scale has been the desire of its manufacturers for a long time, and at last that opportunity has presented itself. Although it possesses but 53% of the electric conductivity of copper, its extremely light weight, being three and a third times lighter than that of copper, it has been found to be a more economical metal in the form of wire for transmitting electricity. It is proposed to use it for transmitting power from Snoqualmie Falls, Wash., to Tacoma, a distance of 45 miles. Its use has also been adapted at Niagara Falls. On account of being a poor conductor of electricity than copper, a larger wire is required to be used, but the tensile strength of the Aluminum wire is much greater. There does not seem to be, however, much danger of its taking the place of copper, except on transmission lines for telegraph, telephone and power uses. Its softness or elasticity being greater than that of copper, it may be found to be not suitable for street or trolley car use. For winding and dynamo purposes its greater bulk over that of copper would prevent its use. In northern districts, its greater diameter of wire used would hold more snow and ice in winter, and endanger the line to breakage from that cause. It will require to be produced in larger amount and at lower cost than at present before it takes the place as a competitor of copper for electrical use.

BLAST FURNACE GAS.

It is only a few years since the waste gas of the blast furnace was utilized for heating boilers for steam purposes. The general adoption of the gas engine, first in small-sized engines, and more recently in those of large capacity, equal to that of steam engines, have made the use of large gas engines operated by the waste blast furnace gas possible. In Belgium and France, and, this economical use of a formerly wasted by-product in smelting iron ore has been adopted on a large scale.

When it is remembered that for each ton of pig iron smelted, there are consumed about two tons of coal or coke, and there are produced in waste gas about 150,000 cubic feet, the economy and profit to be gained by the use of the iron furnace must have an appreciable effect on the profits of iron production. This economy can be of benefit to both large and small furnace plants, and may tend to render iron smelting profitable at points farther removed from the coal fields than was formerly possible; on this account it has special interest to the iron industry of the western states. It is quite within the bounds of future possibilities in this progressive measure that, by using compressed air along with the blast furnace gas, a still greater benefit may be obtained, as it may increase the explosive force and volume of the gas. The application of the gas engine for this work instead of using steam boilers and steam engines, will have the effect of increasing the demand for large engines, as well as in making the district around a blast furnace an industrial center for power, where the power is not used for rolling mill or other iron manufacturing purposes.

SAFETY IN BLASTING.

The too frequent occurrence of fatal accidents in blasting are largely due to carelessness and supposed economy.

While splitting or explosions from this cause is the result of long association with the known dangerous article. Old experienced miners too often care less in handling explosives on the principle that too close adherence with them is to be expected from the many suppose that fuse burns at the rate of one foot per minute, when in fact the speed is one foot in 30 seconds, and may account for the premature blast when others had to be touched off.

When more than one hole has to be exploded at one point at the same time, safety and economy can be assured by the use of the electric blasting cap. The instantaneous explosion is the result of electric blasting, and the gain is in safety from premature explosion and increased amount of ore blasted, as the result of two or more holes fired simultaneously is greater than the separate explosion of each hole by the use of ordinary tape fuse. As in the union of the labor of individuals there is greater strength than in the separate efforts of the same number of persons, so it is in the electric system of blasting two or more holes at the same time, more ore is mined with economy in the amount of explosive energy employed. The increased and greater power of electric batteries from what they were twenty years ago, places these safeguards to life within the reach of every miner and increases his daily output of ore.

MINERAL OWNERSHIP.

When our neighboring States are comparing their mineral production with that of California, the fact is not noticed that a large portion of the mineral territory of this State has been patented into the form of Spanish Land Grants, Railway Land Grants, and mineral lands patented as Homesteads and Pre-eminents. The large surface area of California is often remunerated upon, but the mineral territory at present closed to the public for mining is lost to memory and sight. This wrong condition of mineral ownership is against the best interests of the State in retaining mineral production, and is charged to some extent to restric-

THE PARIS EXPOSITION.

Southern California is rich in minerals, the development of which has scarcely yet commenced, though gold was discovered in this section several years before Marshall reported his find at Coloma, on Sutter Creek, in the northern part of the state, which set half the world crazy. Among the minerals of Southern California, in addition to gold and silver, are petroleum, iron, borax, copper, rock salt, gypsum, limestone, granite, marble, sandstone, and numerous other, all which should make California an important as well as valuable collection to be placed in the Paris Exposition.

It is the earnest desire of every mining man who has the interest of the southern country at heart that a better showing be made at the coming Parisian event, in 1900, than was made at the Omaha exposition, where only one consignment of samples was sent from the City of Los Angeles, and only a few from the whole of Southern California.

It is therefore timely that the press should begin the agitation of this subject that efforts be made to secure adequate legislation, municipal and private, for a proper collection of an exhibit which will be worthy of the west, especially Southern California, and its greatest and most important industry. It is necessary should to collect ores, to properly classify them and determine their value. These things cannot well be done in a hurry.

It will be well to impress on the minds of those interested that from past experience it has been shown that to depend on the miners to send samples in, or leave it to any one and expect them to devote their time to gathering samples and arrange them without compensation would prove a dismali failure.

The business men of Los Angeles would
gladly give small sums for the purpose of employing the most efficient means of getting into the different camps to make a collection of the minerals necessary for a representative display, and at the same time samples could be secured to the permanent cabinet in the Chamber of Commerce. In fact, a duplica-
tion of the one sent to Europe.

Only seventeen months remain before the opening of the great exposition, and, if Southern California cannot accomplish as much as has been done in Europe, it is not due to lack of time or active steps. The railroad, the steamboat, and the combined effort of the mining districts are bringing the rest of the world to the exhibition.

Colorado is already taking steps to have an exhibit at the Omaha sent to the French Exposition, but they do not intend that it shall be all that is to go, they propose to lead in the procession if possible.

As Southern California has no exhibit at Omaha to send, it will be necessary, if we do not want to be at the tail end, to get together as extensive a collection of ores as time will permit.

Colorado claims—"It is able to make an exhibit in a mining way which no other state or region can approach. Also, that it is not only able to make a display of minerals of thousands of varieties and great value, attractive to the eye, but it can show financial results that are not only much larger than in other states, but that the mining investor and operator in this state (Colorado) and which have made him wealthy."

California's mineral exhibit at the World's Fair in Chicago in 1893, elegant as it was, did not do her justice. In many respects it was successful, but it is far more important that our showing at the exposition in France should be, to truly representative, be larger and more numerous and one of 1893, for we are going to be brought under the criticis-m of people who have the capital to aid in the development of our mineral resources.

THE RATIOS.

The ratio in coinage of the precious metals has been a subject of discussion for several years in this country, and a conclusion as to what it should be has by no means been definitively ratio and is satisfied. This subject has a history which will be entertaining to the curious, and of value in bringing about a final and lasting result. The ratio has never been based upon the value of gold or silver. The price of silver remained being quoted in gold, the phenomenon appears as a fall in silver. "This fall in its causes, consequences, and remedies constitute the silver question." It should be added, however, that the fixed and unalterable value of gold, which unlimited coinage tends to produce, is further strengthened by parliamentary law, which compels the Bank of England to purchase all gold offered at a price equal to its coinage value.

There seem to be no reliable statistics showing what proportion of the gold produced is consumed in the arts, and for the reasons that it is too difficult to sell the coins when most convenient for that purpose. On the other hand, statistics on this point are more complete and reliable in regard to silver. It is known that of the silver consumed in the western hemisphere since America was discovered, a little more than three-fourths have been consumed in the arts, and a little less than one-fourth in coinage. The production since that time has been about 15,000,000 tons.

Gold is found in nearly all silver ores, and it is asserted that of the $340,000,000 yielded by the Comstock lode, nearly one-half in value was gold.

STRONIUM AND ITS USES.

Interest has lately been awakened in this matter on account of several newspapers articles describing discoveries both in California and at Put-in-Bay, in Lake Erie, Ohio. At the latter place a most beautiful cave has been opened, lined with crystals of celestite of all sizes, making a natural curiosity well worth a visit. The word very similar to lime in its properties, deriving its name from Strontian, a mining village in Argyleshire, Scotland, where it was first found. It is usually found as Celestine, Strontium Sulphate, or Strontianite, Strontium Carbonate.

At Put-in-Bay there is an area of about twenty acres square that is apparently underlaid with a workable deposit of celestite. This form has not much use at present, but a process has been perfected to convert it cheaply into carbonate. This carbonate as a manufacture of fire-works, as its chloride and nitrate make the red fires. The use of the other salts made from this mineral is, however, increasing, and promises in the near future to be greatly extended, providing a large output can be delivered cheaply. Strontium Hydrate is used by beet sugar refiners to remove the last of the sugar from the molasses. At present time is used but this is not as good as it cannot be used in a hot solution. Barium carbonate can also be used, but as it is poisonous, and a small amount remains with the sugar, causing, it is said, Bright's Disease, there should be a prohibitive law against its use. The sugar refiners of the coast do not use Strontium, as the price at which they can obtain it is too high. How- ever, it is used over and over again at a small loss having to be replaced occasionally.

Strontium chloride is now being used by the zinc etchers in their photo etching processes in preparing collodion for their negatives.

In 1853, Dr. Alex. Griggs of Rhode Island writes: "If we have in the strontium salts remedies that can be used in full doses and for a long time without the unfortunate effects which sometimes follow the potash salts, it behooves us to give our patients the benefit of the fact. Bromide, Iodide and Lactate are the drugs used. The Bromide is used as in Bromide of Potash, but it does not produce the same disturbance or depressing influence. The Iodide of strontia can be pushed far in excess of the potash salt. The Lactate is used mainly in Parachymatous Nephritis." However, it is important that the drug should be perfectly pure as much of the commercial drug is adulterated with Barium salts.

The following salts of strontia find a market:

- Strontium Chloride
- Strontium Oxide
- Carbonate
- Peroxide
- Oxalate
- Bromide
- Nitrate
- Iodide
- Sulphate
- Hydrate

These salts vary in price from 8c. to several dollars per lb., depending on the cost of preparation. In this country the celestite as it is mined sells in bulk for $10 a ton, or $30 a ton for small lots. The celestite, however, is much cheaper in England.

As a paint adulterant it has a brilliant white color and has a weight about the same as Barytes, but at present it is too rare to be supplied by Barytes ground. The price of nine to fourteen dollars per ton. Ground or precipitated it makes an excellent material for weighting papers, etc., as its specific gravity is so much greater (2.97 against 3.06) than Barium Sulphate.

With the increase of the beet sugar industry the demand for the carbonate is likely to increase. It can be made cheaply as a by-product in the manufacture of caustic soda or potash, or the hydrate can be prepared directly from the celestite.

In California, the carbonate is said to be found with the celestite, but at Put-in-Bay none has been found so far.
CRUSHING ROLLS.

The accompanying cuts present the end and side view of a form of crushing rolls, for use in concentrating and cyanide plants, as built from designs and patterns of the Joshua Hendy Machine Works of San Francisco.

The rolls are driven by a pulley fitted to each roll shaft, which method permits of great speed and crushing capacity. The adjustable roll is mounted on a swinging arm pivoted at the bottom; its top being held in place by a heavy tension rod on each side, fitted with heavy steel spiral springs and adjusting nuts. The journal boxes are of the ball and socket form, which prevents any unequal strain upon the bearings—an important feature in their design and construction. Each roll shaft carries a taper center, upon which are secured the shells made of chilled cast iron or cast or forged steel. The feed hoppers are lined with white iron plates which can easily be replaced at a small cost.

The capacities of crushing rolls depend upon their speed, speeds, character of the ore and fineness to which it is to be crushed.

Ordinarily one set of rolls is all that is required, but when fine crushing is necessary, two sets are generally used.

These rolls are built of the sizes and approximate capacities as set forth below:

<table>
<thead>
<tr>
<th>Size of roll</th>
<th>Size main driving pulley</th>
<th>Size of small driving pulley</th>
<th>Weight</th>
<th>Capacity in tons per hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 x 14</td>
<td>14 x 14 inches</td>
<td>14 x 14 inches</td>
<td>90</td>
<td>4.56</td>
</tr>
<tr>
<td>16 x 17</td>
<td>14 x 14 inches</td>
<td>14 x 14 inches</td>
<td>120</td>
<td>6.80</td>
</tr>
<tr>
<td>16 x 20</td>
<td>14 x 14 inches</td>
<td>14 x 14 inches</td>
<td>140</td>
<td>7.96</td>
</tr>
<tr>
<td>16 x 24</td>
<td>14 x 14 inches</td>
<td>14 x 14 inches</td>
<td>160</td>
<td>9.63</td>
</tr>
</tbody>
</table>

A RIVAL OF ACETYLENE GAS.

If report be true, acetylene gas will shortly have a rival in carbonite, for the production of which blast furnace slag is stated to be especially suitable. Preparations are being made at Hammond, Indiana, near South Chicago for utilizing slag for this purpose.

The inventor of the process of manufacture is Mr. Herman L. Hartenstein, a Chicago chemist, who has taken out a patent for utilizing the waste products of blast furnaces in the manufacture of carbonite, from which ethylene gas is produced, defined as an improvement on acetylene, but having the same characteristics. Carbonite is a combination of the carbides of calcium, aluminum and silicon, and for its production blast furnace slag is especially suitable.

The method of production is described as follows: The slag is placed almost as fluid as water, and by means of ladles operated by hydraulic power, it is passed into converters similar to those used for the manufacture of Bessemer steel. The tuyeres are so arranged that finely powdered coke may be fed through them. Before the slag is poured into the converter a strong gas blast is forced through the pipes to keep the molten mass from running into and filling them up.

As soon, however, as the slag is poured into the converter the pulverized coke is fed into the molten mass. This continues until the slag is thoroughly impregnated with the coke. When the mixture is complete the converter is turned on its shaft so as to allow the mass to flow between a series of carbon bars or electrodes which serve to introduce a powerful electric current. Coke is an excellent conductor of electricity, while slag is a re-sistant. The result is that the particles of slag in connection with the particles of coke form innumerable electric arcs, producing a most intense heat within the mixture. In the course of about twenty minutes the mass becomes so superheated that the slag is fused or carbureted with the coke.

When this fusion is effected the material is finished. It is then poured into moulds. When cool it is of crystalline form, has a metallic glint, and is nearly twice the weight of coal. The finished product is carbonite, which can be kept indefinitely and transported without difficulty. Protected by well-jacketed tin cans from water and air moisture, it can be kept as a common article of merchandise, and supplied to the consumer with much less difficulty than illuminating oil. Each pound of carbonite will produce five feet of gas, each cubic foot of gas is equal in illuminating power to fifteen feet of ordinary coal or water gas.

The unused Bessemer plant at Hammond has been secured for the manufacture of carbonite, and is now being fitted up with necessary electrical appliances. If the claims of the inventor are substantiated, he will turn out a product which will make a better gas than acetylene for isolated lighting, at a much lower cost. If the slag can thus be made valuable the cost of producing iron may be considerably diminished.

Electrolytic Deposition of Silver.

Instructions for the electrolytic determination of silver are to be found in many textbooks, but notwithstanding that such directions are carefully followed, the results obtained by the authors, after many trials, are always uncertain and usually unsatisfactory. The only method which is given is keeping upon the maintenance of a certain current density, instead of a constant electro-motive force. In order that the metal may be precipitated in a weighable form, it is essential that the electro-motive force should not exceed a certain value; but as electrolysis proceeds the concentration of the silver in the solution decreases and the resistance of the cell increases. If, therefore, the current be kept constant, the electro-motive force in the cell must increase, and may soon exceed the limiting value. Upwards of 100 experiments were made with a view to finding the most suitable experimental conditions. It was found that the perfect precipitation was obtained when the solution (volume about 150 cubic centimeters), containing about 0.5 gram of silver, is mixed with one or two cubic centimeters of nitric acid, specific gravity 1.4, and five cubic centimeters of alcohol, the electro-motive force being kept constant at 1.350 to 1.385 volts for from six to eight hours. Excellent results are obtained by this method, the maximum deviation from the mean of six analyses of an ordinary coin amounting only to 1 in 5,000, which, when considered, is an excellent result.

Cyanide Poisoning.

There have been several cases reported lately of cyanide poisoning. Practical experience has shown that peroxide of hydrogen may be considered a powerful antidote for cyanide poisoning. It has recently been applied successfully in 2 to 3 per cent. solution, as subcutaneous injection, which were performed every four minutes at different parts of the body. At the same time the stomach was washed out with a 2 per cent. solution. Peroxide of hydrogen forms a compound with hydrocyanic acid, which is a harmless compound.

The Alaska-Mexican Milling Company, Douglass Island, worked 13,527 tons of ore in July, which yielded $2.38 a ton, and the Alaska-Treadwell 21,000 tons, which averaged $3.18 a ton on the plates, and these mines are dividend payers too!
SOUTHEAST KANSAS LEAD AND ZINC INTERESTS.

Willard N. Richart has an article in the *Age of Steel*, of St. Louis, descriptive of the Missouri-Kansas lead and zinc production, from which we take the following:

The upward tendency in prices of both lead and zinc ores is causing a wonderful activity all over the entire Missouri-Kansas district, and the old abandoned mines, which for years have been as dead as Czar's ghost, figuratively speaking, are receiving the attention of the miner whose search for the ores which abound in this district is very perceptually stimulated by healthy prices being paid for the ores.

The turn-in for the week ending September 17th was smaller than that of the previous week by 577,700 pounds of zinc ore and 137,710 pounds of lead ore, and the consequent decline in the value of the district output was $21,595. During the corresponding week last year top grade jack bought $82.50 per ton and lead opened at $54.75 and advanced by bounds and closed at $70.50.

The turn-in of zinc was less last year than for the week just closed by 506,610 pounds but the lead turn-in was greater by 288,240 pounds, the value being less by $24,600. For corresponding thirty-six weeks of last year the zinc turn-in was less than for the same period this year by 63,567,720 pounds, but the lead turn-in was greater last year by 1,145,490 pounds, this being due to the fact that about 1,500,000 pounds of lead is being held for $25 per thousand. The value of the turn-in was less by $1,489.849. The following is the turn-in from the Galena Empire district:

### THE CHEKEROKEE-LANYON ZINC SHELTERS, PITTSBURG

<table>
<thead>
<tr>
<th>Company</th>
<th>Zinc</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheshire &amp; Co.</td>
<td>5,060</td>
<td></td>
</tr>
<tr>
<td>Oakes &amp; Co.</td>
<td>12,310</td>
<td>1,180</td>
</tr>
<tr>
<td>Horning No. 2</td>
<td>1,420</td>
<td>200</td>
</tr>
<tr>
<td>Uncle Sam Mining Co.</td>
<td>6,210</td>
<td>920</td>
</tr>
<tr>
<td>Sawyer &amp; Co.</td>
<td>26,470</td>
<td>490</td>
</tr>
<tr>
<td>Cock Robin Mining Co.</td>
<td>3,030</td>
<td>730</td>
</tr>
<tr>
<td>Gray Eagle Mining Co.</td>
<td></td>
<td>430</td>
</tr>
<tr>
<td>Lot 66 Mining Co.</td>
<td>130,920</td>
<td>5,820</td>
</tr>
<tr>
<td>Horning No. 1</td>
<td>9,190</td>
<td>650</td>
</tr>
<tr>
<td>Bob Roy.</td>
<td>10,240</td>
<td></td>
</tr>
<tr>
<td>Union Mining Co.</td>
<td>56,910</td>
<td>4,070</td>
</tr>
<tr>
<td>Pittsburg Mining Co.</td>
<td>1,000</td>
<td>410</td>
</tr>
<tr>
<td>&quot;4th of July&quot;</td>
<td>7,890</td>
<td></td>
</tr>
<tr>
<td>O'Neil &amp; Atwood</td>
<td>2,540</td>
<td></td>
</tr>
</tbody>
</table>

**Total** ............... 308,580 17,480

Value, $7,918

The operators of the Henry C. Mining Co.'s lease are at work this week. Their turn-in for the week ending September 5 was as follows:

### GALENA CRUSHING PLANTS.

The Star Mining Company on the Galena Lead and Zinc Company's land, started up their new steam concentrating plant last week. The plant is equipped with an 8 1/2 horse power boiler, a 45 house power engine, 12 inch crusher, two sets of rolls and a set of cut rolls, five cell roughers and six cell cleaners. They are drilling at 65 feet on a large face of disseminated ore and are hoisting from two shafts. Mr. Hugh McIndoe is the manager of the company. The Maggie Murphy plant, on the Shellbina lease, is running steadily and makes a big output of both lead and jack each week. This

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**Scene in Lead and Zinc Mining District, Galena.**
mine has been one of the steadiest producers in the district. Luck & Co. have almost completed their new concentrating plant on the Shelbina lease and expect to start up Monday. Miller & Emmons have bought the Troy cruiser on the McCann lease, and are overhauling and repairing it. They will buy crush ore and sludge.

The Eureka plant is being moved from the Bloomington ground to the Battlefield. The Oklahoma City Consolidated Company plant on the Battlefield are running in good shape. J. R. Holmes' plant on his lease is running steadily and is making a good output of ore ever since.

The Eugenia plant on the Midwest lease is running steadily on rich dirt and producing about 40 tons of jack weekly. They are working new ground.

The May Bell, Buck Horn, Monte Cristo Topeka and Luck & Co. plants are all working this week and will make large sales of ore. Most all the operators are at work this week and the shipment of ore from Galena will be considerably larger than the previous week.

ANOTHER KANSAS ZINC FIND.

A number of gentlemen, led by Col. Borgen, drove out to the Fairman farm, east of Port Scott, Bourbon county, last week, to inspect the zinc indications that have been attracting considerable attention lately. Col. Borgen is a veritable pathfinder, and another in hand led the boys a merry chase in search of the shining rocks. There is no question but that there is "jack" to be found in that section, and the fact that it can be found on the surface at numerous places would indicate that it might be found in large quantities if proper prospecting was done.

The parties inspected three places where ore is to be found. At the M. K. & T. railroad bridge on Mr. Fairman’s place large chunks are said to be having blown out by the graders in sinking the pit for the abutments for the bridge. Another place where it can be found is on the river bank where the high water has washed out large amounts of it. Near the river bank is an old abandoned coal shaft that was sunk more than twenty years ago. In the earth and rocks thrown out can yet be found abundant quantities of lead, and the old settlers remember that a peculiar rock containing some mineral was being taken out at the time the shaft was abandoned. In the bottom of a ravine leading to the river, about on the level with the bottom of the abandoned shaft, evidences are also seen of the same rock.

No prospecting has yet been done, but leases have been obtained and the matter will be thoroughly tested, and if the ore is found in quantity and quality suggested by the cropping it will be a rich find for Ft. Scott.

Increasing Use of Fluor Spar in Metallurgical Work.

Some time ago Dr. Focler, a noted German chemist and metallurgist, called attention in an article in the Chemical Zeitschrift to the growing tendency to return to the use of fluor spar as a flux in metallurgical operations. He stated that until the beginning of this century fluor spar was considered indispensible, but was replaced to a large extent by limestone, on account of its being apparently much cheaper. The two fluxes, however, are so different in their action, even when accomplishing somewhat similar results, that no comparison is just when based merely on the relative price per ton.

In the United States fluor spar has probably never been used to the same extent as in England and on the continent, and for this two reasons may be assigned: the lack of information as to its value and the proper manner of using it to obtain good results, and the uncertainty of the supply. This latter cause no longer exists, as extensive and more work on parts of limestone. The fluor spar reduces the quantity of fuel required, forming but two parts of slag where limestone is used, and it if probable that it forms fluorsilicate, whereby heat is likely to be liberated. When it is blown into the tuyeres it forms an energetic solvent. In the manufacture of ferro-silicon, an iron coating 10 percent Si may be obtained in an ordinary blast furnace from silicious ores if fluxed with fluor spar and the slag is strongly basic. The fluor spar first reduces the silicon energetically, forming fluorsilicon, and this is then reduced to silicon by the hydrogen of the furnace gases and possibly also by the coke. A peculiarity of fluor spar is its property of reducing the most different bodies, it being also advantageous in the manufacture of spiegelisen, using a manganese combination and fluor spar. In this case a very basic slag, rich in fluorides, is desirable. In basic open-hearth steel plants in the United States the use of fluor spar is steadily growing, its main function being to render more fluid the slag, not only on the hearth, but in the ladle and mold as well. In the Kuepp and Rollet methods of phosphorizing pig in basic-lined cupola, fluor spar is used to carry phosphorus into the slag.

In foundry work the value of fluor spar as a fluxing agent seems to have been discovered first by the manufacturers of chilled car wheels. Unlike chill rolls, car wheels are cast from iron melted in a cupola. While limestone is used in cupola work, its function is merely to slag off the ashes of the fuel. It has no important chemical action on the iron excepting the unfortunate one of tending to slag the silicon. Fluor spar, while accomplishing all that limestone does in fluxing off the ashes with a smaller quantity, has an important effect on iron, keeping it gray and soft by holding the silicon in an alloy, while it tends to carry some phosphorus and sulfur into the slag. In such work as the manufacture of car wheels, where a low silicon iron is necessary, the advantages of fluor spar have been first appreciated, but in other work its use may be very advantageous, permitting the use of a greater amount of scrap with a correspondingly lower melting ratio, and permitting also the use of lower grades of iron for melting. It is a curious fact, however, that the favorable effects of fluor spar do not increase in proportion to the quantity used is incorrect. The best results seem to be obtained when about one-third of one percent is employed, while beyond one-half per cent the results are distinctly inferior for certain steels, the explanation for which is that the larger quantity of fluor spar tends to hold manganese contained in the iron from slagging. In other classes of work much larger quantities of fluor spar may be advantageously employed to reduce the quantity of slag and make the iron more fluid. In

SCENE IN LEAD AND ZINC MINING DISTRICT, EMPIRE CITY.
English foundries use the flux is much more common than in the United States.

Until recently the only worked deposits of fluorspar in the United States were located in Southern Illinois. The supply was very uncertain at times owing to water in the mines and poor roads. Lately very valuable and extensive beds of almost pure fluorspar have been opened in Kentucky. — Age of Steel.

CORRESPONDENCE

NEVADA

Silver Peak, Nevada, Oct. 18th, 1898.

Editor Journal: In an issue of the Journal (October 1st), an article was printed about Silver Peak Hills which was not altogether truthful. The fact the miner is, Sam Case is working on the Homestake, but no paying rock has been found as yet. There are a couple of Indians at Jagers' place breaking up the waste rock. Jagels himself shows up occasionally.

Archie Valencius has secured a lease from J. Chiatovich on the Bourne mine and is working that property alone, and not with anyone else. He has not struck any ore yet.

Peter Shannon, known as “Pretty Pete,” is in good luck. A few weeks ago he struck a prospect out of which he expects to make a good stake. The ore is full of coarse and fine gold.

Mr. C. H. King of San Francisco is in camp. He came here to see the John Chiatovich property, known as the Mary mine, and Bourne mine, together with a 10-stamp mill and cyanide plant. It is now also his intention of purchasing Mr. Chiatovich’s ranch at Fish Lake, 28 miles from here, which covers over 2,000 acres. It is expected that if the deal is consummated he will put in improved machinery and work the ores on an economical basis and thereby make this camp lively.

I remain for today,

X. L.

Salt Lake City, Oct. 21, 1898.

Editor Journal: The Utah mining stock market this week was satisfactory as to prices and volume of business, which was unusually heavy. The controlling interests of the market are arrayed on the bull side, and such stock is being taken in turn and pushed upwards. I do not look for any immediate reaction, but it is well to take a conservative view of existing conditions. In the end only legitimate values will stand.

Ajax held at last week’s figure. Anchor eased off a little. Bullion-Beck paid its dividend of $10,000 on the 15th. The property continues to ship its usual quota of ore and conditions on the lower levels of the mine are more favorable. The stock was a trifle weaker. Centennial-ureka was a shade higher. For a long time hold, pending the decision in regard to a mill to be built or bought, the stock is a buy around $3. Chloride Point was stronger. The mill is now handling forty tons of ore daily, and the weekly cyanide shipments amount to about $2,000.

Daisy continues to be bought for investment. Four new tanks have been added to the mill and about 150 tons of ore will soon be treated daily. Dalton has not changed much in price. There is no demand for Dal-ton & Lark and developments at the mine do not warrant any particular activity. Daly was in slight demand. There was no change on Duxter. Duxter continued its upward movement to $6.75, and from that point reacted and closed today at $6.65. The talent predicts that the stock will sell at $7.

The company shipped to the smelters this week twelve tons of ore that averaged $100 per ton in gold—$6,000 for the lot. The demand for Eagle and Blue Bell continues. Work will be pushed as soon as the new machinery is in place. The sensational performance of the Grand Central will very likely be repeated in the Eagle and Blue Bell.

Four Aces advanced rapidly on heavy inside buying. The stock sold a week ago at 75 cents and closed today at 30 cents. The cause was the report of a strike of good ore on the 750-foot level. Galena’s assessment is now deluging. I hardly think the new ore developments quite as satisfactory as was first reported. Geyer shows a decided strike of good ore. Experts are now examining the ground to determine the amount of ore extracted from the Geyer claim. Grand Central holds up well. Shipments are regular, and the ore continues at high grade. The price is now maintained at 21 per cent annually upon present selling price. It is thought in some quarters that as soon as the new hoist is placed in position and shipments begin, the price of the mine will be $20,000 monthly instead of $15,250 paid at present.

The report that the Joe Bowers vein was widening out, proved to be an active demand for the stock which doubled in price in three days. An option of five cents per share has been given for the control of the Little Pittsburg. The ground ought to show good values with development work. Mammoth last held at last week’s figures, but the buying has been unusually heavy, and for accounts of those who best understand the conditions at the property. If present values of the new vein hold up, the stock should touch much higher figures, due to increased earnings. Mercur paid its dividend of $25,000 on the 20th. This carries the total to $1,350,000. The stock was not at all so strong as we anticipated, but we hope the price of the mine in a recent interview stated that he believed there were 2,000,000 tons of ore in sight in the Mercur property. Ontario continues in good demand, and Overland is being given an occasional quotation. The showing at the mine is said to be all that could possibly be desired. Ogden was a ready seller above 60 cents.

Sunbeam was rather soft. Silver King held at $30, thus establishing a selling price of $4,500,000 for the entire property. Sacramento was decidedly stronger. The regular dividend of $5,000 will be paid on the 15th and date. Sunbeam eased off from last week’s figures, but the stock is sure to make higher quotations shortly. Swansea was steady and in demand. South Swansea held at last week’s figures. Utah was dealt in limited lots. Valeo was stationary with but a limited amount of stock offered.

Miscellaneous Mining News.

Alaska

A new strike in the Atlin Lake region shows that district to be the equal of the Klondike in perhaps, if the future shall show the news to be supported by facts. There is a vast country around the new diggings, and particular to the north, that has not only not been prospected but has never been explored. Even the Indians knew little or nothing about it; they prefer to remain in the more open country around the lakes and to the eastward.

The ground lays so as to facilitate workings and fair prospects have so far been found on nearly all the creeks. Reports also tell of the finding of some good payable veins in the unprospected region north and east.

There will doubtless be considerable travel in and out of the new diggings all winter owing to their proximity to the coast. They are now only about 100 miles distant.

Arizona.

Superintendent F. J. Martin of Fortuna, who was in Yuma last week, states that the cyanide experiments which have been recently conducted with a view of determining the best methods for the treatment of the immense pile of rich tailings at Fortuna, have demonstrated the superiority of the cyanide method by Mr. Clay Carrard, the company’s assayer, who has conducted the experiments, is thoroughly versed in his profession, and his efforts have produced good results.

California.

Amador County.

The Grover Hill.

The Grover mill at Dayton was burned to the ground October 13th, together with the stamp house. The particular fire has not come to this office, but it is supposed to be of incendiary origin. This is the third mill burned in that neighborhood in a short time—the Bunker Hill of forty stamps, the Cosmopolitan of thirty stamps and now the Grover of twenty stamps. All of these were idle when destroyed.—Amador Ledger.

Calaveras County.

J. Burns is running a tunnel to get under the old workings on what is known as the old Fisher lead. Twenty-five years ago a shaft seventy feet deep was sunk with whim power, but at that depth so much water was encountered that the property was abandoned and has lain idle ever since. Those in position to know say there is an excellent body of ore in the bottom of the shaft and predict success to the owner.

Inyo County.

One million dollars of Pittsburg capital is to be invested in gold mining in Inyo county, California, and Lincoln county, Nevada, gold fields. This was made plain last week when the agreement was made by C. C. McCarthy Mining and Milling Company, made up of Pittsburg business men, had been incorporated under the laws of the state of New Jersey. The president of the new company is C. C. McCarthy, commercial agent of the Missouri Pacific railroad at Pittsburg, while W. W. Hammond, freight agent of the same road, is secretary and treasurer. William Lohmeyer, a well-known Pittsburg business man, is named as vice president.
**THE MINING AND METALLURGICAL JOURNAL.**

**KERN COUNTY.**

The new concentrator mill for the Hard Cash, arrived at Randsburg, Oct. 13. The foundation is all ready and they began hauling out lumber last week.

**MONO COUNTY.**

The Standard Consolidated Mining Company's 20-stamp mill at Bodie, Calif., was totally destroyed by fire the last of September. The fire started in the boiler room. The adjoining offices and the cyanide plant were saved. The estimated loss is $50,000; partially insured.

**SAN BERNARDINO COUNTY.**

A San Bernardino paper says Monroe Stewart and Z. B. Stuart have returned to San Bernardino from their trip to Eagle Mountain, where the parties who have the bond on the Iron Chief are at work. Stewart is one of the owners of that valuable property and, after inspecting the progress of the work, says he would not be sorry if the bond was not fulfilled, and he could again claim his share in the mine, which is proving very rich. He also brought in with him a specimen of marble, which was taken to Stone Bros., to be polished and they pronounced it a magnificent bit of rock.

**SAN DIEGO COUNTY.**

E. F. Bowles, who was for many years engaged in the newspaper business at San Diego, has organized the Royal Group Gold Mining Company with a capital stock of $1,000,000 to work his group of claims at San's, on the desert, eighteen miles northeast of Salton.

According to the deeds filed in the County Recorder's office at San Diego, the Pacific Bank of San Francisco, which owned a half interest in the Helvetia mine at Julian, has sold its share to C. H. Dunsmoor, who was formerly State Bank Commissioner, for $10,000, and Mr. Dunsmoor has transferred the property to Edward W. Schen, for $1,000. Mr. Schen is one of the three Denver capitalists who have entered into a contract with the mine's owners to give it a six months' trial, and since the mine prove satisfactory at the end of that time they will purchase the same. The other half interest in the mine is owned by nineteen parties, who are represented by W. H. Holcomb and H. S. Utley.

**SIKSIYOU COUNTY.**

The copper mine in the Cottonwood district of Siskiyou county, on which considerable development is being done under the supervision of John Davenport, is reported as showing up continually improving prospects.

**TOLUCA MINE.**

At the world-famous Rawhide mine the main shaft has reached a depth of 1,500 feet, at which point miners are now engaged in cutting out a station, after which drifting will be prosecuted both ways on the vein. The vein is large, as usual, holding steadily from 30 to 40 feet wide. The ore is of the best class from top to bottom. The 40 stamps of the mill are hung up but will soon be set dropping. Everything is in readiness to receive power from the new electric plant.

**COLORADO.**

**Dividends.**

Dividends distributed by Cripple Creek companies last month amounted to $168,000, and it was not a particularly heavy month in this connection. This was due to the fact that several of the companies are now making quarterly instead of monthly distributions, and none happened to fall during September. The list is made up as follows:

- Portland: $60,000
- Eliton: $20,000
- Strong: $20,000
- Anchoria: $10,000
- Golden Cycle: $15,000
- Lillie: $9,000
- Gold Coin: $10,000
- Eldora: $1,000
- Modoc: $10,000
- Associated: $12,000

Total: $168,000

This makes the total for the year thus far, $1,185,527, or an average of about $99,902.77 for the nine months which are past. Next month it is expected that there will be a considerable increase, as the Vindicator alone will help it out to the amount of $50,000, and others besides, the list contained above will probably be forthcoming.

Estimates of September production show this to be the banner month in the history of the Cripple Creek district, the total reaching the sum of $1,411,520. This is the largest production for any month since the discovery of the camp. The following are the figures on which this estimate is based:

- Metallic Extraction Company, 4,100 tons; average ton, $20; total value, $82,000.
- El Paso Reduction Works, 4,100 tons; average ton, $20, total value, $82,000.
- Gillett Reduction Company, 8,100 tons; average ton, $20; total value, $162,000.
- Colorado Ore Reduction Company, 2,950 tons; average ton, $25; total, $73,750.
- Colorado-Philadelphia, 7,000 tons; average ton, $30, total, $210,000.
- Brolid, 1,420 tons; value, $28, total, $31,560.
- Total for mills, 25,590 tons; average value, 66.66; grand total, $706,520.

To smelters were shipped 10,500 tons; average value, $70; total, $735,000.

Grand total, 37,590 tons; total value, $1,440,520.—Colorado Springs Mining Inulator.

**IDAHO.**

Mining men and residents of the Coeur d'Alenes are keenly interested in the suit which has just been started at Boise City by the Bunker Hill & Sullivan Mining Company against the Last Chance company and the Empire State-Idaho Mining & Development company. The latter is the company organized by F. Lewis Clark and Charles Sweeney to take over the property of the Last Chance company and the Empire State-Idaho Mining company. The plaintiff company owns the Stemwinder claim, and is asserting that it holds, through this claim, the apex of the great ore body of the delcine. The defendant company is John E. Condon & Company. The Bunker Hill owners are asking for an injunction. A delegation of Spokane mining men and attorneys has gone to Southern Idaho to take part in the case.

**MICHIGAN.**

Raising Pay.

The Menominee range papers state that there will be a raise in pay of ten cents per day at the Aragon mine, Norway. This is of considerable help to the employees. Even ten cents is big help, meaning about $5 per year. It aids in the purchasing of clothes and food. We hope to see the price of iron ore increased so there can be a substantial increase in all the mines of the several Lake Superior ranges in the near future.—Iron Ore.

The Crystal Falls.

The Crystal Falls mine passed the 100,000-ton mark in this year's output during the week, and there is left two months of shipping season ahead of the operators yet. Had there been plenty of labor this mark would have been passed several weeks ago, but operations have been hampered to some extent by the mine on account of the scarcity of miners. In fact, there are very few trains running now and the labor and employment could be given to many more men. There will be a great amount of development work done at the Corrigan, McKinley properties this winter and miners of the town need hardly be in a hurry to be in this winter, as Corrigan, McKinley & Co. alone intend employing 600 men.

**MISSOURI.**

Capitalists of Pittsburg and Washington, Pa., have purchased for $100,000 the Tea tract of land of 120 acres, southeast of Prospect, covered a distance of 200 feet and the lessors and employment could be given to many more men. There will be a great amount of development work done at the Corrigan, McKinley properties this winter and miners of the town need hardly be in a hurry to be in this winter, as Corrigan, McKinley & Co. alone intend employing 600 men.

**MONTANA.**

It is rumored that J. P. Hardy, Wm. Deadmoud and H. H. Meanor have struck it rich on the Cannon property, at Winston, Jefferson county, on which they have been working a lease for two years and a bond for $25,000, says the Helga Independent. The lessors left the old tunnel, where the property had formerly been worked, and began prospecting on the hill a short distance above. Shortly they penetrated beneath the surface when they encountered a two-foot vein of galena ore of great richness. The vein has been uncovered a distance of 200 feet and the lessors are confident that they have one of the best things in the country. It will be remembered that the credit for the recent strike at the Little Bonanza was due to the well planned development work of the same men.

Henry Albertson has returned from Butte to Top o' Deep, a quartz and placer mining district located about 20 miles from Drummond, where he went a few weeks ago to make an inspection of some placer ground in which he holds an interesting interest. Owing to the high altitude of that section the weather has been cold and the wash ing out gold has consequently been interfered with. It was the intention to have made a clean-up several days ago, but ice formed so...
NEVADA.

Work in the Diamond mine, near Eureka, Nev., has been suspended and the mine closed down, throwing about 60 men out of employment.

Cherry Creek Ore Strike.

Fulfilling its pledges, the management of the Star mine, at Cherry Creek, Nevada, have marketed with Salt Lake smelters ore containing as much as 3000 ounces of silver per ton. In early days the production of ore of this class was not an unusual thing, and, while it does not appear in such abundance as in years ago, the high grade chute is now by now and then recovered on the lower levels. Manager Stalman says in its palmy days the Star was productive of dividends aggregating many millions of dollars, and that it will be restored to the column of dividend payers.

A mill will be erected at a point six miles north of the mine and will have a daily capacity of 150 tons.

Experiments that are now going on in Salt Lake City, under the direction of Professor Orr, the cyanide expert, will determine just what process is to be employed in the reduction of the ores at Cherry Creek, and results are expected in the next few days that should enable the company to act. The samples on which experiments are being made show a fine general average in gold, in addition to some silver, and the proposition promises to become as lucrative as any of the number the big company has in hand.

NEW MEXICO.

Output Hillsboro Mines.

Output of Hillsboro gold mines for the week ending Thursday, Oct. 13th, 1898, as reported for The Advocate:

<table>
<thead>
<tr>
<th>Mine</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wicks</td>
<td>25</td>
</tr>
<tr>
<td>K. K.</td>
<td>20</td>
</tr>
<tr>
<td>Richmond</td>
<td>5</td>
</tr>
<tr>
<td>Snake Group</td>
<td>15</td>
</tr>
<tr>
<td>Opportunity</td>
<td>5</td>
</tr>
<tr>
<td>Sherman</td>
<td>5</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>20</td>
</tr>
<tr>
<td>Trippe</td>
<td>75</td>
</tr>
<tr>
<td>Reo (silver-lead)</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>280</strong></td>
</tr>
</tbody>
</table>

Total output since January 1, 1898—6,870.

OREGON.

The Isabel Mining Co. Incorporated.

The Isabel Mining Company was duly incorporated under the laws of Oregon, on Oct. 7, 1898. The incorporators are Chas. Cook, of Glendale; P. S. Anton and Lincoln S. Heafield of Chicago; and Rufus Mallory and Mr. Mallory, jr., of Portland. Capital stock $30,000 in 300 shares of $100 each, fully paid up. The claims of the company are located at Tunnel 6, at Glendale, near the Victory Mine. The company will order at once a stamp mill with shafting and power for 60 stamps, also concentrators and a chloride plant. They have very rich and promising mines, embracing a group of 14 claims in the same mineral belt as the Gold Bug and other properties recently purchased by Senator Jones & Co., of Nevada.—Oregon Mining News.

SOUTHERN MINE.

Another very rich strike of ore has been made in Pennington county, one of the richest and largest ever made in the southern Hills has just been discovered in the Sunny side mine of the New Zealand Mining Co., a direct rival of the Holy Terror of Keystone. The shoot of about fifteen feet wide and it is uniformly distributed with free gold. We are informed by indisputable authority that the ore in the shoot carries a value of $50 to $100 a ton free gold, and that the general average is about $75. If this be true, it is one of the richest things the Black Hills have ever seen. The shoot is now near the surface and has the appearance of being a true fissure, which are the most necessary things for a permanent mine. It is unquestionably the most important result of development work on the Sunny side of Southern Hills. The fact has been demonstrated again that the verticals of free-milling ore hold their values with depth.—Black Hills Mining Review.

TEXAS.

Blackwater Mine District.

Prof. Arthur A. Stiles, civil engineer and member of the United States Geological Department, who has been in Austin, Texas, several days with teams and camping outfit, left Oct. 14th for the Llano Mineral district. The recent discoveries of gold and silver bearing quartz in that section, and the prevalence of the precious metals with the base ores, has induced the government to order a thorough geologic and geological survey of the whole district. The preliminary lines have been established by Prof. Robert T. Hill and Prof. Wills will devote their whole attention to the work until it is completed. These gentlemen have been in the employ of the geological department of the United States government for many years and have made surveys and maps of nearly all the mineral and coal-bearing regions from the Atlantic to the Pacific oceans.

In past years the state undertook this work, but owing to meagre appropriations, very little was accomplished, except the establishment of the fact that almost all kinds of minerals in more or less extent exist there. Pack Saddle Mountain, between the Llano and Sandy River, will be one of the starting points in making the survey. Prof. Stiles is a graduate of the University of Texas and is thoroughly equipped for the important work.

UTAH.

Bullion Beck Co. of Rureka paid its regular dividend of $10,000 on the 15th of October. A number of Boston, Mass., stockholders of the Chalk Dust Point Gold and Silver Mining Co. of Mercur were in Salt Lake City last week having made an examination of that company's property.

The management of the Eagle and Blue Bell mines of Rureka is engaged in putting the workings in shape for energetic operations, and a new air compressor with power drills will be placed in the mine to facilitate rapid work.

Water has been encountered in the lower levels of the Four Aces silver and lead mine of Silver City. The silver-lead property at Fish Springs of the Galena Co. has recently opened up a body of high-grade ore, and the manager, who has been there for the last few days, will soon send in his report, and the public will then know the character of the ore. The Grand Central ore of the Ore Co., with properties at Mammoth, has paid its regular dividend of $15,000 on the 10th of October. The mine is looking well.

The report of encountering ore on the 600-foot level of the Mammoth mine, at Mammoth, Utah, and at a point which would indicate a continuation of the famous Betsy mine, to which in former years was productive of such phenomenally high-grade ore, caused the stock of the Mammoth to seek the ascendant, and at a rapid rate. No official confirmation of the strike has been made.

Mercur declared its regular dividend of $15,000 on the 60th of October, and stockholders of record on that date received the dividend on the 20th of October. The work of placing the new tanks in position at the mill in Mercut, Utah, is progressing rapidly.

Parties have been endeavoring to get hold of the stock of the Sunshine Gold Co. of Sun- shine, Utah, for a few months back and have secured all the floating stock. Should the deal now under consideration be consummated, work will be resumed at the properties, and great results may be expected.

WASHINGTON.

Republic Camp.

The Republic is shipping ore as usual, the mill being fully supplied, as well as all the freight wagons available. The output for September afforded ample means for the October dividend. Machinery for the mill is en route from the railroad. It will be put in place as fast as it arrives.

The shaft on the Bryan and Sewell is down 126 feet. The quarry has passed out to the west, but will be brought back in the drift, which will be started from the 150-foot level. The cross-cut on the Knob Hill is in 50 feet. The rock is growing softer, some water is making its appearance. It is believed the ledge will soon be cut.

A new contract on the tunnel on the Gold- en Harvest has been let and work is progressing favorably, with the ledge making a good showing.

Some dead work is being done on the Black- tail. There is nothing new to report.—Spokane Miner and Electrician.

FOREIGN MINING NEWS

BRITISH COLUMBIA.

September Ore.

The Kootenian of Kaslo publishes the following regarding the ore shipments for September:

"September was not a record shipping month with the mines of the Slocan, though the record is by no means a bad one. A number of ore shipping stocks engaged in development which accounts for the month not coming up to former months. Throughout the country there is great activity and the mines are described as never looking better.

The
continued firm price of lead and silver is having a marked effect.

During the month the following mines shipped via Kosal:

<table>
<thead>
<tr>
<th>Mine</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruth</td>
<td>720,000</td>
</tr>
<tr>
<td>Payne</td>
<td>700,000</td>
</tr>
<tr>
<td>Last Chance</td>
<td>320,000</td>
</tr>
<tr>
<td>Slocan Star</td>
<td>360,000</td>
</tr>
<tr>
<td>Rambler Caribou</td>
<td>50,000</td>
</tr>
<tr>
<td>Antoine</td>
<td>60,000</td>
</tr>
<tr>
<td>Whitewater</td>
<td>40,000</td>
</tr>
<tr>
<td>Treasure Vault</td>
<td>40,000</td>
</tr>
<tr>
<td>Bismarck</td>
<td>39,250</td>
</tr>
<tr>
<td>Miller Creek</td>
<td>30,000</td>
</tr>
<tr>
<td>Wonderful Bird</td>
<td>12,800</td>
</tr>
<tr>
<td>Montezuma</td>
<td>12,000</td>
</tr>
</tbody>
</table>

Total pounds: 2,424,050

This ore was divided among the different smelters and purchasers as follows:

<table>
<thead>
<tr>
<th>Mine</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pueblo</td>
<td>1,930,000</td>
</tr>
<tr>
<td>Everett</td>
<td>510,000</td>
</tr>
<tr>
<td>Kosal</td>
<td>134,050</td>
</tr>
<tr>
<td>Tacoma</td>
<td>50,000</td>
</tr>
<tr>
<td>Omaha</td>
<td>40,000</td>
</tr>
</tbody>
</table>

Total pounds: 2,244,050

The ore cleared at the port of Kosal for shipment during the month of September appears in the records as follows:

<table>
<thead>
<tr>
<th>Mine</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAKASP</td>
<td>4,309,840</td>
</tr>
<tr>
<td>Value</td>
<td>$193,419</td>
</tr>
<tr>
<td>Ounces Silver, Contents</td>
<td>132,150</td>
</tr>
<tr>
<td>Pounds Lead, Contents</td>
<td>1,377,010</td>
</tr>
</tbody>
</table>

It will be seen from the above that during the month nearly two-thirds of the Slocan's output went out via Nakasp. We have no record of the mines shipping other than via the K. & S. Considerable ore went over the Kosal branch. The shipments via Kosal and Nakasp show the output of the Slocan for the month to have been at least 6,733,850 pounds or about 3,367 tons.

The shipments via the K. & S. and Kosal for the first two weeks of October down to and including the 12th, as follows:

<table>
<thead>
<tr>
<th>Mine</th>
<th>Destination</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mine</td>
<td>Pueblo</td>
<td>400,000</td>
</tr>
<tr>
<td>Ruth</td>
<td>Pueblo</td>
<td>160,000</td>
</tr>
<tr>
<td>Ruth</td>
<td>Everett</td>
<td>91,000</td>
</tr>
<tr>
<td>Slocan Star</td>
<td>Pueblo</td>
<td>240,000</td>
</tr>
<tr>
<td>Last Chance</td>
<td>Pueblo</td>
<td>200,000</td>
</tr>
<tr>
<td>Antoine</td>
<td>K. O. Co.</td>
<td>30,000</td>
</tr>
<tr>
<td>Stratton</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 1,076,540 pounds or 535 tons.

LOWER CALIFORNIA

The steamer St. Denis cleared last week at San Diego for Ensenada and San Quintin with the biggest cargo of the year, the principal item being a quartz mill and outfit for the Ybarra Mining and Milling Company at Calmali, and valued at $2,000. A gentleman who returned from San Francisco and who went down on the steamer said: "The Ybarra Company has decided to resume operations on its gold mine at Calmali in real earnest and that a lot of money is going to be sunk there right away, getting things into shape to do business. A ten-stamp quartz mill has gone down, and a lot of other machinery will follow in a few days. The company knows the property is rich and proposes to see if any of the riches cannot be gotten out of it."

GENERAL NEWS

Acetylene Gas.

Numerous inquiries from subscribers regarding acetylene gas has induced us to reproduce the following article on the adaptability of acetylene gas for explosive engines, by Garth and H. H. Morey, of Work on Gas, Gasoline, and Oil, published by Norman W. Henley & Co., of 133 Nassau street, New York, N. Y. The work is considered an authority on the subject treated, and we believe anything found therein can be relied upon as absolutely correct.

"Much interest has been lately shown and some experiments made in regard to the availability of carbide of calcium for generating acetylene gas as a fuel in the motive power of the horseless carriage and launch. Liquid acetylene has also been used as the as an concentrated fuel for power.

The gas liquefies at 41° F., at atmospheric pressure, and at 68° F. at 97 lbs. per square inch. Its liquid volume is about 62 cubic inches per pound.

The specific gravity of gaseous acetylene (C₂H₂) is 91 (air) and its percentage of carbon 97.3 and of hydrogen 0.77. Its great density as compared with other illuminating gases, and the large percentage of carbon is probably the source of its wonderful lighting power.

It is credited by hydrocarbon values at 18,260 thermal units per pound of the gas, (14% cubic feet) and 1259 thermal units per cubic foot.

One volume of the gas requires 2 1/2 volumes of oxygen for perfect combustion, which is equivalent to 125 1/2 volumes of air, provided that all the oxygen of the air can be utilized in the operation of a gas engine; probably the best and most economical effect can be had from the proportion of 1 of acetylene to 14 or 15 of air. This proportion has been used in light duties with the best effect.

One pound of calcium carbide will yield 53 1/2 cubic feet of acetylene gas and requires a little over a half pound of water to completely liberate the gas, 11.8 cubic feet per pound of generating material. The large proportion of air required for perfect combustion makes a favorable compensation for the necessity for carrying water for generating the gas. It is also connected with gaseous line, which yields but 2.8 cubic feet of gas of vapor per liquid pound with the best explosive effect of 9 volumes of air to 1 volume of vapor.

In liberating the gas from carbide in a close vessel the pressure may rise to a dangerous point, depending upon the clearance space in the vessel, say from 30 to 80 lbs. per square inch. In this manner a few accidents have occurred.

One pound of liquid acetylene, when evaporated at 64°F., will produce 14.5 cubic feet of gas at atmospheric pressure, or a volume 400 times greater than that of the liquid gas. The critical point of liquidification is stated to be 98°F.; above this temperature it does not liquify, but continues under the gaseous state at great pressures.

The heat unit value of acetylene gas, from its peculiar hydrocarbon elements, it will be seen, is far greater than that of gasoline vapor per cubic foot, but experiments seem to have cast a doubt upon the theoretical value, and assigned a much less value, or about 868 heat units per cubic foot.

As the comparative volume of explosive mixtures of gas or vapor and air is largely in favor of acetylene gas over others, as the weight of material for a given horse power per hour also favors the use of acetylene, it will not doubt become a useful and economical element of explosive power for vehicles and launches; always provided that the commercial production of carbide of calcium is available as a merchandise factor in cities and towns.

The explosive mixture of acetylene and air spontaneously fires at lower temperatures than illuminating gas mixtures; it varies from 500° to 515°F., while illuminating gas mixtures range from 750° to 800°F. Claims of a higher temperature have been made.

In the use of liquid acetylene, the cost of liquefying the gas may be a bar to its ordinary use, but there are possibilities that only future experiments and trials may develop into useful work from this unique element. In trials of acetylene for power in gas engines in Paris, France, it was found that a much less volume of acetylene was required for equal work with illuminating gas, and that it was a practical explosive fuel.

The only change found to be more perfect regulation of the valve movement, or a smaller valve to meet the smaller volume of acetylene. In these experiments, the explosive mixture was compressed to parts air to 1 part of acetylene, and using from 4 to 7 cubic feet of gas per horse power per hour.

From another account of trials made in France, it appears the result of experiments made by M. Ravel, that 6.35 cubic feet of acetylene gas generates 1 horse-power per hour, which is equivalent to a reduction of two-thirds as compared with petroleum. As to the explosiveness of mixtures of air and acetylene, it was found that 1.55 parts of this gas mixed with one (1) part of air began to be explosive, the explosive force of such a mixture rising rapidly as the percentage of air increases, attaining finally a maximum when there are 12 volumes of air with 1 volume of acetylene; then, as the proportion of air is increased beyond this limit, the explosive force subsides, until at 20 to 1 it becomes entirely extinct. The flash point approximates 500°F., whereas in the case of most other gases used to generate power, the requisite ignition temperature is about 1700°F. The temperature of combustion is very much higher than that of the other gases with which it can be compared. The special characteristics of this gas, therefore, are rapidity of the transmission of flame, low ignition temperature and extraordinary energy evolved in the explosion.

The next appearance of the Black Hills Mining Review deserves comment. The last issue comes out with an elegant colored cover and two pages of new stock, and the hope will be a permanent feature to that enterprising publication.
THE DEVELOPMENT OF THE CYANIDE PROCESS.

BY W. M. ORE.

Five years ago the total cyanide mills in America would not exceed five or six in number, and of these some fifteen were in operation, namely, the famous old Mercur mill, with the history of which almost everyone is familiar, and today there are in operation, over one hundred and fifty cyanide plants within the boundaries of the State. In Camp Floyd, commonly called Mercur district, alone, there are ten cyanide plants, and as this district is dependent entirely on the cyanide process for its ore reduction, I will give you a brief sketch of the methods which have been employed and the difficulties which I (as the representative of many of the various methods of cyanidation) have encountered in the reduction of the ores of this district by means of cyanide. The ore is principally an altered or silicious limestone, which can be easily ground and washed; in fact, the feature of the ore was the cause of the first difficulty encountered by the pioneer operators. Fine crushing was entirely out of the question, for instead of complete grinding, the ore produced retarded or entirely stopped the circulation of the cyanide solution. Here the extremely porous character of the ore came to the assistance of the millman, enabling him to leach the ore in a coarse condition, and the greater portion of the solution was set free at once, so that on a commercial scale the time taken in obtaining a satisfactory extraction is chiefly required in actually washing out or depilating the first solution, which experiments I have made, I conclude, must have dissolved the greater part of the gold. The strength of cyanide solution employed has also been increased, and the strength generally employed varies from 1 to 1.5 per cent, and I have even seen a solution containing 1.5 per cent produce an excellent result, but the process with this solution was imperfect until the solution was restrengthened. The result of this change in the strength of the cyanide solution employed from that used five years ago, namely, 5% of 1 per cent to 1 per cent, is a great reduction in the loss of cyanide and therefore in cost. A great saving in the loss of cyanide in the process has also been effected by the addition of lime, thereby neutralizing the acid salts deleterious to the cyanide, and which occur principally in the surface ores; in fact, on one occasion, I believe, I reduced the total loss of the cyanide solution, and, on investigation, found it was due to the presence of some surface ore from a new ore chute, the ore from which contained a large amount of a tenorite. Large ton after large ton of ore I found the loss of cyanide, without the addition of lime, was nine pounds per ton; with lime added, three-quarters of a pound was saved. The occurrence of this kind will result in a heavy loss of gold in the tailings, if the trouble is not speedily located and overcome. The acidity in the Mercur oxidized ore is principally due to acid iron, aluminum and magnesium salts, which can be neutralized to a large extent by the addition of lime. This lime is charged into the tank, the quantity used being one pound per ton of ore. The lime is generally prepared by the method known as dry-slacking; that is, taking the quick-lime and adding only sufficient water to reduce to a soft fine, dry powder. Thus prepared it is easily powdered and presented in a very efficient form. The exact amount of lime necessary requires careful calculation, as either an insufficient supply, or excess will give unsatisfactory results.

The consumption of zinc, like that of cyanide, has likewise been greatly reduced within the last five years, and now only from one to three eighths of a pound is consumed per ton of ore. The handling of the limestone has an important bearing on the consumption of the zinc.

The surface or oxidized ores of the Mercur district, however, present fewer difficulties, but occasionally a pocket of unoxidized ore will find its way into the tank and therewith make its presence felt in a most objectionable way. This unoxidized ore contains the following minerals which affect the solution, namely, metallic sulphides (regular and orpiment), ferrous arsenide compounds, and occasionally a certain kind of shale. No chemist could suggest a more definite method for removing the gold from the solution of the gold. The alkaline cyanide solution, acting on the sulphur and sulphides, produces a soluble alkaline sulphide, in presence of which no gold can be dissolved. The cause of this is easily explained. Gold to be dissolved by a cyanide solution requires the presence of oxygen in that solution. By the introduction of even a very small quantity of such a reducing agent as water, or an alkaline sulphide, the oxygen is removed and the solution of the gold rendered impossible. Therefore, before the cyanide solution thus found by the presence of an alkaline sulphide can be rendered effective, this sulphide must be removed, either by oxidation to sulphate or precipitation as an insoluble sulphide. The ferrous compounds in the base ore are easily rendered effective by the addition of a different agent from the sulphides, by conversion of the cyanide into ferrous cyanide, which, for all practical purposes, is a non-solvent for gold. However, the trouble, the trouble, the trouble, as it does in a similar manner to the sulphide, namely, as a reducing medium, thereby rendering the solution ineffective. The heavy clay also has the property of precipitating gold already in solution through virtue of the carbon it contains. I have taken a solution as saying $11.60 per ton, and after circulating it through some of this pulverized base ore for twenty-six hours found it contained only $2.70. It will thus be seen that the base ore of the Mercur district is a hard combination for the cyanide process. I have found the entire stock of solution in several of the mills being run to waste, according to the millman, "it had become fouled by arsenic." I have shown by the above that this is partly an erroneous idea, as the arsenic, while present, is in the red form, and the sulphur, in combination with the arsenic, the ferrous iron, and the carbon in the shale are the causes. I have shown that the ore containing over 3% per cent of arsenic has given unsatisfactory results, but the arsenic in this case was carried in the minerals scorodite and haidingerite—oxidized varieties of arsenic minerals. In fact, arsenic is present at all times in the cyanide solution in the Mercur district, and is precipitated to a certain extent on the zinc with the gold.

(To be continued.)

THE REDUCTION WORKS FOR SILVER ORES AT ADUANA, SONORA, MEX.

BY MULTIADIS T. ARMAN.
Formerly Asst. Ass't Superintendent.

The Quintera mine of the Alamor district in Sonora, is a powerful silver-bearing lode, known as the "Quintera" lode, and today is the only one in that section of the country which, notwithstanding the complexity of the ores worked profitably.

With a general course nearly due north and south, and dip of 40° from the vertical towards the west, this lode traverses the crest of the Cerron Grande mountains.

Flanked east and west by higher and more rugged peaks, this mountain forms the divide, or pass, over which a bridle path connects the mining town of the two leading mines, viz., Aduana on the northern side, where the reduction works of the Quintera mine are situated, and Promontorios on the opposite side, with the reduction works of the Alamor and Teposchite mines.

The population of Aduana, Promontorios and the neighboring settlement of "Minas Nuevas" has been made up of native Mexicans mostly of Indian blood, and, living in very dirty and decaying homes, they have become excellent mine and mill operatives. The pure-bred Indians appear to me to be the best of all.

In this part of Mexico the cheapness of labor goes far toward offsetting the evils which may be considered to attend the pursuit of mining or milling by foreigners.

Six miles from Aduana is Alamos. This is one of the most important towns in Sonora, and is connected with Aduana by a wagon road, which continues forty miles to the port of Aguanucho, on the Gulf of California.

This brief geographical description, with some additional information concerning the system of weights and mode of transportation, will probably render clearer the description of the various methods applied at the reduction works of silver ores in Aduana.

Notwithstanding the adoption of the metric system by the Mexican Government, in all its official documents, the large still adheres to the old Spanish measures.

In mining districts the unit is 300 pounds

* A paper read before the International Mining Congress at Salt Lake City, July 9, 1898.
(1 pound = 460 grams), or the weight that a mule can carry comfortably, since the principal means of transportation is by mules.

The natives speak, as a rule, of so many ounces per carga of 500 pounds (1 ounce = 28.35 grams). A description of the divers kinds of ore obtained from the same lode, with an average composition of each kind, will now be considered.

The admixture of ore is complex and varies in quality according to the relative proportions of its several minerals. All is hand-picked and hammer-dressed, and assorted into several grades, according to their composition. The concentration of its metallic contents, or to the predominance of certain ingredients. This work is done at the mine by boys called "pinistas."

Smelting Ores.—A. Argentiferous gray copper, carrying some blende and galena. The practical yield is in silver of ores of this class is from 350 to 600 ounces per ton.

**ANALYSIS.**

<table>
<thead>
<tr>
<th></th>
<th>Per ct.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO₂</td>
<td>30.2</td>
</tr>
<tr>
<td>Cu</td>
<td>1.14</td>
</tr>
<tr>
<td>Pb</td>
<td>9.8</td>
</tr>
<tr>
<td>CaO</td>
<td>1.8</td>
</tr>
<tr>
<td>Fe</td>
<td>0.5</td>
</tr>
<tr>
<td>S</td>
<td>15.5</td>
</tr>
<tr>
<td>Zn</td>
<td>11.5</td>
</tr>
<tr>
<td>As</td>
<td>9.3</td>
</tr>
<tr>
<td>As₂ O₃</td>
<td>6.2</td>
</tr>
<tr>
<td>Ag</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**B. Black Ore— Prize II.**—A complex variety, made up of galena, blende, copper glance, chalcopyrite, with arsenical and antimonial sulphides, all more or less argentiferous, and containing occasionally some stibnite. Their yield in silver is from 200 to 400 ounces per ton.

**ANALYSIS.**

<table>
<thead>
<tr>
<th></th>
<th>Per ct.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO₂</td>
<td>47.4</td>
</tr>
<tr>
<td>Cu</td>
<td>1.14</td>
</tr>
<tr>
<td>Pb</td>
<td>9.8</td>
</tr>
<tr>
<td>CaO</td>
<td>0.8</td>
</tr>
<tr>
<td>Fe</td>
<td>3.1</td>
</tr>
<tr>
<td>S</td>
<td>11.3</td>
</tr>
<tr>
<td>Zn</td>
<td>13.2</td>
</tr>
<tr>
<td>As</td>
<td>4.2</td>
</tr>
<tr>
<td>Ag</td>
<td>3.3</td>
</tr>
<tr>
<td>As₂ O₃</td>
<td>3.8</td>
</tr>
</tbody>
</table>

**C. Browss.**—The same as black ore, B., but with a predominance of galena. The grade of silver in these ores is inversely proportional to the quantity of galena, and as a rule varies between 60 to 200 ounces per ton.

**COMPOSITION.**

<table>
<thead>
<tr>
<th></th>
<th>Per ct.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO₂</td>
<td>33.2</td>
</tr>
<tr>
<td>Cu</td>
<td>33.0</td>
</tr>
<tr>
<td>Pb</td>
<td>28.1</td>
</tr>
<tr>
<td>CaO</td>
<td>6.8</td>
</tr>
<tr>
<td>Fe</td>
<td>16.3</td>
</tr>
<tr>
<td>S</td>
<td>11.2</td>
</tr>
<tr>
<td>Zn</td>
<td>12.1</td>
</tr>
<tr>
<td>As</td>
<td>2.1</td>
</tr>
<tr>
<td>Ag</td>
<td>0.6</td>
</tr>
</tbody>
</table>

**D. Milling Ores.**—Mostly ores yielding between 48 and 72 ounces per ton, and in which the blende predominates.

**ANALYSIS.**

<table>
<thead>
<tr>
<th></th>
<th>Per ct.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO₂</td>
<td>66.0</td>
</tr>
<tr>
<td>Al₂ O₃</td>
<td>0.30</td>
</tr>
<tr>
<td>Fe</td>
<td>4.00</td>
</tr>
<tr>
<td>CaO</td>
<td>1.80</td>
</tr>
</tbody>
</table>

**E. Concentration Ores.**—Various ores, but of a tenor in silver of 23 ounces per ton, and which are never allowed to pass 27 ounces per ton. As a rule the gangue is quartz or molybdenum rock, mostly decomposed. The lode being a contact formation, is between two masses of rhyolite and tuffaceous chalcedony.

The sorting of the lixiviation ore requires particular care so as to avoid all kinds of decomposed rock or gangue, which is liable to interfere in the subsequent treatment of the ore by lixiviation by forming a kind of clay impeding the rapid filtration. Pure quartz, on the contrary, is rather helpful, as we will see further on.

The reduction works are about a mile from the mine, the former being situated at the foot of the hills, and on the banks of a rushing stream, which, however, is mostly dry during the dry season. The transportation of the ore is done by mules at 18½ cents (Mexican money) per carga.

**Hacienda de Beneficio—"Dios Padre."**

**The Mill.**—The lixiviation and concentration ores are treated directly by 20 stamps. Ten stamps are employed for the dry crushing of the lixiviation ore.

The following are the data for the 20-stamp battery:

**Twenty Stamp Battery.**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>3' x 13'6&quot; 320 lbs.</td>
</tr>
<tr>
<td>Tapped</td>
<td>147&quot;</td>
</tr>
<tr>
<td>Clean</td>
<td>220&quot;</td>
</tr>
<tr>
<td>Shoed</td>
<td>126&quot;</td>
</tr>
<tr>
<td>813 lbs.</td>
<td></td>
</tr>
</tbody>
</table>

**Die.**—75-86

**Cam.**—243

**Cam-shaft for 10 stamps 5' 5"x 14' 7 1,000.

**Cam-shaft pulley 1,650."**

**Number of revolutions of the cam-shaft per minute.**—54

**Number of drops per."**—105

**Fall to feet.**—16

**Mortar block 16" x 20" 30"."**

**Horse-power for 20 stamps.**—30

At first the pulp passed through a 50-mesh screen, but it was noticed that the lixiviation of the chloridized ore was not rapid. The filtration becoming slow, the dissolved silver probably was reduced and precipitated by prolonged contact with the sulphides of zinc and lead, or even by their oxides, which always occur in the chloridized ore.

It was therefore necessary to resort to a 16-mesh screen, and the results have been highly satisfactory.

The pulp is conveyed by a belt-elevator to a bin, from which the four roasting reverberatory furnaces are charged.

**Roasting and Chlorination Reverberatory Furnaces.**—The reverberatory furnaces are one of the well-known type with four graded hearths. Dimensions: 14 x 9 feet.

The ore remains at each hearth two hours, and at the last two is continually stirred. Certain kinds of ore, especially sulphides (lately we were treating ores containing mostly blende), rich in antimony, etc., require more time, as the roasting has to be done at a very low temperature in order to avoid volatilization.

The blendeiferous ores, whose analysis I have given, required three hours at each hearth, or, twelve hours in total, the charge being 1,200 pounds.

At first, half of the necessary salt was added at the battery and the other half in the last hearth, but experience showed that it was better to add all the salt at the last hearth two hours before discharge.

The quantity of salt added varied between 4% and 4%, according to the nature of the ores. At the beginning, when nothing but green ore (chrysocolla) had to be treated by lixiviation, a great deal of difficulty was encountered. Soon, however, we found that the sulphides existing with the green ore were in small quantities, and a great part of their sulphur was volatilized; consequently the sulphides formed were insufficient, and required a great deal of time to be converted into that state in order to attack the salt. So we resorted to the addition of 1% per cent. of pyrites. Pyrites, as it is well known, readily loses half of its sulphur and then is rapidly converted into sulphates necessary for the production of chlorine. Even with blendeiferous ores pyrites would not help us in this branch.

With the above-mentioned green ore and the addition of the pyrites, the time of roasting and chloridizing did not exceed eight hours, and the percentage of chlorinaition was on an average of 97.5 per cent. Attention should be directed to the fact that in all kinds of ores, when very silicious, we found that the chlorination was rapid and more nearly perfect.

It can be probably ascribed to the following reaction:

**ROSiO₃ + 2NaCl = Na₂O₂SiO₂ + Cl₂.**

The wood we preferred for the purpose was "torote" and "pioloj," because they produce a large flame and have a great deal of moisture, the conversion of which into steam facilitates so much the chlorination.

**Labor.**—All the men employed at these furnaces are pure Maya Indians, and it can safely be said that this kind of work is their specialty.

For four reverberatory furnaces there are employed:

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 foremen at $1.25</td>
<td>$2.50</td>
</tr>
<tr>
<td>24 ore stirrers at 75 cents</td>
<td>18.00</td>
</tr>
<tr>
<td>10 oil chargers, wood transporters, etc.</td>
<td>7.50</td>
</tr>
<tr>
<td>1 salt transporter at 40 cents</td>
<td>0.40</td>
</tr>
<tr>
<td>10.75 cents</td>
<td>0.40</td>
</tr>
<tr>
<td>0.80</td>
<td></td>
</tr>
</tbody>
</table>

The chloridized ore is discharged on a cooling floor in heaps, where the chlorination is still continued, as always some chlorine remains with the chloridized ore at its discharge.

**Lixiviation—Charging the Vats.**—The charging of the vats is done on contract work. The lumps, which are on mill dump cars and dumped into the "arroyas."

The filter is repaired, and the ore that was previously slightly moistened and the lumps broken up is taken from the cooling floor and charged into the vats.

If the chlorination was properly accomplished, the ore at its discharge from the furnace will have a very strong odor of chlorine and change rapidly its color from dark brown to ochre, owing to the reduction of the perchloride of iron into sesquioxide; when slightly moistened it must assume a spongy appearance, and finally when pressed in the hands it must not become muddy or adhere to the hand.

The characteristics are essential to the good
To Increase the Flow of Wells.

Thomas Gallagher, a Pittsburgh oil-well driller, has brought out an invention to clean oil wells and increase their flow. The idea is to remove the debris by using carts, as the sand and gravel in the cavity in the bottom retard the flow of oil. To do this, Mr. Gallagher has devised a tool weighing about 100 pounds. It is practically an ordinary pipe rack, but, after grinding the wells and about a half feet long attached. They hinge on the upper portion of the jars, and recess into the cavity of the upper portion. The closing of the jars, when it strikes the bottom of the well, causes the arms to extend themselves in the cavity of the well, and the rotary motion of the cable whirs the arms around, thereby driving sand and gravel and bringing the debris to the center of the cavity, where the bails can pick it up and bring it to the surface. It is stated that wells have doubled their flow after being thus cleaned.

Moving Dynamite.

Dynamite may be hauled in wagons, railway trains, mine cars, or similar vehicles, care being exercised that percussion caps, exploders, fulminators, friction matches, or any other article of like nature be not loaded in the same wagon, car or other vehicle. Too much care cannot be exercised in this particular detail.

Appreciating the fact that the demand for a simple and convenient explosive is increasing, a dynamite which is more economical, safer, cleaner, and occupy less floor space than the steam engine, with its coal and ash heaps, water service, its long and tedious and very laborious work, the amount of power and speed, is constantly increasing, the Weber Gas and Gasoline Engine Co., of 434 S. W. Boulevard, Kansas City, Mo., have supplied the demand in the manufacture of Weber Engine and Hoint. Send for their catalogue, No. 14, just out. It is full of useful information.

The well known State Ore Sampling Co. of Denver, Colo., Messrs. Baily & Monnig, managers, are now engaged in the market for Gold, Silver, Lead, Copper, Bismuth, Uranium, Wolfram, Cobalt and Antimony ores, and pay highest cash prices for same. Their long experience in the market enables them to obtain the highest cash prices on marketable ores, and their modern mills and machinery has placed their facilities for sampling ores at the top notch.

Miners will do well to correspond with these people before sending their ores to market.

The Mining Reporter of Denver, Col., gives the Western Mining World of Butte, Montana, a calling down because that paper contained an article describing an Idaho mine, the ore from which runs $60 in silver and 65 per cent lead, and is sole of concern treating "three into one." We have no doubt the above was a typographical error on the part of the World.

General Uses of Fireclay.

Fireclay in some one its varied forms and grades may be put to almost any use which any grade of clay can be used. When used for pottery ware it is called porcelain clay, and when used for making tile it is called tile clay, etc. The fireclays of the coal measures of Pennsylvania are used for the manufacture of the following ware; pure brick; mill brick; and coke-oven brick of all grades. The most refractory grades of each are made from the flint clay with only enough plastic clay to bind the particles of flint clay. The brickets requiring great abrasive strength must have a correspondingly increased proportion of plastic clay of high refractory power. The coke ovens require a very elastic brick. While they are not subject to the very high temperature of the blast furnace they are subject to numerous and violent changes of temperatures, as about every 48 hours the coke is cooled by being cold water over it, and the firebricks are suddenly cooled by a red heat by this cold water bath. Locomotive tiling consumes large quantities of fireclay and requires a clay of high refractory ware. The pots must not only withstand the high temperature of the furnace, but must at the same time resist the strong chemical action of the salt cake and other materials in the glass forming, and must remain sufficiently rigid to hold the large batch of liquid glass. The clay is selected by hand with great care. It is all broken into small fragments, and the very finest, and quality picked out. It is then ground and mixed, often by tramping with the bare feet, and allowed to lie in heaps and sweat for several months before using. The pots are built up by hand, a few inches at a time and requires several weeks to build one and several months to dry one. They are not burnt until they are put in the glass furnace ready for use and not permitted to cool until they are burnt out. Some glass-pot clays are obtained from the fireclays in Western Pennsylvania, but the greater part of that used is imported from Germany and England, although considerable quantities are obtained in Missouri.

PERSONAL NEWS ITEMS

Mr. Needham, who is associated with Johann Walfisch in handling mining properties in the Kootenay district in British Columbia, is looking over some of their holdings in the Fort Steele district.

Bruce M. Glasgow, a placer mine owner from Dutch Country, is in Colorado studying the dredges and other modern placer machines to determine what best to use on his Dutch Country property. He goes from Denver to Idaho and thence to California.

J. E. Rothwell is just completing a new 30 ton chlorination mill at Sugar Loaf, Colorado.

O. B. Hlavko, who has been on a visit to Sonora, Mexico, has succeeded in interesting San Francisco, Cal., capital in some excellent Sonora mining properties.

Ira Lorrick, of the Ferguson & Lorrick Place Co., left Oakland, Cal., for the mines of the company near Grant's Pass, Oregon.

Prof. E. F. Dumile, state geologist of Texas, has returned to Austin, Texas from the Yaqui Country of Sonora Mexico, and will probably return to Sonora the latter part of this month.

E. L. Giroux, of Arizona, still retains an interest in the rich mining property at Pilara, Sonora Mexico.

Charles Conners and A. E. Watts have discovered a lode in the town of Cranbrook, in the Fort Steele district of British Columbia.

J. W. Nelson is superintendent of the Poming Association of Leadville, Colo., in charge of the practical work of unwatering the down-town mines.

W. F. Hilding returned home to Grant's Pass, Oregon from the East Kootenay, B. C., country last week, having been present and located several claims, and has been fortunate in bonding some of them.

Prof. W. P. Blake, the well-known geologist, who is now interested in Arizona, was recently a visitor to Denver, Col.

C. H. Williams, M. C. E., of Boston, has arrived in Nelson, B. C., and will spend some time looking over that section. Mr. Williams is expecting his new acting as agent for the United, two wealthy north of Ireland gentlemen. It is their intention to make investments in that country.

Capt. Pat Durack, of Pecos, Texas, has just returned after a week of work for the company, and many hard-working miners may well envy him. By simple deacon, he has become the owner of a property formerly known as the Precorremain mine, 12 miles from Bacarac and 90 miles northwest of Casas Grandes, Chihuahua, to the north of the property belonged originally to a Chicago syndicate which spent some $50,000 in gold developing it, erecting buildings and putting up machinery, and working about 200 feet of shafts and a tunnel of 150 feet in length.

H. R. Vincent, the mining man who has charge of the English Syndicate's property in the Gavilan Grant near Perris, Riverside county, California, has recently returned from England, and is accompanied by Messrs. A. Bitsey and S. A. Leitch, both of Philadelphia.

Capt. Thomas Couch, of Butte, Montana, is at present in Southern Oregon, looking over some mining properties, and it is expected he will bond some of them.

Robert Bartlett, the mine owner of Nogales, Arizona, recently made a trip to Hermosillo, Sonora, Mexico.

W. A. Cashmore, of Rossland, B. C., mining engineer in charge of the properties of the British America Corporation, and formerly provincial mineralogist was in Pennsylvania last week purchasing supplies for the company.

Louis Ruhl, agent for the Roessler & Hassler Chemical Co. of New York was a recent visitor at the Journal office.
THE MARKETS.

All quotations, financial reports and other statistical figures given under this head are New York quotations, unless otherwise stated in each case. Three figures are given, the revised, each issue, and constitute a very accurate computation of market matters.

New York, Oct. 15, 1898.
The following are the Copper and Lead quotations for the last two weeks:

<table>
<thead>
<tr>
<th>Date</th>
<th>Copper</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct. 3</td>
<td>66 1/2</td>
<td>50 7/8</td>
</tr>
<tr>
<td>Oct. 4</td>
<td>66 3/4</td>
<td>51 1/2</td>
</tr>
<tr>
<td>Oct. 5</td>
<td>67 1/4</td>
<td>51 3/4</td>
</tr>
<tr>
<td>Oct. 6</td>
<td>67 1/2</td>
<td>51 3/4</td>
</tr>
<tr>
<td>Oct. 7</td>
<td>68 1/4</td>
<td>52 1/2</td>
</tr>
<tr>
<td>Oct. 8</td>
<td>68 3/4</td>
<td>52 3/4</td>
</tr>
<tr>
<td>Oct. 9</td>
<td>69 1/4</td>
<td>53 1/2</td>
</tr>
<tr>
<td>Oct. 10</td>
<td>69 3/4</td>
<td>53 3/4</td>
</tr>
<tr>
<td>Oct. 11</td>
<td>69 3/4</td>
<td>53 3/4</td>
</tr>
<tr>
<td>Oct. 12</td>
<td>69 3/4</td>
<td>53 3/4</td>
</tr>
<tr>
<td>Oct. 13</td>
<td>69 3/4</td>
<td>53 3/4</td>
</tr>
<tr>
<td>Oct. 14</td>
<td>69 3/4</td>
<td>53 3/4</td>
</tr>
<tr>
<td>Oct. 15</td>
<td>69 3/4</td>
<td>53 3/4</td>
</tr>
</tbody>
</table>

SILVER

Owing to the withdrawal of India from the markets the price of silver has sagged to 27s. 9.½d. There is no indication that Spanish orders may be placed in the market, and that assists in sustaining the price, which is very sensitive. The expectations of large Spanish purchases, however, is an uncertain reliance.

COPPER

There has been more activity in copper and with this increased demand for delivery during the balance of the year developing. Prices remained. The following quotations: being 12½c. for Lake, 12½c. and 13½c. for electrolytic copper in cans, bars or ingots, and 11½c. and 12½c. for cathodes. The price for casting copper is nominal at 11½c. Most producers appear to be entirely sold up for the balance of the year, and those who are not under the circumstances getting the top prices.

LEAD

Lead is somewhat easier, the latest reports being to the effect that sales have been made at 8½c. at New York, and 7½c. at St. Louis, with sellers outnumbers buyers. With the fall business, soon over, there is not much prospect of a healthy improvement in the price of lead. The foreign market has been firm, the quotations advancing rapidly from 12½d. for Spanish to 13 1½d., with English.

SULPHUR

The improvement has apparently not yet reached its height in all quarters. The market price has now reached the following quotations: 4½d. and 4½d. at St. Louis, and 4½d. and 5½d. at New York.

ANTIMONY

Antimony continues strong, and we quote Cockson's 80½c., Hallett's, E. B. Star and Japanese, 9½c.

NICKEL

Business still continues unchanged and no alteration in prices can be reported. We quote for New York tons 32½c. and 34½c. per lb. and for smaller orders 34½c. and 36½c.

TIN

The price in sympathy with the advance in London, rose considerably but the event has had a tendency to keep buyers from supplying themselves as much as they might have done at any other time, and as a result the business transacted has been small. The quotations are now $17.00 and 17.10.

PLATINUM

Prices are now quoted at $15 and $16 per oz., New York. The London quotations are 59 at 60 $ per oz. Supplies are not large and prices are firm. For chemical use 3½c. for 100 lb. for domestic and 100 lb. for export.

FERTILIZER

Purified, 988.50 per cent., in cases of 120 lb. at 32c. per lb., in lots of 50, 50 and 250 1b. tons at an advance.

QUICKSILVER

The New York quotations are unchanged at $39.50. The London price is also unchanged at 7½ lb. 5s. per fl., with 7 lb., 4s. for second ends.

POWDER

F. O. B. San Francisco: No. 1, 70 per cent. nitro-glycerine per lb., in carload lots, 15½c. less than one ton, 15½c. No. 1 6½c. 100 lb. per carton, carloads lots, 15½c. less than one ton, 15½c. No. 1 6½c. per cent. carloads, 15½c. less than one ton, 15½c. 6½c. per cent., carloads, 15½c. less than one ton, 15½c. No. 2, 4½c. per cent., carloads, 15½c. less than one ton, 15½c. 10c. per cent., carloads, 15½c. less than one ton, 15½c. No. 2, 4½c. per cent., carloads, 15½c. less than one ton, 15½c. Black blasting powder in carload lots, 25½c. kegs, $1.50 per keg; less carload lots, 25½c. kegs, $1.50 per keg.

CORK

There is considerable improvement in the coke situation. Dealers are feeling more cheerful about the outlook, which is that the demand will continue at a corresponding period for several years past.

IN CAR LOTS, ST. LOUIS.

Cannelbore 60c. coke 72 lb., F. O. B. New York...$4.85

Crushed, 30c. per lb., 3 lb. net, $2.00 per lb.

Coke works coke, lump, 10c. per lb.

BeloIT

Leather, * Cotton, Rawhide, etc.

L. P. DEGEN, Manuf'F

Agent for Rubber Belting. Hose and Packing.

105 and 107 Mission Street, San Francisco, Cal.

THOMAS PRICE & SON

Analytical Metallurgical and Physical Testing Laboratory

554 Sacramento Street, San Francisco, Cal.

Sulphuric Acid

MANUFACTURED BY THE

Denver, Col.

The Western Chemical Co.

For Chlorination, Refining and other processes. Also Starch and Nitre Acid, Blister Silver, Copperas, Nitrate of Soda, Etc.

JAMES IRVING & CO.

Gold Refiners and Assayers.

Highest Cash Prices Paid for Gold and Silver Bullion.

128 N. Main Street

Los Angeles, Cal.

SALT COSTS MONEY

Trade mark

Protect your goods and boil them with Wm. Wood's New Salt neutral composition, packed in sacks, easy to transport anywhere. Send for facts and samples.

C. H. VOLL

34 Russell Bldg.

SEATTLE, WASHINGTON

Hoskins' Patent Hydro-Carbon

Blow Pipe and Assay Furnaces

No dust. No ashes. Cheap, effect, easy to portable and automatic. Send for Price-list to

WM. HOSKINS, 81 South Clark St., Room 57

CHICAGO, ILL.

J. H. MASTERS, Manufacturer of and dealer in

 Ore Sacks, Tents, Camp Furnishings

217 Commercial St., Los Angeles, Calif.
ORE TESTING

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

RICKETS & BANKS, Metallurgists & Chemists

No. 104 John Street, NEW YORK CITY

Krogh Manufacturing Company
Successor to San Francisco Tool Co.'s Machine & Tool Dept., MANUFACTURERS OF AND DEALERS IN

MINING AND PUMPING MACHINERY,

COMPRESSORS, ROCK DRILLS, Stone Channelers, The Pohle Air Lift Pump, Coal Cutters,

The Ingersoll-Sargent Drill Co., HAVEMEYER BUILDING, NEW YORK.

LUMBER

FROM CRIPPLE CREEK

New Catalogue No. 32
New Catalogue No. 41
Pamphlet No. 100
Catalogue No. 72
Special.

Air Compressors,
Rock Drills,
The Pohle Air Lift Pump,
Coal Cutters,

James F. Renoey, Proprietor
JOHN HANSON, Gen. Mgr.
FRANK O. RECK, Sec'y & Treas.

THE PORTLAND GOLD MINING CO.,
Blackstone Office, Portland, Oregon.

Miners at Victor, Colorado.

THE INGERSOLL-SARGENT DRILL CO.,

This was in place in our shaft house in the Cripple Creek District, 1000 feet above the level of the sea, and has been used continuously ever since, and at times over ten (10) per cent. The mud was separated into two independent jet condensers, one for the mine water, and the other for the condensation in very low temperatures. The operation of this Condenser is as nearly perfect as that of any machine we have ever seen, and this type is well suited to the extra cost of the great permanent economy in operation. Our mine is equipped exclusively with your drills and we have only the highest words of praise to give them.

James, January 14th, 1918.

The Portland Gold Mining Co., Jan. A. Beach, President.

FROM CRIPPLE CREEK

51 Beale St. and 9 to 17 Stevenson St., San Francisco, Cal.
<table>
<thead>
<tr>
<th>NAMES OF MINES</th>
<th>LOCATION</th>
<th>N. of Shares</th>
<th>Capital Stock</th>
<th>Par Value</th>
<th>No. of last Divid</th>
<th>Date of last Dividend</th>
<th>Total Amount Paid in Dividends</th>
<th>Kind of Mineral Produced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aetna Gems</td>
<td>...</td>
<td>100,000</td>
<td>$500,000</td>
<td>$5</td>
<td>10</td>
<td>Oct 1895</td>
<td>150,000</td>
<td>Q.</td>
</tr>
<tr>
<td>Alaska Treadwell</td>
<td>...</td>
<td>200,000</td>
<td>5,000,000</td>
<td>25</td>
<td>30</td>
<td>July 1896</td>
<td>3,500,000</td>
<td>G.</td>
</tr>
<tr>
<td>Alaska Mexican</td>
<td>...</td>
<td>200,000</td>
<td>5,000,000</td>
<td>25</td>
<td>10</td>
<td>Apr 1896</td>
<td>2,300,000</td>
<td>G. S.</td>
</tr>
<tr>
<td>Alaska Mines</td>
<td>...</td>
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