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## CONTENTS.

	Page.
The Rothschilds' Spanish Loan.....	97
Iron Silver Mining Company Litigation.....	97
Competition in Smelting in the United States.....	97
Condition of the Spelter Market.....	97
Mount Lyell Copper Company, Tasmania.....	97
Broken Hill Proprietary Mine, New South Wales.....	97
The British Iron Trade.....	98
New Publications.....	98
Wolfram.....Coquimbo	98
Bismuth.....Iquique	98
Afterdamp in Coal Mine Explosions.....	William Bottmann 98
Gold Standard for Costa Rica.....	Central America 98
On the Preparation and Properties of Pure Molybdenum.....	H. Moissan 99
Standard Specifications for Structural Steel.....	99
* Angels Camp, California, and Vicinity.....	H. L. Tyler 100
The Early Use of Iron.....	101
Abstracts of Official Reports.....	102
Matte Smelting in California.....	Herbert Lang 103
* Mineral Regions of British Columbia.....	H. M. Beadle 104
The Concentration of Iron Ore—I.....	Wm. B. Phillips 105
Determination of Sulphur in Coke and Coal.....	R. Helmhacker 106
Patents Relating to Mining and Metallurgy.....	106
Notes: Manchester Canal Traffic, 99—British Guiana Gold Product, 105—	
German Iron Production, 105—Polyphase System for Swiss Railroad	
Motors, 106—Tempering Steel by Electricity, 106—Tin in South Africa,	
106—German Iron Imports and Exports, 106—Thomas Slag in Germany,	
106—Youngstown, O., Electric Railroad, 106—Production of Petroleum	
in the United States, 106—Highest Railroad Speed in Germany, 106.	
* Illustrated.	
Personal..... 107	
Obituaries..... 107	
Societies and Technical Schools..... 107	
Industrial Notes..... 107	
Machinery and Supplies Wanted..... 107	
Mining News. United States:	
Alabama..... 107	
Alaska..... 107	
Arizona..... 107	
Arkansas..... 108	
California..... 108	
Colorado..... 108	
Georgia..... 109	
Idaho..... 109	
Iowa..... 109	
Maine..... 109	
Minnesota..... 109	
Missouri..... 109	
Montana..... 109	
Nevada..... 109	
New Mexico..... 110	
New York..... 110	
Ohio..... 110	
Oregon..... 110	
Pennsylvania..... 110	
South Dakota..... 110	
Tennessee..... 110	
Texas..... 110	
Utah..... 110	
Washington..... 111	
West Virginia..... 111	
Wyoming..... 111	
Foreign:	
Br. Columbia..... 111	
Canada..... 111	
Mexico..... 111	
New So. Wales..... 111	
Nova Scotia..... 111	
South Africa..... 111	
Late News Markets.	
Coal:	
New York..... 112	
Buffalo..... 113	
Pittsburg..... 113	
Shanghai..... 113	
Metals:	
Iron:	
Pig Iron Production..... 113	
New York..... 113	
Buffalo..... 113	
Cleveland..... 113	
Philadelphia..... 114	
Pittsburg..... 114	
Gold & Silver..... 114	
Prices, Statistics, Imports and Exports..... 114	
Foreign and Domestic Coms..... 115	
Copper..... 115	
Tin..... 115	
Lead..... 116	
Spelter..... 115	
Antimony..... 115	
Nickel..... 115	
Platinum..... 115	
Quicksilver..... 115	
Minor Metals..... 115	
Salt Lake City..... 117	
San Francisco..... 117	
London..... 117	
Paris..... 117	
Quotations:	
Boston..... 118	
Ind. and Coal..... 118	
Colo. Springs..... 118	
New York..... 118	
Pittsburg..... 118	
St. Louis..... 118	
San Francisco..... 118	
Baltimore..... 118	
Miscellaneous..... 118	
London..... 119	
Paris..... 119	
Mexico..... 119	
Valparaiso..... 119	
Shanghai..... 119	
Denver..... 119	
Philadelphia..... 119	
Salt Lake City..... 119	
Aspen..... 119	
Helena..... 119	
Duluth..... 119	
Chemicals and Minerals:	
New York..... 115	
Liverpool..... 116	
Dividends..... 117	
Assessments..... 117	
Mining Stocks:	
New York..... 116	
Boston..... 116	
Chicago..... 116	
Cleveland..... 116	
Colo. Springs..... 116	
Mining Co's:	
List of..... 120	
Advt. Index..... 17	
Advt. Rates..... 18	

In the Budget recently published by the Spanish Minister of Finance, the amount and terms of the advance made by the house of Rothschilds are set forth. The advance is £3,562,000 redeemable in 30 years by annual payments of £220,000 each. The interest is fixed at 5 per cent. The concession for the quicksilver mine of Almaden is prolonged for 30 years after the four years of the old concession still to run. During the contract the Rothschilds will be the sole agents authorized to sell quicksilver, and they will receive at least 45,000 flasks a year. Their sale commission is to be 1 1/2 per cent.

A very important case has just been decided in favor of a once-famous mine, viz., the Iron-Silver, in Leadville, Colo. Some of the most valuable ground, called the Sierra Nevada, claimed under the Coy's titles, was cut off by an injunction being obtained by other claimants about seven years ago. This wearisome litigation has gone on till now, and the Supreme Court has ordered the restoration of the property in dispute to the Iron Silver Company, which up to April, 1889, had been worked so profitably as to distribute \$3,500,000 in dividends up to that date, and being more dead than alive since, has paid nothing to stockholders during the litigation.

It may be that the intense competition between the large smelting establishments in this country is not very beneficial to that industry itself, with the exception that each of the competitors who hopes to live must, in self-defense, study and adopt every possible economy. The benefit, however, to the mining industry in consequence, both at home and abroad, is very marked and appreciated in most quarters. A case in point has recently come to our notice, in which, only a few years ago, silver ore, which went from the property in question in Peru to Europe exclusively, and the owners were charged about \$26 treatment a ton, is now being shipped to smelting works in the United States, where the charge for treatment is about \$6 a ton.

In spite of the continued low prices of spelter and the closing down of a considerable part of the smelting furnaces, mining work continues to be actively carried on in the zinc-lead district of Kansas and Missouri. The prospectors and miners do not seem to be discouraged, and we hear of new openings and of the extension of old mines at many points throughout the district. The price of zinc ore is low, however, and at the Joplin ore market this week the highest price paid for ore was \$22 per ton, the average for all sold being \$20 per ton. This shows a decided fall during the present year. In March last the highest price was \$23, and the average \$21 per ton, while a top rate of \$23.50 and an average of \$22 were recorded at the opening of the year.

Nothing more has been heard recently of exports of spelter. At present comparative prices zinc could be sent to Europe and sold at a small profit to our producers; but any large shipments would certainly break down to the price, probably to a point where the profit would disappear.

The hope of the zinc producers is not in exporting their surplus of metal, but rather in promoting its extended use here. The present prices certainly favor this, and no increase seems to be probable for some time to come.

The preliminary work on the Mount Lyell Copper Mine in Tasmania has been at last so far completed that the first furnace was started on July 10th, and regular returns are expected hereafter. The first week showed from 420 tons of ore a total of 80 tons of matte, containing 17.2 tons of copper, 1,840 ounces silver and 80 ounces gold, the average per ton of ore having been 4.1 per cent. copper, 4.38 ounces silver, and 0.02 ounces gold; which compares with assays of 4.5 per cent. copper, 3.75 ounces silver, and 0.1 ounce gold per ton.

Great things are expected from this mine, owing to the very favorable reports made by experts some time ago. The company has shown its faith in these reports by expending a large amount of money in opening the mine and in building a railroad 40 kilometers long to connect it with the sea coast. Still further expenditures are to be made on development, though the returns are now beginning to come in, and may be expected to increase.

The opening of the Mt. Lyell will give a great impulse to mining in Tasmania, which has not been increasing in recent years; partly because of the great difficulty of prospecting in the dense forest which covers most of the interior of the island, and partly because most of its mines require for their proper development a large expenditure of capital, which has been provided in the Mt. Lyell case, but has been difficult to obtain in many others.

The great Broken Hill Proprietary Mine in New South Wales continues to make a very good showing as to the extent and value of its returns. For the half-year ending with May the returns, as cabled from Australia, in advance of the full report, show a total product in round figures of 4,150,000 ounces silver and 34,200,000 pounds lead, the average tenor of the 218,000 tons of ore worked having been seven per cent. lead and 19

ounces silver. The total cost of mining and reduction was \$11.04 per ton, and as the receipts from product were \$16.44, the average net earnings were \$5.40 per ton worked. The total net earnings of the company for the half-year were \$1,224,570, enabling it to pay the usual dividends and to carry a considerable sum to the reserve fund, which now amounts to \$2,792,395, no less than \$1,500,000 of this consisting of actual cash in hand or good securities owned.

The company is still working on its remaining stock of oxidized ores, the low-grade sulphides being left until the completion of the great concentrating plant, which will be finished in about five months. The future of the mine depends on the success of this plant and of the treatment of the concentrates from the sulphide ores; though the reserves of oxidized ore have proven much larger than was expected two years ago, owing to the discovery of new bodies of this ore in the mine. The working on the open-cut system continues, and very large reserves of the sulphide ores are already developed. A description of the present methods of working was given in the *Engineering and Mining Journal* of July 25th, but we may repeat briefly that mining is now carried on by an immense open cut which is to run through the property, taking the place of the old shafts.

#### The British Iron Trade.

The British iron trade, which showed a substantial advance in production and sales during 1895, now reports a still further gain during the first half of the current year. The total production of pig iron last year was 7,895,695 long tons, showing an increase of 530,936 tons over 1894, and reaching very nearly the highest point ever reported. Since last January the number of furnaces in blast has risen from 330 to 375 and at the opening of July the production was at the rate of 8,500,000 tons yearly. The actual output for the first half of the year has not yet been fully reported, but an approximate estimate puts the total for the six months at 4,100,000 tons, or nearly 300,000 tons more than in the corresponding half of last year. The gain seems to have been pretty evenly distributed, except that the Scotch furnaces have had a slightly larger proportion of it than those of the other districts.

The increased supply of raw iron has not been all taken up, however, and the stocks of pig iron unsold on July 1st amounted to 1,350,000 tons, which is something like 250,000 tons above the usual quantity. At the same time this accumulation does not appear to disturb the iron-masters, and there is no disposition to blow out any of the active furnaces. This may be due in part to the unsettled condition of the coal trade and to the belief of many furnace owners that it will be good policy to have a large stock of pig iron on hand in case of a repetition of the great strike of three years ago. At present the prices of coal are unusually low, and advantage is taken of this to turn out iron more cheaply than may be possible a few months hence.

While there has been an appreciable increase in the demand for raw iron, the activity of the furnaces, the knowledge that stocks were increasing, and the fact that a number of the unemployed furnaces were ready to blow in at any time, have combined to prevent any permanent rise in prices; though there was a sharp advance in the spring, it was soon seen to be unnecessary, and quotations dropped again nearly to the point where they were before. The following table shows the price of the leading brands in January, on the March rise and at the opening of July:

Kind.	January.	March.	July.
Scotch pig.....	\$10.85	\$11.46	\$11.60
West Coast Bessemer.....	11.10	11.30	11.24
Cleveland forge.....	8.74	9.30	8.88

A more decided confidence and activity have been manifest in the steel and finished iron trades so far this year than at any time since 1891, and the British iron market shows just now a most marked contrast to our own. Almost all kinds of finished products are in demand, and prices are fairly good and firmly maintained, though there has been no considerable advance. This is doubtless due, as with pig iron, to the knowledge that there is still a considerable reserve producing capacity which is ready to start in case a rise in prices offers the opportunity for doing so profitably.

In one department there has been a marked advance, however, and steel rails which were selling a year ago for \$17.40 per ton at mill are now quoted at \$21.60 to \$22.20. This is due to the increased demand for rails for new lines in various parts of Europe and Asia, and especially in British India, where railroad extension on a large scale has been undertaken by the Government.

The weak spot in the British trade is found in the Welsh tinplate trade, which is in a state of partial collapse, with no prospect of improvement, because a large part of the market has been cut off by the growth of the tinplate industry in this country.

Upon the whole, however, the British iron trade is just now in sounder condition than it has been since the Baring incident, with every prospect of an excellent year ahead.

#### NEW PUBLICATIONS.

THE NEW REPUBLIC: A DRAMATIC NARRATIVE OF THE PRESENT HOUR. By Halsey Ney, New York; the Republic Publishing Company. Pages 60; illustrated. Price 10 cents.

Discussions of the financial question are to be expected in all forms and on all sides, and everyone seems to be reading them, selecting according to his opinions and his mental range. The little book before us is a very well-written attempt to popularize its side of the question. It is in the form of a story, with character and incident enough to give it connection, while at the same time opportunity is taken to bring in solid arguments to support the author's views. It is entertaining and will doubtless be read by thousands who have neither time nor disposition to study the more elaborate treatises which the money campaign has brought out. The reader who wants—as everyone should do—to get the arguments on both sides should certainly read this one.

The book is the first of a series which is to be issued on the prominent topics of the day. Should the following numbers be as well written as this opening one, they will have a wide circulation.

#### CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested. Letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

#### Wolfram.

Sir: If there is a reliable market for wolfram please give value at ship's side in New York per ton of wolfram with 50% of tungstic acid, and the additional value per unit of tungstic acid above 50% to, say, 75%. Also the approximate annual quantity wanted in America, and whether the demand is likely to be lasting. Also the amount of objectionable minerals allowable in the ore, and any further information available.

COQUIMBO.

#### Bismuth.

Sir: Please give value per pound of bismuth ore that would give from 50 to 68% of metal, delivered in New York, payment to be in gold. Also the probable quantity that would be taken annually at price given. The ore is probably bismuth ochre. Any further information that would be useful to dwellers in a remote locality would be acceptable. The value to be for 50% ore, and additional value per unit above and below.

IQUIQUE.

#### Afterdamp in Coal Mine Explosions.

Sir: Please excuse me if I send a short communication concerning the explosions in coal mines.

Dr. John Haldane, of England, has found that the afterdamp in mines following an explosion consists of monoxide or half carbon and half oxygen. This afterdamp will not be found in such proportion after all explosions. The percentage of carbon and oxygen depends entirely on the composition of the air exploded. Supposing this air consisted of a mixture of more oxygen than carbon, then the afterdamp will have less percentage of oxygen than carbon. If such explosive mixture consists of more carbon than oxygen, which is usual in coal mines, and this happens to explode, then the after-air will have more oxygen left, as there was not enough explosive power to use up the oxygen. But the more the explosive mixture consists of oxygen the greater is the destructive power, and the more destructive of life is the afterdamp.

To illustrate this, I refer to the generating of gunpowder. This is bound to the oxygen with the carbon (saltpeter with charcoal) into one mass in an artificial way. The more perfect this is, the better will be the explosive power therein.

WILLIAM BORRMANN.

NORFOLK, July 25, 1896.

#### Gold Standard for Costa Rica.

Sir: The following is the measure adopted and put into effect in Costa Rica, on July 3d, which provides that the silver money of foreign countries which was in actual circulation in Costa Rica at the time it was promulgated may be presented at the National Treasury during the following 30 days for exchange for national currency. After the expiration of that period the privilege of exchanging such foreign silver coin will be refused. During the 30 days all importations of silver money are prohibited in order to prevent parties from profiting at the government's expense by presenting such coin for exchange. Any imports of silver specie arriving during the period will either be exported or detained at the respective custom houses.

The Bank of Costa Rica is allowed to retain the foreign silver money now in its possession as a part of its specie reserve for a limited time.

CENTRAL AMERICAN.

#### The following is a translation of the decree:

The Constitutional Congress of the Republic of Costa Rica, considering it to be for the economical interests of the country to prevent, as far as possible, any increase in the silver coin of the country on account of its fluctuating value, which renders it difficult by legal enactment to fix a rate at which the silver coins of other nations shall be received in the republic, and also difficult for the government to establish a new monetary system on a more solid basis, decrees as follows:

Article 1.—Pending the adoption of a new monetary system no national silver coin shall be minted.

Art. 2.—No foreign silver coin of whatever nature or alloy shall be a legal tender.

Art. 3.—All foreign silver coins in circulation in the republic must be presented to the General Administration of Revenues within 30 days of the date of this decree for exchange into national money at the legal rate under which they now circulate. After 30 days the circulation of such coins will not be lawful.

Art. 4.—After the date of this decree no foreign silver money will be received in payment of duties, nor will it be paid out by the government.

Art. 5.—During the 30 days fixed by Art. 3 the introduction of foreign



silver coins into the country is prohibited. Should any arrive at any port, it shall be reshipped or remain on deposit at the custom house, at the option of the importer.

Art. 6.—Foreign silver coins exchanged under the provision of Art. 3 shall be exported and sold in foreign countries on account of the public Treasury.

Art. 7.—This decree abrogates Arts. 486 and 489 of the Fiscal Code and all other laws conflicting with it.

Art. 8.—This decree shall take effect from the date of its issue.

Given at the Hall of Congress, National Palace, San Jose, this July 3d, 1896, and executed on the same date by the President.

RAFAEL IGLESIAS.

ON THE PREPARATION AND PROPERTIES OF PURE MOLYBDENUM.\*

By H. Moissan.

The author has succeeded in obtaining metallic molybdenum in fused masses practically free from carbon by the following method: Pure molybdate of ammonia finely powdered is heated in quantities of 1 kg. in a covered clay crucible for one and a half hours in a Perrot gas furnace. The ammonia is volatilized, leaving bluish-gray powder of molybdic acid (MoO<sub>3</sub>) in the crucible, the yield being from 76 to 78% of the weight of the salt treated. The oxide so obtained is mixed with sugar-charcoal in quantity insufficient for complete reduction; 800 of oxide to 30 of carbon. The mixture, packed into a carbon crucible, is then subjected to the calorific action of the arc produced by a current of 600 amperes at 60 volts for a period of six minutes, care being taken to prevent complete fusion of the metal, so as to keep a layer of solid material in contact with the crucible, which would be rapidly attacked if the charge was completely fused. Under these conditions the metal may be kept perfectly free from carbon, and more than a kilogram may be easily obtained in an hour. The analyses of four samples gave:

Molybdenum.....	99.98	99.37	99.89	99.78
Carbon.....	0.00	0.01	0.00	0.00
Slag.....	0.13	0.28	0.08	0.17

When obtained by this method molybdenum is a tolerably soft metal, can be easily filed and polished, is malleable when hot, and does not scratch glass. Its specific gravity is 9.01. If a fragment is bedded in charcoal powder and heated for several hours to a temperature of about 1,500° C., cementation ensues, a small quantity of carbon is taken up and the metal becomes harder than glass. The cemented metal, when heated to 300° C. and chilled in cold water, becomes brittle and so hard that it scratches quartz. It is but slightly oxidizable in the air at temperatures below a dull red heat, and becomes colored on the surface like steel. At about 600° C. it begins to oxidize, is converted into molybdic acid, which is volatile, so that the mass of metal may entirely disappear without melting. The action of oxygen is similar but more rapid, so that combustion takes place with vivid incandescence.

Carbide of Molybdenum.—When the reduction of the oxide in the electric furnace is effected with excess of carbon, substances containing carbon, both in combined and graphitic condition, as in cast iron, are readily obtained. Their density varies from 8.6 to 8.9. When saturated with carbon the metal is more fusible than pure molybdenum and is intensely hard; but when the proportion of carbon is only 2½ per cent. it is difficult to break it with a hammer. The point of saturation seems to correspond to 5.88%, or the formula Mo<sub>3</sub>C. This runs very liquid and may be easily cast into ingots from 8 to 10 kilograms weight. The liquid metal dissolves carbon very readily, but the excess above this quantity separates out on solidification as graphite; but with less than 5% no graphite is found in the metal, which is white, as shown in the following analysis.

	White metal.			Gray metal.	
Molybdenum.....	95.83	.....	.....	92.46	.....
Carbon combined.....	3.04	3.19	2.54	4.90	5.50
“graphitic.....	0.00	0.00	0.00	0.00	1.71
Slag.....	0.74	0.53	0.62	.....	.....

The carburized metal, like cast iron, may be rendered superficially malleable by closely covering it with powdered oxide of molybdenum and heating for several hours; this produces a skin of the pure metal, which can be filed and polished. The author considers this decarburization of the solid metal at a temperature far below its melting point to be due to the permeability of the metal to the vapor of molybdic acid. The volatility of its oxide seems likely to render molybdenum of value as a deoxidizing agent in steel works in the place of manganese or aluminium; for although the latter is an energetic agent, it has the inconvenience of giving a solid and infusible oxide (alumina), while the molybdenum oxidizing would produce a stirring action in the bath, leaving nothing behind, or, if in slight excess, it would have no effect on the malleability and tempering properties of the steel. For this purpose, however, the solid metal would be necessary, as that in a pulverulent form produced by reduction of the oxide with hydrogen is useless, as it merely burns to waste on the surface of the bath without affecting the metal below.

Manchester Canal Traffic.—The average monthly tonnage of the Manchester Canal was 57,000 tons in 1894, 90,000 tons in 1895 and 110,000 tons in the first half of 1896. The tonnage for last June was 7,000 better than in any previous month of the canal's history. There are now 35 regular lines of steamers, with resident agents in Manchester, using the canal. It is announced that arrangements have been completed for regular frequent sailings of steamers from New Orleans and Galveston to Manchester from the beginning and throughout the coming season, and Manchester expects to receive direct a considerable quantity of cotton. Except a fortnightly Lampert & Holt steamer from New York there is not yet any regular line of steamers from an American port using the canal.

\* Bulletin de la Societe l'encouragement de l'Industrie nationale, June, 1895.

STANDARD SPECIFICATIONS FOR STRUCTURAL STEEL.

The Association of American Steel Manufacturers, which is a voluntary association including nearly all the steel mills in the country, and which was formed for technical purposes chiefly, has, after much consideration, adopted standard sections for beams, channels, angles, etc., in the hope of securing uniformity in work. For the same reason the association has also adopted specifications governing the chemical and physical properties of structural and special steel and rivets. While these are not absolutely imposed upon buyers, the recommendation of the association will certainly have great weight and will do much toward securing general recognition of their provisions.

We may mention that the association has strongly endorsed the bill to secure the general adoption of the metric system of weights and measures.

We give the specifications below in full, as their importance requires:

STRUCTURAL STEEL.

Process of Manufacture.—1. Steel may be made by either the open-hearth or Bessemer process.

Test Pieces.—2. All tests and inspection shall be made at place of manufacture prior to shipment.

3. The tensile strength, limit of elasticity and ductility shall be determined from a standard test piece cut from the finished material and planed, milled or turned parallel; or, if preferred, the form of test piece given under section 2 for sheared plates may be adopted. The elongation shall be measured on an original length of 8 in., except when the thickness of the finished material is ½ in. or less, in which case the elongation shall be measured in a length equal to 16 times the thickness, and except in rounds of ½ in. or less in diameter, in which case the elongation shall be measured in a length equal to eight times the diameter of section tested. Two test pieces shall be taken from each melt or blow of finished material, one for tension and one for bending.

3a. Material which is to be used without annealing or further treatment is to be tested in the condition in which it comes from the rolls. When material is to be annealed or otherwise treated before use, the specimen representing such material is to be similarly treated before testing.

4. Every finished piece of steel shall be stamped with the blow or melt number, and steel pins shall have the blow or melt number stamped on the ends. Rivet and lacing steel and small pieces for pin plates and stiffeners may be shipped in bundles securely wired together, with the blow or melt number on a metal tag attached.

5. Finished bars must be free from injurious seams, flaws or cracks, and have a workmanlike finish.

GRADES OF STRUCTURAL STEEL.

Chemical Properties.—6. In structural steel for buildings, train sheds and similar structures the phosphorus shall not exceed 0.10%.

In structural steel for railroad bridges the phosphorus shall not exceed 0.08%.

Physical Properties.—7. Structural steel shall be of three grades, rivet, soft and medium.

Rivet Steel.—8. Ultimate strength, 48,000 to 58,000 lbs. per square inch. Elastic limit, not less than one-half the ultimate strength. Elongation, 26%. Bending test, 180° flat on itself, without fracture on outside of bent portion.

Soft Steel.—9. Ultimate strength, 52,000 to 62,000 lbs. per square inch. Elastic limit, not less than one-half the ultimate strength. Elongation, 25%. Bending test, 180° flat on itself, without fracture on outside of bent portion.

Medium Steel.—10. Ultimate strength, 60,000 to 70,000 lbs. per square inch. Elastic limit, not less than one-half the ultimate strength. Elongation, 22%. Bending test, 180° to a diameter equal to thickness of piece tested, without fracture on outside of bent portion.

Pin Steel.—11. Pins made from either of the above-mentioned grades of steel shall, on specimen test pieces cut at a depth of 1 in. from surface of finished material, fill the physical requirements of the grade of steel from which it is rolled for ultimate strength, elastic limit and bending, but the required elongation shall be decreased 5%.

Eye-Bar Steel.—12. Eye-bar material, 1½ in. and less in thickness, made of either of the above-mentioned grades of steel, shall, on test pieces cut from finished material, fill the requirements of the grade of steel from which it is rolled. For thicknesses greater than 1½ in. there will be allowed a reduction in the percentage of elongation of 1% for each ½ in. increase in thickness to a minimum of 20% for medium steel and 32% for soft steel.

Full Size Test of Steel Eye-Bars.—13. Full size test of steel eye-bars shall be required to show not less than 10% elongation in the body of the bar, and tensile strength not more than 5,000 lbs. below the minimum tensile strength required in specimen tests of the grade of steel from which they are rolled. The bars will be required to break in the body, but should a bar break in the head, but develop 10% elongation and the ultimate strength specified, it shall not be cause for rejection, provided not more than one-third of the total number of bars tested break in the head; otherwise, the entire lot will be rejected.

Variation in Weight.—14. The variation in cross-section or weight of more than 2½% from that specified will be sufficient cause for rejection, except in cases of sheared plates, which will be governed by the permissible variations mentioned under sections 8 and 9 for sheared plates.

SPECIAL OPEN-HEARTH PLATE AND RIVET STEEL.

Test Pieces.—1. All tests and inspections shall be made at place of manufacture prior to shipment.

2. The tensile strength, limit of elasticity and ductility shall be determined from a standard test piece cut from the finished material and planed or milled to the following shape:

The test piece, cut from a coupon at least 2 in. wide, is of reduced section, and 1½ in. in width for a length of at least 9 in.; the thickness is the same as that of the plate represented by the piece. The radius of the fillet is from 1 to 3 in. and the length of each end gripped by the machine about 3 in. When desired the 9 in. between bottom of fillets is to be marked with light prick punch marks at distances 1 in. apart, so as to give a length of 8 in. centrally located between fillets.

The elongation shall be measured on an original length of 8 in., except

when the thickness of the finished material is  $\frac{1}{4}$  in. or less, in which case the elongation shall be measured in a length equal to 16 times the thickness; and except in rounds of  $\frac{1}{2}$  in. or less in diameter, in which case the elongation shall be measured in a length equal to eight times the diameter of section tested. Four test pieces shall be taken from each melt of finished material, two for tension and two for bending.

2a. Material which is to be used without annealing or further treatment is to be tested in the condition in which it comes from the rolls. When material is to be annealed or otherwise treated before use, the specimen representing such material is to be similarly treated before testing.

3. Every finished piece of steel shall be stamped with the melt number. Rivet steel may be shipped in bundles securely wired together, with the melt number on a metal tag attached.

GRADES OF PLATE AND RIVET STEEL.—CHEMICAL AND PHYSICAL PROPERTIES.

**Extra Soft Steel.**—4. Ultimate strength, 45,000 to 55,000 lbs. per square inch. Elastic limit, not less than one-half the ultimate strength. Elongation, 28%. Cold and quench bends, 180° flat on itself without fracture on outside of bent portion. Phosphorus and sulphur not to exceed 0.04%.

**Fire-Box Steel.**—5. Ultimate strength, 52,000 to 62,000 lbs. per square inch. Elastic limit, not less than one-half the ultimate strength. Elongation, 26%. Cold and quench bends, 180° flat on itself, without fracture on outside of bent portion. Phosphorus and sulphur not to exceed 0.04%.

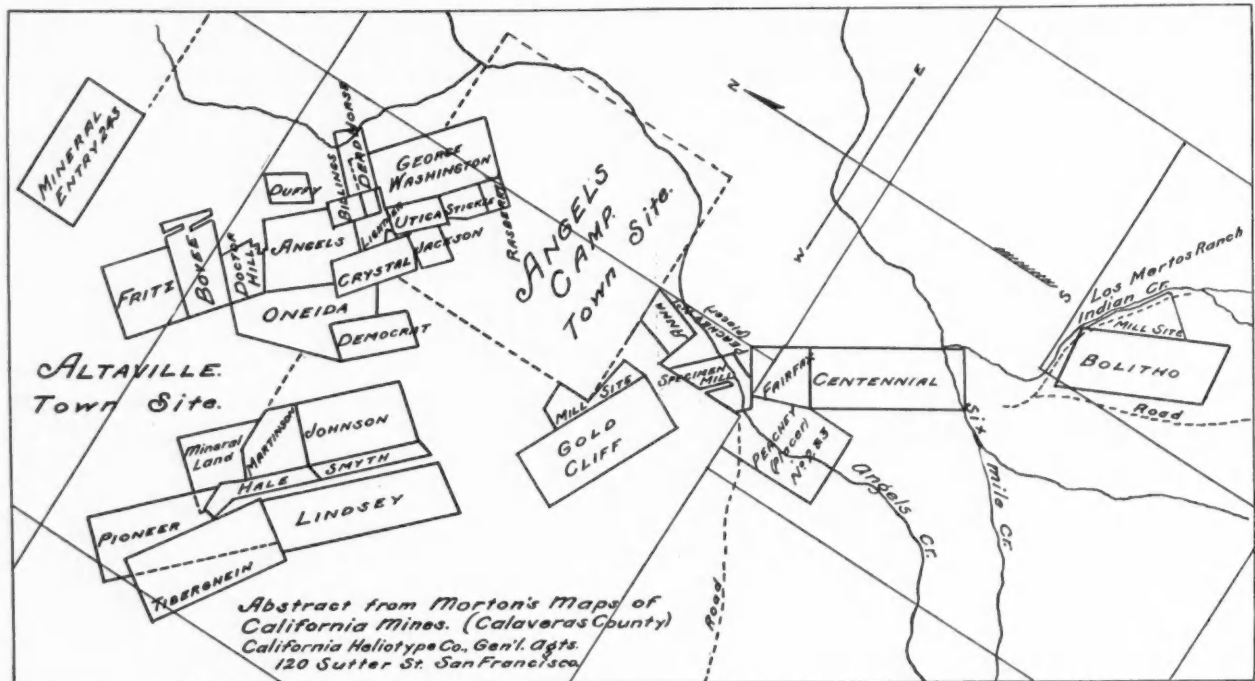
**Flange or Boiler Steel.**—6. Ultimate strength, 52,000 to 62,000 lbs. per square inch. Elastic limit, not less than one-half the ultimate strength. Elongation, 25%. Cold and quench bends, 180° flat on itself, without

ANGELS CAMP, CALIFORNIA, AND VICINITY.

Written for the Engineering and Mining Journal by H. L. Tyler.

One of the most flourishing mining towns in the West is that of Angels Camp, while it ranks at the same time among the oldest of the pioneer settlements of the Argonauts, who led the rush for the newly discovered gold fields of California in the days of 1849. Ever since then without intermission the town has held its own, while so many others of its contemporary communities have succumbed to the ravages of decay consequent upon the vicissitudes of an industry so variable in its phases and so susceptible of change. First established by the placer miner, it has outlived the day when this system of mining could be pursued at a profit, to develop in a greater degree of prosperity with the opening up of the quartz deposits, the matrix of the auriferous gravels so plentifully distributed at one time over the adjacent territory. As it was then, so Angels continues to-day as the distributing center for the supplies drawn by the numerous mining districts scattered throughout the county, along the course of the great "mother lode." Within easy connection with San Francisco, distant by rail and stage 147 miles, it is in close touch all the time with the world at large, while the natural facilities afforded by the county in the way of wood and water are unexcelled. Angels Camp is situated at an elevation of 1,650 ft. above the sea level. Carson Hill, three miles to the south, has an elevation of 2,250 ft., and Chapparral Hill, on the other side of the divide, 2,100 ft.

If for no other reason, Angels Camp would be famous as the site of one of the greatest mining enterprises of the age. Located almost in the heart of the thriving little town is the celebrated Utica mine, which for years



ANGELS CAMP, CALAVERAS COUNTY, CAL., AND VICINITY.

fracture on outside of bent portion. Phosphorus not to exceed 0.06%. Sulphur not to exceed 0.04%.

**Boiler Rivet Steel.**—7. Steel for boiler rivets shall be made of the extra soft quality specified in paragraph No. 4.

**Allowances in Rolling Sheared Plates when Ordered by Weight per Square Foot.**—8. Plates  $12\frac{1}{2}$  lbs. or heavier, when ordered to weight, shall not average more variation than  $2\frac{1}{2}\%$ , either above or below the theoretical weight.

Plates from 10 to  $12\frac{1}{2}$  lbs., when ordered to weight, shall not average a greater variation than the following: Up to 75 in. wide,  $2\frac{1}{2}\%$ ; 75 in. and over, 5%.

**Tables of Allowances for Overweight for Rectangular Plates when Ordered to Gauge.**—9. For all plates ordered to gauge there will be permitted an average excess of weight over that corresponding to the dimensions on the order equal in amount to that specified in the following tables:

Thickness of plate, Inch.	PLATES $\frac{1}{4}$ INCH AND HEAVIER.		
	Up to 75 in. Per cent.	75 to 100 in. Per cent.	Over 100 in. Per cent.
$\frac{1}{4}$	10	14	18
$\frac{5}{16}$	8	12	16
$\frac{3}{8}$	7	10	13
$\frac{7}{16}$	6	8	9
$\frac{1}{2}$	5	7	9
$\frac{5}{8}$	$4\frac{1}{2}$	$6\frac{1}{4}$	$8\frac{1}{2}$
$\frac{3}{4}$	4	6	8
Over $\frac{3}{4}$	$3\frac{1}{2}$	5	$6\frac{1}{2}$

Thickness of plate, Inch.	PLATES UNDER $\frac{1}{4}$ INCH IN THICKNESS.	
	Up to 50 in. Per cent.	50 in. and above. Per cent.
$\frac{1}{8}$ up to $\frac{1}{4}$	10	15
$\frac{3}{16}$ up to $\frac{1}{4}$	$8\frac{1}{2}$	$12\frac{1}{2}$
$\frac{1}{4}$ up to $\frac{3}{8}$	7	10

It is provided that no plate will be rejected if it is within 0.01 in. less than ordered thickness.

past has returned from two to three millions in gold annually. Incorporated with this property are several other locations, each of which has already earned a record as productive mines, the control being vested in Col. Alvinza Hayward, the estate of the late W. S. Hobart and Charles D. Lane, all residents of San Francisco. There are now three shafts on the property, sunk to a depth of 1,000 ft., and from one of them a winze is now down an additional 300 ft. in what is known as the Sick's ground, right underneath Angels Creek. The ore at this point, extracted from a big chute dipping to the south, is growing stronger and richer as depth is attained, yielding on an average from \$200,000 to \$300,000 per month. All of these mines are located on the east and middle branches of the "mother lode," the formation in all being the same, the hanging and foot walls being diorite and talcose slate respectively. Three 60-stamp mills are constantly engaged crushing the Utica ores, and a chlorination plant is in evidence, perhaps the finest of its kind in the world. A water supply is guaranteed for all time by the Union Ditch Company, which furnishes power along a line of flume 45 miles long, running 2,500 in. the year round, and connecting with the north fork of the Stanislaus River. The Utica consumes 25,000 logs per year; these logs are all sugar and yellow pine.

South of the Utica on the east branch of the lode, the Bolitho, a promising property is now being opened up by a Salt Lake Company well provided with the necessary funds to sink on the ledge and exploit it at a good depth. At present the shaft is down 230 ft., with the most favorable prospects.

In the old McCreight mine, once known as the Tryon, lying about three miles southeast of Angels, the shaft is now down 230 ft. in the regular mother lode formation, and a 10-stamp mill is running. The ore, though free milling, carries about 5% sulphurets. This property has recently been placed in London. The claim is a large one, being 450 ft. x 300 ft. and 600 ft. x 625 ft. The shaft is on an incline and a tunnel has also been run in on the vein.

On the Bover mine, another property near Angels, work is active, and a 10-stamp mill is running on a fair grade of ore. The shaft is down 200 ft. West of Altaville the Blair Consolidated is being worked. An immense



deposit of low-grade ore has been opened up in this property, and it stands well in the opinion of experts. The ore carries arsenical and iron pyrites which assay high. A large amount of money has already been extracted from this vein, which is in a slate formation. Some ore running high in free gold is met with at times.

Another celebrated group of mines south of Angels is that known as Chapparral Hill, owned by E. K. Stevenot, of San Francisco. At this point, as in the case of the Rawhide mine of Tuolumne County, the three branches of the "mother lode" unite, the width of solid quartz in the Chapparral property being estimated at 150 ft. No work is being done upon this mine at present, although in the past considerable money has been taken out at various points through tunnels run to intersect the vein.

The adjoining group on Carson Hill immediately across the canon has a historic reputation owing to the immense amount of gold extracted years ago from the old Morgan mine, and the Melones, an extension on the other side of the ridge. Here the "mother lode" crops boldly out, being easily traced to a point where it crosses the Stanislaus River at Robinson Ferry.

A San Francisco company has recently taken up the Melones ground for the purpose of extending the old workings, a tunnel in the old Stanislaus location almost at the base of the hill near the river having been selected for entrance. Recently this tunnel has cut the ledge, which is opening out with promising indications. An English company worked some neighboring ground, known as the Calaveras Consolidated, for some time, but met with poor success, and the property has now reverted to its original owner, who is preparing to take up the work where the foreign investor left off. The ore from this mine contained about one per cent. sulphurets, iron, lead, also azurite and tellurides.

Since the organization of the California Exploration Company by Prince Poniatowski, W. H. Crocker and others, last April, the officers of the company have not been idle. The surveys for the big electric power transmission line from the Mokelumne River to Altaville have been com-

pleted and a contract has been let to the Westinghouse Electric and Manufacturing Company of Pittsburg to erect a plant which it is estimated will, by the aid of water obtained from the Mokelumne River, Speranza Ditch and the Amador Ditch, generate 4,700 H. P. The power thus obtained will be furnished to the different mines located on the mother lode, at such a cheap rate that the owners will be enabled to develop their properties, which, for want of cheap power, have been neglected.

Among the notices in Chinese ancient literature of the use of iron the oldest is in the *Yu Kung*, a most interesting section of the Book of History. It is called, and justly so, by Baron von Richthoven, the oldest national geography of China. The name means the Tribute Roll of Yu, who in the third millennium before Christ was first an active statesman and then himself Emperor. It describes the productions of the nine provinces into which the empire was divided in the time of Yao. The province of Liang, the present Szechuan, is that in which iron is mentioned. Gold, silver and copper are frequently spoken of, but iron only this once. At the time when the people wore skins, grass-cloth and silk, long before the days of cotton dresses and the use of tea as a beverage, in the days of the old civilization, the nation first appears occupied in industrial works of which the aim was to subdue nature and render its products subservient to man. The Chinese were then in the iron age. They had learned to extract iron from the rocks very likely before they entered China, and had thus secured the advantage to be derived from iron in the manufacture of the plough, the harrow and the spade. The original inhabitants understood the art of weaving and agriculture and so also did the Chinese who ruled the country. In B. C. 2300 the country was abundantly fertile and occupied by various races under the sovereignty of the Chinese who came to them with higher knowledge than they before possessed. The waves of Western civilization flowed in upon

THE EARLY USE OF IRON.

pleted and a contract has been let to the Westinghouse Electric and Manufacturing Company of Pittsburg to erect a plant which it is estimated will, by the aid of water obtained from the Mokelumne River, Speranza Ditch and the Amador Ditch, generate 4,700 H. P. The power thus obtained will be furnished to the different mines located on the mother lode, at such a cheap rate that the owners will be enabled to develop their properties, which, for want of cheap power, have been neglected.



CALIFORNIA EXPLORATION COMPANY'S ELECTRIC TRANSMISSION SYSTEM, CALAVERAS COUNTY, CAL.

(Mines marked solid black belong to California Exploration Company.)

If this enterprise is successful, the gold output of Calaveras County will be largely increased by the development of this strip of the mother lode. At the Morgan mine, near the apex of Carson Hill, from which in 1850-51, \$2,800,000 was taken out in gold from a space in the shaft 18 ft. deep and 9 ft. square, the east and middle branches of the mother lode cross each other, and continue south for some miles in this position.

The Iron Rock, also known as the McNear mine, located on the northern slope of Carson Hill, is also looking well. Tunnels are being run on the vein, which is wide and carries free gold. An immensely rich chute of ore has been recently developed. This mine is supposed to be a continuation of the old Carson Hill mine, and is beyond a doubt a continued vein of the Morgan mine.

The Carson Creek mine, at the junction of Carson Creek and the Stanislaus River, is a well-equipped property owned by a New York company. The ore runs high in sulphurets with free gold running as high at times as \$8 per ton. A 40-stamp mill has been erected and enough ore is available to keep it going, although more attention has been given of late to opening up the mine, the intention of the owners being to carry the shaft down 1,000 ft. Some of the sulphurets run very high, those worked in the past assaying over \$300 per ton. The surface improvements and plants are of a superior order, the owners, who are wealthy, sparing no expense in this direction.

North of the Utica, and in the same formation, lies the Thrope mine, with a patented claim 1,000 ft. in length by 400 ft. in width. This mine dates back to the 50's, when the ledge was cut while operating a placer deposit. The shaft is now down about 400 ft., and it is intended to carry

China at successive periods and it was the art of writing which secured to those tribes that possess it a great superiority. This art enabled them to give political unity to the whole country, and to absorb all the population, because it included the power of education. The Chinese as a people are of mixed origin, and it is literature that has welded them into one. In the same passage where iron is first mentioned, steel is also spoken of, and this, too, in the same old geographical treatise above alluded to dating from B. C. 2200. The word is *lou* or *leu* and we are told by native authors that it means "steel." These authors are of the Han Dynasty. The meaning was regarded as certain at that time, that is, about 19 centuries ago. It was an age when literature flourished, and when China sent out warlike expeditions to conquer Cochinchina, Corea and Turkestan. It was a time when the government was so strong as to be able to levy taxes throughout China. Among the taxes of that age those levied on salt and iron were of great importance. The manufacture of iron at that time was quite an ancient matter. The name tells us this; old words become obsolete and new ones take their place. The word *lou* for steel is not without support in the works of Hsuan Ch'ing who lived in the third century before the Christian era. The philosopher speaks of steel under the name of *chü*. This study of Chinese characters soon familiarizes the student with the fact that many characters pronounced *kiau* or *ki* or *ku* are sometimes heard *liau* or *chi* or *lu*. The *lou* of the *Yu Kung* became the word *chü*, steel, in Hsuan Ch'ing. Changes in the language were always proceeding with more or less rapidity. Consequently there is nothing against the probability that it was steel of which the Emperor Yu spoke in the document which has been fortunately preserved to us through such long ages. The province where steel was produced in the third pre-Christian century was Honan and the locality, the Nanyang prefecture. This fact may yet be found useful by those who in the near future may prospect for mines. There does not seem to be the least doubt that *chü* meant steel in the time of the philosopher. By strictly Chinese philology steel was first called *dok*. In Skeat's dictionary our word steel is stated to be derived from *stak*, to resist. The arts of the East and West met in Central Asia. The search for gold and silver spread with commerce both to the east and to the west of the Caspian Sea. Ancient metallurgy and the arts to which it leads, such as the manufacture of the needle, the plow, the cross-bow and arrow, the fishhook, the improved sword and spear;

the construction of suits of armor and cooking vessels of various kinds, spread from one center to the most distant countries.

The primary origin of metallurgy in Central Asia was followed by secondary origins in countries east and west. The Chinese are wrong in saying that their arts were all invented for them by their own sages. They should rather say that their sages saw the advantage there was in foreign arts and taught the people of China to imitate them. Pliny in what he says of Chinese iron strikingly confirms this view of the single origin of the useful arts. He speaks of Spanish and Italian iron, but they were not to be compared in the finer qualities of this metal with the Chinese iron. What Pliny thought of iron was in the form of swords. The Chinese had a way to manufacture steel by mixing a little charcoal with melted iron. Rome was a military monarchy, and for officers in the army of Rome the best possible swords were indispensable. The Chinese in being able to meet the demand of the Roman army had this great advantage. They possess enormous tracts of good ironstone, in many cases magnetic. Ironstone is by its red color and great weight very easily detected. Through the remarkable extent of the ironstone formation throughout China it was quite an easy thing for the Chinese trader with his skins, silk robes and iron swords to outrival his competitors in southern Europe. In fact, he succeeded in this struggle for superiority. It is not expressly said that the Chinese iron went in the form of swords to Rome. But in Chinese books of an early date swords are presented as gifts of honor. They are said to be so hard and sharp that they can cut jade just as easily as if it were clay. In travels to foreign countries, the sword is a convenient article to carry because it can be used in self-defence should bandits attack the caravan. On the whole, then we must read this meaning into Pliny's statement. The superiority of Chinese iron arose from its superior cutting power, and this arose from native blacksmiths having early learned the art of making steel out of the good ironstone abounding in China—*North China Herald*.

#### OFFICIAL REPORTS.

##### Calumet & Hecla Mining Company.

President Alexander Agassiz reports as follows for the year ended April 30th, 1896:

"During the past fiscal year we produced mineral equivalent to 41,981 1775-2000 tons of refined copper; our product in refined copper was 42,776 756-2000 tons. For the previous year our refined copper product was 31,233 414-2000 tons. The price of copper varied from 9¢. to 12c. per lb. It is now 11¢. During the past fiscal year there have been paid five dividends of \$5 each. The Red Jacket shaft has now reached a vertical depth of 4,900 ft. This is the deepest point to which we propose to sink. The rock temperature at this depth is 87.6 Fahr., a temperature which will not interfere with active mining operations. We have purchased from Mr. Thomas F. Mason 120 acres of territory lying adjacent to our lands in the extension in depth of our Hecla shafts No. 6 and 7. We hope that this new territory will prove to contain copper enough to warrant the purchase. The openings of the mine available for stopings amount to 10 years, at last year's rate of production. The openings at the south end of the mine have shown considerable improvement during the past year.

"Great improvements have been made in the general appearance and drainage of the surface immediately around the principal mine buildings and along the line of the lode. In accordance with the original plan an addition has been made to No. 5 Calumet shafthouse to enable us to hoist rock from the ground to the north of the shaft independently of the southern compartment. The old Calumet fire engine house has been removed and its place taken by a new fireproof building situated in a more central position. The only wooden man-hoist building remaining at the date of the last report has been replaced by a brick building. Three officers' houses have been erected during the past year, and a considerable number of our mine dwelling houses have been repaired during the last summer. We have erected two new school-houses, and important additions have been made to others. We have extended our mine line of railroad beyond No. 5 Calumet shaft to the Calumet pond pump-house, so that we can now supply all our boiler houses with coal by rail. Two locomotives have been purchased. The main line of steam pipes has been relaid in a permanent culvert and protected against radiation.

"We have rebuilt No. 4 Hecla shaft, which had been abandoned for several years, and equipped it with a small second-hand hoisting engine, to enable us to carry on independently of our other work the explorations of the lodes parallel to the Calumet lode, from the crosscut at the ninth level, and extending east of the boundary of the company's land. The building for the Superior compressors is completed, the foundations for the engines are laid, and a good part of the machinery is on the ground ready to be erected. The principal loop of the drainage system surrounding the location has been completed, and a number of houses connected with the system. The water distribution remains practically the same as at the time of the last report. We have made a contract for the delivery of wood and coal to our employees, retaining only the supervision of the price—a condition of things which cannot fail to be satisfactory to both the employees and the company.

"An addition has been built to the pumping house at Lake Superior to contain the duplicate pumping engine for the water supply of the mine location; the pump is now in place. An iron standpipe, with a capacity of about 400,000 gal. has been erected at the highest point along the line of the water pipe. This will probably enable us to dispense with pumping during the night shift. The electric light plant house at the mills is completed and fully equipped, and the mills are now thoroughly lighted, as well as all the larger buildings, including the pump-houses, wheel-houses and warehouses.

Treasurer Flagg's statement of assets and liabilities, April 30:

ASSETS.	1896.	1895.
Cash at mine office.....	\$80,125	\$68,404
Cash at New York office.....	15,000	15,000
Cash at Boston office, copper.....	6,216,091	4,782,153
Bills receivable at Boston and mine.....	727,311	707,767
	\$7,038,527	\$5,573,624

#### LIABILITIES.

Drafts in transit.....	\$67,829	\$75,007
Employees' aid fund.....	13,543	5,676
Bills payable at Boston and mine.....	212,217	598,011
Machinery contracts.....	699,193	532,270
	\$992,784	\$1,210,964
Balance.....	\$6,045,744	\$4,362,720

\*Copper at 8½c. and mineral at 4c.

#### Wolverine Copper Mining Company.

The directors of the Wolverine Copper Mining Company present herewith statements showing the operations of the company during the year ending June 30th, 1896.

The product of the mine was 2,325,875 lbs. of mineral, which yielded about 86½%, or 2,011,638 lbs. of refined copper.

The following is a summary of the year's business, viz.:

#### PRODUCTION.

2,011,638 lbs. copper sold for.....	\$218,404.42
Add balance of interest account.....	782.77
Total.....	\$219,187.19

#### COST.

Working expenses at mine as per statement hereafter.....	\$42,731.72
Smelting, freight, cost of marketing copper and all expenses.....	25,525.09
	168,256.81
Leaving a mining profit of.....	\$50,930.38
Less paid for surface right of 40 acres land adjoining mill, and charged to real estate.....	550.00
Making the net gain.....	\$50,380.38
The surplus from previous year was.....	41,299.24
Leaving surplus June 30th, 1896.....	\$91,679.62

The yield of the rock treated during the year shows a marked increase over that of the previous year, and thus the cost of production—per pound of copper—remains about the same, although expenses have been increased by an advance in wages, by more extensive openings underground, and by the expenditure of about \$8,300 on the new shaft (No. 4), which is sinking in the territory acquired last year, but which does not yet contribute toward production.

The extension of this shaft and levels therefrom seems likely to open up the mine to such an extent as to warrant the employment of another head of stamps and doubling the quantity of rock treated. To carry this into effect an output of about 8,000 tons of rock monthly must be made through this shaft, which will require a proper equipment for such service. It is, therefore, important that the development of this end of the mine should be sufficiently extensive to give reasonable assurance of a regular supply of "pay rock" before entering upon so large an expenditure, but it seems probable that in a few months more the openings will warrant the commencement of preparations for such an increase of output.

#### AGENT'S REPORT.

The quantity of rock hoisted during the year was 106,190 tons. Out of this was selected as poor and discarded 21,035 tons, equal to 19,885,775 lbs. mineral, and at 86.49% yielded 2,011,638 lbs. refined copper, showing the contents of refined copper in one ton rock hoisted, to have been 18.94 lbs., and in one ton rock stamped 23.62 lbs.

STATEMENT OF RECEIPTS AND EXPENDITURES OF THE WOLVERINE COPPER MINING COMPANY FROM DATE OF ORGANIZATION TO JUNE 30TH, 1896.

#### RECEIPTS.

From capital stock (60,000 shares at \$10 per share), paid in at organization.....	\$60,000.00
Less paid for real estate, land, buildings, machinery, dwellings, etc.....	550,000.00
	\$60,000.00
From assessments.....	180,000.00
From copper, 510,074 lbs., at 11.30c. (1891-1892).....	56,514.13
From copper, 218,855 lbs., at 10.93c. (1892-1893).....	24,030.20
From copper, 1,611,857 lbs., at 9.83c. (1893-1894).....	158,547.70
From copper, 1,744,070 lbs., at 9.68c. (1894-1895).....	168,763.60
From copper, 2,011,628 lbs., at 10.86c. (1895-1896).....	218,404.42
Interest received.....	1,043.03
	\$857,262.88

#### EXPENDITURES.

Expenses previous to June 30th, 1895.....	\$533,161.22
Real estate (lands purchased).....	61,165.23
Expenditure, June 30th, 1895, to June 30th, 1896.....	168,256.81
	762,583.26
Balance of receipts over expenditures.....	\$91,679.62

#### SUMMARY OF RESULTS.

Rock hoisted.....	106,190 tons
Rock stamped.....	85,155 tons
Product of mineral.....	2,325,875 lbs.
Product of refined copper.....	2,011,638 lbs.
Yield of rock treated, 23.62 lbs., or.....	1.81%
Cost per ton of rock hoisted.....	\$1.314
Cost per ton of rock stamped.....	1.675
Cost per pound of refined copper at mine.....	7.10c.
Cost of smelting, freight and marketing product, including New York office expenses.....	1.26c.
Total cost per pound of refined copper.....	8.36c.

A quite marked improvement in the yield of copper per ton of rock manipulated is shown the year just passed, as compared with former years' operations. The mine as now opened shows considerable good stopping ground available, and prospects for next year's production are quite good.



MATTE SMELTING IN CALIFORNIA.

Written for the Engineering and Mining Journal by Herbert Lang.

(Concluded from page 79.)

THE FURNACE PRODUCTS.

Analyses of ordinary slag :

(1) Cu <sub>2</sub> S.....	0.25	= 0.21% Cu = 39.86% Fe
Fe S.....	7.57	
FeO.....	45.06	
ZnO.....	4.03	
Al <sub>2</sub> O <sub>3</sub> .....	10.72	
SiO <sub>2</sub> .....	30.43	
CaO trace		
MgO.....	0.42	
K <sub>2</sub> O.....	0.30	
Na <sub>2</sub> O.....	2.08	
	100.86	
(2) SiO <sub>2</sub> .....	39.25	
Cu.....	0.43	
(Matte 29.9% Cu)		
(3) SiO <sub>2</sub> .....	31.09	
Cu.....	0.41	

The corresponding matte con-	
tained copper.....	40%
(4) Cu.....	0.47
(Matte 1% Cu)	
(5) SiO <sub>2</sub> .....	30.62
Al <sub>2</sub> O <sub>3</sub> .....	10.76
Fe.....	39.82
(6) SiO <sub>2</sub> .....	40.97
Cu.....	0.61
(7) SiO <sub>2</sub> .....	29.90
Al <sub>2</sub> O <sub>3</sub> .....	10.07
Fe.....	38.95
Zn.....	2.90
MgO + CuO.....	0.57
Cu.....	0.86
(8) Cu.....	1.1

THE GASES.

Samples of gas taken from the top of the charge contained :

	(1)	(2)	(3)	(4)	(5)
SO <sub>2</sub> .....	9.41	12.80	10.00	19.30	3.43
CO <sub>2</sub> .....	10.85	10.81	6.53	6.25	11.57
CO.....	3.27	0.00	0.00	2.50	2.00
H.....	2.55				
O.....	6.00	1.52	4.02	0.60	0.00
N, etc., by					
diff.....	71.52	74.34	79.46	71.95	71.95

\*Delays in the execution of matte analysis prevent the writer from exhibiting the composition of these important products at this writing.

THE COST OF SMELTING.

The work at Keswick was entered upon in the fullest expectation that the results would throw light upon many disputed or misunderstood points in this form of smelting and would go far toward putting the pyritic methods upon a more scientific footing than they have hitherto enjoyed. Especially was it desired by the writer to obtain such data as would enable metallurgists to investigate the "heat balance" so called, of the matting furnace, as that of the iron blast furnace and the open hearth steel furnace have been investigated. Especially desirable, in the opinion of the writer, was it to ascertain the quantity of oxygen which was blown into and utilized in the shaft; the degree of oxidation of the various educts and the composition of the products. These and numberless other questions which have waited a solution for a long time, it was hoped would have at least a partial solution at Keswick. But, owing to the incompleteness of the plant, to the brevity of the time at disposal, to the delays incident to starting, by which the time devoted to smelting was much curtailed, proper attention could not be given to any of these questions and there are only fragmentary results to set before the reader. As regards the costs of smelting, the same causes, added to others, prevent as full an exposition as the reader is entitled to. It will be easily seen that brief trials and short campaigns carried on mainly without reference to expense can hardly afford figures on which to base estimates of a reliable sort. There are, however, sufficient data to enable a reasonable judgment to be formed as to the relative cost of the process as compared with that of other modes of ore reduction.

The smelting of the first 1,500 tons of ore and the concentration of the greater part of the matte product into a matte of 38% copper cost \$7,000 nearly, or about \$4.67 per ton of ore. The final product weighed about 40 tons, and, taken in connection with an amount of first matte which was left over, showed a concentration of somewhat more than 30 tons of ore into one ton of matte. The work improved day by day, the costs getting less, according to ordinary experience in such work, until they became gratifyingly low. The following expense sheet exhibits the cost of the treatment per ton of ore during the last portion of the writer's supervision, when the work had attained the best and cheapest character:

COST PER 24 HOURS (FURNACE DUTY, 131 TONS OF CHARGE).	
Labor.	
9 dump men.....	\$1.25
2 mule drivers.....	1.50
4 charge wheelers.....	1.50
2 feeders.....	2.00
4 " assistants.....	1.50
2 tappers.....	2.65
4 " assistants.....	1.50
2 weighers.....	1.15
2 foremen.....	2.67
Board of above 33 men.....	19.80
Total.....	73.00
Fuel.	
3 cords woods @ \$2.75.....	8.25
6,500 lbs. coke @ \$10.75 per ton.....	31.52
	40.07
Power for blast and lights.....	\$12.65
Blacksmithing and renewals.....	5.00
Assaying.....	3.00
Crushing and sampling, estimated.....	5.00
Proportion of salaries.....	21.00
Interest charges and depreciation losses.....	19.00
(Assumed life of plant, 5 years.)	
Supplies.....	1.25
Miscellaneous.....	4.00
Grand total.....	\$166.97

At this time the charges, or rather half charges, weighed 4,000 lbs. each, and consisted of the following mixture :

Sulphide ore.....	1,400 lbs.
Oxides.....	700 "
Gold quartz.....	500 "
Slags.....	700 "
Matte.....	700 "
Coke.....	100 "
Wood.....	75 to 150 "

Sixty-five such charges were smelted in a day of 24 hours, aggregating 131.62 tons of charge (exclusive of fuel), of which 84.5 tons were ore. The cost per ton of mixture was therefore \$1.26, and per ton of ore, \$1.97. The amount of matte produced from such a charge was about one-fourth of the weight of the sulphides, plus two-thirds the weight of the matte charged. That is to say, the sulphides were concentrated about four into one, while the matte was concentrated three into two. In one particular case where 30,000 lbs. of 12% matte and 66,000 lbs. of 6% sulphides were fed, the resulting matte weighed 40,000 lbs., and assayed 18%. The matte concentration would therefore be one and a half into one, and that of the pyrites three and two-thirds into one. A charge made up as the preceding, largely of slag and matte, proved under the circumstances more economical to smelt than one from which the matte especially is excluded; for although the sulphides alone were susceptible of concentrating in a higher ratio, say of five or six into one, the working of the furnace was much impeded, and the secondary advantage of the enrichment of the first matte was lost. Recharging the matte necessarily entails volatilization and other losses, and its useful effects upon the furnace bottom diminish with the increased copper contents; so that a useful practice at one works might prove detrimental at another.

On poor ores a rate of concentration of four into one does not produce a copper matte fitted for shipping unless the precious metals predominate largely, nor for such a process as bessemerization, which as practiced ordinarily requires a copper content of at least 40%. It follows that the matte needs to be brought up higher by a second concentrating operation, which is carried on handily in the same furnace. The writer prefers to break the matte into pieces of 10 lbs. weight or thereabouts, and feed these into the furnace along with pyrites "fines," a substance that is prejudicial when not accompanied by a large proportion of coarse materials to maintain the porosity of the mixture. With proper treatment the slags are as free from copper as those produced by the ordinary ore smelting, and are discarded at once. A typical concentration charge as smelted at Keswick consisted of :

Matte.....	2,100 lbs.
Sulphides ("fines").....	350 to 700 "
Quartz.....	600 "
Coke.....	100 lbs.

Such a mixture melts at about the same rate as the ore charge and enriches the matte two into one, but with rather more difficulty than in the case of the ore charge, the reason being beyond a doubt the lack of blast. Similar charges have been treated in other works with a higher concentration, the pressure of wind being several times greater. The writer cannot speak with entire certainty in the matter, but it is his impression that an enrichment of two or possibly three into one represents the limit of good work in this line. And as to ore mixtures, a concentration of five into one with copper sulphide ores appears to be about the limit with the light blast, and probably six or eight with a higher wind pressure; though this would depend largely upon the sulphur contents.

As a large proportion (from 30 to 40%) of the concentration charge consists of ore, it follows that the beneficial effects of the melting are not confined to the matte alone, and in assessing the cost of the second fusion it is proper to divide it among all the ore treated in both fusions. Thus the expense per ton becomes considerably less than it would otherwise be. There will probably be a sufficiently high concentration in carrying out this double treatment to fit the final product for the market, but if there should not, it is feasible to resmelt the second matte, producing an enriched third matte, which can be done at a still decreased cost, because the quantity to be operated upon diminishes with each fusion. These repeated fusions of the matte, constituting a process of gradual enrichment, as distinguished from a single initial fusion with very high concentration, would appear to be wholly disadvantageous; it would be urged against it that the matte, with its contents of valuable metals, is exposed to volatilizing influences which must waste the metals, certainly the silver, and possibly the gold and copper, and to the inevitable loss by handling, breaking, etc. Added to these is the cost of resmelting, which is a positive expense, notwithstanding the minute consumption of fuel. On the other hand, we find that the lower degree of concentration and subsequent fusion conforms best to the low pressure of blast, which is an economy, inasmuch as the power required (and consequently the cost) for blowing a given amount of air is doubled with the doubling of the pressure, and also that the production of flue dust is a function of the pressure, increasing with it, or very possibly with a higher power, as the square or the cube, although the writer does not pretend to say that there is any mathematical relation between the intensity of blast and the quantity of dust formed. The slags of the concentration charges were as clean as those of the ore charges. In regular work the copper contents will doubtless average below one-half per cent. copper, and very likely will go as low as three-tenths. The cleanest specimen analyzed showed but two-tenths, which is remarkably free of metal, the more so as the slag contains iron as its principal base. Those who advocate the employment of lime in pyritic charges will do well to consider the above analysis.

The writer does not contemplate nor advise the use of the very large proportions of matte and especially slag in the ore smelting, as carried on, for they would be unnecessary under other conditions, and were used partly because they were on hand and partly for their utility in assisting the smelting of the difficult pyrites. The resmelting was very much overdone. Under ordinary circumstances he would use a smaller proportion of matte, and only that slag which for itself required resmelting. The resmelting of the first matte furnishes an excellent means of getting rid of the fine-grained pyrites, which are so objectionable in the blast furnace when not accompanied by a great deal of coarse material. What the cost per ton of ore for the subsequent smeltings was could not be ascertained. It probably amounted to 50c. per ton, which would bring the whole cost up to about \$2.50, as the cost of producing a 40% matte from quite poor ores.

It is impossible to say what the percentage loss of copper was, but it must have been heavy, notwithstanding the clearness of the slags, for the charge carried something less than 2% of that metal as a rule.

There is, of course, ample room for improvement in the work at Keswick, as the experienced reader will have noticed, the improvement taking the direction especially in the matter of increased practice and skill, increased blast and the substitution of automatic devices to do away with

the laborious handling of materials. The amount of foul slag can be reduced by simple means and, if ore of a sufficiently high grade is provided for smelting, a shipping product may be attained at a single fusion, which will tend to reduce still further the costs as figured. It is hardly worth while to go very deeply into the subject of costs of treatment at plants while they are in the experimental stage, and this subject may be dropped with the remark that as far as can be seen at present there is no reason why the smelting should not be done at Keswick at a cost not above \$1.50 per ton of ore, reaching perhaps as low a figure as has yet been attained in the West. And with rather more favorable charges than those which the works were designed to smelt, that is, containing a rather less proportion of heavy sulphides, the cost should not exceed \$1 per ton of charge. The writer would be glad to hear expressions of opinion from others respecting the possible extent to which smelting costs may be reduced, and in what manner such reductions are likely to be effected. Whatever the final practical results may show as to costs, there is one thing certain: No smelting heretofore has been done with so little fuel. Be it remembered that the only fuel of any sort used is applied inside the stack, the blast, contrary to the usual custom, being heated, as before said, without outside fuel, solely by the waste heat of the slags and matte. The least proportion of coke used was one and a half per cent., during a time when no wood was fed, and when the blast stood at a little over 500° F. Experiment showed that charges of 3,000 lbs. weight were well melted and reduced by the heat given out by the combustion of 50 lbs. coke, with about 100 lbs. each of the iron and sulphur contained in the ore. This is a rough statement, not taking into account the heat introduced by the hot blast, or that produced by the formation of silicates, or that used up by the dissociation of pyrites. From this it will be seen with what facility and what cheapness it is possible to reduce ores or mixtures largely composed of oxidized material alone with a proportion, not too great, of sulphides. It is in work of this kind that the pyritic process shows most advantageously.

The important question of the suitability of this process for copper ores has been canvassed more or less. That question receives light to a certain extent from the Keswick experiments, particularly as regards losses in slags. The analyses herewith submitted show that there is no

this kind inevitably has a broadening tendency, modifying points of view, destroying even the most cherished beliefs and necessitating the making over of old and the formation of new opinions. In this connection the writer hastens to concede that his former views upon the composition of the furnace gases and also upon the blast pressure proper in this kind of smelting were perhaps too narrow, while in other directions his opinions are corroborated in a gratifying manner in such directions as

1. The comparative difficulty of the operation and the necessity for carefully working out all practical details for each situation before success can be claimed.
2. The greater present success of the process on ores not too high in sulphur.
3. The process becomes more difficult (but perhaps not less practical) as the sulphur increases.
4. The gas analyses exhibited herewith corroborate the writer's opinions as to the practicability of manufacturing sulphuric acid from the fumes of the pyritic furnace.

#### MINERAL REGIONS OF BRITISH COLUMBIA.

Written for the Engineering and Mining Journal by H. M. Seadle.

The mineral region of Southeastern British Columbia is so extensive that justice could not be done in one article. I shall confine what I have to say concerning it to the country within a few miles of Rossland.

The country rock is a hard diorite from greenish to almost black in color. Veins traverse this rock in almost every direction, but the veins that have been most explored have strikes easterly and westerly. On the surface the veins are covered by an iron capping and so far in breaking through this capping from a few feet to a less than a hundred feet, north of Trail Creek, ore has been found carrying gold and a small quantity of silver. South of that creek the ores are principally argentiferous galena, carrying some gold. No galena has been found north of Trail Creek, but molybdenite is common to some veins. There has been only one vein found carrying free-milling gold, and that is in diorite also.

There are dikes of granite and syenite traversing the diorite, and



TRAIL, BRITISH COLUMBIA.

greater loss with comparatively rich matte (40%) than with a much lower grade, for the concentration slags carried off no more metal than those produced in the ore smelting. As far as the work shows, the pyritic process is as well adapted to copper smelting as to the treatment of gold and silver ores, this remark to be construed along with the fact that matte richer than 40% has not been produced, and also that smelting there by reason of its before-acknowledged difficulties has not reached the stage which fully authorizes a final opinion.

The two achievements especially adverted to, namely, the smelting at so low a cost, under circumstances of more than ordinary difficulty, and the consumption of so small a proportion of fuel, are properly a subject of felicitation, the more so as they were accomplished under somewhat adverse circumstances. But the attainment of such flattering results does not always constitute an entire commercial success, for the latter often depends as much upon smoothness of running and the careful adaptation of means to ends as upon the more showy evidences of complete metallurgical fitness. Time and patience are required to fit processes to their new environment, to acclimatize them, as it were, and the quality of perseverance has as much to do with the ultimate success of such installations as has the most brilliant engineering skill when it concerns itself only with their inception. Undoubtedly the pyritic, no less than every other difficult process, demands the most careful and laborious efforts to adapt it to surrounding circumstances. The time has gone by when ores were presumed to be fitted to the process, instead of the process to the ores.

Advantage will be taken of favorable opportunities for the leisurely discussion of many of the points involved in the foregoing brief and doubtless imperfect account. Much of the experience had was new to the writer (and perhaps to pyritic smelting), whence the necessity for careful discussion and comparison with pre-existing views. The experience has been very interesting and valuable, and the writer begs to express his gratitude to those whose enterprise made it possible. Work of

there is said to be a considerable body of slate a few miles to the west which I have not seen.

The gold is found in copper and iron pyrites, arseno-pyrites, white and magnetic iron. As a rule the copper is the richest in gold, but there are many exceptions. The ore is not so hard as the country rock, as a general thing, but the harder the ore the richer it is in gold, in many of the mines.

The veins are large, but get larger as depth is attained. This seems to be a law of the district; not only do the ore bodies grow wider in depth, but they get richer. The Le Roi shaft is now down 475 ft. on the incline, (a little over 300 ft. perpendicular), and the bottom of the shaft is in the richest ore yet encountered in the mine. As a rule the ore is richest on the hanging wall.

There are distinct shoots of ore in the veins and their general dip is to the east, though there are exceptions. There are evidently numerous horses in the veins, and in local parlance these are called "faults," which is very misleading to those who apply the word to the displacement of veins.

The size of some of the veins is almost incredible. The Le Roi vein at the 350 level has seven sets of timbers side by side and no walls have yet been reached. The net value of the ore in this mine now in sight is \$3,000,000. The War Eagle vein is very large, but the manager declined to give me any information concerning it. It is reported that the mine is bonded for \$1,000,000. Mr. Jackson, the managing editor of the *Rossland Miner*, estimates the net value of the ore in sight in the War Eagle vein considerably above that sum. A great part of it will run \$75 a ton in gold and silver and carry 8% copper. Deducting the cost of mining and treating the ores, they have a net value of over \$1,500,000. The Centre Star has one large vein and several small ones. Saying nothing of the latter, the net value of the ore shown in a tunnel over 800 ft. long, the face of which is probably 250 ft. below the apex, must be over \$2,000,000. The vein is 70 ft. wide. Large bodies of ore are found in the



Jumbo, the Cliff, the Iron Mask, the Columbia, and a dozen other mines in the north of the creek. The ore bodies in the mines south of the creek are said to be very large also. If the mines having large veins should show ore as good as the mines mentioned, the camp will be one of the greatest gold producers in the world.

The rich ores of the district was the inducement for Mr. Aug. Heinze to organize the British Columbia Smelting and Refining Company and which has erected a smelter at Trail, some seven miles direct from this camp, on the Columbia River. The smelter is erected on a plateau 75 ft. above the river, and the grounds contain 42 acres. The main building is 300 ft. long, and the L which contains the Allen-O'Hara calcining furnace, is about half that length. There are four reverberatory and two blast furnaces. Outside of these is a large building for sampling and assaying ores. There are offices, out-buildings and ore bins, all well constructed. Besides the Allen-O'Hara calcining furnace, there are five circular calcining furnaces, which are built over the blast and reverberating furnaces. Every convenience has been provided for handling the ores. The slag is taken to the bank near the smelter where it is dumped over the steep side hill. The matte which contains both copper and gold is shipped to the smelter of the Montana Ore Purchasing Company at Butte, where it is mixed with the ores reduced at that smelter. About 250 men are employed.

The main stack of the smelter is 140 ft. high, connected with the calcining furnaces with a large flue. The stacks of the reverberatory furnaces are 65 ft. high. There are a million of bricks in the furnaces and stacks, and the greater number of these were made and burned after the first of last December. The smelter was blown in in February. The making of these bricks, the setting of them in the dead of winter, when the thermometer marked zero or below, without injury to the work, was done under the supervision of Mr. E. H. Widekind, the superintendent in charge. In all its appointments the smelter is a model one, and it is working the ores of the district successfully.

There are two towns in the district, Rossland, at the head of Trail Creek, 3,800 ft. above the sea, and Trail, at the mouth of the same creek, 1,400 ft. above the sea. These are connected by a narrow gage railroad, that makes two trips a day. Trail is connected by steamers with North-

THE CONCENTRATION OF IRON ORE.—I.

Written for the Engineering and Mining Journal by Wm. B. Phillips.

(Continued)

It is not the purpose of these articles to discuss the concentration of iron ore in general, but merely to describe as briefly as possible what has been done in concentrating the low grade ores of the Clinton formation, the so-called "red fossil soft and hard ore." In the first part of this article the results obtained by magnetizing and separating the ore were given, and the conclusion reached that the weak part of the process lay in attaining a regular and uniform magnetization. This was foreseen in the earliest stages of the experiments, and it was to this point that special attention was directed all along. But it cannot be said that practical success was reached, and the work was gradually drawing to a close in so far as concerned the appliances for magnetizing that were in use. We were in pretty much the condition of the zinc people who tried to render the franklinite ores more magnetic by a magnetizing roast.

The Converse process would do this, and did do it for quite a while at South Bethlehem. It is not known to me personally why the use of it was discontinued there, but I inferred, after visiting the works, that the trouble lay just where we found it with our ores, viz., in irregular and incomplete magnetization. The franklinite ores are slightly magnetic to begin with, and in this respect have the advantage over the Clinton ores, which are not magnetic at all, in the ordinary meaning of the term, although they are magnetic when exposed to a powerful magnet acting in a saturated magnetic field.

During the discussion of my paper on the "Magnetization of Iron Ores," at the Atlanta meeting of the Institute, last October, Mr. H. A. J. Wilkens remarked that it might be possible to concentrate our ore magnetically without rendering it artificially magnetic before treatment, and he went on to say, privately, that he had been experimenting for some time with a new type of separator, and had found it possible to remove iron-bearing material from its matrix, or associated matter, regardless whether the material was magnetic or not. He re-



THE BRITISH COLUMBIA SMELTING AND REFINING COMPANY'S SMELTER AT TRAIL.

port, Washington, on the Spokane & Northern Railroad, and with the Canadian Pacific road, which has a branch to the head of Arrow Lake, through which the Columbia runs.

Rossland is a town of 5,000 people, about 1,500 of whom find employment in the mines. It has water-works and electric lights, and is supplied with business houses and hotels. Work has been begun on a railroad which will connect Rossland direct with Northport, when there will be continuous railroad service to all parts of the United States. If the last elections in Canada have not changed the intention of the Canadian Government, a railroad will be built from McLeod, which is reached by a branch of the Canadian Pacific, to Nelson over the famous Crow's Nest Pass, and through the great coalfields west of the Rocky Mountains. There is a railroad from Nelson to Robson, and it would only take a short road of some 25 miles to extend the same to Rossland. The railroad facilities of Rossland promise to be ample. Trail is a city of about 800 people.

British Guiana Gold Product.—Export of gold from January 1st to May 25th:

	Oz.	Dwts.	Grs.	
1895.....	37,394	7	12	at \$665,806.11
1896.....	41,330	11	13	at \$731,443.28

German Iron Production.—The production of the German blast furnaces in April is reported as follows, in metric tons: Foundry iron, 81,091 tons; forge iron, 148,241 tons; Bessemer pig, 44,259 tons; Thomas pig, 264,805 tons; total, 538,396 tons, an increase of 67,976 tons over April, 1895. For the four months ending April 30th the output was 2,098,751 tons, showing an increase of 222,908 tons, or 11.9% over the corresponding period last year.

ferred to the Wetherill Concentrating Process in use at the works of the Lehigh Zinc and Iron Company, South Bethlehem, Pa. At his request a box of the ordinary soft red ore of the Birmingham District was sent to him for trial. The results were so encouraging that another lot, this time 1,000 lbs., was sent, and I accompanied the shipment. During the latter part of January, of this year, we experimented at South Bethlehem with the ore, and being satisfied that the process was worth investigation, two machines were sent to Birmingham, set up and operated during May and June.

Without entering upon the electrical questions involved, such as the use of a saturated magnetic field, the winding of the armatures, the size, shape and position of the pole pieces, etc., suffice it to say that the machines personally examined at South Bethlehem, in January, and those sent to Birmingham and operated under my own supervision during May and June, 1896, did concentrate the ore to a remarkable degree of richness, considering the nature of the ore, and that without any preliminary treatment beyond drying, crushing and sizing.

The heads were not as rich in iron as the heads given by the Payne separator when running on magnetized ore, but the final tails were much lower in iron. Considerable experience with the Payne separator had shown it to be an excellent machine for separating magnetic from non-magnetic material, and if we had been able to send to it the kind of ore for which it was designed, there can be no question of the results we would have reached. With the magnetized ore it did as well as any separator of the current type could have done, and if we finally discontinued the use of it we did so because we wished, if possible, to avoid the expense necessarily involved in magnetizing non-magnetic ore. The ore with which concentrates must compete at Birmingham is delivered in the stock-houses for 50c. per ton. It carries 48% of iron. Even should the concentrates carry 54% to 56% of iron, the pressure of 48% ore for 50c. a ton will compel the maker of concentrates to save at every possible point,

He may magnetize the ore and separate it, getting from a 40% ore heads of 58% to 60% of iron, but if he can dispense with the magnetizing and get from 54% to 56% of iron in the heads and much leaner tails, it would be to his advantage to do so.

I make this statement at this time because it has been thought that we discontinued the use of the Payne separator on account of its failure to do our work. This was not the case at all. When we sent to it the material for which it was designed, i. e., ore of comparatively feeble magnetism, it handled it excellently well, and gave richer heads than any other machine we have used. I have no interest in the Payne, the Wetherill, or any other separator, but look at them all purely from a technical and commercial standpoint.

We ceased to magnetize the ore, and therefore ceased to use the Payne separator, and our reasons therefor were entirely distinct from any considerations affecting the efficiency of this separator. It was simply a question as to whether we could dispense with magnetizing the ore. The Payne machine was not designed for handling non-magnetic material, and was never intended for this kind of work. The Wetherill machines were designed and built for the express purpose of treating non-magnetic iron ores, and we used them accordingly.

#### DETERMINATION OF SULPHUR IN COKE AND COAL.

Written for the Engineering and Mining Journal by R. Helmacker.

Shtolba (in the *Bohemian Chemical Journal*) has made an additional improvement on Eshka's method of determination of sulphur in coke or coal, which affords an advantage. According to Eshka, the sulphur was estimated by the ignition of 1 gram of coal or coke with 1½ grams of two parts of magnesia oxide (MgO) with one part of soda-carbonate (NaCO<sub>3</sub>) over an alcohol burner—the extraction of the residue with hot water, and, after filtering from the soluble matter, acidifying with hydr. chloric acid and boiling to expel free acid, precipitation as baric sulphate (BaSO<sub>4</sub>).

To determine the sulphur by the improved method 1 gram of fuel is thoroughly mixed with 1 gram reduced silver powder, ½ gram soda carbonate (NaCO<sub>3</sub>) or rather sodic bicarbonate (NaHCO<sub>3</sub>) and heated in a platinum crucible until the yellow mass, thus produced, shows no remains of non-consumed coal. The igniting of the assay takes place by means of an alcohol flame of sufficient size, because ordinary gas, containing always some sulphur, is liable to attack the substance during assay. Under these conditions the matter under examination comes out higher more or less in sulphur, and the error is considerable.

The chilled mass in the crucible is heated with ammonium nitrate (AmNO<sub>3</sub>) to convert the S. perfectly into SO<sub>3</sub>, then treated in a flask with dilute hydrochloric acid (HCl), and filtrated. To the filtrate a solution of BaCl is added, to precipitate the sulphur as BaSO<sub>4</sub>, that is allowed to settle, then filtrated off, dried, ignited and weighed, which by means of calculation gives the sulphur.

By the suggested use of silver powder in the operation of treating coal the time required for complete ignition is 20 to 25 minutes, that of coke 30 to 40 minutes constant heating. For convenience and for economy the silver powder is treated with HCl, then boiled in an alkaline solution of KHO (hot water sud<sup>s</sup> of potash) with sugar, the object being to remove the impurities. After the operation the silver can therefore be used repeatedly.

**Polyphase System for Swiss Railroad Motors.**—The *London Electrician* states that it has been decided to use the polyphase system on the mountain railway up the Gornergrat at Zermatt, in Switzerland. The system was first tried successfully at Lugano.

**Tempering Steel by Electricity.**—According to a Swiss contemporary, an engineer by the name of Tauxe has just invented a new process of tempering steel by electricity, which not only makes the steel much harder, but at the same time gives it the proper elasticity, that is, it is not brittle like steel made very hard by the usual process.

**Tin in South Africa.**—It seems probable that tin will be added to the list of the mineral products of South Africa, though very little has so far been said about it. Tin ore was discovered in Swaziland three years ago, and the production is gradually increasing. According to the report of the Minister of Mines of the South African Republic, there were 30 tons taken out in 1893. The quantity increased to 141 tons in 1894, and 246 tons in 1895.

**German Iron Imports and Exports.**—For the four months ending April 30th the imports of pig iron in Germany were 62,344 metric tons, an increase of 25,922 tons, or 70% over last year. Imports of iron ore were 658,853 tons, showing a gain of 188,021 tons, or 40% over 1895. Exports of pig iron for the same period were 59,728 tons, a gain of 10,337 tons, or 21½%. Iron ore exports were 778,380 tons, a decline of 73,680 tons, or 8½%. These exports are chiefly made to France and Belgium and are from the Minette ore deposits of Elsass Lothringen.

**Thomas Slag in Germany.**—We have heretofore referred to the increasing use of "Thomas slag"—that is slag from the Thomas-Gilchrist basic steel process—in Germany and Belgium as a source of supply of phosphate of lime in manufacturing fertilizers. The extent of the business is indicated by the fact that for the four months ending April 30th the imports of Thomas slag in Germany were 16,975 metric tons, an increase of 3,255 tons, or 23½% over the corresponding period last year. The exports were 18,368 tons, an increase over 1895 of 9,352 tons, or 103½%. The imports are chiefly from France; most of the exports are to Belgium.

**Youngstown, O., Electric Railroad.**—The electric railroad which is now being constructed in Youngstown, O., by the Park & Falls Railroad Company, of that city, will be one of the most complete trolley lines for passenger and freight service in operation, and the first electric road to handle freight in Ohio. The Lima coal fields, 15 miles from the city, which hitherto have been practically inaccessible, will be mined and the coal taken by 100 cars, constructed especially for the service, into Youngstown to the mills and for shipment. Four 100-ton locomotives will be used for the coal hauling and a large power-house will be equipped with 250 H.-P. automatic cut-off engines and dynamos to suit. The track will be the standard gauge, with T-rails and 68 lb. girder rails in the city limits.

**Production of Petroleum in the U. S.**—The total production of crude petroleum in the United States in 1895 was 52,983,526 bbls., valued at \$58,671,279, against 49,344,516 bbls. in the previous year, valued at \$35,522,095. These statistics are compiled for the Geological Survey by expert Joseph D. Weeks. All important producing districts shared in the increase except West Virginia and New York, which showed slight decreases. Since the beginning of operations in Titusville, Pa., in 1859, the enormous total of 709,713,403 bbls. of crude petroleum have been produced in the country, of which 515,657,260 bbls. represent the product of the Pennsylvania and New York oilfields. The stocks in the Appalachian oil fields at the close of last year were 5,344,784 bbls., a decrease from 6,499,890, the stock on hand at the close of the preceding year. The features of the year were the stock decrease, the increase of production in Ohio, Indiana and California, the rise in prices and extension southward of the profitable producing districts of the Appalachian range.

**Highest Railroad Speed in Germany.**—In order to determine the highest possible speed that may be attained on railways, trial runs were lately made between Berlin and Lubbenau on the Berlin and Gornitz line, states the *Engineer*; and for these runs a special express engine of new design with four cylinders and driving wheels of 2 m. (6 ft. 6 in.) diameter has been constructed, thus giving the engine a much greater height above the rails than usual. The composition of the train was very various, amounting sometimes to 100 axles. With a train of 30 axles the highest performance, viz. 106 km. (65½ miles) per hour was recorded, being 20 km. (12 miles) more than the highest speed hitherto attained by the quickest German lightning train (Blitzzuge), viz. the Berlin Hamburg D-Zug, which runs through a distance of 286 km. (177½ miles) in 3½ hours, while the speed of ordinary German expresses is only 70 km. (43½ miles) per hour. The portions of lines chosen for the runs were tolerably horizontal over their whole length, and had very few curves.

#### PATENTS RELATING TO MINING AND METALLURGY.

##### United States.

The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

##### WEEK ENDING JULY 21st, 1896.

- 561,423. PROCESS OF SEPARATING ORES. Thomas A. Edison, Llewellyn Park, N.J. Filed July 2, 1892. The process of separating copper pyrites from iron pyrites, consisting in separating a crushed ore, containing both pyrites, into different lots, each containing particles of approximately the same size, and then heating the lots of material separately to make the copper pyrites magnetic, while the iron pyrites remains non-magnetic, and subsequently separating the copper pyrites by magnetic action.
- 564,450. MINER'S LAMP. Edward J. O'Keefe, Vandling, Pa. Assignor to the Hendrick Manufacturing Company, Limited. Filed July 30th, 1895. A miner's lamp having a projection extending outwardly and covering, so as to protect the joint between the bottom and side of the lamp-front and adapted for contact with an object to adjust the wick in the spout.
- 564,508, 564,509. COMBINED AUGER AND REAMER FOR MINING PURPOSES. Robert H. Elliott, Birmingham, Ala. Assignor to the Alabama Blasting and Mining Company, same place. Filed June 15, 1895. Combination of a drill spindle, and means for revolving the same in either direction, of an auger revolvably connected to the drill-spindle, and means for checking the rotation of the auger, relative to the drill spindle, a detachable feed-nut adapted to engage the drill-spindle, when desired, and an extensible cutting blade mounted in the drill-spindle with means for forcing the blade outward, when desired.
- 564,510. REAMER. Robert H. Elliott, Birmingham, Ala. Assignor to the Alabama Blasting and Mining Company, same place. Filed October 18th, 1895. The combination with a slotted bar, pivoted in the reamer head, and provided with overhanging lips, of a block traveling in the slot and provided with shoulders to engage beneath the lips, and with teeth projecting between the lips, and means for simultaneously rotating the reamer-head, and reciprocating the block in the slot.

##### Great Britain.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy:

##### WEEK ENDING JUNE 20th 1896.

- 11,894 of 1895. F. S. D. Scott, London, England. Gold-saving machine for treating placers, etc.
- 15,267 of 1895. H. Heenan, Manchester, England. Methods of suspending screens for coal and minerals, and methods of giving motion to them.
- 23,414 of 1895. H. Langen, Duisburg, Germany. Method of separating mixed metals.
- 8,946 of 1896. The Hawkins Steel Company, Detroit, Mich. Refining iron by a method intended as a substitute for the puddling process.

##### WEEK ENDING JUNE 27th, 1896.

- 11,186 of 1895. C. J. Ball, London, England. In dredges for river gravels using diving-bells instead of divers for directing the nozzles.
- 11,976 of 1895. H. W. Hedland, London, England. Electric miners' lamps; arranging the parts so that there shall be no projections.
- 11,959 of 1895. Aluminum-Industrie-Actien-Gesellschaft, Neuhausen, Switzerland. Granulating albumin and similar materials by heating them to a temperature just under melting point and then stamping.

##### WEEK ENDING JULY 4th, 1896.

- 9,601 of 1895. W. Saint, Manchester, Eng. Apparatus for humidifying the air of mines to prevent coal dust from floating.
- 11,444 of 1895. C. Raleigh, Johannesburg. In electrolysis of precious metals from their solutions, a special method of forming the cathodes.
- 12,455 of 1895. A. A. Dickson, Toronto, Canada. Binding together metallic sands or other powdery ores with peat, for smelting.



## PERSONAL.

MR. G. E. KEDZIE, consulting mining engineer, of Ouray, Colo., has gone to Durango, Mex.

MR. F. C. ENGLEHARDT, chemist and metallurgist, has removed from Denver to Durango, Colo.

MR. JOHN VANDERSLICE, superintendent of the Pottsville, Pa., Bridge Works, has been appointed superintendent of the Keystone Bridge Works, at Pittsburg, Pa.

MR. PASCAL GARNIER, a mining expert, is now on his way to examine the Coo'gardie mines in West Australia, where he has been sent by a large French mining syndicate.

MR. A. DRAGOVICH, one of the best-known and most successful miners of California and Nevada since 1870, has returned to Reno to look after some interests there that he has held for 20 years.

MR. ARTHUR S. GOETZ, for several years past a resident of Colorado Springs, Colo., and identified with Mr. HAGERMAN'S mining enterprises, will soon remove to Eddy, as general manager of the Pecos Valley Beet Sugar Company.

MR. EDWARD S. WASHBURN has been elected president and general manager of the Kansas City, Fort Scott & Memphis and the Kansas City, Memphis & Birmingham railways, to succeed the late GEORGE H. NETTLETON.

MR. JOHN S. HICKEY, superintendent of the foundry department of the Anaconda Copper Mining Company, and Assistant Master Mechanic EDWARD McCANNA, of the same company, have gone East for a two months' vacation.

MR. EDGAR HALL, a well-known mining engineer and metallurgist, and the largest owner of stock in the Silver Spur mine, Stanthorpe, Queensland, spent a couple of days in Cripple Creek, Colo., the past week. He intends to spend a month in Utah.

MR. ROBERT G. BROWN, superintendent of the Standard Consolidated, the Bodie Consolidated and the Bulwer Consolidated mines, has also been appointed superintendent of the Mono. All four mines at Bodie, Cal., are now under one management.

PROFESSOR DR. W. NERNST, of the University of Göttingen, Germany, has accepted the appointment of editor (scientific branch) of the *Zeitschrift für Elektrochemie*, also for the annual. The technical branch of the above paper will remain in the hands of Dr. W. BORCHERS, of Duisburg.

MR. CHAS. T. DURELL, of Denver, Colo., who, since he graduated from the Golden School of Mines, has been engaged as assayer at Telluride, has been appointed chemist of the Sheba Gold Mining Company at Eureka City, Transvaal, and will leave for South Africa within the next few days.

PROF. LETSON BALLEET, professor of natural science and geology at the Philadelphia Methodist College, who has been engaged for the past two months in preparing treatment for ores in Eastern Oregon and Idaho, has been called as an expert to Western Nevada and Eastern California to examine some recent discoveries.

MR. F. P. GRIDLEY has been appointed superintendent of the Sweetwater Coal Mining Company, the Rock Springs Coal Company, the Van Dyke Coal and Mining Company, and the Wyoming Mercantile Company at Rock Springs, Wyo., succeeding MR. CHAS. R. KELSEY, and has been in full charge of all business and interests of said companies at Rock Springs since July 2d.

## OBITUARY.

THOMAS J. KINNEY, the first resident of Brad-dock, Pa., died July 23, aged ninety-four years. He was the first river coal operator in Western Pennsylvania, having operated the Kinney mines forty-five years ago. His fortune is estimated at \$6,000,000.

M. KASY, the most distinguished constructor in Russia in modern times, is dead. It was he who entered into a contract with the Russian Government to build 110 torpedo boats some 20 years ago, and brought the contract to a successful termination. He also built the Emperor's yacht. He was the managing director of the Baltic Works, St. Petersburg, from which he retired some years ago.

ALFRED EARNSHAW, of Philadelphia, Pa., a well-known importer of iron ore, president of the Earn Line of steamships, a director of the Pennsylvania Steel Company, and one of the most prominent men in shipping and commercial circles in that city, died suddenly on July 24th, at Chestnut Hill, near Philadelphia, aged 52 years. He was born at Cambridge, England, and came to this country in 1872. He had been active in business since he was a boy.

ROBERT GARRETT, former president of the Baltimore & Ohio Railroad Company, and the head of the widely-known banking house of Robert Garrett & Sons, died July 29th, in Deer Park, Md., aged 49 years. He graduated from Princeton College, N. J., in 1867; in 1871 he was elected president of the Valley Railroad of Virginia, and in 1879 was made third vice president of the Baltimore and Ohio Railroad, being advanced to first vice-president in 1881.

In 1884 he became president of this company, which position he resigned in 1887. He spent some time in travel, hoping to regain his ruined health, but unsuccessfully. Since then he lived in retirement.

PROF. HEINRICH ERNST BEYRICH, late director of the Museum of Natural Science at Berlin, died on the 5th of July. He was born at Berlin, August 31st, 1815, and in his youth he was a schoolmate of Prince Bismarck at the Gymnasium. He entered the university at the age of 16. After receiving his doctor's diploma in 1837 he was appointed as assistant in the Museum of Mineralogy. On the death of Mr. Weisz (1857) he obtained the supervision of the paleontological collection, and in 1875 was appointed head of the Museum, succeeding Mr. Gustav Rœse. Since 1841 he was at the university as private docent, and he obtained in 1846 the degree of extraordinary, and in 1865 as professor. In the Academy of Science he has filled the place which was before held by Leopold von Buch since 1853.

His various manuscripts on paleontology are recognized to be very definite regarding the estimation of the age of rock strata, and are of great importance to the system of zoology.

Since 1873, he was associate director of the government geological department, and he has directed its scientific work, and merited high honors for the completion of a correct geological map of Germany.

## SOCIETIES AND TECHNICAL SCHOOLS.

ALABAMA INDUSTRIAL AND SCIENTIFIC SOCIETY.—The proceedings at the annual meeting of this society, held in the rooms of the Commercial Club, Birmingham, Ala., May 13th, 1898, have been published. In addition to the business proceedings, the report contains the set of resolutions of respect to the memory of Mr. Thomas Seddon, late president of the society, and the following papers: "The Grading of Southern Coke Iron, with Special Reference to the Birmingham District," by W. H. Barron; "Observations on Grading Coke Iron," by W. B. Phillips; "The Manufacture of Steel in the Birmingham District," by P. G. Shook; "Gold Mining in Alabama," by Wm. M. Brewer; "Coal Washer," by F. M. Jackson.

AMERICAN INSTITUTE OF MINING ENGINEERS.—The seventy-first meeting of the Institute will be held in Colorado, beginning at Denver on Monday, September 21st, 1898. Communications concerning the local arrangements may be addressed to Mr. Thomas B. Stearns, Duff Block, Denver, Colo. The Denver headquarters will be, through the courtesy of the Colorado Scientific Society, at the rooms of that society, in the Boston Block.

The following programme is provisionally announced, subject to such modifications as may be found necessary hereafter: Monday and Tuesday, September 21st and 22d, will be spent at Denver, including sessions, visits to smelters, etc. Wednesday, September 23d, will be occupied with a short trip to Central City and Golden. Thursday, morning, September 24th, a special excursion will leave for Cripple Creek, to remain there until Friday night, when the party will proceed to Leadville. Saturday, September 25th, will be spent at Leadville, and Sunday at Glenwood Springs. Monday, September 27th, will be spent at Aspen. Tuesday, September 28th, the cyanide and chlorination works and the oil wells at Florence will be visited. Wednesday, September 29th, will be spent at Pueblo, and the excursion will return to Denver Wednesday night.

## INDUSTRIAL NOTES.

The Cambria Iron Company closed down its Atlas coke plant at Dunbar, Pa., last week, consisting of 100 ovens.

Hereafter the Bell, Lewis & Yates Coal Mining Company, of Pennsylvania, will be known as the Jefferson & Clearfield Coal and Iron Company.

A large plant, consisting of an open-hearth furnace, blooming mill, road and wire nail mill, which is to be erected at Duluth, Minn., is now being considered by the Duluth Iron and Steel Company.

The furnace at Talladega, Ala., formerly operated by the Talladega Iron and Steel Company, has been sold by Captain W. P. Armstrong, of Selma, its latest owner, to the Alabama Iron and Railroad Company.

A party of Iowa capitalists has bought the plant of the Kansas City Steel & Iron Works, at Argentine, Kan., and took possession this week. The works will be enlarged and steel will be manufactured under a new process.

The State Agricultural Society of California have decided to create a special feature to interest mining men at the State Fair. Prizes will be given for one hand and two-hand rock-drilling contests, the State to supply the rock.

A coke-oven plant is being erected by the Jamison Coal Company at the Jamison mines. Also a new coal washer, with a capacity of 350 tons per day. The company will wash and coke its slack and ship the merchantable coal mined.

The plant under construction by the Indiana Steel Casting Company, Montpelier, Ind., will shortly be completed. The president of the company is Dr. J. W. Chisholm; treasurer, Eugene H. Labee; secretary and manager, William Chambers.

The National Rolling Mill McKeesport, Pa., has accepted the Amalgamated scale, affecting over 4,000 men. All the mills of the company, it is expected, will soon be at work double time. The scale price is based on an increase for puddling from \$1 to \$4.50. The increase to puddlers raises the wages for helpers correspondingly.

The East Chicago Iron and Steel Company, of Hammond, Ind., made an assignment in the County Court this morning to David L. Evans, Parkhurst & Wilkinson, who failed recently, were interested in the concern, and at the time of their trouble the company was placed in the hands of a receiver. No statement as to the assets or liabilities was filed with the assignment.

It is reported from Connellsville, Pa., that excavations are being made for the erection of a smelting furnace there for refining old copper and brass into ingots. Two mills, 40 x 100 ft. will be built at present, and later on two others 40 x 200 ft. will be erected. Beside refining metal part of the plant will be devoted to converting old waste to its original state and recovering the oil contained. The Pittsburg Bridge Company has the contract for building the mills, and is making the supporters and girders now.

The Pennsylvania Steel Company is said to have paid \$200,000 for the Bumbaugh farm at Highspire, near Harrisburg, Pa. The farm contains the valuable limestone quarries operated heretofore by George W. Cumbler, and for some time the steel company has been endeavoring to secure them. The quarries are among the best in that part of the State and have the additional advantage of being close to the big steel works. It was undoubtedly the nearness of the quarries to the plant that led to the company's purchase of the property, of only 150 acres, at the big price of \$1,300 an acre.

The Pelton Water Wheel Company has been awarded the contract for the hydraulic work of the new power station of the Central California Electric Company located near Newcastle, Placer County, Cal. The plant consists of two pairs of 48-in. Pelton wheels mounted on a cast-iron base, and direct connected to Westinghouse generators, the wheels having a capacity of 1,200 H. P. running under 420-ft. head at 400 revolutions. The power thus produced is to be transmitted to Sacramento, a distance of 28 miles, and used for light and general power purposes. This company has large water resources and proposes later on to greatly increase the present plant. They have already a station with which they are supplying Penryn, Rocklin and other surrounding towns with light.

## MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" of what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

## GENERAL MINING NEWS.

## ALABAMA.

## CLEBURNE COUNTY.

WISE.—This gold mine resumed work with more men employed than before. They have put in some very fine machinery and claim they can now save all the gold.

WOOD.—This copper mine, some miles south of Edwardsville, is being worked now quite extensively. The new company that has charge of it is having improvements made and will soon have it in full operation again. This mine has been idle about 17 years.

## ALASKA.

ALASKA-MEXICAN GOLD MINING COMPANY.—This company reports its clean-up for the month of June as follows: Period since last return, 30 days; bullion shipment, \$16,100; ore milled, 5,674 tons; sulphurets treated, 125 tons; bullion from sulphurets, \$5,992; working expenses, \$12,855. The average yield was \$2.86 per ton of ore milled, and the average cost \$2.27 per ton. The profit realized in the bullion shipment for the month was \$3,344.

## ARIZONA.

## GILA COUNTY.

CONTINENTAL.—It is reported that this old mine, 12 miles west of Globe, and about 8 miles east of the famous Silver King mine, has been sold on bond to N. L. Amster. This spring a shaft was sunk 50 ft. and a crosscut 55 ft. was made and rich copper ores discovered, carrying gold and silver. Mr. Amster contemplates driving an 800-ft. tunnel from the north side, crosscutting the lode at a depth of 600 to 700 ft.

RATN.—It is reported that this gold claim, owned by E. J. Edwards, a mile and a half from Webster Springs, is making a very promising showing. At a depth of 50 ft. the ledge is strong, with 2 ft. of ore assaying \$60 to \$70 in gold. Another claim on the same lead on which a tunnel 138 ft. has been driven in is ledge matter 40 ft. wide which averages \$5 per ton in gold. A spring has been developed at the



mine which furnishes an abundant supply of pure water.

#### MARICOPA COUNTY.

**CONGRESS.**—Reports from this mine say that from the workings above 700 ft. depth, 100 tons a day are mined and milled, averaging \$20 a ton in gold from refractory looking pyritic ores. A cyanide plant is working 100 tons of tailings daily at a profit.

#### PIMA COUNTY.

A new lead smelter is to be erected at Crittenden, with a 40-ton stack. The intention is to have it ready to blow in by September 1st.

#### YUMA COUNTY.

**EL RIO.**—It is reported that the tailings of this old quartz mill, five miles below Yuma, has been purchased, estimate placing the quantity at about 800,000 tons. Assays show that they contain \$5 in gold per ton. It is figured that \$1.50 per ton will cover the expense of treating them by the 20-ton cyanide plant already built.

**HARQUAHALA GOLD MINING COMPANY.**—The following is from the report of Assistant Manager Thomas D. Murphy for the operations of the cyanide plant during May, 1896:

Amount of pulp treated, 3,830 tons; average assay of pulp, \$1.13 per ton; average assay of tailings, \$1.40 per ton; percentage extracted according to assays, 66%; bullion, slimes, matte and slag, estimated to yield \$9,203.88; miscellaneous revenue, \$85.60; total revenue, \$9,289.57; operating expenses, \$5,031.81; extraneous expenses, \$705.36; total expenses, \$5,737.20; profit, \$3,552.37. The actual running time for the plant during the month was 24½ days.

#### ARKANSAS.

##### PULASKI COUNTY.

**THALHEIMER-ROTTAKEN.**—It is reported that gold in paying quantities has been struck in this mine, which is about 5 miles southwest of Little Rock.

Work was first commenced on the mine January 2d last, but very little information was given to the public. A fully equipped plant has been put in. The strike was made at a depth of 30 ft.

#### CALIFORNIA.

##### AMADOR COUNTY.

(From Our Special Correspondent.)

**ARGONAUT.**—This mine is on the "Mother Lode," about one mile north of Jackson. The shaft is down 1,400 ft., and a station is being cut at the 1,350-ft. level. Sinking will be continued, the object being to reach their north lines and the disputed ground between them and the Kennedy.

**BELL-WETHER MINING COMPANY.**—We are officially informed that this company recently purchased the Bright mine, which will hereafter be known as the Bell-Wether. A new three-compartment shaft is to be sunk in the country rock. Four shafts have already been sunk in various places on the property, all in ore, averaging a depth of 125 ft., and in some of these shafts considerable tunneling has been done. Ore has been found in all the shafts, the veins ranging in width from 10 to 50 ft. The assays are reported as being entirely satisfactory.

**CENTRAL EUREKA.**—At this mine, south of Sutter Creek, the water has been lowered 350 ft. below the mouth of the shaft. Most of the timbering is as sound as when put in 20 years ago.

##### BUTTE COUNTY.

**PRINCESS MINE.**—Geo. E. Hogg, the newly appointed superintendent, writes that since his arrival ten weeks ago he is taking out an average of 150 oz. per month, one day alone 14 oz., besides laying new track, and doing other development work. The greatest enthusiasm exists in the camp owing to the big amount produced one day recently in the Perschbacher mine (at Magalia) which adjoins the Princess on the South. This property was listed on the Gold Mining Exchange about one month ago.

##### CALAVERAS COUNTY.

(From Our Special Correspondent.)

**NIGHT HAWK.**—This gravel mine, located in San Andreas, has been bonded to C. W. Getchell, who will put in a pumping plant and other machinery. Work is now progressing rapidly.

##### FRESNO COUNTY.

(From Our Special Correspondent.)

The San Joaquin Electric Power Company has filed on 320 acres of placer ground located just below their power-house on the San Joaquin River. The discovery of this pay dirt was accidental. Work will commence at once.

##### KERN COUNTY.

(From Our Special Correspondent.)

**ASHFORD BROTHERS' CLAIMS.**—A rich strike has been reported on these claims at Randsburg. The vein is said to be 2 ft. wide, assaying several thousands of dollars per ton. A 10-stamp mill has been contracted for and will be erected at Cuddeback immediately.

##### MONO COUNTY.

**BODIE CONSOLIDATED MINING COMPANY.**—The seam of high-grade ore which was met with two or three weeks ago in the winze below the 550-ft. level still holds out, and though narrow, assays very high. From two to three tons of ore are being taken out from this seam weekly. In the new

crosscut on the 200-ft. level another small vein has been cut, which so far has shown up very well.

**BULWER CONSOLIDATED MINING COMPANY.**—On the 200-ft. level the seam is showing much better, and from 12 to 15 tons of high-grade ore are being taken out weekly. On the South drift a supply of ore continues to be obtained, although it is of rather low grade.

**MONO MINING COMPANY.**—The new crosscut from the South drift on the 400-ft. level is in hard porphyry with clay seams interspersed through it. The ore is high grade.

##### NEVADA COUNTY.

**TEXAS.**—It is reported that the present owners, George E. Turner, Edwin Tilley and John T. Morgan, have sold this mine at Willow Valley to an Eastern company.

(From Our Special Correspondent.)

**CHAMPION.**—This mine, on Deer Creek, is working 70 stamps on good ore.

##### PLACER COUNTY.

(From Our Special Correspondent.)

**MOUNTAIN MAID.**—At this mine, near You-Bet, the tunnel is in 50 ft. The vein is 6 ft. in width and shows free gold. Arrangements are being made to put in a 10-stamp mill.

##### SAN BERNARDINO COUNTY.

**MINT.**—At this group of mines near Ibox, lately purchased by Mr. Harbeck, of Chicago, Ill., a large hoist is being erected, which will be serviceable to a depth of 1,000 ft. For the present it will be operated by a 10-horse power gasoline engine.

##### SHASTA COUNTY.

(From Our Special Correspondent.)

**CALUMET.**—Dr. William Gardick, of Ohio, owner of this mine and mill, six miles north of Redding, is about to establish an electric power plant under the management of A. B. Paul. Power will be supplied to the Calumet, Hart and other mines in the vicinity.

**MOUNTAIN MINES, LIMITED.**—C. W. Fielding is now manager for this company at Keswick. There is considerable activity around the works, and as soon as the roasting plants are completed, the entire property will be put in operation again.

##### TRINITY COUNTY.

**ALTOONA.**—It is reported that this mine, at Cinnabar, is yielding 600 flasks of quicksilver a month. The ledge runs from 8 to 15 ft. in width.

(From Our Special Correspondent.)

**ORO FINO.**—This mine, near Trinity Center, has been sold by the Strode Bros. to John H. Galey and associates, of Pittsburg, for \$150,000. The new owners have large mining interests at Silver City, Utah. Development work will be commenced on a large scale and a 40-stamp mill put in.

#### COLORADO.

##### EL PASO COUNTY.

(From Our Special Correspondent.)

**ABE LINCOLN.**—This claim adjoining the Arcadia and being worked by the owners, the Arnold Brothers, has now a shaft sunk 180 ft., and from present appearances it looks as if near a chute of ore, presumably the same as the Arcadia. The DeWitt lease on this property is a steady shipper. A shipment of 20 tons last week sampled \$86.

**ANCHORIA LELAND.**—This is likely to be one of the leading mines of the camp, the lowest shipment for the month sampling \$84.00, whereas the average shipment of over 5,000 tons shipped by lessees was \$43 per ton. It shows plainly either one of two things, that the ore is better assorted, or that with depth the ore is of a higher grade, and I am inclined to the latter, as the richest gold specimens yet found in the camp were found two or three days ago in the cross-vein at the 300 ft. level. The machine drills which will be at work during the coming week will be engaged in the driving of drifts and crosscuts and not in the sinking of the shaft unless the ground becomes much harder.

**ARCADIA.**—This property, in Poverty Gulch, recently shipped 25 tons of second-grade ore. The ore chute still continues, but not the rich seam of telluride to which reference was made in last week's notes. A pump is now at work at the 14-ft. level.

**CHRISTMAS.**—This property, on Bull Hill, is now furnished complete with steam hoist, large shaft house, ore house, screens, bins, etc. The shaft has been sunk 200 ft. A drift north at the 170-ft. level has been extended north 87 ft. on a fairly well-defined vein. A crosscut is being driven east to intersect the Vindicator vein. This mine is now under the management of Capt. Samuel Rowe, late of Norway, Michigan.

**CITY VIEW.**—This mine, on Gold Hill, has a shaft sunk 300 ft., but at the 250-ft. level crosscuts are being driven to boundaries. At the 180-ft. level a winze is being sunk, and stopping carried on at a lively rate. This property is also worked under lease.

**GILLETTE CHLORINATION WORKS.**—These treated during the month of June 1,420 tons of Cripple Creek ores, which carried an average value of 1½ oz., or \$30 per ton. During the month as many ounces of ore were taken daily as number of tons of ore were purchased daily, and the daily accumulations of ounces of samples amounted to quite a large amount at the close of the month, which was

submitted to quite a number of chemical tests, continuing for several days.

**HOWE RUN.**—This property is on the south slope of Squaw Mountain, and will resume operations on September 1st by the owners, Messrs. Burns, Doyle & Haman, the original owners of the Portland, the lessees having taken away all their machinery.

**KEYSTONE.**—This is located on Gold Hill and worked under lease by Messrs. Smith & Fogleman, and is doing fairly well. Six men break about 35 tons of ore each month, of an average value of from 3 to 4 oz. A raise is being made above the 1st level, in hopes to catch another ore chute, which is supposed to dip south. The geological conditions of the claim are very favorable for mineral, granite, porphyry and phonolite dike, which at 130 ft. on third level is 46 ft. wide. One man is employed at surface, or about 12 ft. deep, breaking fairly good mineral. Almost every part of Gold Hill has improved much during the past two months.

**LEGAL TENDER.**—This mine is owned by the Golden Cycle Mining & Milling Company, and has made a shipment of 300 tons of \$30 ore this month. This shaft is now 210 ft. deep, but a drift at the 160-ft. level north for 6 ft. wide averages \$25 per ton. The first steam hoist in the camp was erected on this claim over four years ago, and now it looks as if this property is to be one of the big shippers of the district. This claim is being worked by Mr. Cone, one of the pioneers of the camp, and an "old-timer" of the State.

**PHARMACIST.**—This mine had an output during June of \$6,000. The two-drill compressor plant is expected to begin work at once, and is to be used in the sinking of the new shaft now 65 ft. deep.

**PORTLAND MINE.**—This mine, on Battle Mountain, gives employment to 150 men. The Burns shaft has not been sunk for four months, the present depth being 610 ft. It is the intention to resume sinking this shaft on August 1st another 200 ft. and at that depth to drive and crosscut to the Anna Lee ore chute. The present depth of the shaft is about equal to the bottom of the Anna Lee shaft, 900 ft., or supposed to be, whereas the depth of the Anna Lee shaft was not so great, as but few of the 50-ft. levels were 50 ft. apart, one of the levels being only 42 ft. By making communication with the ore chute 200 ft. deeper a fairly good-sized block of stopping ground would be available. The Black Diamond ore is being hoisted through the new shaft, as the facilities for the sorting and handling of the ore are so much more economical and convenient. The grade of ore has improved very materially over the output of 1895 thus far. The chute of ore has "straightened itself" during the sinking of the last 150 ft.

**VICTOR.**—This mine, on Bull Hill, gives employment to 110 men. The shaft has been sunk 400 ft.; but little, if any, stopping has been done below the 250 ft. level. The mine never showed to better advantage than at present. The ore house has recently been enlarged. This mine has been the most steady dividend payer in the camp for nearly four years, and not a month has been passed, save during the strike of 1894.

**WATSON TUNNEL.**—This tunnel has pierced "Guyot Hill" from the southwest, a distance of 160 ft. The tunnel is well timbered with 12x12 timbers, 7x8 ft. in the clear. The breast of the tunnel is granite and is fast becoming hard.

##### LAKE COUNTY.

(From Our Special Correspondent.)

**THE STRIKE SITUATION.**—No change occurred this week. Business is very dull and the smelters, although all running, are suffering from shortness in ore shipments.

**BELGIAN.**—Considerable development work is being carried forward and shipments are light at present. The last strike proved pockety, but a good lead body is being operated now.

**BON AIR.**—A few men were allowed by the Miners' Union to go down the shaft this week and make some necessary repairs.

**HALF MOON DISTRICT.**—Quite a number of new prospectors have entered this section during the month. The principal placer territory is owned by the Alexander Placer Mining Company. This company owns four miles of ground and intends to conduct important operations. It is claimed by the people of that section that an amalgamating mill is badly needed to handle the low-grade ores.

**LEADVILLE GOLD AND SILVER EXTRACTION COMPANY.**—A force of 160 men is building this plant, which promises to be far larger and more elaborate than has been generally supposed. A visit to the plant shows that the big tanks are almost completed, the crushers and rollers already up, two 80-H. P. boilers in position and the foundation being laid for the engines. The crushers have a capacity of 100 tons a day, and the mill will treat from 75 to 100 tons daily.

**SIXTH STREET.**—Steam was up for a short time this week, but no work was done. Simply an inspection was made of the workings.

**STARS.**—At the Morning and Evening Star mines extra men have been put on and themselves are shipping about 150 tons of iron daily.

**UNION LEASING AND MINING COMPANY, LEADVILLE.**—At the annual meeting of the stockholders of this company held July 14th, 1896, at Denver, the following board of directors was elected: Messrs.



S. W. Mudd, Robert B. Estey, H. I. Higgins and John Harvey, of Leadville; Messrs. F. L. Bellan, John E. Price and James H. Crandell, of Denver. The new board re-elected the following officers: S. W. Mudd, president; Robert B. Estey, vice-president and general manager, and H. I. Higgins, secretary and treasurer.

WELDEN.—Peter Breene, who is in possession of this mine, has filed a demurrer to the complaint made by the other owners alleging insufficient cause for action taken by them. He asks that the injunction be set aside. The case will probably be heard on July 31st. In the complaint filed by the other owners of the Welden, they set forth that the different levels in the mine are over 5,000 ft. in extent, and that the property has yielded in profits \$100,000. The deposed manager, Mr. Schlessinger, stated to your representative that he has over \$100,000 worth of ore already blocked out in the mine.

## SAN JUAN COUNTY.

LOST HOPE.—It is reported that this mine, in Ice Lake Basin, has been sold to the Ice Lake Gold Mining Company. The property was owned by Charles H. Stockman and George Lacy, of Silverton, and the price of the property is said to be \$35,000.

## GEORGIA.

## LUMPKIN COUNTY.

BOARTFIELD.—This mine, near Dahlonega, is being worked on a small scale and some good ore is being taken out.

## IDAHO.

## ELMORE COUNTY.

(From an Occasional Correspondent.)

A Des Moines Company is preparing to line up some properties that give assay values from \$29 to \$38, and there is a 4-ft. ore body. Practically no ore is in sight, but the prospects are exceedingly likely. The company owns the property and will do only development work this year.

GOLDEN KING MINING COMPANY.—Manager Dan Nebor, of this company, is preparing to erect a 100-ton cyanide plant, to treat the product of the mine, which changed from a free to a base sulphuret ore on reaching the water level. The 10-stamp mill that has been running on this property will be run as a custom mill. The average values of the ores have been from \$12 to \$22, and the amalgamation took out about \$9 to \$15. The concentrates from the tailings run from \$50 to \$120 per ton.

## LEMHI COUNTY.

AMERICAN DEVELOPING AND MINING COMPANY.—It is reported that this company has purchased the Goldsmith and Hidden Treasure claims near their property in Gibbonsville.

## OWYHEE COUNTY.

DE LAMAR MINING COMPANY, LIMITED.—The following is the return reported for the month of June: Mill worked 20 days and crushed 3,100 tons; bullion produced in the mill, \$38,365; estimated value of ore shipped to smelters, \$4,775; miscellaneous revenue, \$415; total produce, \$43,555; total expenses, May and June, \$37,389; profit for two months, May and June, \$6,166.

## SHOSHONE COUNTY.

CRESCENT MINING COMPANY.—This company, operating near Pierce City, has completed a 160-ft. shaft. The vein shows more strength and value at the bottom of this shaft than at any point above.

## IOWA.

## POLK COUNTY.

It is reported that two veins of coal have been discovered under Grandview Park, north of the State Fair Grounds, at Des Moines. There are 100 acres, and the total value of the find to the commissioners is about \$50,000.

## MAINE.

LIME PEAK MINING AND MILLING COMPANY.—This company has been organized at Bath for the purpose of owning mines (gold, silver or copper) in the State of Idaho, and working the same with \$250,000 capital stock, of which \$4,000 is paid in. The officers are: Francello G. Jellson, president; Wm. R. Tillinghast, treasurer, both of Providence, R. I.

## MINNESOTA.

(From Our Special Correspondent.)

One shipment from Two Harbors last week were 78,000 tons, and from Duluth about 100,000 tons. One day during the week the docks at Duluth loaded 28,350 tons of ore, breaking the record. Docks at both places are now badly congested with ore, however. Vessel rates are still at the low point of the past few weeks, and there is absolutely nothing new in the situation here.

## MESABI RANGE.

(From Our Special Correspondent.)

BIWABIK ORE COMPANY.—The stripping crews worked at this mine by the Drake and Stratton Company have been laid off, and 150 men discharged. The same company will curtail its operations at Virginia, and has laid off one shovel at the Lone Jack.

CANTON MINING COMPANY.—This company has begun shipping once more, one shovel being at work in its stockpile. The low freight rate is too great an inducement to be refused.

LAKE SUPERIOR MINES.—Water still bothers this group greatly. At the Rust the miners were again

surprised the other day by a flow of water that compelled them to flee for their lives and drowned the pumps. Another large duplex Prescott pump has been received at the mine, but the shafts will probably not be unwatered till more can be had. At the Hull mine of the group, five duplex pumps of large size are now at work, and it is expected that by the last of next week the mine will be cleaned to the pump level.

MAHONING ORE COMPANY.—This company one day last week loaded 105 30-ton ore cars from the ore body with one shovel.

VIRGINIA GROUP.—At these mines the only activity is at the Oliver and Lone Jack. The Franklin, Norman, Commodore, Ohio and Auburn are working but slowly, and with small forces.

## VERMILLION RANGE.

(From Our Special Correspondent.)

CHANDLER IRON COMPANY.—At the stock piles a steam shovel is working night and day, and with the daily hoist of 3,000 tons, the shipments are 5,000 tons a day. About 320,000 tons have been shipped so far. The mine has a pay roll of about \$40,000 a month.

LOCKART.—This claim, on which more or less cursory examination has been made, will be optioned and opened by C. C. Prindle and wealthy Michigan capitalists. It is supposed to contain a fine quality of ore.

## MISSOURI.

## JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The output of ore was the same last week as the week before. The sales of zinc ore were larger than they have been for several weeks, as considerable ore that had been held over was sold last week. There is now very little zinc ore left over in the different camps. The top price paid for zinc ore was \$22.50 per ton, with average \$20 per ton. The sales of lead were less than they have been for several weeks on account of the low price paid, which was \$15 per thousand, with 50 cents added for hauling. This coming week several large plants will start up again and will largely increase the output of ore. The water from the late rains has nearly all been pumped out of the mines. The following was the output from the different camps in the district: Joplin zinc, 961,330 lbs.; lead, 176,430 lbs.; value, \$12,916. Webb City zinc, 366,480 lbs.; lead, 16,170 lbs.; value, \$3,936. Cartersville zinc, 1,174,900 lbs.; lead, 187,220 lbs.; value, \$18,457. Galena, Kan., zinc, 2,830,000 lbs.; lead, 462,000 lbs.; value, \$31,816. Mt. Vernon zinc, 86,780 lbs.; value, \$868. Oronogo zinc, 43,730 lbs.; lead, 7,620 lbs.; value, \$743. Alba zinc, 46,390 lbs.; value, \$464. Aurora zinc, 576,000 lbs.; lead, 42,000 lbs.; value, \$4,331. Totals for the district: Zinc, 6,085,610 lbs.; lead, 891,440 lbs.; value, \$68,561.

ALLEN CRAGIN & COMPANY.—This company has leased 40 acres of the Dan Collins land east of Belleville, and think it will prove to be the foundation of a new camp. They have developed chunks of zinc ore only 8 ft. from the surface, and have gone through more or less all the way down to 50 ft. On July 24th the ground changed from spar to flint, and the water came in so strong that sinking had to be stopped, not being able to handle it with the horse hoister which they were using. The shaft will be drilled from the bottom, and if the ore body meets the expectations of the company a big pump will be put in. On the same tract Jack Dolan and Jim Lane are sinking a prospect shaft.

CONSONANT COMPANY.—The Consonant Company is going to remove their plant from the shaft on the Eleventh Hour lease to the Little S. shaft on the Central lease at Midway, where they have opened up a fine zinc ore prospect at 125 ft. in open ground. They will concentrate the ore from their shaft on the Eleventh Hour lease on the Grasshopper plant in the adjoining lot.

CRISMAN & COMPANY.—On the Gramby land this company is drifting at 120 ft. on a large face of zinc ore in timbering ground and enough water to clean their ore. With three hand jigs they are making 20 tons of high-grade zinc ore each week.

GRANBY LAND.—Dr. Price and his partners are happy over the fact that the Mabel Prince, on the Gramby land in Leadville Hollow, has verified the indications shown by the drill and at 94 ft. a big zinc prospect has been opened up. The ore is very rich and the tubs hoisted last week were fully half ore.

HOCUS POCUS COMPANY.—This mining company has put in a new engine and boiler. They are drifting at 60 ft. on a large body of caved dirt that is very rich in pebble zinc ore, and with four hand jigs are making over four tons of top-price zinc ore each shift. Below this caved dirt they have a 15-foot face of zinc ore, with good ore in the bottom of the shaft. They are sinking at night, and will thoroughly develop their four lots on North Heights and soon put in a steam jig plant.

MYERS & COOPER.—On the Leonard land these people are drifting at 98 ft. on a good run of lead in pink spar and tuff ground with only enough water to clean the ore. Three hand jigs are making over 25,000 lbs. of lead each week. They are sinking at night and are taking out good zinc ore that is getting richer the deeper they sink. They are down 125 ft. in hard ground.

PETERSON & COMPANY.—On the Gramby land this company is drifting at 90 ft. on a large face of zinc

ore in timbering ground, with enough water to wash the dirt. They are making over 25 tons of high zinc ore each week and employ only 11 men.

QUINTUPLE MINING COMPANY.—The Quintuple lease came to the front last week with three new prospects, and they are all good ones. Henritz, Devore & Co., of Cartersville, struck good pay dirt Saturday in their shaft at 70 ft. This prospect is in the same formation of ground as the discovery prospect. Hart Bailey was also among the lucky ones on this lease last week, he having struck a fine lead prospect at 40 ft. in soft ground. Frank Stewart, Dr. Cook, Dr. Jocelyn and W. M. Williams are also in luck, as they have opened up a good prospect of both lead and jack at 65 ft. in open ground that shows up fine.

## MONTANA.

## DEER LODGE COUNTY.

ARGUS.—Leasers of this mine, in the Zosel district, are working 17 men and are making regular shipments of ore to Butte. The machinery recently put in is working satisfactorily and greatly increases the output of ore.

## MEAGHER COUNTY.

GALT COMPANY.—This company, at Nelhart, is pushing work on the main tunnel on the Galt claim and is taking out a large amount of silver ore. The tunnel has reached a point which gives a back of about 500 ft. of stopping ground. The ore being taken out is as good if not better than any yet uncovered in this mine and contains wire and is covered with native silver. As yet no stopping has been done and all the ore being taken out comes from the main drift.

## NEVADA.

## ESMERALDA COUNTY.

(From Our Special Correspondent.)

SILVER PEAK.—This mine, at Silver Peake, 40 miles south of Candelaria, was bonded by J. B. Wright and B. A. Gamble, of San Francisco, in May, 1895. It was owned by John I. Blair, the railroad millionaire. Since that time about \$170,000 has been expended on machinery and development work. A fine cyanide plant has been erected to work the old tailings which have been accumulating for the past three years. About 70 tons, which average \$7, are being worked per day. The 3-stamp mill is crushing about forty tons of free-milling ore per day. This ore averages \$20 per ton. A tunnel has been run 700 ft. to tap the 10-ft. ledge, which gives about 1,200 ft. of backs and a shaft down 100 ft. on an incline gives 300 ft. more.

## STOREY COUNTY—BRUNSWICK LODGE.

The following are extracts from the latest weekly reports of the mine superintendents:

BEST & BELCHER.—Shaft No. 2 was sunk 9 ft. on the incline; total depth, 283 ft., bottom in porphyry. On the 150 level discontinued work in the south drift, started from the west crosscut, and resumed work in the main south drift, started from the east crosscut No. 1 and extended it 15 ft.; to a length, 95 ft.; face in porphyry and quartz.

GOULD & CURRY.—The joint shaft No. 2 has been sunk 9 ft. on the incline; total length, 283 ft., bottom in porphyry. The main tunnel has been extended 25 ft., passing through porphyry and stringers of quartz; total length, 814 ft. The west crosscut No. 5 started in this tunnel at a point 800 ft. from the mouth has been extended 14 ft.; total length, 54 ft., passing through hard porphyry and quartz; total length, 40 ft.

## STOREY COUNTY—COMSTOCK LODGE.

The following are extracts from the latest weekly reports of the superintendents:

ALPHA.—The southwest drift, 26 ft. east from the shaft, 500 level, was advanced 14 ft.; the face is in clay and porphyry with stringers of quartz through it; total length, 146 ft.

ALTA.—The east drift, 725 level, was driven 5 ft.; total length, 50 ft. The south drift, east vein, was driven 12 ft.; total length, 228 ft. Four days of the past week were consumed in retimbering and repairing the south drift in the Keystone vein and the winze started and sunk 4 ft. in quartz, some of which we are saving for ore.

ANDES.—420 level—The east crosscut No. 2 from the upraise up to 50 ft., advanced 19 ft.; total length, 57 ft. Formation quartz and porphyry. Shipped to Selby Smelting & Lead Company 5 1424-2000 tons of concentrates from the ore which we had concentrated, and received for the same \$4,247.39 after Selby & Company's charges and the freight charges on the concentrates had been deducted.

BEST & BELCHER.—Bonner shaft—800 level—The joint east crosscut started on our south boundary has been advanced 11 ft.; total length, 33 ft.; face in hard porphyry.

BULLION.—The west drift from the station 820 level has been advanced during the week 9 ft.; total length, 2,339 ft.; face in porphyry and quartz.

Consolidated California & Virginia, 1,000 level—West crosscut No. 2 started at a point in the north drift 550 ft. north from the Consolidated Virginia shaft station, has been advanced 22 ft.; total length, 500 ft., passing through harder porphyry and clay separations and narrow lines of quartz, assaying \$1 per ton. The face is showing a slight seepage of water. 1,650 level—On the ninth floor, the first floor above the sill floor of this level, the south drift from the east crosscut from the drift run south from the end of the slope, has been extended 13 ft., passing through porphyry, clay and quartz



assaying \$2 and \$3 per ton; total length, 432 ft. 1,750 level—From the 13th, 14th, 15th, 19th and 21st floors above the sill floor of this level at the north end of the stope in old ground of former workings, we have extracted during the week 101 tons of ore, the average assay value of which, per samples taken from the cars in the mine, was \$64.80 per ton. We are timbering in the upraise from the 21st to the 24th floors. From the upraise which was carried up from the northwest drift from the main west drift from the C. & C. shaft 50 ft. above the sill floor of this level, the northwest drift has been extended 10 ft., passing through porphyry and quartz assaying from \$2 to \$5 per ton; total length of drift, 106 ft. From the northwest drift at a point 70 ft. in from its mouth an east crosscut has been started and advanced 23 ft. through porphyry and quartz assaying \$2 and \$3 per ton. The total extraction of ore for the week amounted to 101 tons, the average assay value of which, per samples taken from cars when raised to the surface, was \$58.01 per ton.

**CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.**—This statement shows that after selling all the bullion received from the recent run of the Morgan mill and paying all expenses for the month of June the company entered July with a cash balance of about \$28,000. In the mine they continue to flood the old stopes on the 1,650 level, where fire and gas exist with water, which is doing good work. The escaping water is naturally causing a steady rise in the water in the bottom of the mine.

**GOULD & CURRY.**—Bonner Shaft—800 level—The joint east crosscut, started on our south boundary, has been advanced 11 ft., total length, 33 ft.; face in hard porphyry.

**MEXICAN.**—1,000 level—The west crosscut No. 1 from the north drift on the sill floor of this level, started at a point 480 ft. from the Ophir shaft station or 230 ft. north from the south boundary line of the Mexican mine, has been extended 21 ft., passing through hard porphyry, carrying clay seams; total length, 597 ft.

**OCCIDENTAL.**—550 level—North drift from east crosscut has been advanced 22 ft.; total, 29 ft.; face in quartz. South drift from same crosscut is in 49 ft.; extended during the week 23 ft. 650 level—The north drift from west crosscut No. 2 is now in 47 ft.; extended 36 ft. since last report; face in ore of low value. South drift from west crosscut No. 2 is 227 ft.; advanced during the week 20 ft. 750 level—The east crosscut was discontinued. West crosscut from south drift is in 15 ft., total length, 47 ft.; face in hard porphyry. Have resumed drifting south and have made during the week 15 ft. in quartz of low assay value.

**OPHIR.**—1,000 level—The west crosscut No. 1 started from the south drift from the shaft station on the sill floor of this level at a point 350 ft. south of the shaft station, or 70 ft. north from the south boundary line of the mine, has been advanced 23 ft., passing through porphyry, carrying seams of clay and lines of quartz, the latter assaying \$1 per ton; total length, 457 ft. Central tunnel, from the sill floor, from the upraise started on the north side of the crosscut running west from the drift run northwesterly from the Mexican shaft—56 ft. above the sill floor of this level—at a point 194 ft. in from the mouth of the crosscut the south drift has been extended 7 ft., through porphyry and quartz formation, assaying \$2 and \$4 per ton; total length, 137 ft.

**SAVAGE MINING COMPANY.**—The bullion yield of this mine from May 24th to June 26th was as follows: Gold, \$9,228; silver, \$22,908; total, \$32,136; discount on silver, \$11,221; net cash received, \$20,915; tons of ore milled, 1,080; yield per ton, gross, \$29.75; yield per ton, net, \$19.36; car samples average per ton, \$47.25; battery samples average per ton, \$57.75; proportion obtained, 78.81 p. c. of the average battery assay.

**SIERRA NEVADA.**—LAYTON TUNNEL—The east crosscut No. 2 from the north lateral drift, 100 ft. north from east crosscut No. 1, was advanced 20 ft.; total length, 120 ft.; the face is in porphyry and clay.

**UNION CON.**—900 level—East crosscut from the south drift started at a point 50 ft. south from the upraise 115 ft. vertically above the sill floor of this level has been extended during the week 18 feet; total, 49 ft.; face in porphyry. East crosscut No. 8 started from the north lateral drift at a point 75 ft. north from east crosscut No. 7 was advanced 23 ft.; total, length 80 ft.; face in clay, porphyry and quartz, the latter giving low assays.

**UNION SHAFT.**—The east crosscut from the south drift, started at a point 50 ft. south from the upraise, 115 ft. vertically above the sill floor of the 900 level, has been advanced during the week 18 ft.; total length, 40 ft.; face in porphyry. East crosscut No. 8, started from the north lateral drift at a point 75 ft. north from east crosscut No. 7, was advanced 23 ft.; total length, 80 ft.; face in quartz, giving low assays.

**UTAH.**—The west crosscut started from the south drift at a point 130 ft. in from its mouth, has been extended during week 3 ft., passing through porphyry and clay; total length, 51 ft. Have completed repairs from the end of the west tunnel, where it connects with the old Utah shaft.

#### STOREY COUNTY.

(From an Occasional Correspondent.)

Virginia City will have a pay roll for July of about \$80,000.

#### WASHOE COUNTY

(From an Occasional Correspondent.)

Chicago capitalists have had experts examining the properties in the Pea Vine Pyramid and Cotton Wood districts with the intention of starting operations there. The ledges of these districts are somewhat similar to those of the Comstock region, and are only a short distance from them. The values of these ledges and the stability of the vein matter is yet a question, but it is being thoroughly sampled by competent experts.

#### NEW MEXICO.

##### SOCORRO COUNTY.

**GALVESTON COMPANY.**—Superintendent George R. Brown, of this company's property at Cooney, is working 20 men, some on development and several getting in readiness for the erection of a mill.

#### NEW YORK.

##### ERIE COUNTY.

**GENESEE VALLEY BLUE STONE COMPANY.**—This company, which has opened a fine quarry near Portageville, has the necessary buildings for the plant completed, and the machinery required for sawing the stone, together with the battery of boilers to operate the same, are already in position. Active operations will begin in August.

#### OHIO.

##### MUNROE COUNTY.

**ELLSWORTH, MORRIS & COMPANY.**—This firm, one of the largest coal-operating concerns in this State, has decided to cut their coal by electrical machinery. The system to be employed is the three-phase system of the General Electric Company, and the plant will consist of one 135-H. P. electric generator and eight coal cutters of the new induction motor chain type. These will be placed in two mines at Trail Run and Hartford, distant from each other 2½ miles. The power-house will be located centrally, and the current will be carried for nearly two miles, over aerial wires, which will be run through drill holes into the entries of the mines and be carried to the various points where the cutters are employed. Naturally such an order as this was not secured without competition. Induction motor cutters were adopted in place of the direct current motor cutters for the reason that the former are lighter; possess many characteristics rendering the method of applying power to the cutter superior; decrease the amount of copper required to equip the mine; have no commutator or brushes demanding constant attention; have no starting rheostat and do not spark. The fact that the operative is not called upon to devote part of his time to attending to a brush and commutator mechanism, but can continue his work uninterrupted, is an important desideratum.

##### PORTAGE COUNTY.

**HUTSON COAL COMPANY, DEERFIELD.**—This company has adopted electrical apparatus for cutting its coal. The plant consists of one 100-H. P. three-phase generator and one 6-ft. coal cutter furnished by the General Electric Company. The particular mine in which the cutter is working has just been opened. The entry is driven in only a few hundred feet, and there is room at present for only one cutting machine.

##### TRUMBULL COUNTY.

It is reported that Frank Bennett, of Franklin, Pa., an experienced oil and gasman, has leased over 2,000 acres along "Braceville Ledge," and will begin drilling. Evidence of oil has been found in many springs on the "Ledge."

##### WASHINGTON COUNTY.

On Newell's run near the town of Newport, two wells have been drilled into the Berea grit and each is reported good for two barrels a day from that level.

##### WYANDOT COUNTY.

**MOHAWK OIL COMPANY.**—Well No. 6 has just been drilled by this company and is good for nearly 50 barrels without being shot. The directors have decided to put down another well at once, and the work will be commenced as soon as the derrick can be put up.

#### OREGON.

##### BAKER COUNTY.

(From an Occasional Correspondent.)

Cable Cove Mining District will see the greatest amount of work this year it has ever experienced. This is considered one of the best if not the best district of Eastern Oregon.

California capitalists are preparing to operate extensive placers in Grant County, near the Baker County line.

#### PENNSYLVANIA.

##### ANTHRACITE COAL.

**CRANBERRY.**—Work on this new breaker, near Hazleton, is being pushed forward rapidly. The company expects to have this breaker in operation by August 15th. When completed it will give employment to 1,300 men and boys.

**COXE COLLIERIES.**—The proposition to drain these collieries at Beaver Meadow by means of a tunnel through Spring Mountain to empty into the Quakake Valley has been satisfactorily settled and work on the tunnel will be commenced at once. It is proposed to empty into a stream called Wetzel's Creek. This flows into the Quakake near Hudson-

dale. The proposed tunnel will be 1½ miles in length and will be a gigantic engineering feat. It will give all of the mines in that basin natural drainage.

**JONES COLLIERY.**—All mining in this colliery of the Philadelphia & Reading Company, at Milneville, has been stopped owing to a threatened deluge from an adjoining mine.

**PHILADELPHIA AND READING COAL AND IRON COMPANY.**—By an explosion of gas at the Bear Ridge colliery of this company on July 27th, three men were killed, one of whom was the fire boss, and one man was injured, perhaps fatally. The explosion took place in old workings in some manner yet unknown. It is said the mine has always been comparatively free from gas.

**PHILADELPHIA & READING COAL AND IRON COMPANY.**—This company has decided to sink a new shaft at the Burnside Colliery. Six coal beds will be tapped that are the richest in the Shamokin region. Eight hundred feet will be the extreme depth. The shaft will be put down between two mountains. From 600 to 800 men will be given employment after the colliery is in operation.

**PHILADELPHIA & READING.**—The foreclosure sale of all the property of the Philadelphia & Reading Railroad Company and the Philadelphia & Reading Coal and Iron Company is advertised to take place in Philadelphia on Wednesday, September 23d, 1896. Included in the property of latter company are iron-ore lands in Putnam Valley, N. Y.; Putnam County, N. Y.; Nelson and Amherst counties, Va.; Albemarle County, Va.; Seasholtzville, Pa.; Big Pond, Pa.; Boiling Spring, Pa.; Heim & Vanasden lands. Also the following furnaces: Bechtelsville, Swede, Kutztown, East Penn, Emaus, St. Clair, Ringgold, Monceacy, Port Carbon Furnace and Rolling Mill, all in Pennsylvania, and Powhatan Furnace, Va.

**TURKEY RUN COLLIERY.**—The Buck Mountain vein, which has been sought for by the mine officials of this colliery for the past year, has been cut. The vein is of considerable thickness and is of a good quality of coal.

#### CHESTER COUNTY.

The lead mines in Upper Uwchlan township, which have been idle for nearly six years, have been leased by the Pettinos Brothers, of Bethlehem, and are being put into condition for a resumption of operations. A force of men is at work making repairs and putting in machinery. The lead will be extracted from the ore by a different process than formerly. Six years ago these mines were successfully worked under the name of the Phoenix Plumbago.

#### SOUTH DAKOTA.

##### LAWRENCE COUNTY.

**STAR MILL.**—Work on the new steel tramway from the Edison hoist to this mill, at Lead, is being rapidly pushed to completion. A force of men is now at work on the pits for the pier foundations. A double line of track will be utilized.

**YANKEE BOY.**—Development work on this property, situated in Carbonate Camp, is being steadily carried on. It is reported that the ore chute recently struck is now 5 ft. wide and from 2½ to 3 ft. thick. The ore has an average value of \$32 per ton.

##### PENNINGTON COUNTY.

**APEX COMPANY.**—This company has started its 60-stamp mill near Rochford, and is filling its ore bins. All the dead work has been completed and the company is now prepared for active work.

#### TENNESSEE.

**VIRGINIA & TENNESSEE COAL AND IRON COMPANY.**—According to the Knoxville *Tribune*, a plan has been completed for the reorganization of this company and the transfer to it of a tract of 42,000 acres of mineral and timber land in Sevier and Cocke counties. The company now owns furnaces at Cranberry, Bristol and Big Stone Gap, and purposes adding to the number. Parties largely interested in the Norfolk & Western and the South Atlantic & Ohio railroads are concerned in the plan.

##### POLK COUNTY.

**PITTSBURG & TENNESSEE COPPER COMPANY.**—All the employees of this company went on a strike last week. Their object is to secure a regular pay day.

#### TEXAS.

##### MILAM COUNTY.

**LOVE STAR COAL COMPANY.**—This company has opened a new vein at Rockdale. It is said that at a depth of 105 ft. a 5½-ft. vein of pure, solid lignite, without trace of dirt or slate, has been struck.

##### ROBERTSON COUNTY.

**CALVERT COAL & CLAY COMPANY.**—W. H. A. Lewis, of Calvert, and Wm. A. Moroney, of Houston, and others have incorporated this company, for mining, etc., with a capital of \$500,000.

#### UTAH.

##### SALT LAKE COUNTY.

**CONGLOMERATE MINING COMPANY.**—This company, at Bingham, which succeeds the Société des Anonymes des Mines des Lexington in the ownership of the Old Telegraph mine at Bingham, has filed a copy of its articles of incorporation with the county clerk of Salt Lake County. It is capital-



ized at \$1,000,000, and the principal place of business is Cripple Creek, where other properties owned by it are located.

**MINERAL LANDS AND LAND GRANTS.**—The Utah State land commissioners propose to ascertain, by a test selection, whether mineral lands were included in the land grant carried by the enabling act. This is a very important question, for if mineral lands may be selected, they may prove to be an important source of revenue provided the State disposes of them upon such terms as will encourage their development. In the absence of any reservation of mineral lands from the grant, there seem to be reasonable grounds for testing the matter. When the Idaho commissioners last winter proposed to select mineral lands a protest was forwarded to Washington and the Land Office recognized the exclusion of such lands, but we believe such exclusion is authorized by the express terms of the act conveying lands to that State.

**SALT LAKE COPPER MANUFACTURING COMPANY.**—This company, of Salt Lake City, has submitted its fourth quarterly report to the court. The receiver, C. P. Mason, shows: The total receipts for the quarter were \$5,542.77, and the disbursements were \$15,073.03. There is a balance on hand of \$7,335.09.

**SUMMIT COUNTY.**

**CRESCENT.**—The shaft of this mine, at Park City, is being re-timbered, with a view to the early resumption of work.

**CREOLE.**—It is reported that in sinking the new working shaft at this mine a body of ore was encountered recently that assayed 28% lead, 15 oz. silver and \$1.60 in gold, and 50% lead, 57 oz. silver, and \$2.60 in gold.

**WASHINGTON.**

**KING COUNTY.**

**HEMLOCK GROUP.**—In Granite Mountain district, within 60 miles of Seattle by the Great Northern Railway, Baltimore capitalists are reported to have purchased interests amounting to \$25,000 in this group of mines. It is said they have been made to pay from grass roots, the ore being carried nine miles over a difficult trail.

**SNOHOMISH COUNTY.**

**RIVERSIDE GOLD MINING COMPANY.**—This company was incorporated last week with a capital stock of \$1,000,000, divided into 1,000,000 shares at \$1 each. Seven trustees will manage the concern until November, 1896, as follows: C. C. Filson, W. H. Clark, George T. Gilmore, A. W. Conant, J. G. Cotton and J. A. Forehand, for King County; C. R. Martin, for Okanogan. The principal place of business will be in Seattle. The objects of the corporation are far-reaching. It will not only own, lease and control mines, but will deal in city lots and other lands, build and operate waterworks, borrow money on bonds, build, operate and sell gas works, build, maintain and operate hotels, opera houses, summer resorts and promote in the construction and equipment of railroads.

**STEVENS COUNTY.**

**RESERVATION MINING AND MILLING COMPANY.**—It is reported that a test shipment of ore from the Lone Star and Washington claims of this company in the Colville reservation gave returns of \$32.32. The tunnel is now in about 100 ft. and nearly half the distance is in ore of the grade above referred to.

**WEST VIRGINIA.**

**MCDOWELL COUNTY.**

**CROZER COAL AND COKE COMPANY OF ELKHORN.**—This company, whose large electric locomotive was illustrated in the *Engineering and Mining Journal* of July 4th, has already decided to add to its plant, and will install several smaller locomotives for side entry haulage. A contract has also been placed with the Westinghouse Company for new and larger generators and power-house equipment.

**WOOD COUNTY.**

**BAINSDALL & COMPANY.**—This company's well, on the William Richardson farm, located two miles south of the Ogden field, has been drilled through the Gordon and found that formation barren. At the depth that the regular Gordon sand should have been found nothing was encountered but a shell.

**WYOMING.**

**SWEETWATER COUNTY.**

**BLAIR.**—These coal mines, with buildings and equipment have been leased to Charles R. Kelsey, of Rock Springs, who will commence the shipment of coal at once. The Blair property contains Union Pacific No. 1, No. 3 and No. 7 veins of coal, and Sweetwater and VanDyke veins.

**FOREIGN MINING NEWS.**

**BRITISH COLUMBIA.**

**ESQUIMAULT & NANAIMO RAILWAY VS. BAINBRIDGE.**—A cable from London states that the Privy Council has affirmed the decision of the Supreme Court of British Columbia in the case of the Esquimault & Nanaimo Railway against Bainbridge, which was argued on July 9, 1896, raising the question of the right to mine in land granted for the construction of railway. The Council ordered the appellant to pay the costs of the appeal.

**NORWAY.**—There is considerable excitement in camp over a new strike made in this mine about

half a mile from Trail. The vein is about 18 to 20 in. wide of free-milling ore and can be traced over 1,000 ft. Only a little work has been done, as the owners are intending to perfect title before further development work takes place.

**ONTARIO GROUP.**—This group is said to have been bonded for \$40,000, the bond calling for immediate work. The ledge matter in this camp is the same character as in the Roseland and Trail camps, assaying from the grass roots, having the heavy iron capping, with decomposed iron and red stains.

**CARIBOO DISTRICT.**

**GOLDEN RIVER QUESNELLE (LIMITED).**—This company has been incorporated for the purpose of working an alluvial gold-mining property on Quesnelle River. The capital is \$250,000, divided into 103,000 10% cumulative preference shares of £1 each and 217,000 ordinary shares of £1 each. The resident managing director is Major C. T. Dupont. The advisory board in British Columbia comprises Sir Henry Perring, Fellow Crease, Hon. Chas. E. Parley, Q. C.; Joseph Hunter, C. E., and F. B. Pemberton, C. E. The consulting engineers are Messrs. Bainbridge, Seymour & Co. The secretary is Jasper Foster, with offices at Great St. Helen's, E. C., London.

According to the prospectus, the company is formed to acquire the rights and powers conferred by three acts of the legislature of British Columbia, granting the exclusive right to extract the gold and precious metals in the entire length of the South Fork of Quesnelle River and a portion of the main Quesnelle River, about 9½ miles long.

Messrs. Bainbridge, Seymour & Co., in their report to the directors of the company, make these statements:

"Daily evidence comes before us of the increased attention which is being paid to British Columbia, which, notwithstanding the ever-increasing importance of South Africa and West Australia, appears, in our opinion, certain to rank as one of the first gold-producing countries in the world."

**SLOCAN DISTRICT.**

The following figures are an estimate by Mr. J. C. Ryan, showing the net earnings of 16 Slocan mines during the first six months of 1896. The Slocan Star, it is said, spent \$125,000 on a mill and other improvements, in addition to its \$100,000 dividend. The gross earnings are placed at \$1,500,000: Idaho Group, \$125,000; Slocan Star, \$100,000; White Water, \$40,000; Wellington, \$40,000; Keoc, \$30,000; Ruth, \$25,000; Last Chance, \$25,000; Goodenough, \$20,000; Monitor, \$20,000; Northern Belle, \$20,000; Payne Group, \$20,000; Deadman, \$20,000; Antoine, \$12,000; R. E. Lee, \$10,000; American Boy, \$4,500; Slocan Boy, \$4,000. Total, \$515,500.

**TRAIL CREEK.**

It is reported that a 3-ft. body of chalcocopyrite copper ore has been uncovered in the View mine in this district. The value is said to be from 15 to 20% in copper, and about \$5 in gold. The discovery was made in a 30-ft. tunnel about 49 ft. from the west end line of the Southern Belle.

**CANADA.**

**ONTARIO.**

(From Our Special Correspondent.)

Capt. J. C. Foley, the successful promoter of the Ray-Foley group of claims, returned here this week, accompanied by several representatives of his new organization, viz., the Ontario Gold Mining and Milling Company. After completing payments of their numerous employees, an examination of the underground working upon "AL 74," "AL 75 and 6" was carefully made by the company, and so satisfactory did the prospects for a continuation of present rich and abundant output of ore appear that the early erection of a 20-stamp Frazer & Chalmers stamp mill was decided upon, and its site, upon the margin of an expansion of La Seine River finally selected.

K 198.—The force of skilled miners under Colonel Ray have been eminently successful in their efforts upon at least five out of eight lodes, viz., "A," "B," "C," "D" and "E," in all of which native gold in great nuggets, as well as finely disseminated throughout the quartz, is now visible everywhere. Like the Ray-Foley and "Ferguson's," K 198 is within the protogenic belt—so favorable to the existence of true fissured lodes and free-milling ores generally. This and surrounding groups were visited last week by two French engineers said to be in the interest of capital.

**THE SEINE RIVER (ONTARIO) GOLD MINES, LIMITED,** is the name by which the Ferguson group will in future be known. This company, just organized in London, with a nominal capital stock of £100,000, to operate mining claims "AL 110" and "AL 111," and, according to their somewhat modest prospectus, "K 223" also. The two former claims have been under active development since last October, and are as a matter of fact fairly and honestly described in their prospectus, while "K 223," upon which no development has been made, has, as a matter of fact, most, if not all, of the well-defined and highly auriferous lodes of "AL 110" and "AL 111," traversing its area of 40 acres diagonally. As this memoranda goes to mail Mr. Ferguson, the promoter, and apparently this company's consulting engineer, arrived at La Seine River, accompanied by others interested in his ventures. The Bad Vermillion group, including HP 423, and the Rodi claims adjacent, are attracting much attention from American capitalists, and notwithstanding the absorbing questions, both financial and political

cal presently prevailing, Americans are slowly but surely securing most eligible bargains.

**MEXICO.**

**CHIHUAHUA.**

**EL PORVENIR.**—It is reported that a company has been formed to work this mine, recently discovered at Julimes, district of Camargo. Assays of the ore taken from the mine are said to give 46 oz. of silver and 64% lead per ton. The property is divided into 1,200 shares, 600 of which belong to the owners of the mine, and the other 600 have been placed on sale.

**ZACATECAS.**

**FRANCO-MEXICANO COMPANY.**—This company is exploiting eight mines in the Caluagua and Celestina mountains. Specimens of the ore show gold, silver, copper and lead. The ore will be shipped to the smelters.

**NEW SOUTH WALES.**

**BROKEN HILL PROPRIETARY COMPANY.**—Cable dispatches from Melbourne give the following summary of the company's report for the half-year ending May 31st. The net profit for the six months was \$1,225,570. The profit and loss account shows: a balance of \$3,091,360. The available assets, including reserve, are: Cash in bank and on deposit, \$875,000; Consols and Colonial securities held, \$625,000; bullion and stores on hand, \$1,292,895; total, \$2,792,895. During the half-year there were 218,022 tons of ore treated, the average being 7% lead and 19 oz. silver per ton. The average value per ton of ore worked was \$16 44; the average cost was \$1.04, leaving a profit of \$5.40 per ton. The exploration and prospecting work in the mine has been carried on actively. The expenditure on account of the damages resulting from the fire in the mine was \$14,500, and no further trouble is expected from this source. The company does not intend to make any changes in the present reduction works until the new concentration plant is completed, which will hardly be before the end of the year.

**NOVA SCOTIA.**

(From Our Special Correspondent.)

During the past few months there has been little to note in the provincial mining business. In Cape Breton the coal trade has shown a decided increase and it is expected will much more than make up last year's deficiency. The increase over last year to the end of July is estimated at about 300,000 tons. The General Mining Association is about 10,000 tons ahead of their shipments to this date last year. In Pictou County the trade continues dull, the mines working little more than half time. It is reported that these collieries have secured large shares of the railway contracts, and that with the demand for coke a better fall trade will be done. In Cumberland County the Springhill colliery shows an increase of 50,000 tons over last year to the end of June. Work continues dull at the Joggins.

The Londonderry and Terrona furnaces continue running. The Steel Company of Canada, owners of the latter, have recently made satisfactory shipments from their Newfoundland iron-ore mine.

Gold mining continues quiet. Many enquiries are made for gold mines here, but seem to be mostly in the line of large low-grade properties. A new district at Cow Bay, near Halifax, has yielded satisfactory trial crushings. A chlorination plant is being put up in Queens County to work tailings as well as some large bodies of low-grade ore.

Plaster shipments continue brisk from Windsor and other points. Manganese mining continues dull, although much prospecting is being done for this ore in connection with steel making.

**SOUTH AFRICA.**

**TRANSVAAL.**

**WITWATERSRAND GOLD PRODUCTION.**—The announcements made respectively by the Johannesburg Chamber of Mines and by the secessionist Association of Mines, show that the gold produced in the Rand district last month amounted to 193,640 oz., a reduction of 1,363 oz., as compared with the May total and of 7,301 oz., as compared with the corresponding month of last year. The fact that June contains one day less than May much more than accounts for the decrease in last month's yield, and as June is usually an extremely cold month, it is generally found that the production of gold exhibits a shrinkage, owing to the difficulty of keeping the natives at work. The latest accounts from the Rand, however, show that labor is abundant, that there is a plentiful supply of water for mining operations and that the industry is being favored by a reduction in the cost of transporting fuel and materials generally. For the six months ending June 30th the total output this year has been 1,054,533 oz., which compares with 1,113,547 oz. for the corresponding period in 1895; 973,736 oz. in 1894; 661,971 oz. in 1893, and 562,704 oz. in 1892. At the usual value of Witwatersrand gold the output for the six months this year represents a total value of \$17,788,000. The largest outputs reported by individual mines in June were: Robin-on, 20,243 oz.; Ferrieva, 13,418 oz.; Crown Reef, 10,723 oz.; Langlaate Estate, 9,131 oz. The Robinson continues to show a very large increase.

**LATE NEWS.**

Fire broke out on the night of July 31st in Argall's Opera House, Grass Valley, Cal., and spread to the whole block. Twenty-five houses and stores were



totally destroyed and twelve others partially burned. Total loss, \$150,000.

DR. J. A. S. GRANT, of Cairo, Egypt, better known as DR. GRANT BEY, who has for many years been prominent as a physician and Egyptologist, died Tuesday last at Bridge of Allan, Scotland. DR. GRANT BEY had long been recognized on the hieroglyphic records of the Nile Valley, and a multitude of Americans have pleasant recollections of the hospitality of his Cairo home, where so many were interested and instructed by his talks upon the religion and literature of the ancient Egyptians.

PITTSBURG COAL COMPANY.—Striking miners went to the Hymera mines of this company near Sullivan, Ind., at 2:30 on the morning of July 30th, covered the three watchmen with guns and marched them to the woods half a mile distant. While three stood guard, the balance of the crowd set fire to the plant. It was totally destroyed. Burning timbers fell into the shaft and set fire to the mine below. Their work done, the mob left and went east, toward Clay County. The mines were probably the best equipped of any in Sullivan County. The loss is estimated at nearly \$50,000.

PONTIAC & MESNARD MINING COMPANY.—Report comes from Houghton, Mich. that receiver Sheldon has sold the Pontiac and Mesnard Mining Company's real estate for \$34,000 to Thos. L. Chadbourne. It is understood that Mr. Chadbourne bought for the Quincy Mining Company. The mineral locations each contain 160 acres, lying between the Franklin and Franklin, Jr., properties, and are not regarded as valuable for mining properties. The two companies possessed between them a mile frontage on Torch Lake between the Quincy and Osceola Mills, and this is more valuable than the property on the mineral land. The entire amount of real estate owned by both the Pontiac and Mesnard Companies was slightly in excess of 1,000 acres.

The Truax Manufacturing Company, the manufacturers of the ore car of that name, established in Denver, Col., for the past two years, has, during that time, convinced its customers of the excellence of its product, and is at present doing a large business. During the past few weeks they made one shipment of 24 cars to the Guggenheim smelter at Aguas Calientes, Mexico. Also a number are now being manufactured for the old Telegraph mine in Utah, and for the Isabella Mining Company at Cripple Creek, and orders are coming in from all parts of the United States. It is only a short time ago since the inventor, Geo. E. Truax, started on a very small scale, but by perseverance and industry he has worked up a business which promises fine results for the future.

THE ALLIANCE EXPLORING AND FINANCE CORPORATION (Limited).—This company has a capital of £200,000, divided into 192,000 ordinary shares of £1 each and 8,000 founders' shares of £1 each. The consulting engineers are H. M. Deakin, M. E., and T. F. DeCourcy Browne, M. E.; secretary and offices (pro tem.), H. Shynn, 85 Gracechurch St., London, E. C.

According to the prospectus, the corporation has been formed for the purpose of carrying on the business of a Parent Financial Mining and Exploration Corporation, more particularly in connection with the British Colonies of Western Australia, New Zealand and British Columbia; it will also act as founders and agents for the purposes of acquiring options upon proved mining properties in the gold fields of these colonies, with the view to their re-sale to subsidiary companies formed by the corporation to acquire the same.

Among other properties the company has an option to acquire an interest in a property situated in British Columbia, of which the provincial government have thought so well that they have already advanced a considerable sum of money toward its development. There is a reserve of about 7,000 tons of ore in sight, giving an assay average of about 2 oz. of gold per ton; while from stringers, as high as 600 oz. per ton have been obtained.

CLEVELAND, July 30th, 1896.—At last the long lockout and serious labor union trouble between the Brown Hoisting and Conveying Machine Company may be said to have worn itself out. In principle the matter was settled on Sunday last, and during the week places have been found for as many of the employees as possible. The terms are as follows according to a letter from Mr. Alexander E. Brown, the manager of the company.

The terms of settlement offered by the company, and which we understand were unanimously accepted by the men, are as follows:

"Our late employes can resume employment at our works as fast as we can furnish them work.

"In order to save confusion and disappointment at the works we request each former employe who desires employment to notify us at the works, or by letter, and await notice from us of our having work to set him at.

"Our contract of employment will continue to be individual with each man, and we will continue to endeavor to do justice to each man.

"All employes shall bring their grievances or complaints, first, before their foreman, but if not satisfactorily adjusted by the latter, they may then

bring them before the superintendent, and after him before the manager; and all such complaints or grievances shall receive careful consideration."

These terms are practically confirmed by the labor leaders.

PENNSYLVANIA.

TWIN SHAFT DISASTER.—Conditions at this mine are about the same as reported last week, the searching parties continuing to advance slowly. On July 30th, District Mine Inspector McDonald ordered a temporary cessation of work because of the unusually dangerous condition of the mine. As soon as this danger lessens the work is to be resumed.

UTAH.

JUAB COUNTY.

BUCKEYE.—It is reported that the shaft in this mine, near Silver City, Tintic, is in a solid body of ore on the 300-ft. level that averages from 15 to 20 oz. silver, \$19 to \$80 gold and a good percentage in lead and iron. The mine is shipping regularly.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 31.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending July 25th, 1896, compared with the corresponding period last year:

	1896.		1895.
	Week.	Year.	Year.
Pennsylvania Railroad.....	59,499	1,940,551	2,023,984

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending July 25th, and for years from January 1st, 1896 and 1895:

	1896.		1895.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	33,308	1,318,048	2,693,568
Barclay, Pa.....		22,875	
Beech Creek, Pa.....		1,705,174	1,619,606
Broad Top, Pa.....	6,152	234,278	294,820
Clearfield, Pa.....	60,614	2,804,517	3,630,212
Cumberland, Md.....	81,073	2,065,054	2,083,047
Kanawha, W. Va.....		1,785,640	1,615,591
Phila. & Erie.....	630	30,368	46,114
Pocahontas Flat Top.....		2,083,645	1,694,045
Totals.....	264,502	14,929,228	13,677,003

\* For year ending July 18th.

	1896.		1895.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	17,949	582,481	559,789
Pittsburg, Pa.....	28,564	1,139,995	1,260,478
Westmoreland, Pa.....	37,182	1,118,153	1,256,453
Totals.....	83,695	2,840,629	3,076,720
Grand totals.....	348,197	14,929,228	16,753,723

Production of coke on line of Pennsylvania Railroad for the week ending July 25th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 76,202 tons; year, 2,311,808; to corresponding date in 1895, 3,188,196 tons.

Anthracite.

The conditions which have ruled the anthracite coal market during the week are unchanged. Both the producers and consumers are waiting for the fall season.

The operators and carrying companies have been devoting the greater part of the week to closing up their books, and have about mined their full quota for July. It is expected that the production will amount to 3,600,000 tons for the month; 400,000 tons less than the tonnage set for August.

Lehigh coals continue scarce, and we understand that egg is being sold at \$4.50. It is said that some operators have sold Lehigh coal for some time ahead.

The free burning coals do not show any scarcity, and what little business is being done in them is at the July circular. There is only a limited amount of coal coming to tide-water, most of that mined being used along the line and for Western shipment. Business in the East is quiet; in the West it is a little more encouraging, though not very active.

Retailers have their yards pretty full of coal, as there is no domestic demand just now, and the manufacturers are not ordering, owing to the business uncertainty. The average coal dealer is living on credit and his hopes for the fall trade.

The July circular of prices is as follows: \$3.75 for broken; \$4 for egg; \$4.25 for stove, and \$4 for chestnut, subject to the usual commission of 15c.

The statement of the Philadelphia & Reading Coal and Iron Company for June and for the seven months of the fiscal year from December 1st to June 30th is as follows:

	June.	Seven months.
Gross earnings.....	\$2,057,589	\$12,592,332
Expenses.....	1,993,120	13,097,415
Net or deficit.....	N. \$64,469	D. \$505,083
Fixed charges.....	95,000	665,000
Deficit.....	\$30,531	\$1,170,083

For the seven months there was an increase of \$567,468 in gross earnings, and an increase of \$110,944 in deficit. The expenses included \$485,390 for colliery improvements.

NOTES OF THE WEEK.

The Dominion Coal Company of Nova Scotia has

made the following shipments of coal during the first six months of 1896:

Month.	1895.	1896.	Increase.
January.....	21,077	44,097	23,020
February.....		9,171	7,372
March.....	5,824	30,313	24,489
April.....	75,139	111,177	36,038
May.....	113,401	153,000	39,599
Total.....	217,240	347,758	130,518

A large part of this coal has been shipped to the United States, chiefly to Boston.

Bituminous.

In the soft-coal trade business is a little duller than last week, and the falling off in tonnages from the various regions reflect this fact. Ordinarily at this time of the year there is prevalent a mid-summer dullness, but producers are very apt to attribute the present condition of the market to the working of the association.

The far Eastern trade is feeling the shutting down of the mills on part or full time.

The railroads which have made the greatest objection to the association's schedule of prices are gathering in all the outside coals they can get hold of, and are pushing the shipments of the Dominion Coal Company's product so as to undersell the association figures. Notwithstanding this the operators in the bituminous regions continue to live up to their agreements with the association.

Orders are scarce with almost all the shippers; the poorer grades of coal feeling the condition of the trade more severely than the better class.

The main line railroads that have supported the Bituminous Coal Association by keeping faith with reference to rates on the different coals going over their lines continue to do so, and so long as they keep their freight rates without favoritism the association will last.

A meeting was held at the office of the Pennsylvania Railroad Company in Philadelphia this week by the presidents of all the main line roads transporting soft coal. Among those present were President George B. Roberts, of the Pennsylvania Railroad Company, together with the vice-president, Frank Thomson, president, John K. Cowen, and receiver, Oscar G. Murray, of the Baltimore & Ohio Railroad; M. E. Ingalls, president of the Chesapeake & Ohio Railroad; Chauncey M. Depew, of the New York Central, which owns the Beech Creek Railroad, and F. J. Kimball, receiver and president of the Norfolk & Western Railroad. This gathering was caused by the irregularities in freight rates in transportation of bituminous coal. After some discussion the meeting closed with the understanding that the existing schedule of freights would be maintained.

The points east of Cape Cod continue to take the principal part of the tonnage, while the Sound ports are taking very little. In New York harbor trade there is little to report, but the shipments are fairly active. Trade local to the shipping ports is very dull, practically no orders being placed.

The Chesapeake & Ohio Canal is suffering from a small blockade of boats at Georgetown on account of the lack of ocean tonnage going to this point. The boats from the mines that have accumulated at this end have been relieved to some extent by a break which has detained some of the boats en route on the Cumberland side, thus preventing a further gathering of these vessels.

Transportation from mines to tide continues to be excellent considering that these times are generally slack, and the orders in the shippers hands are not in over abundance. On the other hand, it would be preferable if transportation was slower now.

All rail trade is in much the same condition as the tidewater market; tonnages are reduced, and the demand is small.

The car supply is up to all demands, and the points on the main line roads that were embargoed at the corresponding period last year are now open for shipment.

In the coastwise market the supply of vessels largely exceeds the demand, and where boats are chartered to any extent their place is promptly taken by new arrivals. Rates are down to the lowest ebb, and some captains are tying up their vessels rather than accept the present prices, claiming a dead loss at figures now offered. This condition applies also to Sound barges, and indeed to the smaller craft plying around New York harbor.

On July 28th bids were opened in the United States Navy Department, at Washington, for coal to be supplied during the year at the various navy yards and stations on the Atlantic seaboard. Some of the bids that have been accepted are the following: 2,500 tons bituminous, at \$2.99 per ton, delivered at Boston, Mass., by Mr. Fairfield; also 2,500 tons George's Creek Cumberland coal at \$3.19 per ton, delivered at the same place by the same gentleman; 4,456 tons at \$2.77@2.98 per ton, delivered at New York, by Davis Coal and Coke Company; also 80 tons of coke, at \$5.25 per ton, same delivery by the same concern; 250 tons at \$2.58 per ton, delivered at League Island, by the Clearfield Bituminous Coal Company; 5,200 tons at \$2.49@2.59 per ton, delivered at Annapolis, Md., by the Davis Coal and Coke Company; 8,850 tons at \$2.55 per ton, delivered at Washington, D. C., by John Miller, and 4,800 tons at \$2.95 per ton, delivered at Norfolk, Va., by the Davis Coal and Coke



Company. By this statement it will be seen that the Davis Coal and Coke Company has been the most successful bidder so far. The second in this regard is Mr. John Miller, while Mr. Fairfield holds third place.

We quote current rates of freight from Philadelphia: To Boston, Salem, Portland and the Sound ports, 50c.; Portsmouth, 50@55c.; Wareham, 75c.; Lynn, 60@65c.; Newburyport, 65c.; Dover, 90c. @ \$1, alongside and towage; Saco, 75c. alongside and towage; Bath, 50@55c.; Gardiner, 65c. and towage; Bangor, 60@65c. Five and ten cents above these rates are asked from Norfolk, Newport News and Baltimore.

The Association prices remain as follows: F. o. b. Philadelphia, Norfolk and Newport News, \$2.35; Baltimore, \$2.28; New York Harbor shipping ports, \$2.80, alongside; New York Harbor, \$3. There is a 20c. differential in favor of Clearfield and Beech Creek coals.

**Buffalo.** July 30.

(From Our Special Correspondent.)

The anthracite and bituminous coal trade continues to exhibit midsummer quietude, with no changes announced in quotations. Lake freights on coal unchanged; movement very light. Many vessels are laying up for want of business.

The most important topic of conversation is the fact that 1,000 electric horse power will be transmitted to Buffalo from Niagara Falls on and after November 4th this year. Contracts were signed on Monday last between the Buffalo Street Railroad Company and the other parties in interest for all the apparatus and machinery necessary "for the transmission, transformation and delivery" to be used in operating their cars, etc. It is said that the price of the power to be supplied will be in the neighborhood of \$20 per horse power per year, which is about 30% cheaper than the average horse power can be produced per year by coal and engines at Buffalo. This is the preliminary move for the fulfillment of the 45,000 H. P. wanted in our city.

The shipments of coal westward from Buffalo by lake from July 19th to 25th, both days inclusive, aggregated only 55,720 net tons, distributed as follows: 20,950 tons to Chicago; 15,300 tons to Milwaukee; 4,300 tons to Superior; 6,170 tons to Toledo; 650 tons to Bay City; 1,150 tons to Lake Linden; 500 tons to Gladstone; 900 tons to Green Bay and 500 tons to Saginaw. The rates of freight were 30c. to Chicago, Milwaukee, Green Bay and Lake Linden and 25c. to Duluth, Superior, Gladstone, Toledo, Bay City and Saginaw. Closing dull.

The steel propeller "Queen City" broke all her previous records as well as of lake vessels generally by bringing to this port a cargo 202,000 bu. of corn last week.

The Connellsville coke region continues to operate about 10,000 ovens, and producing 100,000 tons of coke weekly. The shipments for the last week were 5,708 carloads. The quotations given out are unchanged.

There were delivered at Cleveland last week, 4,537 net tons of iron ore from Ashland, being the cargo of the "Sir Henry Bessemer," the first vessel of the Rockefeller fleet.

The anthracite coal output for August will, it is said, be in the neighborhood of 4,000,000 tons.

**Pittsburg.** July 30.

(From Our Special Correspondent.)

**Coal.**—The water in the Monongahela reached 23 ft. before it began to recede, doing immense damage from the head waters to the mouth; the damage will run up to hundreds of thousands of dollars. Not only the coal men, but the iron and steel plants at most points were flooded and work suspended. There were no coal shipments; in fact coal is a drug in the lower markets.

As to miners' wages, there is much agitation in the Pittsburg district, and Ohio is not any better. High officers of the miners' organization have been called here; 2,000 men are already idle, with few mines in operation. The rail coal trade continues as unsatisfactory as before. The mining rate is more demoralized than ever.

Northwestern buyers are still holding aloof and as a consequence activity is confined to direct shippers only. The Western Coal Company on the Charters Branch of the Panhandle road has reduced the price of mining from 70 to 60c. a ton.

At New Philadelphia, O., the right of way has been secured for an extension of the Cleveland & Pittsburg Railroad up Beaver Dam Valley. All preliminary work will be built as far as New Cumberland this fall; the surveys have been made. The extension is to be made for the purpose of developing the fields of coal of fine quality in that portion of the country. The East Goshen Coal Company has been organized and incorporated with \$100,000 capital with J. A. Bledler, of Cleveland, and C. J. Brohenshure as the principal stockholders. A mining town is to be established on the Joshua Liggett farm and the output of coal will begin about November; the company is under contract to ship 100,000 tons of coal yearly over the road.

**Connellsville Coke.**—Independent coke production continues to hold up exceedingly well, showing an increase of 311 tons; the demand was not so good. The shipments east and to Pittsburg held up well, and show an increase in demand to three points of 134 cars, but there was a falling off to points west of 170 cars, making a net decrease of 36 cars. The Western falling off is not from any weak condition of the trade. The railroads have been at variance to some extent over division of shipments and owing to this difference Western

shipments over the Lake Erie system were not up to the average. These differences have now all been settled and no trouble will be experienced by the operators in getting their coke out from this on. The trade is fairly good.

The summary of the region shows 10,312 ovens in blast with 7,635 idle, this report shows about the same as last week, estimated upon the ovens charged amounted to 101,316 tons, an increase of 311 tons. The prospect for a greater active list of ovens in the near future is good.

Shipments from the region for the week reached 5,988 cars, distributed as follows: To points east of Pittsburg, 1,036 cars; to points west of Pittsburg, 2,900 cars; Pittsburg and river points, 2,050 cars; total, 5,988 cars.

The Cambria Iron Company closed down its Atlas coke plant, at Dunbar, consisting of 100 ovens employing 125 men.

**Shanghai, China.** July 3.

(Special Report of Wheelock & Co.)

**Coal.**—We mentioned in our last that there were heavy stocks of the inferior Japan article, and since then they have been augmented by further arrivals; business consequently is almost at a standstill, and as far as we can ascertain there has not been a single transaction of importance; shippers in Japan have begun to realize that it is preferable to hold their stocks in hopes of higher prices rather than ship to a stagnant market. Small lots of Cardiff have changed hands, but the market is weak. Sidney Wollongong is exceedingly dull and uninteresting; deliveries seem to get smaller every day.

We quote: 9 taels per ton for American anthracite, 10.50 taels for Welsh Cardiff, 9 taels for Australian Wollongong. Japan coal is quoted at 5.75 taels per ton for Takasima, 4.35 taels for Namazuta lump, and 3@3.25 taels for other sorts.

**Kerosene Oil.**—There has been a very large business done in Devoo's, but it has been of a speculative nature entirely, the prices fluctuating daily, even hourly, one moment 1.60 Tls. per case and then a fall of a couple of points; things have steadied a bit since and 1.58 Tls. per case for prompt delivery and 1.60 Tls. within the month is the present quotation. Little attention has been paid to other brands. There have been two arrivals of Bato m case, thereby opening the market for this brand, bringing 234,000 cases; two arrivals of Devoo's, with 154,050 cases. Our stocks, including these arrivals, are now estimated at 554,000 cases Devoo's, 359,000 cases Russian, 15,000 cases Comet and 7,000 cases Langkat. Quotations are as follows per case: American Devoo's, 1.59 1/2 taels; Russian Batoum, 1.55 taels; Russian Batoum bulk, 1.47 1/2 taels; Langkat, 1.50 taels; Comet, 1.55 taels.

**IRON MARKET REVIEW.**

NEW YORK, Friday Evening, July 31, 1896.

**Pig Iron Production and Furnaces in Blast.**

Fuel used.	Week ending		From Jan., '95.	From Jan., '96.
	Aug. 2, 1895.	July 31, 1896.		
Anthracite.	39	21,501	39	24,100
Coke....	133	142,804	130	155,950
Charcoal....	17	3,731	23	6,600
Totals...	189	168,036	192	186,650
			4,989,756	5,802,879

The market generally shows no improvement, and the depression which has existed for some time past seems to be deepening. The demand for raw material is steadily falling, and iron is not selling even at low quotations.

The steel combine meets to-day and to-morrow in New York, but its action is very uncertain. It is understood that some members favor a reduction in price of billets, while others believe that such action will be entirely useless just now, and will be more over a confession of weakness which would not be politic. It is also reported that some sharp questions may be asked as to the mysterious way in which stocks of billets in middlemen's hands have held out, and whether deliveries under "old contracts" have not been rather "elastic."

**NOTES OF THE WEEK.**

The first cargo—3,000 tons—of the 50,000 tons of iron ore contracted for by the Maryland Steel Company from the mines at Conception Bay, Newfoundland, was received in Baltimore last week.

A statement has recently been published that a steamer had been chartered to bring iron ore from Vizagapatam, in British India, to Philadelphia. This seems somewhat doubtful, especially as the freight to be paid is given at 16s. 3d. per ton. Even if the ore can be put on board at a very low price, this would mean a cost of at least \$6 per ton at Philadelphia, and at present prices of iron it would hardly be a profitable transaction. It is possible that a cargo may be brought over as an experiment, or for a special purpose, but it is not likely to be repeated.

**New York.** July 31.

The local market is dull, far beyond the usual summer quiet. There is hardly anything doing and little prospect of an improvement. In fact, there is nothing to record.

**Pig Iron.**—The demand is extremely light. Prices,

however, hold their own nominally, and in the absence of sales we cannot say that there has been any shading.

Latest quotations for tidewater delivery are as follows: No. 1 Northern, \$12@13; No. 2 Northern, \$11.75@12.25; No. 3 plain, \$10.75@11; gray forge, \$10.75@11. No. 1 Southern we quote \$11.25@11.50; No. 2 Southern, \$10.75@11; No. 3 Southern, \$10.50@10.75.

**Cast-Iron Pipe.**—No business in cast-iron pipe is reported for the past week. Market quiet with few inquiries.

**Spiegeleisen and Ferro-Manganese.**—Market quiet, and only a few small sales reported. Prices remain unchanged at \$19.50@20 per ton for foreign spiegeleisen, and \$47@47.50 for ferro.

**Steel Billets and Rods.**—Butt little business was done last week buyers holding off for the result of the pool meeting to-morrow. Prices remain unchanged at \$21.75, New York delivery. Rods are \$20.

**Merchant Iron and Steel.**—The volume of business in finished and bar last week was small. Prices remain unchanged and are quoted as follows: For common bars 1"10@1"20c.; refined bars, 1"25@1"50c.; soft steel bars, 1"25@1"35c. Other quotations are: Steel hoops, 1"50@1"60c.; steel axles, 1"65@1"80c.; links and pins, 1"65@1"75c.; tire steel, 1"80@1"95c.; spring steel, 2@2"20c. All prices are for delivery on dock, New York.

**Plates.**—The plate market is quiet with few enquiries. Prices remain about as last reported and are as follows: Universal mill plates are 1"45@1"55c. For other sorts we quote: Tank, 1"40@1"50c.; boiler shell, 1"45@1"55c.; good flange, 1"65@1"75c.; firebox, 2@2"40c. Charcoal iron plates are 2"25c. for shell, 2"75c. for flange, and 3"25c. for best firebox. Rivets are 2"15@2"25c. for steel and 3@3"25c. for iron.

**Structural Iron and Steel.**—The outlook for late summer and fall building seems good, and is certainly having a tendency to hold prices firm. Several new building enterprises are talked of. Latest quotations are as follows: Angles, 1"45@1"50c.; channels, 1"70@1"80c.; tees, 1"60@1"65c.; beams, 1"70@1"80c. in quantities, with a slight advance for small lots.

**Wrought-Iron Pipe.**—Market dull and weak, and but few small sales reported during the week. Discounts are as follows, with the usual shading for large lots at mill: Butt black, 57, 10, 10, 10; lap black, 67, 10, 10, 10; butt galvanized, 52, 10, 10, 10; lap galvanized, 55, 10, 10, 10.

**Nails.**—The mills report no improvement in demand, and the outlook is not at all encouraging. The export trade, however, is fair, and has helped out some of the mills in business. Prices are for car-load lots of wire nails, \$2.55 per keg; cut nails, \$2.30 per keg, all f. o. b. Pittsburg.

**Steel Rails and Rail Fastenings.**—The important transaction of the week in the rail market was the final closing of the contract for 23,000 tons of rails, which the Lackawanna Company secured from the New York, New Haven & Hartford road. The original contract was for 20,000 tons, but was increased to 23,000 tons. This is the largest order for rails placed this year. The next largest was for 20,000 tons street rails placed with the Cambria Iron Company by the Pittsburg Traction Company. Aside from the above, the market was quiet, with prices unchanged at \$28.75 per ton at tidewater, with girder rails at \$28@30, same delivery.

No change in rail fastenings.

**Old Rails.**—No sales of any importance are reported. Prices remain unchanged at \$11@12.50, New York harbor or Sound port. Old rails for relaying purposes still hold at \$19@22, New York delivery. Old iron rails, \$13@14.50 f. o. b. New York.

**Scrap Iron.**—The demand is weak and prices remain at unchanged at \$10@11.50 per ton for good machinery scrap. Ordinary cast-iron scrap is \$9@10; stove-plate and mixed, \$6@7.50.

**Buffalo.** July 29.

(Special Report of Rogers, Brown & Co.)

There is no change to note in this district, except that there seems to be more feeling that a pig-iron purchase at present prices would be a good investment. At the same time, buyers are not taking hold and the general market is dull and almost lifeless, with prices weak. Undoubtedly the prospect of a good-sized order would bring out lower prices on some kinds of iron than quoted below. Lake Superior charcoal remains firm and shipments up to the average for this time of the year. We quote on a cash basis f. o. b. cars Buffalo as follows: No. 1 foundry strong coke iron, Lake Superior ore, \$15; No. 2 foundry strong coke iron, Lake Superior ore, \$12.50; Ohio strong softener No. 1, \$13; Ohio strong softener No. 2, \$12.50; Jackson County silvery No. 1, \$15.25; Southern soft No. 1, \$12; Southern soft No. 2, \$11.50; Lake Superior charcoal, \$14@14.50.

**Cleveland, O.** July 29.

(From Our Special Correspondent.)

**Iron Ore.**—The market in Cleveland is very dull, and practically no ore is being brought to Ohio ports at present. During the past week quite a number of large ore carriers have been laid up here because their owners cannot get what they deem a fair rate, and the ore dealers claim that there is no incentive at present to induce them to bring their ore to the lower lake ports. A member of the firm of Pickands, Mather & Co. said to-day that they had closed down the Alice blast furnace at Sharpville because of the stagnation of business. M. A. Hanna's fur-



nance, at the same place, will close August 1st for the same reason. Notwithstanding the depression in the iron business, standard prices agreed upon some time ago prevail, and no sales below that figure are reported during the past week. Standard Bessemer are quoted at \$4, standard non-Bessemer hematites at \$3.25 and \$3, and Mesabi non-Bessemer at from \$2.45 to \$2.60.

The lake freights have declined somewhat since last week, and the result has been that some of the vessel owners have tied their boats to the docks, saying they lost money on their last cargoes. Among them is the "Coralia," one of the largest ore carriers on the lakes, and as she was built especially for economy in freighting, the owners of the other vessels are seriously alarmed at the outlook.

**Pig Iron.**—The has been no change in the price of pig iron. Lake Superior charcoal brings \$13.50@ \$14; bituminous coke, No. 1 foundry, \$12.25; No. 2, \$11.75; Ohio Scotch, No. 1, \$12.25; No. 2, \$11.75; Bessemer pig, \$12.25.

Philadelphia, July 31.

(From Our Special Correspondent.)

**Pig Iron.**—There is no buying of consequence. The brokers who are in town are fanning themselves until the expected telegram from New York comes. The talk about a crisis is nonsense. Things will be straightened out as soon as the great body of consumers see what it is best to do. Weaker prices are looked for by consumers, but brokers and furnace men say the very opposite condition is more likely to arise. Combinations have kept prices of certain iron products above their normal level. The present commotion is simply the evidence of the correction of that evil. Foundry and mill buyers are ready, and, in fact, anxious to get their orders in. Furnace interests assert that \$12.50 is bottom for good No. 1. Some fair No. 2 is now offered at \$11.75, though there are makers here who are not trying to sell at less than \$12.25. Mill iron has sold as low as \$10, and even \$11 is asked. A few days will blow the fog away.

**Steel Billets.**—Brokers predict the quick placing of large orders by three or four consumers here if prices suit.

**Merchant Bar.**—The settlement of the scale affects nothing here. Two or three mills that have been idle resume on Monday. The week's business indicates that a gradual enlargement of demand is in progress. Large lots, 1'20; smaller, 1'30; store, 1'40@1'50c.

**Nails.**—Business is not encouraging. Retailers have about all the nails they care for.

**Skelp.**—The week's orders indicate a movement of some force among builders and buyers.

**Sheet.**—Mill owners report increasing activity, especially among the smaller buyers, for quick delivery. Stocks are even and if an improvement came mills would be crowded to make quick deliveries.

**Wrought Pipes and Tubes.**—Business is picking up on both pipes and tubes, but the orders are for the most part small.

**Plate and Tank.**—Prices are said to be unsettled, but that simply means that billet quotations have not been regarded as fixed for several weeks and large buyers have waited on that account. Tank is 1'40; shell, 1'55; flange, 1'60; fire-box, 1'80@2.

**Structural Material.**—As stated often there is enough projected business to make everything right for the structural mills when the business dead-lock is broken. Angles are 1'40c.; beams, 1'70c @2c., according to size.

**Steel Rails.**—Our brokers say if billets are put where they ought to be, there will soon be some steel rail business to report.

**Old Rails.**—Old iron rails are quoted at \$14.

**Scrap.**—There is nothing whatever to report in the scrap market this week.

Pittsburg, July 27.

(From Our Special Correspondent.)

**Raw Iron and Steel.**—Business during the week has continued within contracted limits in most lines, partly as a result of midsummer conditions, but largely on account of the disturbance of confidence. In nearly all branches of trade there has been a noticeable hesitation to extend operations beyond the supply of immediate requirements. Consumers seem to have been waiting for something that up to the present time has failed to arrive. Only five months remain of 1896, and yet the outlook for business is a long way from what was expected, with little visible signs of improvement. We have entirely too much pig iron on hand, yet many of the furnaces that closed for repairs are nearly ready to resume work and will be in operation in August; many of them have increased their daily capacity from 50 to 100 tons per day. The question that has to be met is what to do with the increased supply. With over 800,000 tons of iron made and waiting a market, prices are down to figures which furnacemen say hardly covers first cost. Hence the iron trade conditions continue very unsatisfactory, both in crude and finished products, and the general tendency of prices is downward.

The Amalgamated wage scale has generally been signed; there are some plants holding back. A dispatch from Sharon says that a reduction of 20c. in wages will be made at every furnace in the Mahoning and Shenango Valleys, except New Castle, on August 1st. The Mahoning and Shenango Valley

Iron Manufacturers' Association sent out notices to that effect. The men may strike, which will mean nearly 2,000 out of employment. The Sharpville and Sharon and the Youngstown, Hubbard, Niles, Struthens and Brier Hill furnaces are all affected. It is hoped this wage question may be satisfactorily adjusted without a strike.

**Latest.**—Dullness, inactivity and low prices control the Pittsburg market. We have never seen less inclination to operate. Sales are confined to very limited amounts at prices the lowest for many months. It has been a long time since Bessemer pig sold at \$11.25@ \$11.50. There was no activity even at these low prices; many of the leading ironmen are away on their vacations, and the way things look they will not be in a hurry to return. Steel billets show sales of small description, principally by middlemen, who appear to have some left. The billet pool called to meet in New York on Friday will likely reduce prices. They ought to be convinced by this time that billets at \$20.25 are not wanted at present.

COKE SMELTED, LAKE AND NATIVE ORE.		Tons.	Cash.
2,000	Bessemer, July, and August, Pitts.....	\$11.50	300 Billets, Aug., at mill..... 18.75
1,000	Bessemer, July, and August, Pitts.....	11.25	200 Billets, Aug., at mill..... 19.50
500	Bessemer, spot, Pitts.....	11.50	500 Sheared, Pitts, \$1.40 4 m.
500	Grey Forge, August, Pitts.....	10.00	250 Wide grooved, Pitts..... 1.20 4 m.
500	Grey Forge, August, Pitts.....	10.00	150 Narrow grooved, Pitts..... 1.20 4 m
200	Grey Forge, spot, Pitts.....	9.75	250 Sheared, Pitts, \$1.30 4 m.
100	No. 1 Foundry, August, Pitts.....	12.00	200 Wide grooved, Pitts..... 1.10 4 m.
50	No. 2 Foundry, August, Pitts.....	11.50	150 Narrow grooved, Pitts..... 1.10 4 m
50	No. 2 Foundry, August, Pitts.....	11.25	50 Cold Blast, Pitts, 23.25
28	No. 2 Foundry, August, Pitts.....	11.50	50 Warm Blast, Pitts..... 21.00
25	No. 2 Foundry, spot, Pitts.....	11.50	50 No. 2 Foundry, Pitts..... 16.00
25	No. 2 Foundry, spot, Pitts.....	11.25	25 No. 2 Foundry, Pitts..... 16.00
25	Low phosphorus Bessemer, spot, Pitts.....	16.00	250 Neutral, deliv'ed, Pitts..... \$20.50
25	No. 2 Foundry, spot, Pitts.....	11.25	BLOOMS, BILLETS AND SLABS AT MILL.
1,500	Billets, Aug., at mill.....	\$19.80	200 Tons f. o. b. Mill, Pitts..... \$25.00
1,000	Billets, Aug., at mill.....	19.00	300 August delivered, Pitts..... \$22.50
500	Billets, Aug., at mill.....	19.75	100 August, Pitts..... \$22.25
500	Billets, Aug., at mill.....	19.60	FERRO MANGANESE.
500	Billets, Aug., at mill.....	5061	200 80 per cent, delivered, Pitts..... \$19.00

METAL MARKET.

New York, Friday Evening, July 31, 1896.

Gold and Silver.

Prices of Silver per Ounce Troy.

July.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$1.	July.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$1.
25	4'88 1/2	31 3/4	68 3/4	531	29	4'88 1/2	31 1/2	68 3/4	532
27	4'88 1/2	31 3/4	68 3/4	531	30	4'88 1/2	31 3/4	68 3/4	531
28	4'88 1/2	31 3/4	68 3/4	531	31	4'88 1/2	31 3/4	68 3/4	531

The market continues very steady. The India and China exchanges have shown only very small fluctuations.

The United States Assay office in New York reports the total receipts of silver at 71,000 oz. for the week.

Gold and Silver Exports and Imports.

At all United States ports, June, 1896, and years from January 1st, 1896 and 1895:

	Coin and bullion.		In ores.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
<b>GOLD</b>					
June.	\$6,915,066	\$899,325	\$13,470	\$95,681	E. \$5,933,530
1896..	42,935,551	25,233,959	260,979	7,9,977	E. 17,252,594
1895..	35,231,438	25,991,945	318,169	830,594	E. 8,723,967
<b>SILV.</b>					
June.	4,347,778	1,206,951	95,638	1,379,246	E. 1,857,219
1896..	29,927,230	6,163,065	685,534	8,616,181	E. 15,839,518
1895..	23,897,427	4,312,425	35,202	6,075,803	E. 13,544,401

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

Gold and Silver Exports and Imports, New York

For the week ending July 30th, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

Week	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1896	\$117,000	\$125,237	\$863,690	\$26,301	E. \$879,022
1896	40,327,798	17,494,397	22,114,713	1,888,102	E. 43,560,612
1895..	25,062,532	24,295,616	23,960,400	1,022,825	E. 33,794,251
1894..	80,316,001	10,989,711	21,243,111	992,639	E. 89,576,769
1893..	69,219,427	12,927,569	19,611,415	1,475,284	E. 74,123,049
1892..	49,858,090	6,348,600	12,953,418	1,203,100	E. 55,260,867

All the gold exported during the week went to France, while the silver went to London. The specie imported came chiefly from Central and South America.

Average Monthly Price of Silver

in New York and London, per ounce Troy, from January 1st, 1896, and for corresponding months, 1895 and 1894.

Month.	1896.		1895.		1894.	
	Lon-don, Pence.	New York, Cents.	Lon-don, Pence.	New York, Cents.	Lon-don, Pence.	New York, Cents.
January	30 69	67 13	27 26	59 69	30 81	66 69
February..	31 01	67 67	27 47	59 90	29 18	63 43
March	31 34	68 40	28 33	61 98	27 28	59 10
April.....	31 10	67 92	30 39	66 61	28 95	62 92
May.....	31 08	67 78	30 61	66 75	28 69	62 98
June.....	31 16	68 69	30 47	66 61	28 63	62 59
July.....	31 45	68 75	30 48	66 75	29 82	62 45

FINANCIAL NOTES OF THE WEEK.

The result of agreement between the leading foreign exchange houses on the top of the voluntary contributions by national bankers and trust companies, here and all over the country, has restored the Treasury surplus to about \$10,000,000 in gold.

Whether this can be maintained will depend upon withdrawals on a smaller scale than for foreign exchange transactions by first class houses. Much of this class of withdrawal is nominally credited to Canadian bankers who are receiving instructions from their depositors to withdraw loans from the United States while the free silver question is being agitated. It is very doubtful, however, whether all of these withdrawals have been bona fide on Canadian account, and it is suspected that some of them are for hoarding purposes.

We learn, however, both from official and well informed banking circles that there is no intention or apprehension of making another bond issue before the vital currency question has been decided by vote in November.

The government reserve is officially computed at \$109,175,965, with about \$3,000,000 yet to be paid into the Treasury from cities under pledges given by the national banks. Withdrawals from the local sub-treasury yesterday footed up \$258,500, while the deposits aggregated \$10,000.

Further payments into the Treasury have brought the reserve up to \$110,567,322.

There has been \$100,000 gold withdrawn from the Sub-Treasury, reported to be for shipment to Canada.

The treasury deficit for July, as will be shown in the official statement to be issued to-morrow, will be in round figures, \$12,800,000.

The receipts for July have been \$29,400,000, and the expenditures \$42,200,000.

Interest checks to the number of 4,186, aggregating \$1,879,293, were to-day mailed in payment of interest due August 1st on United States bonds.

The statement of the United States Treasury on Thursday, July 30th, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

	July 23.	July 30.	Changes.
Gold.....	\$89,669,975	\$109,175,965	L. \$19,505,990
Silver.....	39,306,077	39,068,474	D. 237,603
Legal tenders.....	87,890,115	68,220,675	D. 19,669,440
Treasury notes, etc.,	31,960,850	34,525,932	D. 434,916

Totals..... \$251,821,917 \$250,991,616 D. \$830,911

Govt bank deposits, 17,237,819 16,419,617 D. 818,202

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$128,546,280. Against these are held in the Treasury 9,963,604 coined standard silver dollars, and the silver bullion purchased at a cost of \$118,582,676, making a total of \$128,546,280.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending July 25th, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

	1894.	1895.	1896.
Loans and discounts.....	\$181,633,600	\$5,617,600	\$174,229,900
Deposits.....	584,019,100	570,941,900	493,358,300
Circulation.....	9,371,400	13,138,800	14,676,700
Specie.....	90,642,300	65,297,400	56,231,300
Legal tenders.....	127,265,600	119,434,300	85,807,800
Total reserve.....	\$217,918,500	\$184,732,300	\$141,839,100
Legal requirement.....	146,094,775	142,733,125	123,337,050
Surplus reserve.....	\$71,903,725	\$41,999,175	\$18,502,050



Changes for the week this year were increases of \$77,300 in circulation; decreases of \$5,301,060 in loans, \$12,632,900 in deposits, \$6,102,100 in specie; \$329,600 legal tenders and \$3,273,475 in surplus reserve.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding dates last year:

	Gold.	Silver.	Total.
Asso. Banks of New York	1895.....	1895.....	1895.....
Bank of England	1895.....	1895.....	1895.....
Bank of France	1895.....	1895.....	1895.....
Imp. Bank of Germany	1895.....	1895.....	1895.....
Austro-Hungarian Bank	1895.....	1895.....	1895.....
Netherlands Bank	1895.....	1895.....	1895.....
Belgian National Bank	1895.....	1895.....	1895.....
Bank of Spain	1895.....	1895.....	1895.....
Bank of Italy	1895.....	1895.....	1895.....
Imp. Bank of Russia	1895.....	1895.....	1895.....

The return for the Associated Banks of New York is of date July 25th; all the others are of date July 30th, except the Bank of Italy, which is dated June 10th, and the Bank of Russia, whose return is dated June 1st-13th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports its gold only, not considering silver at all. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

The movement of gold and silver in Great Britain for the six months ending June 30th is given by the Board of Trade returns as below:

	Gold	Silver
Imports	1895.....	1895.....
Exports	1895.....	1895.....
Excess	1895.....	1895.....

There was a notable increase in the silver movement this year.

The foreign merchandise trade of Great Britain for the six months ending June 30th is given by the Board of Trade returns as below:

	1895.	1896.
Imports	1895.....	1896.....
Exports	1895.....	1896.....
Excess, imports	1895.....	1896.....

The increases in imports and exports very nearly balanced each other.

Shipments of silver from London to the East for the year up to July 16th are reported by Messrs. Pixley & Abell's circular as below:

	1895.	1896.	Changes.
India	1895.....	1896.....	D. \$263,752
China	1895.....	1896.....	D. 546,755
The Straits	1895.....	1896.....	I. 57,179
Totals	1895.....	1896.....	D. \$753,328

Arrivals for the week this year were £140,000 in bar silver from New York, and £38,000 from Chile; a total of £178,000. There were no shipments of silver from London this week.

The demand for Indian exchange still continues active under the pressure of large exports and the new rupee loan. The 50 lakhs of Council bills offered in London for the week were all taken up, and at a slightly higher rate, the average price being 14'13d. per rupee.

**Domestic and Foreign Coins.**

The following are the latest market quotations for the leading foreign coins:

	Bid	Asked.
Mexican dollars	\$0.5494	.....
Peruvian soles and Chilean pesos	.....	.....
Victoria sovereigns	.....	.....
Twenty francs	.....	.....
Twenty marks	.....	.....
Spanish 25 pesetas	.....	.....

**Other Metals.**

**Copper.**—At last some business has been transacted, but at a sacrifice in price. Consumers did not enter the market to any appreciable extent, and some of the producers became weary of waiting, which, coupled with the reports cabled from Europe to the effect that American copper had been freely sold at lower prices, brought about a decline. We have to quote Lake copper 1 1/2%; but it is difficult of sale thereat, and large quantities cannot be placed at that figure, but in the absence of any actual business this is the closest quotation that can be made. Electrolytic copper has declined to 10 1/2% for cakes, wirebars and ingots, while cathodes are 10%, and

the latter price has also been accepted for casting copper.

The exports continue rather large, and reports from the other side indicate a marked change. For several weeks past hardly any business had been done abroad so far as fine copper is concerned, but the lower prices are now again attracting attention. In London g. m. b. copper opened at £48 17s. 6d @ £49 and for the first few days of the week this quotation was steadily maintained, but when fine copper was offered cheaper prices gave way from day to day, and close at almost the lowest, £48 10s. for spot and £48 7s. 6d. for three months prompt. These figures are still very high in comparison with the prices at which fine copper has been sold in not inconsiderable quantities. Some important government orders will soon be given out abroad.

**Tin.**—While prices are somewhat easier than last week, in consequence of the decline in London, the demand has been remarkably good, and fair quantities have been delivered. Spot tin remains exceedingly scarce, but in the absence of any speculation, does not command any premium. We quote spot and futures 13 5/8c.

Abroad prices have given way about 10s. for the week, but at the end there was some better buying, and the market closes at £60 for spot and £60 12s. 6d. for three months prompt.

**Lead.**—The decline continues, and lower prices have again been established. In fact, the low-water mark has been reached, and we have practically to record lower prices than have ever been quoted within the last two or three decades. It is rather remarkable that in spite of the low values, consumers do not show more interest, and remain thoroughly apathetic. We have to quote 2'87 1/2 @ 2'90 New York and 2'62 1/2 @ 2'65 St. Louis, with sellers over at these figures.

The foreign market is also somewhat easier, Spanish lead being quoted £10 17s. 6d. @ £10 18s. 9d., with English lead 5s. higher.

**St. Louis Lead Market.**—The John Wahl Commission Company telegraphs us as follows: Since our last report the market has, if anything, weakened some, owing to the general stagnation of trade all over the country. Last sales have been made at 2'65 down to 2'62 1/2, according to brands and quality.

**Spelter** has relapsed into dullness, and hardly any business has been done. We have to quote 3'90c., New York and 3'70c., St. Louis.

The foreign market is reported to be weaker, sales for forward delivery being pressed. Spot is quoted £17 12s. 6d. and forward £17 5s. for good ordinaries, while specials are 2s. 6d. more.

**Antimony** is very dull and depressed; Cookson's 7c., U. S. Star 6 1/2c. and Hallett's 6 1/2c.

**Nickel.**—Business is rather light, but prices are firmly held, and we continue to quote 34 @ 35c. per lb. for ton lots, and 38 @ 38c. for smaller orders. London prices are 13 1/2 @ 14 1/2d. for large orders and 14 1/2 @ 16d. per lb. for small lots. The New York price is on a parity with London, allowing for the United States duty of 6c. per lb. on the metal.

**Platinum.**—Demand is steady and prices are again a little higher, say \$14.50 @ \$15.50 per oz., New York. London quotations are 57s. 6d. @ 59s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotation, the prices given being respectively for orders of over 250 grams; for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 50c., 51c. and 52c. per gram. Wire and foil are 47c., 48c. and 49c., per gram. The current retail price for crucibles is 60c. per gram.

**Quicksilver.**—The price is unchanged at \$35.50 per flask, New York. The London quotation is also unchanged at £6 7s. 6d. per flask, with the same price from second hands also.

**The Minor Metals.**—Quotations for these metals are given in the table below, the prices being for New York delivery:

Aluminum:	
No. 1, 98% pure rolling ingots, per lb	50 @ 55c.
No. 1, " ingots for re-melting, per lb	48 @ 53c.
No. 2, 94% pure, " "	38 @ 42c.
Ingots from scrap, per lb	35 @ 40c.
Aluminum-nickel casting metal, per lb	40 @ 45c.
Bismuth, per lb	\$1.30 @ \$1.75
Phosphorus, per lb	50 @ 55c.
Platinum, per oz	\$14 @ \$15
Tungsten, pure, powder per lb	70c.
Tungstic acid, per lb	45c.
Ferro-tungsten, 60% in ton lots, per lb	60c.

**Imports and Exports of Metals.**

Philadelphia.††	Imports.	
	Week, July 23	Year, 1896.
Antimony, casks	.....	102
Copper ore, long tons	.....	14,281
Ferro-Manganese, long tons	.....	380
Ferro Silicon	.....	60
Iron ore, long tons	3,600	153,530
" pig	.....	400
" and steel scrap, long tons	.....	618
Manganese ore, long tons	.....	4,561
Spiegeleisen " "	.....	134
Tin " "	.....	206
Tin and black plates, boxes	.....	27,073

†† From New York Metal Exchange Reports.

New York.*	Week, July 23.		Year, 1896.	
	Expts.	Imps.	Expts.	Imps.
Aluminum..... lbs.	.....	.....	10,000	1,569
Antimony ore..... short tons	.....	.....	95	10,000
" regulus..... casks	.....	.....	.....	2,91
Brass, old..... short tons	.....	.....	142	1,187
Copper, fine..... long tons	71,955	.....	44,017	4,351
" matte..... "	223	.....	9,633	1,256
" ore..... "	.....	.....	.....	1,980
" sulphate..... "	.....	.....	4,431	.....
Iron ore..... "	.....	.....	.....	.....
" pigs, bars, rods..... "	.....	74	53	4,394
Iron pyrites..... "	.....	.....	.....	1,200
" sulphate..... "	.....	.....	.....	610
Ferro-manganese..... "	.....	.....	.....	490
Ferro-silicon..... "	.....	.....	.....	.....
Manganese ore..... "	.....	.....	.....	1,722
Spiegeleisen..... "	.....	408	.....	21,412
Lead ore..... "	.....	.....	.....	.....
" pigs and bars..... "	11,291	1680	3,736	28,552
Magnolia metal..... "	.....	.....	.....	17
Nickel..... "	15	.....	41	30
Steel, billets, rods..... "	.....	812	.....	16,284
Tin..... "	.....	160	.....	8,311
Tin and black plates, boxes..... "	.....	52,983	30	493,747
Zinc (spelter)..... long tons	197	.....	1,639	12

\* Metal Exchange Reports. † Week ending July 30.

Baltimore.**	Week, July 30.		Year, 1896.	
	Exp.	Imp.	Exp.	Imp.
Bismuth metal, cases.....	.....	.....	.....	52
Chrome ore..... long tons	.....	.....	40	4,894
Copper, fine..... "	476	.....	18,175	.....
" matte..... "	.....	.....	500	.....
" sulphate..... "	40	.....	1,579	.....
Iron ore..... "	11,410	.....	239,742	.....
" pigs, bars, ingots, blooms..... "	.....	.....	.....	2,076
Iron oxide..... bags	.....	.....	.....	300
" pyrites..... long tons	.....	.....	150	.....
Ferro-manganese..... "	.....	.....	.....	1,357
Ferro-silicon..... "	.....	.....	.....	70
Lead..... "	50	.....	2,848	.....
Limestone..... short "	.....	.....	.....	2,743
Manganese ore..... long "	.....	.....	.....	6,518
Spiegeleisen..... "	.....	.....	.....	415
Steel..... "	.....	.....	.....	18
Steel wire, bundles..... "	.....	313	.....	6,453
Tin, long tons..... "	107	17	107	233
Tin and black plates, boxes..... "	.....	4,737	.....	105,194
Zinc (spelter) long tons..... "	.....	.....	211	.....

\*\* From our special correspondent.

**Average Monthly Prices of Metals**

In New York since January 1st, 1896, and for the corresponding periods in 1895, 1894, 1893 and 1892, in cents per pound.

Month.	1896.	1895.	1894.	1893.	1892.
<b>Copper:</b>					
January.....	9'87	10'60	10'13	12'13	11'00
February.....	10'31	10'00	9'63	12'00	10'40
March.....	11'03	9'75	9'81	11'88	10'38
April.....	10'98	9'75	9'50	11'38	11'70
May.....	11'15	10'25	9'30	11'00	11'63
June.....	11'67	10'63	9'94	11'60	11'76
July.....	11'40	11'25	9'00	10'88	11'50
<b>Tin:</b>					
January.....	13'62	13'25	20'16	19'59	20'50
February.....	13'44	13'35	19'60	20'30	20'00
March.....	13'30	13'20	19'09	20'71	20'25
April.....	13'34	14'00	19'75	20'81	20'10
May.....	13'54	14'65	20'21	19'96	20'10
June.....	13'59	14'15	19'75	19'76	22'00
July.....	13'63	14'10	19'22	19'15	21'00
<b>Lead:</b>					
January.....	3'08	3'10	3'19	3'87	4'70
February.....	3'19	3'12	3'31	4'22	4'12
March.....	3'14	3'12	3'37	3'96	4'21
April.....	3'67	3'08	3'43	4'08	4'15
May.....	3'03	3'16	3'39	3'89	4'22
June.....	3'13	3'25	3'31	3'77	4'16
July.....	2'96	3'25	3'50	3'8	4'13
<b>Spelter:</b>					
January.....	3'75	3'28	3'56	4'39	4'69
February.....	4'03	3'20	3'85	4'39	4'69
March.....	4'20	3'23	3'89	4'28	4'79
April.....	4'19	3'30	3'62	4'38	4'68
May.....	3'98	3'50	3'47	4'41	4'79
June.....	4'10	3'65	3'40	4'27	4'71
July.....	3'97	3'75	3'43	4'13	4'78

**CHEMICALS AND MINERALS.**

NEW YORK, Friday Evening, July 31.  
**Heavy Chemicals.**—This market assumed no better position than we have been reporting for several weeks past, and there does not seem to be the slightest indication that trade will improve in the near future. The comments made by interested parties would tend to substantiate our views of the situation. No definite understanding as to prices of alkali has yet been arrived at by the domestic makers. Trade in alkali is only moderately active. Bleaching powder remains quiet. Sal and bicarb. soda show some business, but on the whole they have been in only moderate request. Quotations are as follows: Caustic soda, 60%, \$2.22 1/2 @ \$2.42 1/2; 70, 74 @ 76c. \$2.12 1/2 @ \$2.37 1/2 per 100 lbs. Alkali, 58%, 8c @ 8 1/2c. for 50-ton lots and over, and 60c. @ \$1 for smaller quantities; 45%, \$1.20 @ \$1.40 for jobbing lots. Bleaching powder, prime brands,



\$1.75@1.87½; Continental, \$1.65@1.75 per 100 lbs. Bicarb. soda, English, 1.50@1.60c.; American, bulk, \$1.50@1.55 per 100 lb. Sal-soda, English, 70@72½c.; American, 65c. (in barrels), 80c. (in kegs) per 100 lbs.

**Acids.**—Trade in a general way shows but little change, and both the wholesalers and retailers are confining themselves merely to answering the demands of their customers; the former making deliveries on yearly contracts, and the latter doing a hand-to-mouth business. The increase in the price of brimstone has necessarily stiffened the price of sulphuric acid. Some makers, as usual, are using pyrites exclusively; and we have no doubt others will do likewise should the price of brimstone continue to advance.

An increased demand from acid manufacturers for pyrites would stimulate the industry where pyritic deposits exist on this side of the Atlantic. The present source of supply is but limited in the United States, as the deposits of pyrites are too far away from railroad transportation to make the business so far remunerative. Efforts are still being made by both large and small acid manufacturers to advance the price of their product in proportion to the cost of the raw material, but whether or not the concerns will agree as a unit upon this point is a matter of conjecture. It is said that competition in the trade could be stopped only by consolidation of all interests. Even then it is doubtful whether the prices and production could be regulated, as new acid works could be started up at a moderate cost. The acid market has been practically in this condition for years; and it is likely to remain so for some time, unless some harmonious action is taken by the manufacturers to establish a stable market.

Quotations show no change, and are as follows: Acetic acid (in barrels), \$1.25@1.40; muriatic acid, 18°, 75c.; 20°, 75@85c.; 22°, \$1.10@1.25, according to make and quantity. Nitric acid, 36°, \$3.25@4.36; 40°, \$4@4.50; 42°, \$4.50@5.50. Oxalic acid, \$7.25 ex-dock and \$7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66°, 75@95c., 10@15c. higher for small quantities; chamber acid, \$6@8.50 per ton at factory. Blue vitriol, \$4@4.25, according to grade and order.

**Brimstone.**—There have been no arrivals of Sicilian brimstone this week, but it is said that the next steamer will probably be in port on August 20th. This sulphur has already been largely contracted for, hence there will be but little to fill a jobbing demand. The price quoted for best unmixed seconds is \$20 per ton. It is anticipated that prices will be still further advanced, according to the cable advices from the Societa Anglo Siciliana.

**Fertilizing Chemicals.**—The past week has been very quiet for the fertilizer trade, and only a moderate business has been done in potash salts; the same may be said of the leading ammoniates. There has been some talk as regards an important deal in fish scrap, but nothing definite can be gleaned from those interested in the trade. We quote: Sulphate of ammonia, gas liquor, \$2.35@2.40; bone, \$2.25@2.30 per 100 lbs. Dried blood, high grade, \$1.60@1.65 per unit, low grade, fine ground, \$1.40@1.42½, f.o.b. Chicago. Azotine, \$1.65@1.70 basis New York. Concentrated phosphate (30% available phosphoric acid), 60c. per unit. Acid phosphate, 13% @15%, av. P<sub>2</sub>O<sub>5</sub>, 54@65c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P<sub>2</sub>O<sub>5</sub>, 87½@90c. per unit. Acidulated fish scrap, \$9@9.50, and dried scrap \$18.50@19 f.o. b. fish factory. Tankage, high grade, \$19@20; low grade, \$18@19. Bone tankage, \$21; ground bone, \$22@22.50. Bonemeal, \$19.50@22.

Sulphate of Potash: 90-95%, New York and Boston, \$1.96½; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 48-53%, New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk, \$1.02; Southern ports, \$1.03½.

Muriate of potash: The new prices are 1.78c. at New York and Boston; 1.79½c. at Philadelphia, Baltimore and Norfolk, and 1.81½c. at New Orleans for 80@85% (basis of 80%), in lots of 50 tons and upward.

**Kainit.**—Quotations for 1896 are as follows: New York, Boston, Philadelphia and Baltimore, \$8.80 per ton; Norfolk, \$9.15, and New Orleans, \$9.30 per ton, for 25 tons and upward. Sylvinit at the same ports is quoted at 30½c., 37½c. and 38c., respectively.

**Nitrate of Soda.**—Although there has been but a sparing demand for this article, sales of several thousand bags have been made during the week at 1.80@1.82½c., according to position. There have been two arrivals with 32,000 bags of nitrate of soda. The next steamer will be due about August 14th. The prices quoted are 1.77½@1.80c. for spot, according to quantity; 1.80c. to arrive, and 1.82½@1.85c. for futures.

**Liverpool.** July 21.

(Special Correspondence of Joseph P. Brunner & Co.)  
The market for heavy chemicals is without improvement and the demand continues disappointing.

Soda ash is inactive, but values are fairly steady, as there is little offering in second-hands. For tierces the spot range according to market is about as follows: Leblanc ash, 48½%, £4@£4 5s.; 58%, £4 5s.@£4 10s. per ton, net cash. Ammonia ash, 48%, £3 5s. @ £3 10s.; 58%, £3 10s. @ £3 15s. per ton, net cash; bags 5s. per ton less. Soda crystals in fair request at £2 7s. 6d. per ton, less 5% for

barrels, and 7s. per ton less for bags. Caustic soda is dull. We quote spot range as to market as follows: 60%, £8 5s.@£8 7s. 6d.; 70%, £7 5s.@£7 7s. 6d.; 74%, £8 5s.@£8 7s. 6d.; 76%, £9@£9 5s. per ton, net cash.

Bleaching powder is depressed and easier, at £6 12s. 6d.@£7 per ton, net cash, for hardwood packages, as to destination.

Chlorate of potash is nominally quoted at 4½d.@4¼d. per lb., but there is practically nothing doing to test the market.

Bicarb. soda meets with the usual steady demand, at £6 15s. per ton, less 2½% for the finest quality in 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is a shade weaker, at £8 3s. 9d.@£8 8s. 9d. per ton, less 2½% for good gray, 24@25% in double bags f. o. b. here, as to quality.

Nitrate of soda is quiet, at £8 2s. 6d.@£8 5s. per ton, less 2½% for double bags f. o. b. here, according to quality.

Carb. ammonia, lump, 3d. per lb.; powdered, 3¼d. per lb., net cash.

**MINING STOCKS.**

Complete quotations will be found on pages 118 and 119 of mining stocks listed and dealt in at:

- |               |                   |                    |
|---------------|-------------------|--------------------|
| New York.     | Aspen, Colo.      | St. Louis.         |
| Boston.       | Colorado Springs. | Paris, France.     |
| Philadelphia. | Duluth, Minn.     | Mexico.            |
| Baltimore.    | Helena, Mont.     | Shanghai, China.   |
| Pittsburg.    | Salt Lake, Utah.  | Valparaiso, Chile. |
| Denver, Colo. | San Francisco.    | London, England.   |
- Chicago and Cleveland, page 116.

NEW YORK, Friday Evening, July 31.

There has been a notable increase in the amount of business transacted during the week at both the Consolidated Stock and Petroleum Exchange and the New York Stock Exchange, being 31,740 shares, which were sold at better prices than for some time past. Some activity has appeared in the demand for Iron Silver, brought about by the recent decision of the United States Supreme Court in the company's favor. Another stock which helped the market along was Brunswick Consolidated. The reports from this mine are said to be quite satisfactory. The Colorado shares have been more in favor this week, and we note several stocks, which have not been traded in for some time, making fairly good sales at reasonable prices.

The Comstocks have been in better request during the week, Comstock Tunnel realizing sales of 3,500 at 7c. Consolidated California & Virginia records transactions of 440 shares at \$1.70@1.85. Hale & Norcross was traded in at \$1.25 with sales of 100 shares. Belcher was sold at 45c., transactions amounting to 100 shares. Chollar was traded in on Monday at \$2, and rose to \$2.80 at the close of the week, dealings aggregating 200 shares. Sierra Nevada was stationary at 60c., with sales of 500 shares. Union Consolidated showed transactions of 100 shares at 48c. There were also sales of 300 shares of Yellow Jacket at 45@47c.

The only California stocks to show any sales were Brunswick Consolidated and Bulwer; the former shows dealings of 9,300 shares at 20@21c., and the latter, sales of 200 shares at 35c.

The following sales of Colorado stocks were made in the Cripple Creek group: 1,300 shares of Cripple Creek Consolidated at 12@13c.; 300 shares of Isabella at 58c.; 200 shares of Argentum—Juniata at 40c.; 1,500 shares of Mount Rosa at 13@14c.; 3,400 shares of Pharmacist at 10c., and 2,100 shares of Creede & Cripple Creek at 5c.

The most active among the other Colorado stocks was Iron Silver, which shows sales of 2,200 shares; the price was 25c. at the opening, then rose to 95c. and closed at 50c. The suit which was brought against the Iron Silver Mining Company in 1889, restraining it from working the Sierra Nevada mining property, originally claimed by this company has been finally decided in its favor by the United States Supreme Court. This decision has naturally put life into the recently-dead shares of the company, but the holders are not anxious to sell, now that the property in dispute has been gained. It is doubtful whether much stock can be secured at less than \$2 per share. We are informed that the Iron Silver Mining Company's shares are largely held by Detroit capitalists who purchased them when the stock was selling around \$4 some eight years ago. An attempt was made by one of the brokers in New York to obtain a 30 day's option on 80,000 shares of the stock at \$2, unsuccessfully. It is expected that when the company is in good working order again dividends will probably be resumed. So far the price of the stock has had an upward tendency, being 18c. a few weeks ago and 95c. one day this week, with a possibility of higher figures being seen. We also note sales of 400 shares of Breece at 18c., and 200 shares of Little Chief at 16c.

Bedford Consolidated, the Montana prospect was traded in rather heavily this week, although the stock is scattered. Sales amounted to 5,100 shares, and the prices ranged from \$2.50 to \$5.00, the latter figure being realized at the close.

The Utah stock, Horn Silver, shows dealings of 300 shares at \$1.75@1.80.

**Boston.** July 30.

(From Our Special Correspondent.)  
The past week has been extremely dull in mining stocks with a tendency to lower prices. The dealings in copper stocks have been largely in Boston & Montana and Old Dominion copper, both of

which have declined from \$2 to \$3 per share. Boston & Montana opened at \$78 and gradually settled all the week, touching \$75 to-day, with a rally to \$76 at the close. Old Dominion has been freely offered all the week, and after opening at \$13½, sold down to \$11, and closed \$11½ bid, \$12 asked. Outside of these two stocks the dealings have been very small and without special feature. Calumet & Hecla holds steady at about \$300, a few shares selling a little above this price. The annual report is now being distributed to stockholders and is considered quite satisfactory. Quincy has ruled dull and sold at \$107@108; ex-dividend scrip sold at \$75.

Tamarack declined \$1 to \$76, with very few sales; Osceola advanced from \$22.50 to \$24, closing one-half less at \$23.50; Kearsage advanced ¼ to \$10¼ and Franklin sold at \$10, as also did Tamarack, Jr.; Wolverine declined from \$7 to \$6½; Atlantic touched \$17, but declined to-day to \$13 again; Butte & Boston sold at \$1½, and Allouez at 50c.

The gold stocks have made but little show this week. Pioneer declined from \$4½ to \$3½; Merced advanced to \$8 and closed at \$6; Gold Coin advanced from 50c. to 54c., closing at 53c.

Three p. m.—At the close \$76 was bid for Boston & Montana and \$107 for Quincy; Tamarack was \$77½ bid, \$79 asked.

**Chicago.**

The following table gives the highest prices with sales of the stocks recorded on the Chicago Mineral and Mining Board for the week ending July 29th:

Stocks.	July 23	July 24	July 25	July 27	July 28	July 29	Sales.
Capazone.....	.04					.03½	5,000
C. C. & C. C.....	.08½	.09½	.08½	.08½	.08	.08	8,500
C. C. Golden Group.....	.12½	.12½	.12½	.12½	.12½	.12½	23,500
C. C. G. M. B. & L. Co.....	.04						50
Chi. & G. Mt. Chi. & Mont.....	.11½	.11½	.11½	.11½	.11½	.11½	61,500
Christmas.....	.08½						5,500
Chula Vista.....	.08½						5,500
Cosmopolitan.....	.46½	.46½	.46½	.46½	.46½	.46½	2,900
Delaware Cf.....	.11½	.11½	.11½	.11½	.11½	.11½	9,700
Finance.....	.37½	.37½	.37½	.37½	.37½	.37½	2,500
Great Fissure.....							
Hawkeye.....							
Imperial Pfd.....							
Investors' and Prospectors' Lion's Gold.....							
Little Gem.....							
Lucille.....							
Medina G. M. Co.....	.08½	.08½	.08½	.08½	.08½	.08½	7,800
Michigan Gold.....	.10½	.10½	.10½	.10½	.10½	.10½	14,000
Peerless G. M. Co.....	.14½	.14½	.14½	.14½	.14½	.14½	14,300
Rhyolite.....	.12½	.12½	.12½	.12½	.12½	.12½	2,500
Royal Age.....	.10	.10½	.10½	.10½	.10½	.10½	7,900
San Pedro.....	.04½	.04½	.04½	.04½	.04½	.04½	11,500
Squaw Mt.....	.12½	.12½	.12½	.12½	.12½	.12	3,500
Sumpter.....	.17½	.17½	.17½	.17½	.17½	.17½	5,200
Sun nyside.....	.04½	.04½	.04½	.04½	.04½	.04½	13,500
Gilpin.....							
Thompson.....							
Utah Mercur.....							

Total shares sold, 200,800.

**Cleveland.** July 29.

(From Our Special Correspondent.)

The mining stock market has been very dull during the past week, and only a few inquiries have been made at the offices of the leading brokers, and less sales made. Messrs. C. H. Potter & Co. report that Minnesota stock has declined considerably during the past ten days. Last week \$65 was offered for it, and it was held at \$69. This week it is held at \$58, and offers made for it at \$56. The quotations are as follows:

Name of Company.	Par val.	July 29.
Aurora.....	\$25	\$5.00 \$8.00
Biwabik.....	100	32.00 34.00
Champion Iron Company.....	100	10.00 30.00
Chandler.....	25	34.00 35.00
Cincinnati Iron.....	25	10.00 13.50
Cleveland-Cliffs Iron Co.....	100	45.00
Jackson Iron Co.....	25	70.00 75.00
Lake Superior Iron Co.....	25	30.00 31.00
Lake Superior Consolidated.....	100	20.00 21.00
Minnesota.....	100	55.00 58.00
Pittsburg & Lake Angeline.....	25	75.00
Republic Iron Co.....	25	18.00

**Colorado Springs.** July 29.

(From Our Special Correspondent.)

Business at both the Colorado Springs Mining Stock Association and the Board of Trade and Mining Exchange during the week has been of a more satisfactory nature than for some time past, and better prices have been recorded.

The hot weather, coupled with the general stagnant condition of the country, seems to have lessened the ardor of both the operator and speculator in mining stocks. However, the foreign speculating element continues to patronize our exchanges, and the views of brokers in this regard would tend to show that a satisfactory volume of business is being done.

BY TELEGRAPH.

Colorado Springs, Colo., July 30.—The closing quotations to-day were as follows: Anaconda, 55c.



Bankers, 10½c.; Cripple Creek Consolidated, 12½c.; Gold & Globe, 18c.; Gold Standard, 4½c.; Isabella, 54c.; Jefferson, 17c.; Mount Rosa, 12c.; Portland, \$1.40; Union, 33c.; Work, 9c.

**Salt Lake City.** July 25.  
(Special Report of James A. Pollock.)

Comparatively little change from the conditions existing during the previous week was experienced by the local mining stock market throughout the week just closed.

There was only a limited amount of business in Ajax, quotations not being materially changed, although the tendency was slightly downward. The properties are making a good record of production. Alliance is doing some development work, but the stock is not in demand. Anchor strengthened again quite materially, with offerings light. Encouraging developments just made are responsible for this change for the better.

Bullion-Beck paid its July dividend on the 20th. The properties are in good condition. Development work is being prosecuted. The offerings of Centennial-Eureka were very limited, with quotations unchanged. Contrary to expectations in certain quarters, the failure of the deal did not exert a depressing effect upon the stock and sellers are very few. Dalton remained practically unchanged, although toward the close there was more inquiry. Dalton & Lark was quiet. Daly was about unchanged as to quotations, with only a comparatively small amount of business done in the stock. Daly-West is pushing its improvements. The stock was very strong at slightly advanced quotations.

Four Aces, Eagle, East Golden Gate and Elko remained the same. Galena also. Some good shipments are being made from the properties. Horn Silver is reported to be looking well and the usual rate of shipment is being maintained. The stock was slightly lower in New York than on the local market. A small seam of ore has been encountered at the Lucky Bill. The stock was somewhat stronger, although the demand was light. Another two-cent assessment has been levied. Nothing new was received from the Little Pittsburg.

Mammoth has declared the usual dividend of 5c., payable August 1st. The stock was shaded somewhat during the week. Mercier is operating to its full capacity and making a good showing. There was little change in the stock during the week, the offerings being very light. The July dividend was paid on the 20th. The Ontario has declared its July dividend of 10c. per share. The company produced during the year bullion to the value of \$849,851, with ore sales of \$47,297. Its cash balance is now over \$400,000. Overland will build a mill this year, according to the management. Silver King was strong. The new tanks at the Sunshine mill are being placed without delay. There was an increased inquiry for the stock. Swansea did not recover its lost strength. Shipments are gratifying. Utah is putting out the usual amount of ore and besides paying its regular dividend is increasing its surplus. Development work at the Gold Dust is being prosecuted with vigor and the showing of ore is good. South Swansea is looking well and making shipments of ore.

**San Francisco.** July 25.  
(From Our Special Correspondent.)

The market for the Comstock shares opened up very quietly this week and continued dull throughout, an attempt to engineer a rise having failed after a very brief spurt had been made. The market closes as it opened, dull, with prices weak and inclined to go lower still.

Some closing Comstock quotations are: Chollar, \$1.90@1.95; Consolidated California & Virginia, \$1.70@1.75; Confidence, \$1.25@1.30; Hale & Norcross, \$1.20@1.25; Ophir, \$1.05@1.10; Potosi, \$1@1.05; Mexican, 57@58c.

The dealing in the Bodie was very active and prices rose steadily all the week. All four of the Bodie mines are now under one management and their prospects are better than for a long time past. At the close Bodie Consolidated is quoted at 6½c. @ 63c.; Bulwer, 38c. @ 40c.; Mono, 19c. @ 20c.

At the annual meetings of the Union Consolidated and Yellow Jacket mining companies on Monday the old officers were re-elected.

An injunction suit was commenced last week in the Superior Court of Yuba County against the Cleveland & Sierra Mining Company, operating a mine by the hydraulic process near Scales, which is alleged to be discharging its tailings and debris into Rabbit Creek, which flows and empties into Slate Creek, which latter creek enters into the North Yuba, over 100 miles above Marysville, the way the river runs.

The Black Flat Mining Company of Butte County has levied an assessment of \$12.50 per share, delinquent August 1st.

The Consolidated Imperial Mining Company has levied an assessment of 1c. per share, delinquent August 27th.

**THE NEW EXCHANGE.**

The business at the Gold Mining Exchange was more active this week, and a good many shares changed hands. A new stock, the Princess Gold Mining Company, has made its appearance on the list.

Some quotations noted are: Princess, 53@54c.; Sebastopol, 49@52c.; Savannah, 46@50c.; Grant, 40@45c.; Lockwood, 30@32c.

Messrs. D. B. Lyman, Superintendent, and Chas. H. Fish, President of the Consolidated California & Virginia Mining Company, have had framed and presented to the Gold Mining Exchange a handsome

picture illustrating underground mining, timbering, stoping, etc. Material will be taken from this picture to illustrate the free public lecture on underground mining soon to be given by the Exchange.

**London.** July 18.  
(From Our Special Correspondent.)

The London mining stock market has not shown any feature of interest during the past week. There has been a general disinclination to initiate new business, and the absence of bear attacks has kept the market steady. In the South African section Chartered has continued to occupy the chief attention. Last week I mentioned that the debenture issue had been arranged privately, and that considerable dissatisfaction had thereby been caused, since it was argued that shareholders should have had the first offer to subscribe. The directors have now seen the mistake they made and have got some of the underwriters to cancel their allotment, so that they could offer the debentures first hand to the shareholders. This action has, however, made the situation worse, because the debentures are being sold by the other underwriters in the open market at 98, and it is not likely that shareholders will buy them for 100 from the directors. This muddling work has given the public a very poor idea of the abilities of the directors, and has certainly not advanced the popularity of the Chartered Company.

The West Australian section has not been very active, but on the whole quotations have advanced. New Zealand and Indians have been quiet.

In the American section attention is confined to British Columbians. Two promoting companies, which have come out this week, make references to options in British Columbia, but there is nothing to show what they intend to do. A company called "Golden River Quesnelle, Limited," has also been placed before the public. It has been formed to acquire nine miles of the South Fork of the Quesnelle River measured up from the junction of the two forks. A dam is to be built so as to unwater the river bed and then the bed is to be washed for gold. The details of the work to be done are so meager and the data relating to the value of the river gravel are so scanty that it is not easy to form an idea of the prospects of the company. The dam is estimated to cost \$222,255, figures which are supposed to show wonderful precision of detail, but one would suppose that if it is to stand weather such as has been experienced this spring a few odd cents will have to be added to the estimate. The man at the bottom of the scheme is Major Dupont, and he has been successful in obtaining the support of several influential British Columbian officials. In fact, the agent general of the Province in London, Mr. F. G. Vernon, is chairman of the company. It is not generally supposed to be good form for a government official in active service to be director of a company, and Mr. Vernon would be well advised to withdraw from his present false position.

**Paris.** July 19.  
(From Our Special Correspondent.)

The stock market is not in a very exuberant condition just now; one might almost say that the summer weather had made events as well as persons languid.

The South African gold stocks continue very quiet, though there are some disquieting rumors from London, which no one here places much confidence in. Those who are inclined to speculate are afraid to touch these shares after their past experience with the routine of operators who control the market. Those who have bought for investment do not want to sell at a loss, and there are no new buyers coming forward. The quotations are a little higher this week, but, so far as we are concerned, they represent a very small amount of business. The condition of the Chartered Company, moreover, does not encourage confidence in the future.

The copper stocks have apparently reached the end of their rise for the present and are beginning to fall a little; but I do not think that they will go much lower. The fact is that they have reached almost too high a point and people are beginning to ask how long the present extraordinary demand for the metal is going to continue.

The zinc and lead companies' shares are generally well supported and show no signs of a decline. In nearly all the trades the demand for raw materials is good, and it seems evident that we are to have a period of improving business.

Huanchaca shares are more in demand. It is announced that the engineers are at last succeeding in disposing of the great inflow of water in the lower levels, and that some important reforms are to be made in the management of the great silver mine.

The metallurgical shares are less active, and have probably reached about the highest level that can be expected.

One hears reports of new Russian gold mines which are soon to be placed here. Much interest is felt in these properties, and there may be a good deal of money invested in them. Two admirable monographs have lately been brought to my notice, one by M. E. D. Levat and M. Sabachnikoff on the "Siberian Railroad," and one by M. Levat on the "Working of the Gold Mines of Eastern Siberia." I understand that Mr. Levat has now returned to Siberia, where he is to make further investigations.

Our German neighbors do not seem best pleased with the final result of the visit of Li-Hung-Chang. After receiving with true Chinese impassiveness all the honors which they heaped upon him and after posing as the representative of a great nation, he

has quietly told them that he was without authority to place any of the orders or to make any of the contracts which they had so eagerly expected. He had adroitly postponed to the last this announcement, very probably understanding how much the hope of profitable trade transactions had to do with the enthusiasm of his reception.

One wonders how much this representative of the Far East was impressed with our Western demonstrations. It has been supposed that Li-Hung-Chang, more than any other Chinese statesman, knew something of Europe and its power; yet he is a mandarin of the mandarins, impressed to the full with the force of Chinese tradition and the haughty sense of the exclusive possession of true wisdom. Too shrewd to put the fact too much in evidence, those who have watched him closely can see that throughout his conduct has expressed a contempt for Western civilization and its ways.

We are still unable to understand clearly the present state of your political parties; but wish you all success in fighting financial follies.

**AZOTE.**

**ASSESSMENTS.**

Name of Co.	Loc'n.	No.	Dirq.	Sale.	Amt.
Belle Isle.....	Nev...	26	" 15	Aug. 12	10
Hest & Belcher..	"	60	Aug. 6	" 27	25
Bullion.....	Cal...	8	July 20	" 11	15
Channel Bend..	"	3	" 31	" 22	05
Challier.....	Nev...	42	" 14	" 4	25
Eureka Con.....	Utah..	"	" 11	Sept. 5	10
Vogus.....	Nev...	"	" 13	Aug. 15	10
*Gold Bar.....	Cal...	"	" 20	" 20	02
Gold Belt.....	Utah..	"	" 20	" 10	00½
Granite Hill....	Cal...	15	" 29	" 19	05
Hale & Norcross	Nev...	109	Aug. 14	Sept. 4	15
Hartery Con....	Cal...	19	" 3	Aug. 22	02
*Jamison.....	Cal...	8	" 10	" 31	05
Kentuck Con....	"	12	June 22	" 12	05
Leo.....	Mont..	"	" 23	" 14	00½
*Lucky Bill....	Utah..	20	Aug. 17	Sept. 15	02
Mabelle.....	Ore...	2	July 13	Aug. 3	08
Marguerite....	Cal...	3	" 28	" 28	10
Nimshew.....	"	1	" 13	" 3	03
North Belle Isle	Nev...	24	" 13	" 10	10
Pine Hill G. & S.	Cal...	8	" 13	" 10	05
Utah StateGold.	Utah..	1	" 20	" 5	00½
*West Cable....	"	6	Aug. 17	Sept. 17	01

**DIVIDENDS.**

NAME OF COMPANY	Current Dividends,		Paid since Jan. 1, 1896.	Total to date.
	Date.	Amount.		
Aetna Con.....			\$20,000	\$80,000
Alaska-Mexican..			34,200	187,031
Alaska-Treadwell			200,000	2,875,000
Anaconda.....			750,000	
Aurora Iron.....			50,000	700,000
Bangkok-Cora Bell			6,000	107,510
Big Six.....			2,500	2,500
Boston & Mont...	Aug. 20	450,000	1,050,000	4,475,000
*Bullion-Beck & Ch			110,000	2,060,000
*Columbia & Hecla			1,500,000	15,850,000
*Cariboo.....			32,000	95,000
*Centennial Eureka			240,000	1,770,000
C. O. D.....			5,000	25,000
*Dalton & Lark...			75,000	75,000
Dominion Coal...			600,000	
Elkton Con.....			20,000	65,000
Florence.....			54,390	89,348
*Galena.....			21,600	41,000
Gold Coin.....	Aug. 10	20,000	65,000	80,000
*Golden Fleece...			126,000	527,179
Gold & Globe Hill			19,500	28,875
Hecla Con.....			30,000	2,130,000
Highland.....			25,000	3,159,918
*Homestake.....			212,750	5,931,000
Hope.....			10,000	
Horn Silver.....			50,000	3,130,000
Low.....			20,000	20,000
Iron Mountain...			30,000	440,000
*Isabella.....			135,000	157,500
*Jackson.....				
Le Roi.....			100,000	175,000
*Mammoth.....	Aug. 1	20,000	20,000	1,070,000
*Mercur.....			125,000	475,000
*Minnesota Iron...			495,000	3,240,000
*Mont. Ore Pur. Co.			280,000	440,000
Moon-Anchor....			18,000	18,000
Moose.....			6,000	186,000
*Napa Con.....			50,000	79,000
*Ontario.....			105,000	13,280,000
*Osceola Con.....			125,000	2,072,500
Outaqueachy....			1,000	1,000
Portland.....			125,000	745,000
Quincy.....	Aug. 17	4300,000	70,000	8,370,000
*Silver King.....			262,500	712,500
Slocan Star.....			100,000	100,000
Small Hopes.....			25,000	3,275,000
*Smuggler-Union			100,000	100,000
*Tamarack.....			150,000	4,320,000
Union.....			23,500	73,000
*Utah.....			15,000	147,500
*Victor.....			140,000	605,000
Victor M. & L....			12,000	42,000
War Eagle.....			25,000	157,500
Totals.....			\$790,000	\$8,498,340

\* June dividend paid. † Extra dividend of \$2 included.

This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information. Readers of the *Engineering and Mining Journal* will confer a favor on the publishers if they will notify the *Journal* of any errors or omissions in the above table.



STOCK QUOTATIONS.

BOSTON, MASS. Table with columns for Name of Company, Location, Par value, and dates from July 24 to July 30. Includes companies like Allouez, Arnold, Atlantic, etc.

NEW YORK Table with columns for Name of Company, Location, Par value, and dates from July 25 to July 31. Includes companies like Adams, Ajax, Alamo, etc.

\* Official quotations Boston Stock Exchange. Total sales, 21,814.

INDUSTRIAL COAL AND COAL RAILROAD Table with columns for Name of Company, Par value, and dates from July 25 to July 31. Includes companies like Balt. & Ohio, Col. & I. Dev, etc.

\* Official quotations N. Y. Stock Exchange. Total shares sold, 85,346.

NEW YORK Table with columns for Name of Company, Location, Par value, and dates from July 25 to July 31. Includes companies like Adams, Ajax, Alamo, etc.

\* Official quotations N. Y. Stock and Con. Stock & Petroleum Exchanges. Total sales, 32,740.

COLORADO SPRINGS, COLO.

COLORADO SPRINGS, COLO. Table with columns for Name of Company, Par value, and dates from July 21 to July 25. Includes companies like Ajax, Alamo, Anaconda, etc.

\* Official quotations and sales Colo. Springs Mg. Stock Assoc. \* Board of Trade Exchange.

ST. LOUIS, MO. Week ending July 28.

ST. LOUIS, MO. Table with columns for Name of Company, Company's Office, Par Value, Bids, Asked, and Last Dividend. Includes companies like Central Lead, Con. Coal, etc.

SAN FRANCISCO, CAL.

SAN FRANCISCO, CAL. Table with columns for Name of Company, Location, Par value, and dates from July 25 to July 31. Includes companies like Alta, Belcher, Best & Belcher, etc.

\* Official telegraphic quotations, San Francisco Stock Exchange.

BALTIMORE, MD. Week ending July 30.

BALTIMORE, MD. Table with columns for Name of Company, Location, Par value, Bids, Asked, and Last Dividend. Includes companies like Balt. M. & S., Conrad Hill, etc.

\* Official quotations Baltimore Stock Exchange.

BRITISH COLUMBIA. Week ending July 17.

BRITISH COLUMBIA. Table with columns for Name of Company, Par value, Selling price, and Name of Company, Par value, Selling price. Includes companies like Boundary Creek, Old Ironsides Leasing, etc.

\* From our special correspondent.



LONDON.

Table of mining companies in London with columns for Name of Company, Country, Product, Capital Stock, Par value, Last dividend, and Quotations.

DENVER, COLO.

Table of mining companies in Denver, Colorado, with columns for Name of Company, Par value, and Quotations for various dates from July 20 to July 25.

PARIS.

Week ending July 17.

Table of mining companies in Paris with columns for Name of Company, Country, Product, Capital Stock, Par value, Divs. last year, and Prices.

MEXICO.

Week ending July 23.

Table of mining companies in Mexico with columns for Name of Company, State, No. of shares, Last dividend, Last assessment, and Prices.

VALPARAISO, CHILE.

July 2.

Table of mining companies in Valparaiso, Chile with columns for Name of Company, Capital, Share value, Last dividend, and Prices.

SHANGHAI, CHINA.

June 26.

Table of mining companies in Shanghai, China with columns for Name of Company, Country, No. of shares, Value, Last dividend, and Price.

SALT LAKE CITY, UTAH.

Week ending July 25.

Table of mining companies in Salt Lake City, Utah with columns for Stocks, Par value, Bids, Asked, Actual selling price, and Actual price.

PHILADELPHIA PA.

Table of mining companies in Philadelphia, PA with columns for Name of Company, Location, Par value, and Quotations for various dates from July 23 to July 29.

HELENA, MONT.

Week ending July 21.

Table of mining companies in Helena, Montana with columns for Name of Company, Location, Company's office, Par value, Bids, Asked, Shares sold, and Price.

PITTSBURG, PA.

Week ending July 28.

Table of mining companies in Pittsburgh, PA with columns for Name of Company, Location, Par value, Bids, Asked, Selling price, and Name of Company, Location, Par value, Bids, Asked, Selling price.



DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last), and Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last).

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. \* Non-assessable. \* The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. † Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends and the Cons. Virginia \$42,390,000. NOTE.—Corrections to this table are made monthly. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.



CLASSIFIED LIST OF ADVERTISERS.

**Air Compressors and Rock Drills**  
 Bullock, M. C., Mfg. Co.  
 Burlington Rock Drill Co.  
 Clayton Air Compressor Works.  
 Fraser & Chalmers.  
 Ingersoll-Sergeant Drill Co.  
 Laidlaw-Dunn-Gordon Co.  
 (See Diamond Drills.)

**Air Hoists.**  
 Whiting Foundry Equipment Co.

**Amalgamators**  
 Bucyrus Steam Shovel & Dredge Co.  
 Fraser & Chalmers.

**Amalgam Plates.**  
 Western Plating and Mfg. Co.

**Anti-Friction Metals**  
 Besley, Chas. H., & Co.  
 Chester Steel Cast. Co.

**Architects and Builders**  
 Berlin Iron Bridge Co.  
 Pittsburgh Bridge Co.  
 Pollock, Wm. B., & Co.

**Assayers' and Chemists' Supplies**  
 Assayers, Wm. Baker & Adamson.  
 Baker & Co.  
 Becker, Christian.  
 Bullock & Crenshaw.  
 Denver Fire Clay Co.  
 Elmer & Amend.  
 Henry Hill Chem. Co.

**Attorneys, Corporation**  
 Emig, C. E.  
 Hammersley, Hamilton & La Maistre.

**Automatic Boiler Feeds**  
 Penberthy Injector Co.

**Babbitt's Metal**  
 Besley, Chas. H., & Co.

**Bankers and Brokers**  
 Artell, E., & Co.  
 Bartlett & Co.  
 Bonbright, W. P., & Co.  
 Breitung, E. N.  
 Crip, G. S., Inv. Co.  
 Crooks, E. W.  
 Decker, L. R.  
 Duer, G. A. C.  
 Dorsey Investment Co.  
 Fitts, G. W., & Sons.  
 Fletcher, C. S., & Co.  
 Freyschlag, Kirby & Co.  
 Grant, E. K.  
 Handv & Harman.  
 Heron Bros.  
 Hodgins, L. W.  
 Hicks & Benzie.  
 Johnson, L. L.  
 Keith, F. M.  
 Key, J. J.  
 Kinney, L.  
 Krellander, C. F., & Co.  
 Leibelmer, N.  
 Lentz, John S.  
 Mayer, Andrew.

**Belt Lacing.**  
 Bristol Co.

**Blasting Caps.**  
 Metallic Cap Mfg. Co.  
 Rhenssh Westphalen Explosive Co.  
 Schroeder, Fr.

**Blasting Batteries**  
 Climax Fuse Co.  
 Lau, J. H., & Co.  
 Macbeth, James, & Co.

**Blowers, Pressure.**  
 Connorsville Blower Co.

**Boilers**  
 Denver Eng. Wks. Co.  
 Fraser & Chalmers.  
 Philadelphia Eng. Wks. Co.  
 Pollock, Wm. B., & Co.  
 (See Machinery.)

**Brattice Cloth**  
 Besley, Chas. H., & Co.

**Brick Machinery**  
 Freese, E. M., & Co.

**Bridges**  
 Berlin Bridge Co.  
 (See Machinery.)

**Car Wheels.**  
 Whiting Foundry Equipment Co.

**Carbons**  
 Bishop, Victor, & Co.  
 New York Diamond Drill Co.  
 Lexow, Theodor.

**Chain and Link Belting (See Belting.)**

**Chemicals**  
 Baker & Adamson.  
 Bullock & Crenshaw.  
 Elmer & Amend.  
 Henry Hill Chem. Co.  
 Maryland Coal Co.  
 Potts, F. A., & Co.  
 Stickney, Conyngham & Co.  
 Ward & Olyphant.

**Chilled Castings.**  
 Whiting Foundry Equipment Co.

**Coal Cutters**  
 Ingersoll-Sergeant Drill Co.  
 Jeffrey Mfg. Co.  
 Leyner, J. Geo. (See Machinery.)  
 Link Belt Machinery Co.

**Compressors.**  
 Clayton Air Compressor Works.  
 Laidlaw-Dunn-Gordon Co.  
 Norwalk Iron Works Co.  
 Rand Drill Co.

**Concentrators, Crushers, Pulverizers, Separators, Etc.**  
 Allia, E. P., & Co.  
 Bradley Pulverizer Co.  
 Colorado Iron Works.  
 Denver Eng. Works Co.  
 Dodge Mining Machinery Co.  
 Fraser & Chalmers.  
 Frue Vanner Concentrator.  
 Hendri & Bolthoff Mfg. Co.  
 Krupp, F.  
 Link Belt Machinery Co.  
 McCully, R.  
 Scoville, H. H., & Co.  
 Stedman Foundry & Mach. Co.  
 Walburn-Swenson Mfg. Co. (See Machinery.)

**Contractors. (See Machinery.)**

**Conveying Belts.**  
 Robbins Conveying Belt Co.

**Coppers, Boilers and Producers.**  
 American Metal Co.  
 Arizona Copper Co.  
 Atlantic Mining Co.  
 Balbach S. & Ref. Co.  
 Baltimore Cop. Wks.  
 Bath, H., & Son.  
 Bridgeport Copper Co.  
 Canadian Copper Co.  
 Copper Queen Mfg. Co.  
 Detroit Copper Mfg. Co.  
 Elliott's Metal Co., Ltd.

**Corrugated Iron**  
 Berlin Iron Bridge Co.  
 Cincinnati Corrugating Co.  
 Sykes Steel Roofing Co.

**Cranes.**  
 Whiting Foundry Equipment Co.

**Crucibles, Graphite, Etc.**  
 Denver Fire Clay Co.  
 Dixon, Jos., Crucible Co.  
 (See Machinery.)

**Cyanide.**  
 Roessler & Hasslacher Chemical Co.

**Diamonds**  
 Bishop, Victor, & Co.  
 Lexow, Theodor.  
 New York Diamond Drill Co.

**Diamond Drills**  
 Bishop, Victor, & Co.  
 Bullock Mfg. Co., M. C.  
 Lexow, Theodor.  
 New York Diamond Drill Co.  
 Sullivan Machinery Co.  
 (See Air Compressors and Rock Drills.)

**Draughtsmen.**  
 Young, Wm. H.

**Drawing Materials**  
 Heer, Peter  
 A. S. Co.  
 Besley, Chas. H., & Co.  
 Dietzgen, E., & Co.  
 (See Engineering Instruments.)

**Dredges**  
 Bucyrus Steam Shovel & Dredge Co.  
 Marion Steam Shovel Co.  
 Souther & Co.

**Dryers.**  
 Brown, Horace T.  
 Cummer, F. D. & Son Co.  
 Denver Eng. Wks. Co.

**Dump Cars**  
 Denver Eng. Works Co.  
 Hendri & Bolthoff Mfg. Co.

**Educational Institutions**  
 Columbia University.  
 Columbian University.  
 Chicago School of Assaying.  
 Correspondence School of Mines.  
 Lehigh University.  
 Mass. Inst. of Technology.  
 Michigan Mining School.  
 Missouri School of Mines.  
 Rose Polytechnic Institute.  
 Worcester Polytechnic Inst.

**Electrical Batteries**  
 Macbeth, James, & Co.

**Electrical Machinery and Supplies**  
 Besley, Chas. H., & Co.  
 Card Electric Co.  
 Denver Eng. Wks. Co.  
 Electrical Engineering Co.  
 General Electric Co.  
 Jeffrey Mfg. Co.

**Elevators, Conveyors and Hoisting Machines**  
 Brown Holst. & Conv. Mach. Co.  
 Caldwell, H. W., & Co.  
 California Wire Wks.  
 Cooper, Hewitt & Co.  
 Crook, W. A., & Bros. Co.  
 Denver Eng. Wks. Co.  
 Electrical Engineering Co.  
 (See Wire Rope Tramway and Machinery.)

**Emery Wheels**  
 Besley, Chas. H., & Co.  
 New York Belting & Packing Co., Ltd.

**Engineers, Chemists, Metallurgists**  
 See Directory Pages 4, 5 and 6.

**Engineer's Instruments and Supplies.**  
 Aloe, A. S. Co.  
 Buff & Berger.  
 Bullock & Crenshaw.  
 Dietzgen, F., & Co.  
 Fauth & Co.  
 Gurley, W., & L. E.  
 Heer, Peter  
 Kenuff & Esser Co.  
 Hahn & Co.  
 Serlog & Kandler.  
 Lietz Co.

**Engines**  
 American Engine Co.  
 Bullock, M. C. Mfg. Co.  
 Fraser & Chalmers.  
 Hercules Engine & Hoisting Co.  
 Lidgerwood Mfg. Co.  
 Philadelphia Eng. Works, Ltd. (See Machinery.)

**Excavators**  
 Bucyrus Steam Shovel & Dredge Co.  
 Marion Steam Shovel Co.  
 Souther & Co.  
 Vulcan Iron Works.

**Fire-Brick and Clay**  
 Chur, E. T.  
 Burnaces.  
 Brown, Horace.  
 Dodge Mining Mch Co.  
 (See Machinery.)

**Fuses.**  
 Climax Fuse Co.  
 Ingersoll-Sergeant Drill Co.  
 Standard Fuse Co.

**Gas Engines.**  
 Hercules Engine & Hoisting Co.  
 Norman, J. J., & Co.

**Gas Works**  
 Pollock, Wm. B., & Co. | Wood, R. D., & Co.  
 Bristol Mfg. Co.

**Gearing**  
 Besley, Chas. H., & Co. | Denver Eng. Wks. Co.  
 Chester Steel Cast. Co. | Fraser & Chalmers.  
 (See Machinery.)

**Grease, Graphite, Etc.**  
 Besley, Chas. H., & Co. | Dixon, Jos., Cruc. Co.  
 Pierce & Miller Engineering Co.

**Heavy Machinery**  
 Denver Eng. Works Co.  
 Fraser & Chalmers.  
 Rose, Hubber, Etc.  
 New York Belting & Packing Co., Ltd.

**Injectors.**  
 Jenkins Bros.  
 Penberthy Injector Co.

**Insulated Wires and Cables**  
 Okonite Co., Ltd. The  
 Insurance Companies  
 Hartford Steam Boiler Inspect'n and Ins. Co.  
 Mutual Life Insurance Co.

**Joint Fittings**  
 Tight Joint Co.

**Lead Linings for Chlorination Tubs.**  
 Raymond Lead Co.

**Locomotives**  
 General Electric Co.  
 Hunt, C. W., Co.  
 Porter, H. E., & Co.

**Lubricators.**  
 Asbestos Paraffine Co.  
 Detroit Lubricator Co.

**Machinery**  
 Allia, Edw. P., & Co.  
 Bacon, E. C.  
 Beckett, F. J. & Mch. Co.  
 Besley, Chas. H., & Co.  
 Blake, T. A.  
 Bradley Pulverizer Co.  
 Buckeye Engine Co.  
 Bullock, M. C. Mfg. Co.  
 Caldwell, H. W., & Co.  
 Card Electric Co.  
 Colorado Iron Works.  
 Connorsville Blower Co.  
 Crook, W. A., & Bros. Co.  
 Davis-Colby Ore R. Co.  
 Denver Mfg. Mach. Co.  
 Denver Eng. Wks. Co.  
 Dodge Mfg. Mach. Co.  
 Ellison, Wm., & Son.  
 Engelbach M. Mfg. Co.  
 Field, F. R.  
 Fraser & Chalmers.  
 Hammond, Mfg. Co.  
 Hendri & Bolthoff Mfg. Co.  
 Hercules Engine & Hoisting Co.  
 Ingersoll-Sergeant Drill Co.  
 Jeffrey Mfg. Co.  
 Jessop, W., & Sons, Ltd.  
 Leyner, J. Geo.  
 Lidgerwood Mfg. Co.  
 Link Belt Mach. Co.  
 (See Machinery.)

**Manganese Steel.**  
 Taylor Iron & Steel Co.

**Metal Dealers**  
 American & Dev. Mfg. Co.  
 American Metal Co.  
 Am. Zinc-Lead Co.  
 Baker & Co.  
 Bath, Henry & Son.  
 Besley, Chas. H., & Co.  
 Bridgeport Copper Co.  
 Cherookee - L. & Lyon  
 Spelter Co.  
 Cookson & Co.  
 Elliott's Metal Co., Ltd.  
 Eureka Co.  
 Foster, Blackett & Wilson.  
 James & Shakspeare.

**Metallurgical Works and Ore Processors**  
 American Dev. & Mfg. Co.  
 Amer. Zinc Lead Co.  
 Baker & Co.  
 Balbach S. & Ref. Co.  
 Baltimore Copper Wks.  
 Bridgeport Copper Co.  
 Canadian Copper Co.  
 Cookson & Co.  
 Denver Eng. Wks. Co.  
 Elliott's Metal Co., Ltd.  
 Electro Cyanide Gold & Silver Ext'n Co.  
 Foster, Blackett & Wilson.  
 James & Shakspeare.  
 Fraser & Chalmers.

**Mine Cars**  
 Denver Eng. Wks. Co.  
 Hendri & Bolthoff Mfg. Co.  
 Hunt, C. W., Co.  
 Nelsonville Foundry & Machine Co.  
 Whiting Foundry Equipment Co.  
 (See Machinery.)

**Mine, Mill and Smelters Supplies.**  
 Denver Eng. Wks. Co.  
 Dodge Mining Machinery Co.  
 Gates Iron Works.  
 Parkst & Wilkinson.  
 Roessler & Hasslacher Chemical Co.  
 Stiersen, William E.  
 (See Machinery.)

**Mining and Land Companies**  
 American Dev. & Mfg. Co.  
 Atlanta Mfg. Co.  
 Arizona Copper Co.  
 Canadian Copper Co.

**Ore Cars.**  
 Truax Mfg. Co.

**Ore Roasters**  
 Brown, Horace F.  
 Cummer, F. D., & Sons Co.  
 Davis-Colby Ore Roaster Co.

**Ore Testing Works**  
 Hunt, F. F.  
 Ledoux & Co.  
 Montana Ore Purchasing Co.  
 (See Machinery.)

**Packing and Pine Coverings**  
 Asbestos Paraffine Co.  
 Braundt, Handolph.  
 Jenkins Bros.  
 Hine & Robertson.  
 Ricketts & Banks.  
 Robertson, W. F.  
 Simons & Wainwright  
 State Ore Sampling Co.

**Refrerated Metals**  
 Aitcheson, R., Perf. Metal Co.  
 Fraser & Chalmers.  
 Harrington & King Perforating Co.

**Peroxide of Sodium.**  
 Roessler & Hasslacher Chemical Co.

**Phosphor-Bronze**  
 Phosphor-Bronze Smelting Co.

**Pile Drivers**  
 Besley, Chas. H., & Co. | Denver Eng. Wks. Co.  
 Ingersoll-Sergeant Drill Co.

**Pipes**  
 Pollock, Wm. B., & Co. | Wyckoff, A., & Sons.

**Finishing**  
 Baker & Co.  
 Johnson, Matthey & Co.

**Powder**  
 Atlantic Dynamite Co. | Lafin & Hand Pow-  
 der Co.  
 Ingersoll-Sergeant Drill Co. | Lau, J. H., & Co.  
 Repano Chem. Co.

**Pressure Blowers**  
 Connorsville Blower Co.

**Publications**  
 American Fertilizer.  
 Arms & Explosives.  
 Australian Mg. Stand.  
 Bullionist.  
 Colliery Guardian.  
 Denver Republican.  
 El Minero Mexicano.  
 Electrical Plant & Electrical Industry.  
 Jeanerville Iron Wks.  
 Stillwell-Bierce & Smith-Valle Co.  
 Tod, Wm., & Co.  
 Worthington, Henry.

**Quarrying Machines**  
 Ingersoll-Sergeant Drill Co.  
 Rand Drill Co.  
 Sullivan Machinery Co.

**Quicksilver**  
 Sureka Co.

**Railroads**  
 Chicago & N. West. R. R.  
 C. B. & Quincy R. R.  
 Denver & Rio Grande R. R.  
 Denver, Leadville & Gunnison Ry.  
 Florence & Cripple Creek R. R.  
 Illinois Central R. R.  
 Midland R. R. of Kentucky.  
 Rio Grande Southern R. R.  
 U. P., D. & G. R. R.

**Railroad Supplies and Equipments**  
 Hunt, C. W., Co.  
 Porter, H. E., & Co.  
 (See Machinery.)

**Regulators, Damper, Rent, Etc.**  
 Eddy Valve Co.  
 Jenkins Bros.

**Reek Drills. (See Air Compressor.)**

**Roofing**  
 Berlin Iron Bridge Co.  
 Cincinnati Corrugating Co.  
 Sikes Steel Roofing Co.

**Rubber Goods**  
 New York Belting & Packing Co., Ltd.

**Screens**  
 Aitcheson, R., Perf. Metal Co.  
 Denver Eng. Wks. Co.  
 Fraser & Chalmers.  
 Harrington & King Perforating Co.  
 Link Belt Machinery Co.  
 Ludlow-Saylor Wire Co. (See Machinery.)

**Second Hand Machinery**  
 Robinson & Orr.

**Separators**  
 Dodge Mining Machinery Co.

**Shoes and Dies**  
 Chester Steel Cast. Co. | Fraser & Chalmers  
 Oncross Steel Works. | Pierce & Miller Engi-  
 Crescent Steel Co. | neering Co.  
 Denver Eng. Wks. Co.

**Shovels (Steam)**  
 Bucyrus Steam Shovel & Dredge Co.  
 Marion Steam Shovel Co.  
 Souther & Co.

**Smelting and Refining Works**  
 Balbach S. & Ref. Co.  
 Baltimore Copper Wks.  
 Crescent Copper Co.  
 Elliott's Metal Co., Ltd.  
 Kan. City Sm. & Ref. Co.  
 Mathison Smelting Co.  
 Orford Copper Co.  
 Penna. Salt Mfg. Co.  
 Pennsylvania Ref. Co.  
 Newark Paving Wks.  
 Orford Copper Co.  
 Penna. Salt Mfg. Co.  
 Ricketts & Banks.  
 Russell Process Co.  
 State Ore Sampling Co.  
 W. A. Burdick-Swenson Mfg. Co.

**Steel Rails, Castings, Rolls, Drill Steel**  
 Bethlehem Iron Co.  
 Carpenter Steel Co.  
 Chester Steel Cast. Co.  
 Crescent Steel Works.  
 Crescent Steel Co.  
 Moore, S. L., & Sons Co.  
 Pierce & Miller Engi-  
 neering Co.  
 Robinson & Orr.  
 Pollock, Wm. B., & Co.  
 Taylor Iron & Steel Co.  
 Jessop Wm. & Son Ltd.  
 (See Metal Dealers.)

**Tanks.**  
 Denver Eng. Wks. Co. | Walker Co.  
 Gates Iron Works. | Williams Mfg. Co.

**Telegraph Wires and Cables**  
 Okonite Co., Ltd. The

**Testing Laboratories**  
 Fairbanks Co.

**Tools**  
 Besley, Chas. H., & Co.  
 Pratt & Whitney Co.

**Tubes**  
 Besley Chas. H., & Co. | Pollock, Wm. B., & Co.  
 Williams Bros.

**Tubing-Rubber**  
 New York Belting and Packing Co. Ltd

**Turbine Water-Wheels**  
 Leffel, Jas., & Co.  
 Pelton Water Wheel Co.  
 Stillwell-Bierce & Smith-Valle Co.

**Valves**  
 Eddy Valve Co. | Jenkins Bros.

**Ventilators**  
 Bullock, M. C. Mfg. Co. | Tod, Wm., & Co.  
 Fraser & Chalmers.

**Vulcanite Emery Wheels**  
 New York Belting and Packing Co. Ltd

**Water-Wheels**  
 Leffel, James, & Co.  
 Pelton Water Wheel Co.  
 Stillwell-Bierce & Smith-Valle Co.

**Well Drilling Machinery**  
 Sullivan Mach'y Co. | Williams Bros.

**Wharfage**  
 Lambert's Wharfage Co.

**Wheels, Car**  
 Chester Steel Cast. Co.  
 Taylor Iron & Steel Co.

**White Lead**  
 Cookson & Co.  
 Foster, Blackett & Co.

**Wire Cloth**  
 Aitcheson, R., Perf. Metal Co.  
 Harrington & King Perforating Co.

**Wire Rope and Wire**  
 Besley, Chas. H., & Co. | Hunt, C. W., Co.  
 Broderick & Bascom | randa, Douge & Co.  
 Hope Co. | Rilling, J. A. Sons & Co.  
 California Wire Wks. | Ropeways Syndicate  
 Carpenter Steel Co. | Trenton Iron Co.  
 Cooper Hewitt & Co.

**Wire Rope Tramway**  
 Brown Holst. & Conv. | Hunt, C. W., Co.  
 Machine Co. | Roebing, J. A., Son  
 California Wire Wks. | & Co.  
 Colorado Iron Works. | Ropeways Synd. Lt.  
 Denver Eng. Wks. Co. | Vulcan Iron Works.  
 Fraser & Chalmers.



POSITIONS VACANT.

FREE ADVERTISING

Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE, whether subscribers or not.

The labor and expense involved in ascertaining what positions are open, in gratuitously advertising them and in attending to the correspondence of applicants, are incurred in the interest and for the exclusive benefit of subscribers to the ENGINEERING AND MINING JOURNAL.

Applicants should inclose the necessary postage to insure the forwarding of their letters.

1468 WANTED—A MAN WHO IS A THOROUGHLY competent Mechanical Draftsman and Chemist, who is willing to start with low wages, where chances for advancement are good; steady position. Address, stating references, experience and salary expected, XY, ENGINEERING AND MINING JOURNAL.

1469 WANTED—A THOROUGHLY EXPERIENCED furnace man who understands manufacturing Ferro Manganese and Spiegel. Address, with full particulars, O. R. E., ENGINEERING AND MINING JOURNAL.

1470 WANTED BY AN ENGLISH COMPANY a competent and experienced mine manager, to open up gold mine near Rat Portage, Ontario, Canada, and to erect stamp mill. Must assay and have chemical knowledge. Age not less than 35. References to persons in London, England, desirable. State salary. Address R. E., ENGINEERING AND MINING JOURNAL.

1472 WANTED—A FIRST-CLASS MILLWRIGHT accustomed to quartz mill for mine in Central America. Contract three years. Give terms and references. Address MILLWRIGHT, ENGINEERING AND MINING JOURNAL.

1473 WANTED—A GOOD BLACKSMITH for mining camp in Central America. Must understand mule shoeing. Contract three years. State terms and references. Address BLACKSMITH, ENGINEERING AND MINING JOURNAL.

1474 WANTED—ANALYTICAL CHEMIST, for position at a blast furnace. Young man with a few years' experience preferred. Send references and salary expected. Address CARBO, ENGINEERING AND MINING JOURNAL.

1475 WANTED—MINING ACCOUNTANT in California, age about 30, unmarried and Scotch preferred. Undeniable references as to personal character and practical experience. Able to arrange and control the accounts, returns and general commercial business of a large concern. Good salary to a first-class man. Address CALIFORNIA, ENGINEERING AND MINING JOURNAL.

1476 WANTED—A FIRST-CLASS ASSAYER and ore sampler, also as assistant manager and engineer in the operating of a large deposit of manganese of the kind known as "wad" or "box." Address with full particulars, references, etc. PRINCIPAL, ENGINEERING AND MINING JOURNAL.

1477 WANTED—A PRACTICAL MINING engineer and metallurgist to take charge of a gold mine and mill in one of the Northern States. Send references and name salary wanted. Address M. & R. Co., ENGINEERING AND MINING JOURNAL.

1478 WANTED—A FIRST-CLASS ASSAYER for custom sampling works in the Northwest; experience and credentials of the best class indispensable; acquaintance with the business of custom sampling would be an advantage. Reply, stating record, references and salary, to NORTHWEST, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

Advertisements for SITUATIONS WANTED will be charged only 10 cents a line.

YOUNG MAN, THIRTY YEARS OF AGE, desires position as foreman or assistant superintendent of copper or lead-silver smelter. Has practical knowledge of reverberatory and blast furnace work; practical builder of both furnaces. Address COPPER, ENGINEERING AND MINING JOURNAL, No. 17,463, Aug. 22.

YOUNG AMERICAN, ENGINEER, TECHNICAL graduate, with long experience as assistant manager with large concerns, having office in downtown New York, would like to act as representative of manufacturing concern, mechanical line preferred. Address J. X., ENGINEERING AND MINING JOURNAL, No. 17,470, Aug. 8.

WANTED—POSITION AS SUPERINTENDENT to sink shafts, drive tunnels, open up mines, etc. Fifteen (15) years' experience with largest companies in America. Can give best of references. Address H. J. S., ENGINEERING AND MINING JOURNAL, No. 17,472, Aug. 22.

A MINING ENGINEER, OF MANY YEARS' experience as superintendent and manager of mines and works in North and South America, having lately returned from South America, wishes engagement as superintendent, manager or consulting engineer, or will examine and report on mining properties. Is capable of designing and erecting all kinds of mining machinery and works for the treatment of refractory ores. Address "S. A.," ENGINEERING AND MINING JOURNAL, No. 17,479, August 15.

MILLMAN DESIRES CHANGE.—THOROUGH experience in milling, concentration and chlorination. Considerable knowledge of cyanide process. Now in charge of successful reduction plant. Address MILLMAN, ENGINEERING AND MINING JOURNAL, No. 17,458, August 8.

WANTED—POSITION AS RESIDENT manager or superintendent; 15 years' practical experience; now with the largest company in Northern Mexico as mine superintendent; Spanish American country preferred; highest recommendations. Address AMERICANO, ENGINEERING AND MINING JOURNAL, No. 17,452, Aug. 1.

MINING ENGINEER AND METALLURGIST of high standing is open to engagement. Large properties or works preferred. Specialties made of successfully treating low-grade ores. Address CONCENTRATOR, ENGINEERING AND MINING JOURNAL.

WANTED—POSITION WITH COMPANY intending to adopt the cyanide process. Large experience; good references. Address CYANIDE, ENGINEERING AND MINING JOURNAL, No. 17,465, Aug. 15.

A CIVIL ENGINEER WANTS TO REPRESENT manufacturers of mining and other machinery and supplies in the south and west part of the United States. Address C. E., ENGINEERING AND MINING JOURNAL, No. 17,466, Aug. 23.

CHEMIST AND ASSAYER, SIX YEARS' in responsible positions now in charge of a Lake Superior laboratory, desires position in Southwest. Refers to present employers. Address "V.," Box 399 Ironwood, Mich. No. 17,468, Aug. 29.

MECHANICAL ENGINEER AND METALLURGIST would like a change after July 31; has charge of furnace and concentrating works. Address F. H. A., care W. Hoegner, Indiana Hotel, Cincinnati, Ohio. No. 17,469, Aug. 22.

POSITION WANTED—BY YOUNG GRADUATE engineer. Has had one year's experience in active mining, mostly in Colorado. Can assay, survey, keep books, etc. Best of references. Address J. F., ENGINEERING AND MINING JOURNAL, No. 17,473, Sept. 5.

WANTED—POSITION BY METALLURGICAL chemist, four years' experience in silver, lead and copper smelters. Mexico or West preferred. Address C., Box A, Globe, Ariz. No. 17,474, Aug. 29.

WANTED—POSITION BY MINING ENGINEER and metallurgist. Several years' experience in gold, silver and copper mining. Can do his own assaying and surveying. Address E. B., Box A, Globe, Ariz. No. 17,475, Aug. 29.

PRACTICAL CHEMIST AND METALLURGIST, familiar with the cyanide leaching process, wants a position; best reference. Address H. P. C., ENGINEERING AND MINING JOURNAL, No. 17,478, Aug. 29.

A PARIS ENGINEERING AGENT REPRESENTING in France the most important English Cotton Belting Co., desires to represent American manufacturers of patent articles, tools and especially "wood split pulleys." Apply with particulars to F. KING, 33 Soho Square, London. No. 17,476, Aug. 8.

MINING ENGINEER AND METALLURGIST, graduate of Lehigh University, '95, desires a position with reliable mining company in United States or Canada, but will go to Mexico. Address LEHIGH, ENGINEERING AND MINING JOURNAL, No. 17,477, Aug. 8.

A POSITION WANTED IN SPANISH SOUTH America as chief accountant or representative of a mining or manufacturing concern. Experience for a number of years with one of the largest mining enterprises in Mexico; full knowledge of English, Spanish and German; also some French; 30-31 years; single; best references. Address SPANISH SOUTH AMERICA, ENGINEERING AND MINING JOURNAL, No. 17,461, Aug. 22.

Contracts Open.

TREASURY DEPARTMENT, OFFICE SUPERVISING ARCHITECT, Washington, D. C., July 28th, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m., on the 28th day of August, 1896, and opened immediately thereafter, for all the labor and materials required for the erection and completion (except heating apparatus) of the U. S. Post Office Building at Beaver Falls, Pa., in accordance with the drawings and specifications, copies of which may be had at this office or at the office of the Superintendent of Construction at Beaver Falls, Pa. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any and all bids and to waive any defect or informality in any bid if it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for Erection and Completion (except heating apparatus) of the U. S. Post Office, Beaver Falls, Pa.," and addressed to WM. MARTIN ALKEN, Supervising Architect. Orig.

DREDGING.—U. S. Engineer Office, 39 Whitehall street, New York.—Sealed proposals for dredging in Canarsie Bay, New York, will be received here until August 24th, 1896. Information furnished on application. H. M. ADAMS, Major Engrs.]

WATER-WORKS.—Sealed proposals will be received at the office of the Board of Water Commissioners of Village of Le Roy, N. Y., until August 15th, 1896, for furnishing material and labor for building a water-works system, the amounts of which are approximately as follows: Furnishing and laying: 10,500 ft. of 10 in. cast-iron pipe, 2,100 ft. of 8-in. cast-iron pipe, 24,300 ft. of 6-in. cast-iron pipe, 9,500 ft. of 4-in. cast-iron pipe, 5 tons of special castings, 65 double-nozzle fire hydrants, 9 10-in. valve gates and boxes, 3 8-in. valve gates and boxes, 50 6-in. valve gates and boxes, 20 4-in. valve gates and boxes. Separate bills are also asked for furnishing the above material and for laying and setting the same. Furnishing and erecting a stand-pipe, 20 ft. by 100 ft.; furnishing and erecting one force pump of 750,000 gallons daily capacity; also one 50-H.P. boiler and connections; constructing a pumping station. Bids must be accompanied by certified cheques as follows: For the distribution system, a \$500 check; for the pump and boiler, a \$250 check; for the stand-pipe, a \$250 check; for the pumping station, a \$250 check. The successful bidders must within eight days of the date of award enter into a contract, giving bonds acceptable to the Commissioners. Plans and specifications may be seen and forms for proposal procured on application to the Board of Water Commissioners, or at the office of POTTER & FOLWELL, engineers, 137 Broadway, New York City.

CEMENT, SAND AND STONE.—U. S. Engineer Office, Boston, Mass.—Sealed proposals for cement, sand and stone for battery at Long Island Head, Mass., will be received here until August 13th, 1896. Information furnished on application. S. M. MANSFIELD, Lt.-Col. Engrs.

DAM, ETC.—U. S. Engineer Office, Custom House, Cincinnati, O.—Sealed proposals for building chanoine dam and stone masonry pier, and for iron work for movable dam, Lock No. 6, Ohio River, will be received here until August 20th, 1896. Information furnished on application to WILLIAM MARTIN, Mahan, Beaver County, Pa., or to W. H. HEUER, Maj. Engrs.

JETTY.—U. S. Engineer Office, 39 Whitehall street, New York.—Sealed proposals for dredging in Patchogue River and Brown's Creek, and for constructing jetty at mouth of Patchogue River, N. Y., will be received here until August 24th, 1896. Information furnished on application. H. M. ADAMS, Major, Engrs.

DREDGING.—U. S. Engineer Office, 39 Whitehall street, New York.—Sealed proposals for dredging in Shoal Harbor and Compton Creek, New Jersey, will be received here until August 24th, 1896. Information furnished on application. H. M. ADAMS, Major Engrs.

WATER-WORKS.—Proposals for furnishing material and constructing a water plant will be received until August 13th, 1896. For particulars address W. B. DE WITT, Clerk, Skaneateles, N. Y.

MATERIALS FOR GUN EMPLACEMENTS.—U. S. Engineer Office, 1428 Arch street, Philadelphia, Pa.—Sealed proposals for furnishing and delivering at Finn's Point, N. J., cement, broken stone, sand, brick, lumber, steel I-beams, steel bolts, pipe, iron stairways, bronze and brass fittings, concrete mixer, derrick fittings, car wheels, wire and manilla rope, derrick masts and miscellaneous hardware, will be received here until August 12th, 1896. Information furnished on application. C. W. RAYMOND, Major Engineers.

THE ENGINEERING AND MINING JOURNAL. ADVERTISING RATES. (NONPAREIL MEASUREMENT.) Table with columns for Line, Inch, Regular, One Month, Three Months, Six Months, Nine Months, and Yearly. Includes SPECIAL POSITIONS section.





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Notice is hereby given that the undersigned, Receivers of the Charter Oak Life Insurance Company, acting under authority and in pursuance of an order passed on the 12th day of June, 1896, by the Superior Court of Hartford County and State of Connecticut, will, between the hours of 12 o'clock, noon, and 3 o'clock P. M. on Saturday, the 29th day of August, 1896, at the west front entrance to the City and County Building, in the City and County of Salt Lake, in the State of Utah, offer for sale, and sell at public auction, to the person or persons who shall make the highest bid therefor for cash, upon delivery of the deed therefor by said Receivers, within thirty days after said sale, all the right, title and interest vested in, and which they now as Receivers as aforesaid have, of, in and to the following described mining claim and machinery, and tunnel claim and other property connected therewith, situate in Ophir Mining District, Tooele County, State of Utah, described as follows, to wit:

That certain mining claim situate in said district commonly known as and called the Mono Mine, being more particularly described as follows, to wit: Mineral entry No. 105 in the series of the Land Office at Salt Lake City, Utah, designated by the Surveyor-General as lot No. 46, containing 3.67 acres of land, more or less, and according to the return on file in the General Land Office in said City of Salt Lake, described and correctly described, with magnetic variation at 16° 30' east, as follows, to wit: Beginning at corner No. 1 a post marked No. 1, Lot No. 46, thence south 83° 30' east, 1,600 feet to corner No. 2 a post marked No. 2, Lot No. 46, from which a fir tree 17 inches in diameter marked B. T. bears north 71° 30' west at the distance of 21.5 feet; thence from said corner No. 2 north 6° 30' east 100 feet to corner No. 3, a post marked No. 3, Lot No. 46, from which a fir tree 17 inches in diameter, marked B. T., bears north 76° west at the distance of 13 feet, and U. S. Mineral Monument No. 6 a fir tree 17 inches in diameter, marked U. S. M. No. 6 on the south side, and U. S. Mineral Monument No. 6 on a board nailed on the east side bears north 59° west at the distance of 462 feet; thence from said corner No. 3 north 83° 30' west 1,600 feet to corner No. 4, a post marked No. 4, Lot No. 46; thence south 6° 30' west 50 feet to a point from which discovery stake bears north 83° 30' west, at a distance of 800 feet, 100 feet to the place of beginning. A description of which is also found recorded in the Recorder's office in said county of Tooele, in Book BB of records on pages 622 to 636, inclusive. Nevertheless, however, reserving and excluding therefrom all that part thereof "which is situate east of the center of the ravine crossing said premises nearest the eastern boundary thereof, which ravine is further designated and identified as the one in which a living spring rises a short distance above the north boundary of said premises." Together with all and singular the tenements, hereditaments and appurtenances thereunto belonging or in any wise appertaining, including all hoisting works, engines and machinery, tailings and property therein and thereon. Also in the same district and nearby the same, and once worked in relation to said mine, that certain mining tunnel commonly known and called in that vicinity "The Aetna Tunnel."

Upon such sale being so made and the purchase money paid, said Receivers will convey said property to the purchaser within thirty days after said sale. Dated this 7th day of July, 1896. ISAAC W. BROOKS & EDMUND A. STEDMAN, Receivers as aforesaid. MARSHALL & ROYLE, Salt Lake City, Utah, Attorneys. GROSS, HYDE & SHIPMAN, Hartford, Conn., Attorneys.

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A dividend of TWENTY-FIVE CENTS PER SHARE has been declared, payable 22d inst. Transfer books close on 17th.

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COLORADO SPRINGS, Colo., July 10th, 1896. DIVIDEND NO. 7.

A dividend of ONE CENT PER SHARE (\$22,500) has been declared, payable July 25th, 1896, to stockholders of record July 18th, 1896.

The stock transfer books will be closed July 18th, 1896, at 3 o'clock p. m., and will be re-opened on the morning of July 26th, 1896.

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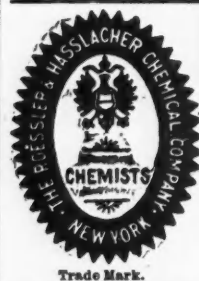
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