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CONTENTS.

Table listing contents with page numbers. Includes sections like Editorial Notes, Some Diamond Figures, Copper and Prices, The Smelting Corporation, Limited, New Publications, Books Received, Correspondence, The Rapid Determination of Copper and Nickel in Sulphide Ores and Matte, The Helicoidal Wire System of Quarrying, Notes from the Atlin District, British Columbia, Aluminum at a Moderate Price, The Calorimetric Assay of Copper, The Assay of Copper Materials for Gold and Silver, The Oil-Bearing Shales of the Coast of Brazil, The Pro-ecton of Blast Furnace Linings, Recent Decisions Affecting the Mining Industries, Gold Mining in Nova Scotia, The Ingersoll-Sergeant Drill Company's Paris Exhibit, The Baldwin Acetylene Lamp for Mines, The Simpson Pulverizer, Abstracts of Official Reports, Mineral Collectors' and Prospectors' Column, Questions and Answers, Patents Relating to Mining and Metallurgy, Personal, Obituary, Societies and Technical Schools, Industrial Notes, Trade Catalogues, Machinery and Supplies, Mining News, United States (Alaska, Arizona, California, Colorado, Georgia, Idaho, Michigan, Minnesota, Missouri, Montana, Nevada, Oregon), Personal, Meetings, Dividends, Assessments, Stock Quotations, Chemicals and Minerals, Mining Stocks, Market Reviews, Mining Co's, Current Prices, Minerals, Chemicals, etc., Alphabetical Index to Advertisers, Classified List of Advertisers.

We find it necessary from time to time to call attention to certain fundamental rules which editors and publishers find necessary. The first of these is that we cannot use nor answer anonymous contributions. When correspondents desire it, their identity will remain known to the editor alone; but to receive notice of any kind they must send their names and addresses.

Second: While we are always ready to give information on practical points and to answer questions of a proper kind which may be asked us by subscribers, we cannot recommend or pass judgment on processes of ore treatment, nor can we give opinions on the possible or probable value of ore deposits or mining property. In other words, we cannot undertake to answer questions which require examination and advice of an expert for their proper solution. To do so would require time which we cannot spare, and would be unjust to the many mining engineers and metallurgists who are our friends and constituents.

A third rule is that we cannot give individual advice as to mining investments. We give all the news which can be obtained as to districts and different mines, and we warn our readers against probable "fakes" and wild-cats," but beyond this we cannot go.

We trust that our readers will bear these rules in mind and thus save themselves from disappointment and us from the regret which always accompanies the necessity of failing to comply with a correspondent's request.

The general strike of the anthracite coal miners, to the possibility of which we have heretofore referred, has been finally ordered, and the men will quit work in the collieries on September 17th. The reasons given and the motives for this strike have been fully discussed, and it is enough to say now that its chief object seems to be to force the anthracite operators to recognize the organization known as the United Mine Workers of America. We believe the strike to be an unnecessary one, and a movement much to be regretted. Just now the large coal companies are in position to offer determined resistance and to hold out much better than the miners can.

The American Smelting and Refining Company's brief statement for the year ending April 30th last—the first year of the consolidated company—shows a total profit of \$3,524,961, of which \$2,296,018, or more than two-thirds, was made in the second half of the year. This profit was equal to 5.4 per cent. on the company's total capital stock of \$65,000,000. One-half of this, however, or \$32,500,000, is preferred stock, carrying 7 per cent. interest. With this deducted from the profit there would have been left for the common stock last year only \$1,249,961, or 3.8 per cent., if the entire sum had been distributed. This does not look like an exorbitant profit. Comment on the statement is difficult to make, however, in view of the very few facts given in the report.

The announcement that President Kruger has left the Transvaal and on September 12th had reached Lourenco Marques, in Portuguese territory, probably means the end of organized war in the Transvaal. It is significant that at the same time comes a report that General Botha has opened negotiations for the surrender of his force. Probably Mr. Kruger will not remain long at the Portuguese port, where his presence might be a serious embarrassment, but will make his way to Europe. How much of the gold commandeered at the beginning of the war, or taken from the Witwatersrand mines during the war, he may have with him is uncertain. Not much of this gold was used, the Transvaal Government having made an issue of notes with which all the payments in the country were made. Some gold, doubtless, was used in buying supplies from abroad, but the greater part of it is in Mr. Kruger's possession, either at Lourenco Marques or—more probably—safely deposited with banks in Europe. "Oom Paul" has escaped capture by the British forces, and he has doubtless a sufficient provision for his remaining years. Mr. Kruger made a good fight, but the end looks sordid rather than heroic.

The English papers are beginning to receive accounts from the Witwatersrand in relation to the condition of the mines there. In almost every case these reports corroborate the statements made by our special correspondent during the period when the Boer forces occupied Johannesburg and the mines were entirely under their control. As a rule there has been no destruction of property. In a few cases tools and machinery which could be used in the arsenal were removed from the repair shops or engine-rooms; but the number is comparatively small. In the mines operated by the Transvaal Government the ore blocked out has been taken out and no new development work done. A number of the mines are full of water, and the mills show the deterioration which

might be expected after nearly a year's idleness. There are few mines which could not be put in producing condition within a month after work is fairly resumed. When the new start will be made is still uncertain, for the military necessities still prevent any general return of mine employes or civilians to Johannesburg, and may continue to do so for some time to come. Present indications, however, are that it will be possible to make a beginning by the end of the current year.

As is generally known, the great iron ore bodies which have made the Mesabi Iron Range in Minnesota famous do not show above ground, and for this reason the Vermilion Range, farther from Lake Superior, was developed earlier. At the point where the Duluth & Iron Range Railroad crosses the Mesabi iron formation, Prof. Chester, in 1883, examined and reported on the iron-bearing rocks. Subsequently considerable work was done by various explorers, particularly by one John Wellman, and in 1891 arrangements were about completed for building a railroad spur to one of the locations. The small size of the ore bodies found and the discovery of the great ore bodies about Biwabik, 12 miles to the west, in 1891, and the subsequent opening of those at Virginia and Hibbing, still farther west, led to a suspension of work east of Biwabik for some years, and the explorations first made on the Mesabi were generally condemned and passed over by the experts of the various mining corporations. Our Minnesota correspondent, however, now reports that an ore body a mile long and half a mile wide under but 50 feet of surface, has been found in this long neglected spot, and an iron mining company which for years refused to have anything to do with the ground has taken an option on the property for \$480,000. This is another of those little jokes that nature sometimes plays upon even expert mining men.

SOME DIAMOND FIGURES.

Not everyone has the facilities for measuring and weighing a cubic foot—or even a cubic inch—of diamonds. The figures given below, which were furnished us by an official of the De Beers Consolidated Company, will have much curious interest. The first measurement taken was of diamonds sufficient to fill a space of 75 cubic inches, the time being July of the present year. The diamonds were what a coal operator would call "run-of-mine;" that is, they were of all sizes, mixed together just as received from the works where they were separated from the blue-ground matrix, but had been cleaned by boiling in acid. Three measurements were made, the first giving 14,617 carats, the second 14,666, and the third 14,860; the average being 14,713 carats.

According to these measurements 1,000,000 carats of diamonds of average size would make:

	Cub. inches.	Cub. feet.	Cub. meters.
First	5,131	2.97	0.0841
Second	5,114	2.96	0.0838
Third	5,047	2.92	0.0827
Average	5,097	2.95	0.0835

Conversely, taking the average, a cubic foot of diamonds would weigh 336,700 carats, and a cubic meter 11,976,000 carats. Assuming them to run about the De Beers average, a cubic foot would be worth about \$2,215,500, and a cubic meter \$78,802,000.

During the 11 years ending June 30th, 1899, the mines of the De Beers Company produced, in round figures, 25,098,000 loads of "blue ground"—the diamond yielding ground—averaging 16 cubic feet each. This is equivalent to 18,851,000 metric tons. The diamonds saved from the blue ground were 24,476,000 carats, including all sizes, and the amount realized for the stones was \$161,152,303. This is an average return of \$6.58 per carat. The average recovery was 1.3 carats per metric ton, and the average yield in money was \$8.55 per ton of blue ground.

The blue ground extracted during the 11 years would make a cube with sides 740 feet or 226 meters long; while the diamonds recovered would be represented by a cube with sides 50 inches, or 1.27 meters long. The ratio in size of the diamond cube to the blue ground from which it was taken would be about 1:178 in the length of one side of the cubes, or 1:6,000,000 in total bulk.

COPPER AND PRICES.

Some of our contemporaries in England and on the Continent of Europe are inclined to resent the present high price of copper, and to attribute it to speculation in the United States; and especially to what they call the control of the market by a single interest. They consider, moreover, that the price can be brought down if purchasers for consumption will hold back their orders. Such is the advice given by some prominent foreign journals; but it is based on a mistaken theory altogether, and will not—indeed it cannot be followed, for very substantial reasons. The most important of these is that many British and Continental manufacturers have accepted this theory and have for months past held back, buying only for their immediate needs, and making no

contracts for the future. Most of these people now find themselves practically without supplies and with orders that must be filled; and they are compelled to buy at the prices now prevailing, which promise to rise to a still higher point before a fall can be expected.

We have several times pointed out the great increase in the consumption of copper during the past three years, and the causes which made this increase much greater than would result simply from the general activity of trade. It is not necessary to go into these again in detail; briefly speaking they are the great extent of new electric work, the large accumulation of war material by all the leading nations of Europe, and the activity in shipbuilding. The first and second causes continue to operate with full vigor. The quantity of new electric work undertaken seems to increase instead of diminishing, while the demand for war material, apart from its consumption or destruction in South Africa and China, is also on the increase. There is at present a temporary cessation in activity in shipbuilding, but we do not believe that it will continue long, when we consider that the existing demand for ocean tonnage exceeds the supply, and that high freight rates must necessarily stimulate the demand for vessels. On this side of the water, indeed, shipbuilding is very active. Thus the main sources of demand for copper show no indications of falling off in the immediate future, and much the same can be said of the minor uses of the metal, which are extending and increasing rather than diminishing. The substitution of other metals for copper in construction, especially in electric work, has made but little advance, for reasons which we have frequently indicated.

While there has been some speculation here, as would naturally be the case in such favorable conditions, it has not by any means attained the proportions which foreign writers attribute to it. The narrow control of the market is also an overestimated factor. The fact is that the recent advances in copper have been due chiefly to economic causes which admit of easy explanation; which are still in operation, and which are well understood by those who study the market carefully.

THE SMELTING CORPORATION, LIMITED.

It is now two years and a half since the Smelting Corporation, Limited, was floated in London to acquire and work the Fry process for smelting zinc lead sulphides. The prospectus promised that the new works, on the Manchester Ship Canal, at Ellesmere Port, were to be ready in seven months' time, so that the supporters of the corporation confidently expected that operations would begin within a year of the flotation. The process was vouched for by the promoters to be a success, as far as the winning of the lead and silver was concerned, while the recovery of the zinc was said to be practically a certainty. The company also started out with a large supply of ore obtained from the vendors. The working capital received by the flotation was £170,000, of which £90,000 was to be devoted to the erection of the new works and plant, and £60,000 to the purchase of ore and general working capital. We pointed out at the time of the flotation that the estimates of profits were, to say the least, optimistic, and that the process, though of considerable metallurgical interest, was quite impractical. The vendors received £350,000 in shares and £80,000 in cash, and in addition handed over their stocks of ores to the company, at a price not specified, but, no doubt, quite in proportion to the other favors received in the flotation.

It has been commonly supposed that the corporation has been successful in its operations, owing to the interest taken in the process and to the possession of a large supply of working capital. There have not been wanting many unbelievers in the whole affair, but it is only natural that a company promising to solve a difficult metallurgical problem and backed up by such influential financial support, should receive encouragement in every quarter where the zinc-lead problem claims consideration.

It is therefore a great surprise to hear that the corporation has long since come to the end of its capital, and has already run up a credit at the bankers of nearly £100,000. This credit has been obtained with the stocks of ore as security, and consequently the directors now think it right to increase the borrowing powers of the corporation so that other indebtedness may be met. The works have been built on most liberal lines, or, it should be really said, on extravagant lines; for all sorts of machinery have been installed before the actual process has been proved and elaborated. The prospectus promised that the new works, which were to be ready in seven months, were to be able to treat ore at the rate of 100,000 tons per annum; but no smelting began until early in June this year and even then the operations were intermittent. Only one cupola furnace is at present working, and its capacity is not stated, though the directors claim to be producing 70 to 100 tons of lead a week. In the prospectus, as already mentioned, the amount of ore to be treated per annum is given as 100,000 tons and the average lead content is put at 27 per cent. of lead, so it is obvious

that the output at present is not more than one-fifth of that promised at the flotation of the company.

The question of recovering the zinc is still in an experimental stage. The United Alkali Company, which is at present supplying the corporation with sulphate of soda, is desirous of utilizing some of the hydrochloric acid for the recovery of all the chlorine and it is hoped to make the process for recovering the zinc by the electrolysis of the chloride of zinc a commercial one, both as regards the production of metallic zinc and the recovery of chlorine. The plant for demonstrating this process is still in the experimental stage and its usefulness to the corporation is not yet proved.

The corporation was floated with very influential support, for the board of directors included Mr. Lidderdale, a former governor of the Bank of England, and Mr. Bevan, a director of the great banking firm of Barclay & Company. In addition to these gentlemen, there were Mr. Bryant, of Bryant & May, and Mr. Allhusen, the chemical manufacturer, Mr. De la Rue, and Sir Gerald Fitzgerald. The moving spirit in the whole concern was Mr. H. E. Fry, who reaped the chief advantage in the flotation, as vendor of the patents, as seller of the stocks of ore, and as director of the new company. The fact that the Burnham Syndicate was the actual vendor of patents and stocks of ore is a mere detail, as Mr. Fry was the controller of this syndicate.

The Smelting Corporation continues to circulate news about its ability to treat ores, and professes to be willing to buy ores; but we do not know of any purchases of ores having been made, except from the Burnham Syndicate. In the interests of miners of complex zinc-lead sulphides we have from time to time recommended them to apply to the Smelting Corporation, but, seeing that the corporation has run short of capital, we are not at the present time inclined to repeat this advice.

NEW PUBLICATIONS.

Through a misprint in our issue of August 25th last (page 213), the price of Volume II—"Silver"—of Henry F. Collins' "Metallurgy of Lead and Silver" was given at \$2. The correct price of the two volumes is \$9, either volume being sold separately for \$4.50.

"Analyses of Pig Iron." San Francisco: Collected and published by Seymour R. Church. Pages, 176; illustrated. Price, \$2.50.

This book enters a field which is comparatively new. Plenty of analyses of pig iron have been published, but they have not been presented together. The object of the book is, perhaps, best stated in the words of the preface, as follows:

"This work comprises analyses of pig iron made in the United States, Great Britain and other countries, and also important statistics relative to the production. The analyses in nearly every instance were received either from the furnaces direct or from furnace agents, and although the publisher realizes that some of them do not seem correct, yet they have been copied just as they were received, and are on file open to inspection. The collecting of these analyses has necessarily opened up a voluminous correspondence, several thousand letters having been written to obtain the information contained in this volume, and if every furnace had given the desired information, a great many more analyses could have been published, but some of them declined to give same; however, the publisher hopes that when the different makers of pig iron see this work they will at once realize its importance and furnish the desired information for the next volume, which will be published in the early part of the year 1901. It will contain entirely new matter, and will not be a repetition of the matter contained herein. The half-tone cuts, representing the fracture of different brands and grades of pig iron, will be interesting, as they show the various characteristics of the iron, and the accompanying illustrations of furnaces will give the reader a very good idea of the plants where the iron is manufactured."

The idea of the work is excellent, and it ought to be very serviceable to buyers and users of pig iron. It is to be hoped that the author will be able to expand it, as he suggests, in future editions.

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review on another page of the Journal.

"United States Commission of Fish and Fisheries; Bulletins 431; 432; 436; 437; 440 and 441." Washington; Government Printing Office. Illustrated.

"Sixteenth Annual Report of the Commissioners of the New York State Reservation at Niagara." Albany, N. Y.; State Printer. Pages, 128; illustrated.

"Geology of Dubuque County, Iowa." From "Annual Report," Iowa Geological Survey. By Samuel Calvin and H. F. Bain. Des Moines, Iowa; State Printer. Pages, 266; illustrated.

"Preliminary Report on the Structural and Economic Geology of Missouri." Bureau of Geology and Mines: John A. Gallaher, State Geologist. Jefferson City, Mo.; State Printer. Pages, 260; illustrated.

"The Journal of the Iron and Steel Institute." Volume LVII, being No. 1 for 1900. Edited by Bennett H. Brough, Secretary. London; E. & F. N. Spon, Limited, and New York; Spon & Chamberlain. Pages, 520; illustrated.

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 will only 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.

The Hans A. Frasch Process.

Sir: I was much interested in your article on the Hans A. Frasch process, in the "Engineering and Mining Journal" of September 8th, but considering the intricacy of the process and the innumerable difficulties involved, I think you are a little premature, and too positive in speaking so enthusiastically concerning it.

My own experimenting in this line and our investigations of the action of cupric chloride on copper mattes and bornite resulting in the solution of the mineral and the formation of cuprous chloride showed the process to be so slow that it always prejudiced me against the Hoepfner process.

New York, September 10th, 1900.

German Patents.

Sir: The prejudice against the German Patent Office which prevails among a large number of American patent attorneys and many classes of American inventors is occasioned by the great differences between the German and American patent practice. The German Patent Office only grants protection for an idea by means of which some new effect is obtained. For example, assuming that all locomotives were at the present day provided with inside steam cylinders and somebody were to design a locomotive with outside cylinders, a patent would be granted in America for the new construction, but not in Germany, because the "useful effect" obtained from the locomotive is not increased. American claims for a machine are usually a summary of details of the construction, constituting certain new combinations, while German claims are a statement of the characteristic features by means of which some new effect is obtained. The most usual forms of American claims are "In a the combination with of", or "A comprising" (so many details of the construction), while the form of a German claim is usually, "A characterized by the fact that is arranged in such a manner that" (such and such an effect is obtained), or "A characterized by" something by which some new effect is obtained.

This brief explanation will show that there is an essential difference between the practice before the American and German patent offices and this difference accounts for the misunderstanding on the part of American patent attorneys and inventors of the doings of the German Patent Office. It will be seen that some inventions for which American patents have been obtained, can still be refused protection in Germany, because they only relate to new combinations by means of which no new technical effect is obtained. When considering the question whether to apply for a German patent or not for any given invention the inventor should first ascertain whether a new, essential, technical effect is obtained by the same. If such a new effect is obtained and this can be proved, it is certain that a patent can be obtained for the invention in Germany. An invention is regarded as new if it has not been previously used in Germany nor disclosed in print in any country during the last 100 years.

The growing importance of German industry is increasing the value of German patents. Experience shows that good patents can now be as readily disposed of in Germany as in America. For this reason inventors would do well to get rid of their prejudice. When they have new inventions of real industrial value by means of which some desirable end is obtained that has not been attained before, they can confidently apply for protection in Germany, with the certainty that the invention will be considered on its true merits at the Patent Office, and with as good a prospect of financial success as in the United States.

H. & W. Pataky.

Berlin, Germany, August 30th, 1900.

THE RAPID DETERMINATION OF COPPER AND NICKEL IN SULPHIDE ORES AND MATTE.

Written for The Engineering and Mining Journal by Titus Ulke.

It is a well-known fact that the methods for determining nickel and copper in sulphide ores described in the standard works require considerably more time than is usually at the disposal of the metallurgical chemist. With a view to shortening the time required the following method which is both rapid and commercially accurate, has been adopted by the chemists of the Canadian Copper Company, at Copper Cliff, and by Mr. D. P. Shuler, of the Great Lakes Copper Company, Sudbury, Ontario, to whom credit is due for some of the improvements described below.

Weigh out (in duplicate, if necessary) 1 gram of the ore pulverized to 80 or 100-mesh and place the sample in a Griffin beaker about 4 in. high and 2½ in. in diameter and add 4 c.c. of 50 per cent. sulphuric acid and about 10 to 15 c.c. of strong hydrochloric acid. Evaporate on a steam-heated plate until effervescence ceases; then add 5 to 10 c.c. of nitric acid and run to dryness. This takes from 1 to 2 hours. Add water and filter into a narrow lipless beaker about 1½ in. in diameter and 4 in. high. After adding 10 drops of nitric acid deposit the copper from the solution by electrolysis over night, using from two to three-tenths of an ampere for each assay.

On the following morning take off the cathode with its copper deposit, washing it first with water and then with alcohol and either burn off the latter or place the cathode in a hot air bath to dry. The solution, now free from copper, is oxidized with hydrogen peroxide, heated to boiling and the iron precipitated by a large excess of ammonia under or in front of a hood. To this iron precipitate on the filter is added 5 to 10 c.c. of ammonia, and it is stirred up by a jet of hot water and washed. It is

now dissolved in hot dilute sulphuric acid, 1 part of acid to 5 parts of water, and reprecipitated by an excess of ammonia and this process is repeated, making in all three precipitations of iron with ammonia. The three filtrates, which should not much exceed half a liter in bulk when combined, are united and evaporated down to about 200 c.c., this evaporation taking about an hour. To the nickel solution, contained in a flat-bottomed beaker with ground-tops and approximately 3 in. in diameter and 4 in. high, is added about 100 c.c. of ammonia. It is now ready for the electro-deposition of the nickel.

Four nickel determinations can be made in from 2 to 4 hours' time, when 8 Grove cells or 10 Edison-Lalande batteries are employed, each assay requiring a current of about 2 to 3 amperes. The anodes are made from very pure and soft iron wire (hay wire No. 14), about 1/16 in. thick, bent into spirals about 5/8 in. in diameter, and the cathodes consist of irido-platinum cylinders about 2 1/4 in. high and 1 1/4 in. in diameter with stems 4 in. long. The cathodes should be ordered free from holes and blisters, with stems extra hard and weighing about 22.5 grams, no cathode to vary more than 10 milligrams from the standard weight. These can readily be secured from the firm of Eimer & Amend, New York.

The beaker with the nickel solution is placed on an iron stand under the electrodes, covered by two pieces of thin star-glass or a split watch-glass and gently heated over an alcohol lamp to a temperature of about 65° C. during the process of deposition. When the latter is considered complete a few drops of the solution is pipetted off and tested with potassium sulphocarbonate—a 50 per cent. mixture of equal parts of CS₂ and K₂S, which temporarily colors pink a solution containing traces of nickel. This test solution, which is conveniently retained in a patent drop bottle, must be kept in the dark, as it is injuriously affected by light. The nickel on the cathode is washed with water and alcohol, and the latter burned or dried off in a hot air bath. The iron anodes are washed with water and have simply to be heated to prepare them for further use. These very cheap and practical anodes may be employed for as many as 30 or 40 determinations before they become too rusty and scale off.

The total time required for the above determinations of both nickel and copper is not more than a day, as a sample received at 4 p. m. may be analyzed and the results reported by noon on the following day. The results obtained ordinarily check to within 0.1 per cent.

When it is desired to determine the copper and nickel in common matte, only 1/2 a gram of the sample is weighed out and any insoluble residue found present need not be filtered off before proceeding with the deposition of the copper. In other respects the above outlined method of analyzing ores containing nickeliferous pyrrhotite and chalcopyrite is followed with matte and equally good results are obtained.

Convenient stands for the electrolytic apparatus with aluminum frames can be obtained from Richards & Co., of Chicago, Ill., from whom the Great Lakes Copper Company secured the stands employed by its chemist. The aluminum bars are 1/2 in. square and are adjusted on the vertical supports to a height of about 14 in. above the base. Each frame should have at least 4 places for suspending the electrodes spaced about 4 in. between centers, and should have all holes for the flat-tipped aluminum binding screws of full depth. The stands are preferably placed under a hood to draw off the fumes of ammonia produced by heating the nickel electrolyte. The current should always be turned on before the electrodes are immersed in the electrolyte as the iron anodes are apt to disintegrate when left in the warm ammoniacal solution in open circuit. Platinum anodes cannot be employed, as they are attacked by the hot solution and in this case as much as a milligram of platinum may be deposited with the nickel on the cathode, thereby causing large errors in the results. Good flat-bottomed beakers of Bohemian glass and convenient size for the above nickel and copper determinations and having ground tops can be secured from Eberbach & Co., Ann Arbor, Michigan.

THE HELICOIDAL WIRE SYSTEM OF QUARRYING.*

By N. Pellati.

In describing this method of quarrying marble and other stone, the author says that cuts from 10 to 15 m. long, and of similar depth, are made by the helicoidal wire (a wire-cord formed of three hard steel wires twisted together with a very slow pitch), in rocks of slight hardness with an advance varying from 4 to 15 cm. per hour; and among the advantages of this method may be mentioned the suppression of shot-blasting, rapidity of excavation and the diminution of waste—important in the case of marble—occupying valuable ground or entailing great expense for its removal. Formerly, in order to permit the running wire to enter a rock mass, it was necessary to sink a few holes—at least three, but generally four—for receiving the frames carrying the guide pulleys over which the wire passed; and, considering the rigidity of the cord, the pulleys must have a diameter of about 60 cm., requiring a shaft at least 1.2 m. wide. In Belgium these shafts were sunk by a rotary borer consisting of a steel tube the crown of which, aided by the action of sand and water, made an annular cut in the rock; but this borer was only suitable for vertical shafts.

In the large quarries of Carrara the helicoidal wire was used with advantage for subdividing the blocks of quarried rock; but the nature of these quarries did not permit of its being used for cutting out blocks from the rock mass, although such use would have overcome certain difficulties of working insurmountable by other methods. An attempt was indeed made to sink a few shafts by means of small shots for applying this method; but the work was slow and difficult, while powder might damage the marble, and the application of the helicoidal wire itself was also attended with difficulty, so that the need was felt of means for cutting into the rock in any direction without the necessity for sinking shafts.

The problem was solved by Sig. A. Monticolo, with what he calls the "penetrating pulley," by means of which simple boreholes of slight diameter can be substituted for the shafts. This pulley enters the

rock at the same time as the helicoidal wire which guides it, follows the cut which it slightly enlarges, while the pivot, its bearings in a fork, and also the carriage that follows it up, advance in the borehole along the plane of the cut that is being made. The pulley is a disc of 50 mm. diameter and 8 mm. thick, this thickness being slightly less than that of the helicoidal wire; and in its periphery is turned a groove of semi-circular section. The disk has a small hub in the center for carrying a steel spindle, and is sunk in a steel fork, cylindrical outside, of 64 mm. diameter; and, following the fork, a series of tubes of equal diameter constitute a column that can be lengthened at will, and inside which passes a pipe for lubricating the pivots. This appliance is completed by a carriage, which is fixed to the rock in any position by three screws; and a slow automatic feed is given to the tube column, and therefore to the penetrating pulley, by a pulley outside the rock face carrying the helicoidal wire.

For making a cut into the rock a few holes of 6 to 7 cm. diameter must first be bored for receiving the forks that carry the pulley spindles; and the helicoidal wire is made to run over two penetrating pulleys or over one penetrating and one ordinary pulley, the latter arranged on the face of the quarry. When the penetrating pulley acquires a rapid rotation owing to the motion of the cord, it is pressed strongly against the rock; and the cord projecting from its groove wears away the rock, so as to make a cut into which the pulley penetrates, thanks to its slight thickness. If it be required to widen the cut a little, the pulley is sufficient for that purpose, with the aid of silicious sand and water which are continually fed into the cut. During this time the fork carrying the pulley follows the borehole, descending as the cut progresses; and thus the helicoidal wire, while guided by the penetrating pulley, serves in turn to protect the latter, being the only part subjected to the wearing influence of the rock.

It was found in practice, however, that the groove of the penetrating pulley, although protected by the wire, deteriorated at the edges through the action of the silicious sand; and again the pulley pivots, always immersed in a mixture of sand and water, also became worn. To meet the first of these difficulties the inventor conceived the idea of maintaining the form of the groove by facilitating wear on the inside, so as to render it equal to that of the edges; and this is effected by making at the bottom of the groove a narrow slit 15 mm. deep and 1 1/2 mm. wide, so that the bearing surface of the wire is reduced, the wear is equalized over the whole cross section of the groove, and thus, while the groove always retains the same form and depth, the diameter of the pulley becomes slowly and almost imperceptibly diminished. The second difficulty was overcome by entirely inclosing the pivot bearings except, of course, where the pivot enters; and along the annular surface of contact between the pivot and its bearings, a piece of cloth is twisted in its groove, being kept tight by an india-rubber ring. In this manner sand is prevented from getting into the bearings, although oil can penetrate by a narrow chink, so that the pivots run for a long time without appreciable wear.

With Signor Monticolo's improvement the helicoidal wire soon came into practical use; and not only vertical cuts, but also oblique and nearly horizontal cuts were made; the latter rendered possible because there is no clamping or dragging of the wire. In March, 1898, several vertical cuts, from 8 to 9 m. deep and 15 m. long, starting two or three from the same borehole, were made at the Campanile Quarry, Carrara, cutting from the rock mass about 400 cubic meters of valuable marble, most of which would otherwise have been lost. Some oblique and horizontal cuts were afterward made at the same quarry, so as to permit removal of the masses that had been cut out on their vertical side; and when this paper was written a cut was in progress, 15 m. long and 5 m. deep, making an angle of 5° with the horizon.

The invention, thus improved, has given good results at several quarries in Spain and Belgium, as well as in Italy, while negotiations are on foot for its use in France and Hungary; and the Maison Thonar-Dejaiffe, of Namur, Belgium, has acquired the right to grant licenses.

THERMOMETERS IN GERMANY.—The Chancellor of the German Empire has issued an ordinance to the effect that the Reaumur thermometer will not be admitted to official control after January 1st, 1901. This will lead to the exclusive use of the Centigrade thermometer in Germany.

GOLD IN NORWAY.—According to a dispatch to the Christiania "Press," valuable discoveries of gold have been made at Karasjok, in Finmarken. The gold is alluvial, and one expedition is said to be washing gold at the rate of \$220 a day. In other rivers, too, washing is carried on successfully. The expedition have been organized by miners returned from Klondike, where most of them have been unfortunate, but they are of opinion that the prospects in the Lapland rivers are very promising. As, however, is well known, small quantities of gold are constantly found in the rivers of Lapland and Finland, but hardly sufficient to pay the cost of extraction on a large scale. But perhaps men with more experience and better apparatus may be more successful.

MINES IN NATAL.—The London "Engineer" says that some dissatisfaction has been occasioned among Natal mine owners by a decision of the Natal Compensation Committee, acting on instructions, not to recognize any claims for damages to mines during the war. Large companies will be able to stand the loss, but to several smaller ones the decision means actual ruin. In one instance the enemy destroyed the whole of the machinery, locomotives, and tram line of a small mine owned by a few individuals who had embarked their all in the venture. The damage done is estimated at £7,000, and the owners have no means of restarting work unless they get a promise of compensation. The mine owners have formed a committee to represent the matter to the Secretary of State. The mines throughout the colony are generally being got into working order, although some delay is being experienced in obtaining new machinery to replace that damaged by the Boers.

*Abstract of paper read before the International Congress of Mining and Metallurgy in Paris.

NOTES FROM THE ATLIN DISTRICT, BRITISH COLUMBIA.

Written for The Engineering and Mining Journal by W. M. Brook.

Owing to the new discoveries of gold at Cape Nome and later the strike on the Koyokuk River, which is also in Alaska, the population of the Atlin District has been reduced over one-half from what it was a year ago. It was demonstrated by last season's work that the gravel deposits were well suited for hydraulic mining but not rich enough to pay to mine by the ordinary crude method of sluicing. However, there were exceptional claims that paid upwards of 6 oz. gold per day to the men, but they were shallow diggings and now most of these are worked out.

also has charge of the company operating on Boulder, which Mr. De La Mar is handling for a French syndicate. The Birch Creek ground is controlled by London capital, which is represented by Mr. Williams. George A. Bracket, formerly of Minneapolis, is operating his hydraulic plant on Willow, adjoining Nugget Point, which has so proven to be the richest part of the district. The companies which I have mentioned will invest \$500,000 this year in improvements on their Atlin placers.

Considerable attention is being paid to the new discoveries of quartz. On Monroe Mountain, which is about 2 miles west of the Stevendyke benches on Pine Creek and 7 miles from Atlin, the Lord Ernest Hamilton Company bonded a group of claims late last fall for \$7,000. Under



SUNRISE FLUME, PINE CREEK, ATLIN DISTRICT, B. C.

The benches running parallel with the streams have proven to be even richer than the creek beds. The illustration of claim No. 98 below discovery on Spruce Creek shows the dump of gravel excavated during the winter months preparatory to sluicing. A lot of 150 yards previously washed from the same drift averaged over \$6 per cubic yard. Sixteen other drifts have been made at intervals along the south benches of Spruce Creek from discovery claim running down stream for over 2 miles, and from these which are now open for inspection can be taken gravel containing \$1 per yard and upwards. With two exceptions these tunnels are not on bed-rock.

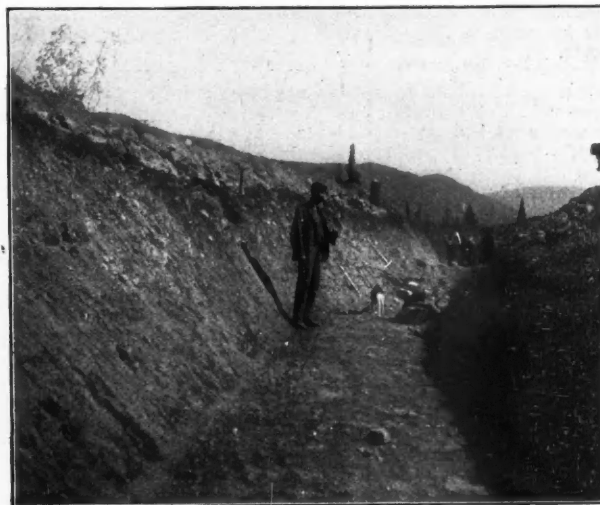
Hydraulic mining is by no means an experiment in the Atlin District, for we have four complete plants operating successfully on Wright,

the supervision of R. D. Featherstonhaugh a tunnel was started about 1,500 ft. above the base of the mountain on a ledge which varies from 4 to 7 ft. in width. The first 100 tons which was hauled to their 5-stamp mill in Atlin yielded \$9,000, paying for the mine and leaving a balance. Hardly 20 ft. has been drifted on this rich lode. An ideal mine could hardly be wished for with more favorable surroundings. A mill site can be secured within 2 miles or thereabouts at the foot of Pine Creek Falls, where an average of 20,000 miner's inches of water falls 90 ft. for six months in the year, and the volume of water is reduced about one-half during the winter months.

The Anaconda Group, near Atlin Lake, under bond by the same parties, has suspended development work pending the decision of titles by the Supreme Court. The Yellow Jacket Claim on Pine, near Discovery, owned by Mr. Wise and Dr. Runnels, of Skagway, Alaska, is also in dispute. The surface croppings of this ledge show any amount of free gold. No shafts, drifts or cross-cuts have been made on this property of suffi-



GOLD NUGGET FROM ATLIN, B. C.



SUNRISE DITCH, ATLIN DISTRICT, B. C.

Boulder, Birch and Willow creeks. In addition to these, the Sunrise Mining Company has over 200 men in its employ building flumes, digging ditches and by August will have the large giants piping on Pine Creek placer claims. The company has contracted to wash out this for 80 per cent. of the returns. This company has for its manager L. H. Griffith, of Seattle, Wash., and the works are superintended by Fred Cook, a well-known California mining man. In 40 days this company has built 3 miles of ditch and flume with a capacity of not less than 4,000 miners' inches of water.

Wright Creek is being exploited by parties connected with the White Pass & Yukon Railroad under the management of C. Christopher, who

cient extent to determine the magnitude of pay ore. The numerous chunks of free gold, ranging in weight from 5 to 30 oz. found on the near-by placers, most of which have so far been unearthed below the Yellow Jacket, together with the character of the gold, is convincing proof that it has come from this source.

The Engineer Group of quartz claims on Taku Arm, across from the Golden Gate, was bonded this summer by people interested in the White Pass & Yukon Railroad. This locality mentioned is about 40 miles west of Atlin, where a chain of lakes intersects mountain ranges some 4,000 or 5,000 ft. in elevation. There has been a large number of locations made for quartz around the section named and some fine specimens

carrying free gold are shown by the locators. Most of the prospecting has been done in the last 18 months and there has now been enough development work done to form an estimate on the value of the ledges at present discovered.

The British Columbian Government is offering very liberal inducements to capital in order that this new mining field may be developed. R. C. Lowry, Provincial Surveyor for Atlin, contributed some valuable information on this point in the "Engineering and Mining Journal" of June 16th last. The annual report of the Minister of Mines, Victoria, for the year 1899, published not long ago, gave a very accurate as well as interesting account of last season's operations in the district.

The government officers deserve a great deal of credit for the way they administer the laws and especially for the good roads that are extended to every gold-producing creek, thus relieving the miner of a very heavy expense.

By an act of the Dominion Government the alien bill which this Province placed on its statute book January, 1898, has been repealed. Now an American citizen has equal rights here with a British subject. The Dominion telegraph line via the Teslin route and Yukon will be completed very soon, connecting Dawson and Atlin with the outside world by wire.

A very large area of country embraced in this part of British Columbia is yet unexplored. We have had no idle men in camp all summer. Anyone who wanted work could get employment at from \$4 to \$5 per day. Atlin offers practical mining men as good returns for their capital invested as they can possibly obtain in any other gold field in the world.

The nugget shown in the accompanying photograph was found July 24th, 1900, and the owner has refused an offer of \$700 for it. A number of other large nuggets have been washed out from claims on this portion of Pine Creek adjoining the Stevandyke. This negative was developed August 1st, 1900, and Muirhead Brothers, the owners, have given their consent to have it published.

ALUMINUM AT A MODERATE PRICE.*

By M. Heroult.

In this paper the author, who is engineer and manager of the Societe Electro-Metallurgique de Froges (France), and whose name is well known in connection with the metallurgy of aluminum, apologizes for the mention of his own labors; an apology which was hardly needed, since it would be impossible to write of aluminum without recalling his work.

In 1886 the world's consumption of aluminum was about 1½ tons, that metal costing 80fr. per kg.; but in 1899 the consumption exceeded 5,000 tons, the price having fallen to about 3fr. per kg.; while at the present time no less than 2,500 tons of this metal are employed in the steelworks of France and other countries, the remainder being worked up into various objects.

Aluminum has been substituted for several other metals in special applications, and it certainly plays an important part in the production of alloys, while its general use for overhead electric conductors can be looked forward to in the not far distant future. In fact, its conductivity for equal sectional areas is 60 per cent. that of copper; and a comparison of the densities will show that an electric line in aluminum will weigh for equal conductivity half that of one in copper. Aluminum, therefore, is more economical even at its present price, which is likely to be still further reduced; and that is not the only advantage possessed by this metal, as a comparison of weights and resistance to tensile strain shows that its use permits the use of longer spans in a line, thus reducing the number of posts or other supports.

The true pioneers of the industry, whose processes approached very nearly the conditions of present practice, are Dr. Kleiner, of Zurich, Switzerland, and the Brothers Cowles, of Cleveland, O. About 1884 large works at the last-named place and also at Milton-on-Trent, in England, began to produce aluminum alloys at comparatively low prices; but these manufacturers have since disappeared owing to the competition of new methods.

The only method which has survived is that known as the Heroult process in Europe and Hall process in America, consisting in the electrolytic decomposition, in a carbon vessel, of alumina dissolved in cryolite, melted by means of a carbon anode not soluble but combustible. Persuaded that aluminum could be produced by electrolysis, the author endeavored, after many failures with the aqueous solution, to decompose the melted hogenous salts by electric current; but he encountered many difficulties through want of suitable apparatus, because at that period (about 1886) the electrical industry was far from having attained its present development. After numerous disappointments he received great encouragement when, on endeavoring to electrolyze molten cryolite, the iron cathode melted, allowing the contents of the crucible to escape. The temperature at which he operated, and the few Bunsen cells he used at that time, were not sufficient to account for this melting of the iron; and examination of the broken pieces of the cathode led to the belief that an alloy had been formed. A few days afterward, having endeavored to lower the temperature of the electrolyte by mixing with it some double chloride of sodium and aluminum, the author was surprised to notice that the carbon anode bore evident traces of corrosion; and he concluded that he had had to deal with an oxide the reduction of which had been effected at the expense of the anode. On inquiring into the matter, he found that what had been sold for the double chloride was in reality alumina obtained by the decomposition of chloride by humidity; and from this experience to the process now employed for making aluminum there was only one step, although that step was a difficult one.

Several authorities have asserted that the alumina is not electrolyzed, thus contradicting the declaration to that effect in the author's

*Abstract of paper read before the International Congress of Mining and Metallurgy at Paris.

patent; but he has proved that this substance is electrolyzable by melting with the arc and decomposing alumina by the electric current. He obtained a quantity of metal, which if not large attained several hundred grammes; and this is a step toward the assertion that, in the process now employed, there is electrolysis of the alumina pure and simple. In fact, if we electrolyze cryolite alone we obtain aluminum; and no fluorine will make its appearance. This latter substance is therefore fixed for forming, with the excess of sodium fluoride, a compound which is permanent at the temperature employed; and this substance may be shown to exist by braying the cooled mass in a mortar and digesting it in water, when there will be obtained an insoluble portion having the composition with all the characteristics of cryolite, and a soluble portion which is nothing else than acid fluoride of sodium. On the other hand, if the experiment be made at a high temperature, no aluminum will be formed; but a disengagement of sodium vapor will be noticed.

The conclusion to be drawn from these manifestations, as regards the explanation sought, is that the effect of the electrolysis is to precipitate (on the cathode) sodium which, if in the liquid state, reduces the fluoride of aluminum; and in this case only will the last-named metal appear. If the temperature be higher the sodium will make its appearance as vapor, and reduction of the aluminum fluoride will not be effected through want of time with the absence of favorable circumstances; and in such case there is probably a doubling of the cryolite, since, although the fluoride of sodium be not in excess, the fluorine must be fixed by the electrolyte. This granted, the part played by the alumina is easily explained. In fact, on the one hand we have a liquid compound containing fluorine in excess, and on the other alumina and carbon; and it is evident that, if the formation heats of alumina and fluoride are comparable, we shall have, in favor of the conversion of alumina into fluoride, the fact that the oxygen of the alumina can burn in contact with the anode. In reality this is just what occurs; and the reaction in question, although secondary, only takes place in contact with the positive carbon.

The aluminum industry has paved the way for electro-metallurgy generally; and it must also be credited with having stimulated the utilization of natural forces that previously ran to waste. The Societe pour l'Industrie d'Aluminium de Neuhausen has works driven by water power at that place in Switzerland, at Rheinfelden in the Duchy of Baden, and at Gastein in Austria, while receiving its alumina from the Bergius Works in Silesia. In France two companies make aluminum—the Societe d'Alais et de la Carmargue which produces its alumina at Salindres in the Gard, and the Societe Electro-Metallurgique, which makes its alumina at Gardanne in the Bouches-du-Rhone. The British Aluminum Company of Foyers, in Scotland, which makes its alumina at Larne Harbor, in Ireland, possesses works at Greenock and also at Milton-on-Trent, while the power station of the Pittsburg Reduction Company is at Niagara Falls. All these various works, which utilize about 50,000 H. P., produced last year more than 5,000 tons of aluminum, representing a value of 16,000,000 fr., or about \$3,200,000; while the importance of the industry is steadily increasing.

"AMERICAN" BLAST FURNACE IN BELGIUM.—The London "Mining Journal" says: "At Couillet, in Belgium, a new large blast furnace has been completed. It is the first blast furnace of the American type erected on the continent of Europe."

ELECTRIC PLANTS AT COAL MINES IN SCOTLAND.—A Glasgow paper recently stated that a project is on foot in the West of Scotland for establishing on or near the coalfields stations for generating electrical energy on a large scale. The scheme, which has been under consideration for a considerable time, embraces portions of the counties of Lanarkshire, Ayrshire, Renfrewshire, Stirlingshire, and Dumbartonshire. The promoters of the scheme propose to supply electricity in bulk for power, traction, and lightign purposes to local authorities and other large consumers.

AMERICAN PROSPECTORS IN SIBERIA.—United States Commercial Agent Greener, at Vladivostok, Siberia, writes to the State Department as follows: "In 1896, the Government dispatched to the shores of the Sea of Okhotsk an expedition which, according to the latest news, has found rich alluvial drifts. There have recently arrived at this port direct from the United States 6 practical American miners under the auspices of the Russo-Chinese Bank. They are supplied with modern machinery, are men of experience, and go to the Yumen, where rich discoveries are reported."

A FRENCH NICKEL PROCESS.—A new process for the production of nickel has been announced by a French metallurgical society. The object of the process is to obtain pure nickel in two operations only, starting from the nickel matte. In the first operation the matte is treated in the Manhes converter, the iron being thus totally eliminated, and a crude nickel is obtained, which only contains about 3 per cent. of sulphur. The second operation consists in treating in an open-hearth furnace the crude nickel previously obtained, and by means of special desulphurizing re-agents the true color of pure nickel is secured.

TRADE MARKS IN CHILE.—The Chilean Trade Mark Laws have hitherto been very unsatisfactory, says the London "Engineer." Lately, however, a step in the right direction has been taken. An act has recently been passed which provides that, in the case of an action for infringement, the judge may be allowed, providing the original mark has been duly registered, to use his discretion as to whether or not the infringing mark is intended to deceive the public. Formerly, to successfully bring an action, the infringing mark had to be an exact copy, any little alteration, however slight, being sufficient to render a prosecution useless.

THE CALORIMETRIC ASSAY OF COPPER.*

By J. D. Audley Smith.

Heine's "blue test" for copper, as described by the authorities generally, calls for a set of standard colors; and there has been some discussion concerning the relative superiority, for this purpose, of sulphate and nitrate solutions. The whole matter evidently hinges on the preservation of the standard colors in well-stoppered bottles. The apparatus described by G. L. Heath cannot be much improved, when very accurate readings are required.

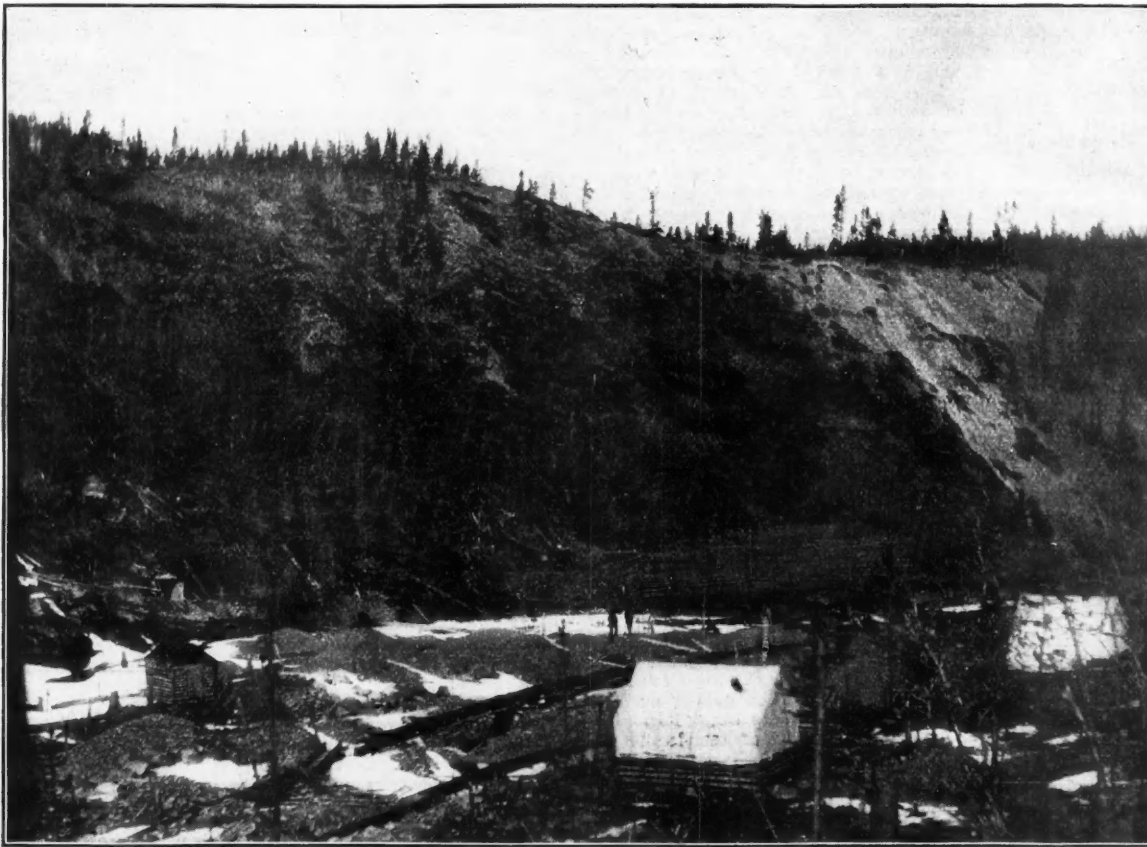
The following method was devised for the purpose of doing away with preserved sets of standard colors, by making a fresh standard for each batch of assays. The solutions are prepared in the usual way, each ammoniacal solution being filtered into its separate bottle, and then filled up to the containing-mark and thoroughly mixed. A similar color-bottle, with an "S" etched upon it, to distinguish it from the other bottles, which are numbered to correspond with the samples, is kept to run the standard. About 150 c.c. of water is put into it, and then the amount of acid (sulphuric or nitric) present in each determination, followed by 30 c.c. of ammonia (s. g. 0.90), which should make the mixture strongly ammoniacal.

The liquid is now made up almost to the containing-mark (200 c.c.), say within 1 c.c. The lowest assay is selected first and placed alongside the standard, which, at the beginning, contains no copper. A copper-solution is then dropped into the standard from a burette; and

the precipitate with a jet into the original vessel, the operation can be performed in less than a minute, and with very little water. The solution is now reprecipitated with ammonia, and the filtrate is combined with that obtained from the first precipitation. One final washing is enough (0.1 ammonia) for any material not running over 1.5 per cent. of copper.

Slag-Assay.—One gramme is boiled in a dish with 15 c.c. of water; then 5 c.c. of HNO_3 is added along with 5 c.c. of 1 to 1 H_2SO_4 . The digestion is carried on until the slag is thoroughly decomposed, and any sulphur globules are yellow. It is not necessary to dehydrate the silica; and as decomposition is immediate, there is rarely any delay at this point. The assay is now treated in the way as described above for the tailings-assay; only, care should be taken to avoid using too large quantities of water in washing and transferring precipitates. A third precipitation of the iron has always resulted in a filtrate free from copper when working on blast-furnace slags; but in analyzing high-grade slags, some copper may remain in the second precipitate. The standard is prepared as already described, and the colors are carefully matched. When one gramme is taken, each c.c. of copper-solution is equivalent to 0.25 per cent. of copper. Green tints generally result in a low reading. Organic matter is the principal cause; but considerable percentages of arsenic will also interfere, and produce tints which it is impossible to compare. Small percentages of arsenic have no effect.

The advantages of the above method over the usual method of using sets of standard colors are:



KLONDIKE DEVELOPMENT COMPANY'S DRIFTS, SPRUCE CREEK, B. C.

after each addition the bottle is well shaken and compared with the assay-sample. This operation is repeated until the two shades match exactly, when the burette is read and the assay-result is calculated. The assay next in order of depth of color is now taken and treated in the same way, and so on, until the batch is completed. It will be found that the volume of the deepest colors is from 1 to 2 c.c. less than the standard, which has increased by successive additions of copper-solution. This is corrected by adding the necessary amount of water to the assay, just before the last one or two drops of copper-solution are added to the standard.

The copper-solution contains 5 grammes chemically pure copper per 2,000 c.c., and is made by dissolving the metal in a small quantity of nitric acid and diluting, so that 1 c.c. = 0.0025 gramme Cu.

It is convenient to have a syphon-attachment, for filling the burette with this solution.

Tailings-Assay.—One gramme is digested on a hot plate with from 3 to 5 c.c. of HNO_3 to 3 c.c. of HCl , and 5 c.c. of H_2SO_4 . Rapid heating will soon decompose the mineral; and the treatment should be continued until the sulphur globules which form are quite yellow. Add about 30 c.c. of water; then an excess of ammonia-water (s. g. 0.90). Mix thoroughly and filter hot, through a S. and S. folded filter No. 588 or a very rapid paper. Wash the iron precipitate twice with 1/10 ammonia-water; then dissolve off again into the original vessel with 5 c.c. of 1 to 1 H_2SO_4 and hot water. By lifting the filter and its contents out of the funnel, then opening it out and washing back

1. In a small office space is valuable, and a set of standard colors will take up room which may be used for something else.

2. An exact match is made with each assay.

3. The assays are read from a fresh standard, and not from a bottle which may have been made up months before.

It was found that Mr. G. L. Heath's bottle was expensive, and easily broken. A bottle which is inexpensive, stands the wear of the assay-office of a works, and, at the same time, gives excellent result, is a square bottle, No. 5675 of Eimer & Amend's catalogue, 2 in. in diameter, and 4 1/4 in. high from bottom to neck, upon which any required markings for contained volumes can be readily etched, according to the desire of the assayer.

THE ASSAY OF COPPER MATERIALS FOR GOLD AND SILVER.*

By A. R. Ledoux.

The so-called "combination method" is generally used in assaying bar copper for silver. It has been modified from time to time. Briefly outlined as now practiced, it is as follows: One A. T. of the borings is dissolved in dilute nitric acid. When solution is complete the liquid is boiled and then filtered to remove gold. The filtrate is treated with sufficient salt solution to precipitate all the silver, but avoiding any unnecessary excess. The liquid is allowed to stand over night and next morning the silver chloride is collected on a fresh filter,

*Abstract of paper read at the Canadian meeting of the American Institute of Mining Engineers.

*Criticism of paper read by L. D. Godshall before the American Institute of Mining Engineers.

which, together with the paper containing the gold and insoluble matter, is scorified and cupelled. Formerly many assayers added sulphuric acid to the nitric acid solution of the copper and silver and then acetate of lead, thus producing a heavy precipitate of sulphate of lead which was supposed to entangle the silver chloride and prevent it from passing through the filter. As a matter of fact, the use of sulphuric acid and lead salts is entirely unnecessary. Very few assayers now make use of them. If it is not possible to let the silver chloride settle over night accurate results may be obtained by stirring the liquid vigorously with some form of mechanical stirrer for half an hour. The silver chloride may then be easily filtered without fear of any of it escaping through the filter. The same result may be attained by blowing air through the liquid. It is quite possible to make an accurate assay by this method in three hours. In some cases, noticeably those in which the copper is very free from impurities and the gold contents small, the correct gold assay may be obtained by parting the bead obtained by this process. In many cases, however, the gold assay obtained by the above process is too low, even though the gold be removed from the liquid by filtration before adding the salt solution. It would appear that sometimes the gold is present in the copper in some combination which is soluble in nitric acid or strong nitrate of copper solution. However, it may be, and frequently is, necessary to resort to the "all-fire method" to obtain correct results. This method consists in weighing out a number of 1/10 A. T. portions—usually ten—and scorifying them with lead until most of the copper is removed—then cupelling the lead-buttons either separately or uniting them five and five, rescoring, and the cupelling. This method is expensive and laborious, involving many scorifications and the use of much test-lead. The first scorification must be conducted at a high temperature, and the operations consume a great deal of time and muffle-room. But the gold obtained is usually appreciably more than can be extracted by the combination-method—though it does not seem to bear any fixed ratio to it even in the same class of copper. In general, in 96-98 per cent. copper, containing from 1 to 5 oz. of gold per ton, the "all-fire" results will be from 0.1 to 0.3 oz. higher than can be obtained by the combination-method. Any method that would give correct gold and silver results on all classes of bar-copper at one operation, and that would avoid the tedious and expensive operations of the all-fire process, would find ready acceptance among assayers. The method described by Dr. Godshall seemed to offer some possibilities in this direction. To test the practical accuracy of this method, comparative assays were made in my laboratory on three samples of bar-copper, using the "combination-method" for silver, and the "all-fire" process for gold, alongside of Dr. Godshall's method. Some preliminary experiments were made by the new method to obtain a knowledge of any peculiarities that might be developed. The process of assay was as follows: One A. T. of borings dissolved in dilute nitric acid (90 c.c. strong to 100 c.c. of water). The solution was then evaporated to expel free nitric acid, a little sulphuric acid (20 c.c.) was added, and the evaporation continued. Finally the copper salts were dissolved in hot water, the solution diluted to 800 c.c., and allowed to cool. Then sulphuretted hydrogen was passed rapidly into the liquid for two minutes. A heavy black precipitate of sulphides was produced, which settled rapidly, leaving a clear blue solution. The liquid containing the precipitate was stirred rapidly and then allowed to settle for about half an hour, and finally the sulphides were filtered off. The filtrates in most cases gave no visible reaction for silver; sometimes, however, silver was not completely precipitated by the sulphuretted hydrogen. No reason was developed why this should be the case, as those solutions which contained silver had apparently been treated exactly like those which did not. The assays noted below did not show any reaction for silver when the filtrate was tested with salt-solution. The copper sulphide containing the silver and gold was dried, the papers burned in scorifiers, and the residue scorified with 50 grammes of test-lead. The results were as follows:

No.	Silver—Ounces per Ton.	
	Godshall Method.	Combination Method.
No. 1.....	67.70	67.20
No. 2.....	57.20	58.80
No. 3.....	59.00	59.30

No.	Gold—Ounces per Ton.	
	All-Fire Method.	
No. 1.....	2.25	2.42
No. 2.....	1.89	2.10
No. 3.....	2.06	2.18

From the foregoing results one would infer that the new method can give good results on silver. But the gold-assays are too low, being about the figures which would be obtained by parting the silver-beads obtained by the "combination-method." The new method does not seem to possess any advantage over the "combination-method" in point of speed. When the silver chloride is stirred well or "blown down" with air, it can be filtered off as quickly as the sulphide precipitate. On the other hand, the new method requires the use of sulphuretted hydrogen, which is a noxious and troublesome reagent to handle on a large number of samples at the same time.

THE OIL-BEARING SHALES OF THE COAST OF BRAZIL.*

By John C. Branner.

Shales rich in oil are found at several places along the coast of Brazil. The material has been prospected at several places, and samples have been examined and reported upon by competent authorities. So far as I am acquainted with them, these oil-bearing beds are of Cretaceous age. A glimpse at the distribution and character of the Cretaceous rocks of the region should give us some idea of the possible distribution of these oil-bearing shales. Cretaceous

rocks skirt the northeast coast of Brazil from the northern part of the State of Espirito Santo almost or quite to the Amazon Valley. Here and there this narrow strip is cut in two by the encroachment of the sea, and the underlying gneisses, granites or other crystalline rocks are exposed upon the beach. In other places, the Cretaceous belt widens out until it is 80 kilometers or more in width.

Along the coast from Prado, in the State of Bahia, northward to Natal, there is a line of bluffs from 15 to 90 meters high, interrupted here and there by stream-valleys. As seen from the sea, these bluffs are rather conspicuous and highly colored yellow, brown, red, white, black and purple. These colors are often so mingled as to give the beds a mottled or parti-colored appearance. In some places, especially in the southern part of the State of Sergipe, and in the northern part of Rio Grande do Norte, the immediate coast is covered with sand-dunes. Here and there these sand-dunes have been carried inland over the top of the Cretaceous beds, and the subsequent encroachment of the sea has exposed the Cretaceous rocks again, where they form the bases of the bluffs.

The width of the Cretaceous belt has been determined at several places and varies from 0.5 up to 85 kilometers. Owing partly to the fact that the landward margin of the beds is generally more or less ragged, and partly to the lack of good maps, these measurements must be accepted as only approximately correct.

In some places the Cretaceous rocks are marine deposits; the Sergipe Basin, for example, contains an abundance of marine fossils, as do also those of Pernambuco, Maria Farinha, the island of Itamaraca, and Parahyba do Norte. The Bahia beds, on the other hand, are of fresh-water origin. The relations of the Bahia fresh-water beds and the Sergipe marine beds have never been studied. North of the Sergipe Basin, along the Alagoas coast, oil-bearing shales are exposed at many places in the Cretaceous series.

A section made across country from the coast inland at almost any point shows the same geology, with only local variations. In some places the shales are thicker; in others they are entirely wanting.

The same company that prospected the oil-shales south of the Rio Camaragibe has dug several pits near the beach at Riacho Doce also. Boverton Redwood found the shales from this place to be richer in oil than those of Camaragibe District. The following table is taken from his report upon them:

Composition of the Riacho Doce Shales.

No.	Volatile Per cent.	Non-volatile Combustible Per cent.	Ash Per cent.
1	34.9	1.1	64.0
2	46.3	19.5	34.2
3	26.9	8.1	65.0
4	32.8	14.6	52.6
5	25.4	10.5	64.1

A further examination was made by Mr. Redwood of the richest of these shales (No. 2). This contained 4.7 per cent. of sulphur, and upon distillation yielded 44.73 gallons of crude oil and 19.58 gallons of ammoniacal water to the ton. Mr. Redwood says further, in regard to these oil-shales: "The presence of sulphur would not, however, be a serious drawback, if the crude oil were used as a liquid fuel, or as a source of gas for illuminating purposes. One ton of such oil would, if properly burned, afford rather more heat than two tons of good steam coal, and from each gallon of oil about 90 cubic feet of 60-candle gas could be produced. As regards the quality of the crude oil, it should be remarked that results obtained on the laboratory-scale of working are less satisfactory than those yielded when the shale is distilled on the manufacturing-scale in retorts of suitable construction. The difference is far greater in the case of the ammoniacal liquor, and a yield of probably as much as four times the quantity of sulphate of ammonia may be reckoned upon."

The turfa beds on Rio Marahu, just south of the Bay of Camanu, and 115 kilometers south of the city of Bahia, have been known for many years, and the material has been much less talked about in Brazil. Hartt says of this turfa: "The material burned readily when ignited in a candle, affording an abundant smoky flame. . . . The material appears to be merely a mud impregnated with bitumen, and as it appears to exist in large quantities, it would be very valuable for gas-making or the manufacture of kerosene."

Within a few years the oil-shale deposits of Marahu passed into the hands of a company controlling abundant means, and the most extravagant preparations were made to manufacture soap, paraffine, various kinds of oils, and I know not what. A town was built about the extensive factories; vast quantities of expensive machinery and supplies of every kind were imported from England; and the establishment started operations on a scale out of all proportion to the possibilities of the market. As might have been expected, the whole business collapsed within a few months, and much of the machinery is now rusting in the mud of the mangrove swamps, and the empty houses are being devoured by white ants. I believe this is the only effort that has been made to utilize the oil-bearing shales of Brazil. It is to be regretted that the business was not conducted in a more conservative manner, for after so colossal a failure other companies will hesitate to embark in any enterprise that attempts to utilize the oil-shales of Brazil.

The oil-shales of the Brazilian coast are of Cretaceous age, and the parti-colored beds exposed in the bluffs along that coast are for the most part the weathered portions of this same Cretaceous series. The Cretaceous strata rest upon granites, gneisses and other crystalline rocks, with a bed of very coarse conglomerates forming the base of the series. The only known exception to this is in the Serra d'Itabaina, in the State of Sergipe, where there is a series of beds between the granites and the Cretaceous that appear to be Paleozoic, though no fossils have been found in them. The failure of the Marahu Company was evidently due to extravagance and mismanagement, and cannot be regarded as a sufficient reason for condemning the oil-shales of Brazil as unworkable.

The total thickness of the Cretaceous beds does not much exceed the total thickness of the mottled and parti-colored beds exposed

*Abstract of paper read at the Canadian meeting of the American Institute of Mining Engineers.

on the coast—that is, from 30 to 90 m. (100 to 300 ft.). This is shown by the fact that at many places the basal conglomerates are exposed, while at several points the crystalline rocks themselves are uncovered.

No oil-shales are now known in Pernambuco, Parahyba, Rio Grande do Norte, Sergipe, or Espirito Santo; but they may be expected in any of those States within the Cretaceous area.

THE PROTECTION OF BLAST-FURNACE LININGS.*

By S. S. Hartranft.

Furnace-men of the present day agree very nearly as to the best cooling devices for the protection of blast-furnace hearths and boshes, and the best location of the cooling system in the brickwork for the maintenance of favorable furnace lines throughout the blast. The replaceable bronze and copper plates are practically faultless; and there seems to be no reason why a furnace hearth and bosh should not be held in good condition by intelligent management and the use of replaceable plates, for a period several times the length of the average blast of today. While furnace-men have taken these precautions to protect the hearth and bosh beyond the life of the lining, the portion of the lining above the mantle has been partly protected by some and wholly neglected by others. Some would not construct a furnace without mantle plates, and others would not construct a furnace with them. In most cases, furnace-men have either trusted to Providence or to the bosh-plates for the continuance of favorable working conditions above the mantle, and the prolongation of the life of the lining; consequently furnaces are constantly blown out for repairs to the lining, or for relining, when the hearth and bosh are in good enough condition to last through another blast.

The working life of a furnace depends upon the ability of the lining, from the stock-line to the mantle, to withstand melting or wearing away,

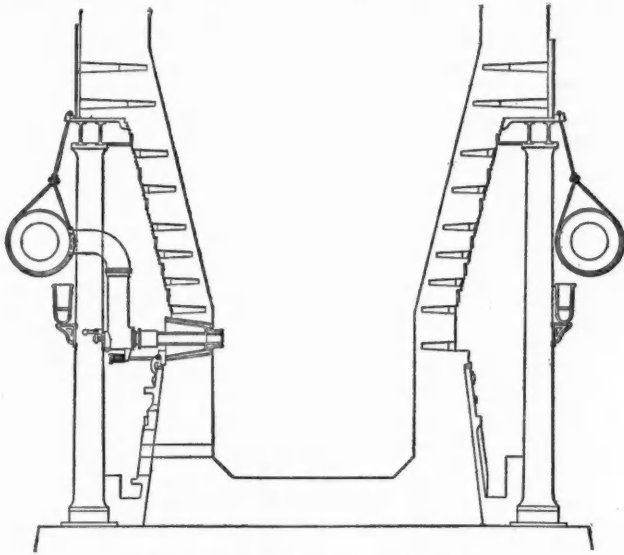


FIG. 1.—SECTION OF BLAST FURNACE.

which causes extravagant fuel consumption and irregular working. Consequently, it seems that furnace-men should endeavor to ascertain the lines necessary to insure good economical working conditions, and to protect these lines as the hearth and bosh are protected, thereby making the life of the lining from the mantle to the top equal to the life of the hearth and bosh.

Mr. F. E. Bachman, my predecessor in charge of the Buffalo Furnace, informs me that the furnace, as put in blast in 1895, had the following dimensions: Diameter of hearth, 11 ft.; diameter of bosh, 18 ft.; angle of bosh, 75°; and that it was provided with replaceable copper plates up to the mantle, and three rows of double-pipe cast-iron plates of the ordinary type above the mantle. The inner 1¼ in. pipe was 2½ in. from the inner edge of the plate and the outer 1¼ in. pipe was 6 in. from the inner pipe, and parallel to it, both running lengthwise through the plate, which was 8 ft. in length. The first row of these plates was placed 5 in. above the mantle, with the front edge of each plate 4½ in. from the inside line of the brick work; the second row was 2½ ft. above the first, with the front edge of each plate 9 in. from the inside line of the brick work; and the third row was 2½ ft. above the second, with the front edge of each plate 4½ in. from the inside line of the brick work.

After blowing-in, the furnace worked very well for the greater part of the first year, when it began hanging and slipping, which gradually became so pronounced as to interfere materially with the grade of the iron. About the end of the first year, the water circulation was lost on the inner pipes of the three rows of plates above described; after which there was no more hanging and slipping, while the grade of the iron improved and the output increased. In about a year and a half from the time the inner rows of pipes were lost, the outer rows were lost also; and, there being no water protection left, the furnace soon enlarged at this point to such an unfavorable diameter and shape that it became necessary to blow out at the end of the third year.

On several occasions I have cut the water off from the inside pipes in three or four of the upper rows of bosh plates, usually after the furnaces had been in blast a year or more, and the inner pipes had been lost in a few of these plates. A quick and favorable response was in-

variably noticed in the way of improvement in grade and increase in output. The ledge or offset that forms above the upper row of plates by the wearing away of the brick work from the original lines interferes with the regular descent of the stock in proportion as it grows larger; the effects of which (when the plates are placed, as is customary, with the front edge of each a few inches from the inside line of the brick work), are generally noticeable about the middle of the blast. I think that the wearing away of the lining could be sufficiently retarded to insure the retention of favorable lines, through the period of an average blast, by six rows of plates above the mantle, placed 2½ ft. apart, with their front edges at least 9 in. from the inside line of the brick work.

It has been the experience of some furnace-men, who place plates above the mantle and extend them through the lining until the front edge of each plate is within a few inches of the inside of the brick work, that the furnace does better work when the first row of pipes in the plates burns off, and the diameter of the furnace enlarges until the second or rear row of pipes prevents further enlargement in diameter. When the last row of pipes in these plates burns off and all protection is lost a further enlargement in diameter causes extravagant fuel consumption and irregular working, to such an extent that it becomes necessary to blow out the furnace and put in a new lining. It seems, therefore, from experience with these plates, that in a furnace of modern lines to secure the protection of plates and the retention of favorable lines for a period more nearly approaching the life of the hearth and bosh, the plates should be placed with the front edge from 9 to 12 in. from the inside of the brick work. This will permit an enlargement of diameter of from 18 to 24 in., without destruction of the plates; and if the furnace can be held by the plates after this increase in diameter, a blast of regular work somewhat longer than ordinary might be expected. Plates set back from 9 to 12 in. from the inside of the brick work would not suffer so much from heat and abrasion, and would, no doubt, hold out for a much longer period than when placed according to the present custom. The construction might be such as to permit replaceable plates similar to the present replaceable bosh-plates; and when the most favorable lines to which the furnace should be held above the mantle had been determined, these plates could be placed with their front edges as close to the inside line of the brick work as many furnace-men place their bosh-plates at the present time.

The accompanying drawing made by an eminent blast-furnace engineer, shows the hearth and bosh of an 18 by 80-ft. furnace with an 11-ft. hearth and 75° angle of bosh, fitted with replaceable copper plates up to the mantle, and double-pipe iron plates above the mantle.

I have had an opportunity recently to observe the result of fitting up a furnace with rows of solid cast-iron plates at the stock-line; and I am much pleased to find how well these plates, with an inner edge 5 in. wide, placed in rows 1 ft. apart, have worn, and have protected the lining at this point. I would not be surprised to see, before long, furnace-stacks plated from the mantle to a point above the stock-line with water plates and solid plates. The only question difficult to decide will probably be the point in the ascent at which the water-plates should stop and the solid plates begin.

RECENT DECISIONS AFFECTING THE MINING INDUSTRIES.

Specially Reported for the Engineering and Mining Journal.

DUTY ON WIRE ROPE.—Wire rope made of round steel wire, valued at over 4c. per pound, with a hemp core, held to be dutiable under paragraph 137, act of 1897, at 40 per cent. ad valorem on the value of the completed rope, plus 1c. per pound on the weight of the finished article, and 0.2c. per pound for galvanizing. Wire rope composed of round steel wire having a hemp core, valued at less than 4c. per pound, held to be dutiable at the maximum rate of duty imposed upon the wire used in its manufacture.—Appeal of the Upson Walton Company from Collector of Customs at Cleveland, Ohio; United States Board of General Appraisers.

GOLD MINING IN NOVA SCOTIA.

Written for the Engineering and Mining Journal by G. W. Stuart.

I sometimes think perhaps it is because of the great accessibility of the gold mining region of Nova Scotia that so little interest is manifested by the neighboring Republic and the rest of the world, as well as our own people of the Dominion. Perhaps the quietness of our wonderful metalliferous resources is due to our own lethargy; while other Canadian provinces are not slow to "blow their own horn," and boom their resources, I am sure no such charge against our Provincial Government can be sustained, so far as they are concerned, in enlightening the world of our gold mining possibilities. A very brief history of this industry in Nova Scotia, touching the geology and structural formation (for which I am much indebted to Mr. E. R. Faribault and Dr. E. Gilpin, Jr.) will, I think, prove interesting and instructive to your many readers.

Gold was first discovered in Nova Scotia in 1860 on the Tangier River, in the County of Halifax; other discoveries soon followed; eventually it was known to exist from one end of the province to the other, on the Southern Atlantic Coast side, a distance of 260 miles, and from 20 to 40 miles inland. It is variously estimated there are from 3,500 to 5,000 square miles of auriferous formation in this stretch of country, after deducting the intrusive and sterile granites, which occupy a large space of this coast territory, causing sometimes disturbances and dislocations of considerable magnitude. Geologists classify the rocks constituting the gold measures here as Lower Cambrian.

The beds of quartzite and slates forming these gold measures were apparently originally in a horizontal position, and from great lateral pressure, when possibly in a semi-plastic condition, have been folded into a series of large undulations or folds, averaging from 2½ to 3½ miles apart, and approximately parallel with the coast. These folds are not perfectly regular; there is much deviation from the horizontal, the fissured portions inclosing the veins crop-

* Abstract of paper read at the Canadian meeting of the American Institute of Mining Engineers.

for 20 years. The situation is on a rising hill on the eastern side of a beautiful valley, with the Shubenacadie passing quietly through to the north. At a few feet above the level of these waters an adit tunnel has been driven into the hillside a distance of 668 ft., meeting the first lode, the one being developed, on its western dip within a few feet of its axis, and at 225 ft. below the surface at the cropping. A winze, or interior shaft, has been sunk from this level to a depth of 240 ft., surface connections have been made and extensive development work has been done by levels being driven around both sides of the dome on the north and the south dips, exposing at a conservative estimate, 150,000 tons of ore now ready for stoping.

This vein is from 2 ft. to 5 ft. thick, and is systematically corrugated. It took its name, the "Barrel" lode, from its resemblance to a row of barrels lying side by side, each close up to the other in the first trench opened on its apex, which is also the apex of the hill. For 100 ft. or more there was but a few feet of surface covering the crown of this interesting quartz vein. The mine is comparatively free of water, no pump being required. The quartz is fine grained and of a dark gray color. The gold is fairly well distributed, both fine and coarse, and is readily saved by amalgamation; 90 per cent. of that collected is saved inside the mortars. The associated minerals are named below.

I have referred to a series of veins; this has been determined by a diamond drill hole from the apex of the present workings. At a depth of 97 ft. a vein 16 to 18 in. was tapped, showing greater values than the upper vein, and at 400 ft. the extent of the drill hole, four other smaller veins were tapped. It is the intention of the owners to at once penetrate to 1,000 ft. The inclosing walls of these veins are whin, a feldspathic quartzite.

The mill when complete will have 60 stamps, 950 lbs. each, 40 of which are now dropping. A Blake type crusher 9 by 15 size, and 6 Wilfley concentrators, set on solid masonry insuring stability. The stamps are set at 4½ ins. and drop 92 per minute. The stamp frame is of the back-knee style, and is entirely independent and free of the building. The

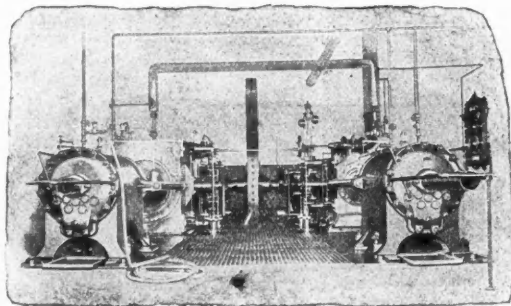


FIG. 1.—SERGEANT INTERCOOLER.

mill is situated on the hillside, conveniently receiving the ore by a tram road from the main shaft of the mine, which is at a greater elevation. The building is 116 ft. long by 82 ft. wide, affording plenty of light and room. The concentrators are being set aside for the present and will be submitted to a series of experiments.

The motive power is taken from a series of 8 lakes, located from 2 to 6 miles east of the mine. These lakes are substantially dammed to regulate supply. There are 25 square miles of surface drainage supply to these lakes. The water is delivered to the wheels at the works by a combination ditch and flume 9,000 ft. long at a 94 ft. head. The mill is operated by a 15 in. special turbine, of the Crocker encased type. The supply pipe is 32 in. in diameter, the power is transmitted by wire rope over two 12-ft. sheaves—275 ft. centers. The capacity of this wheel and gear is 160 H. P. A 24 by 26 in. compound duplex cylinder Rand compressor, capable of running 16 drills, is now being installed, which will be driven direct from a 16 by 24 in. special Pelton wheel. It will also drive the hoist at the main shaft. Two dynamos are also driven by water, to light the mine, mill and other buildings.

There are some 40 odd districts in the Province, where more or less gold mining has been done. None of these districts is 20 miles from either rail or water communication, and the majority of them are within a few miles of either. The whole region is well watered; opportunities for generating electrical power by water abound. In most cases there are streams or rivers within a mile or two.

The following list of associated predominating minerals in the districts named below, by careful analysis by Messrs. Mason and Askwith, of Halifax, may be of interest to both scientific and mining men. The percentages vary from 1½ to 5 per cent.:

Goldenville.—Galena, blend, pyrrhotite, copper and iron pyrites and mispickel, largely the latter.

Waverley.—Mispickel, galena, blend, copper pyrite and calcite.

Montague.—Mispickel, blend, galena, iron and copper pyrites.

Brookfield.—Mispickel and iron pyrites.

Isaac's Harbor.—Mispickel.

County Harbor.—Mispickel, pyrrhotite and garnet.

Rawdon.—Iron pyrites and mispickel.

West Gore.—Stibnite.

Uniacke.—Iron pyrites.

Mosher's River.—Mispickel.

Wine Harbor.—Mispickel.

Tangier.—Mispickel and iron pyrites.

Good hard and soft wood is procurable in the most of the districts, at from \$1.50 to \$3 per cord. The price of coal is governed by the foreign demand; in the past year the price has been higher than any previous year; the cost now is \$3 free on board at wharf nearest mine.

Wages average about as follows: Machinists, \$2 per day; engine drivers, \$1.50-\$2; power drill men, \$1.40-\$1.75; strikers and drill holders,

\$1.25-\$1.50; muckers, \$1.20-\$1.30; blacksmiths, \$2; mill men, \$1.50-\$2.50; carpenters, \$1.50-\$2. These figures are for 10-hour shifts.

Supplies cost about as follows: Dynamite, 35-50 per cent., 16-20c. per lb.; detonators, \$6 per M.; candles, 10½c.; steel, 8-8½c.; lumber and timber sawed, \$9.50-\$11; mine timber, round, 10-20 in., 2½-8c. per lineal ft.; poles, 15 ft. 4 in. top, \$5-\$12 per 100. The price of tools and machinery of all kinds is much the same as in the rest of the Dominion and the Eastern States. Nearly everything required is now manufactured in the Province.

THE INGERSOLL-SERGEANT DRILL COMPANY'S PARIS EXHIBIT.

One of the most extensive exhibits of the United States is that of the Ingersoll-Sergeant Drill Company, of New York City, which company has exhibits of its air compressing, mining, tunneling and quarrying machinery in three places. On the Champ de Mars, in the Palace of Machinery and Electricity, it has established its headquarters in the United States Machinery Section. Here one of the company's class H compressors is in operation, supplying air for all the pneumatic tool companies' exhibits and the tubular dispatch of the Batcheller Pneumatic Tube Company. This compressor has duplex steam and compound air cylinders. The former are 12 by 12 in., and the latter 18 in. diameter for low pressure, 12 in. diameter for high pressure and 12 in. stroke for both. The engine is of the well-known Tangye frame type, mounted on a solid base which contains a special cooler through which the air passes on its way from the low to the high pressure cylinder. In this way its temperature is reduced to about that of running water, and the work required to compress a given volume of air is considerably reduced. In this machine the cylinders are jacketed all around and in the heads, by which arrangement the air is cooled and the working parts kept at a low temperature. Adjustable cut-offs are used for the steam cylinders, with a range of from ¼ to ¾ cut-off,

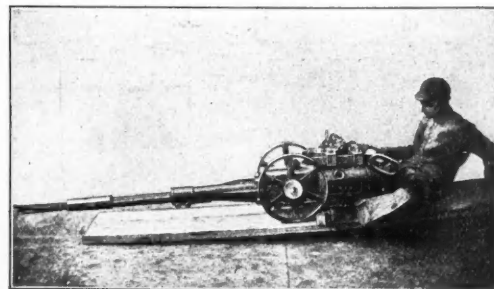


FIG. 2.—INGERSOLL-SERGEANT ROCK DRILL.

while an automatic regulator, which is attached to the air receiver or reservoir, maintains a constant air pressure, cutting off the steam supply or opening up to a greater or less extent, as the air pressure runs or drops below the set pressure. In this case, the compressor regulates to within 1 to 1½ lbs., when set for 100 lbs.

In Group IV, Civil Engineering and Transportation, are found a small motor-driven compressor and some interesting models, all exhibited by the same company. This compressor has a single air cylinder, 6 by 6 in. It has, on its base, a 5 H. P. General Electric Company's direct current motor, to which it is geared with a single reduction. When running at full speed, about 150 revolutions per minute, it has a capacity of 28 cu. ft. per minute to a pressure of 50 lbs. per square inch. This machine was installed by the United States Commission to furnish air for operating models of the machinery used in the excavation of the Chicago Drainage Canal which are here shown. Among these machines are found four little working models made to ¼ scale and illustrating the construction of a bar channeler, a track channeler, both being machines for cutting out work in quarries, canals or railway cuts, and also showing a standard rock drill and one of the company class A compressors. There is, in addition, a full-sized pneumatic or compressed air coal cutter, such as is coming into extensive use in the United States, and an interesting series of photographs showing other apparatus manufactured by this concern.

It is, however, at Vincennes where the company has the main exhibit, that the most interest centers. Occupying a space 41 by 34½ ft., or about 1,400 sq. ft., in a prominent position, it has two compressors and all of its mining and quarrying apparatus in the form of rock drills, coal cutters and channeling apparatus. The largest compressor shown, occupying one side, is a horizontal cross compound Corliss type, with steam cylinders 12 by 22 and a 30-in. stroke. The low-pressure air cylinder is 16¼ by 30 in. and the high-pressure 10¼ by 30 in. Between them is placed a Sargeant vertical inter-cooler, shown in section by Fig. 1. This device effectually removes the heat resulting from compression in the first cylinder and at the same time acts as a receiver or reservoir from which the high-pressure cylinder draws. The low-pressure cylinder has an exceedingly novel and satisfactory form of inlet and discharge valve devised by Mr. H. S. Sargeant, the engineer of the company. This is a type of mechanical valve which avoids the difficulties inherent with air-compressor valves which have rigid rod connections, and it depends upon compressed air for its operation. In this way a perfect adjustment can be obtained, and cards taken from the cylinder are as regular as those obtained from a well-adjusted Corliss steam cylinder. The high-pressure steam cylinder is provided with the well-known Sargeant system of piston inlet valves. In this type, which has a high volumetric efficiency, owing to the remarkably small clearance volume necessary, the large valve openings and the rapid opening and closing of valves resulting from

the peculiar construction of the valves themselves. The piston is hollow and has a hollow extension at the back and which passes out through a suitable stuffing box in the head of the cylinder. The piston, it will be seen, has in either face a circular slot concentric with the piston rod. These slots are closed by a ring, which, in a cross section, resembles a letter T. No springs are needed to open or close these valves, as the inertia resulting from the movement of the piston throws them open or closed at the proper moment. It will be seen that this form of valve admits of a remarkably small clearance. In addition, the constant inrushing of cold air always passing in one direction helps to prevent excessive heating of the piston, while the water-jacketed cylinder and heads hold their temperature down to a low point. Both compressors discharge into a receiver which resembles the inter-cooler already described. This again reduces the temperature of the air to that of running water, and, as a result, precipitates nearly all of the moisture contained in the air.

From this reservoir, a 4-in. pipe line is run straight away for over 900 ft. to the Palace of Civil Engineering and Transportation. The air supplied by this line runs two Baldwin locomotives, the New York Air Brake Company's exhibit, that of the Westinghouse Brake Company, Westinghouse signal system, the Standard signal system and other exhibits.

A second and smaller line runs the entire length of the Machinery Annex Building, which taps off to the Q & C Pneumatic Tool Company,

cutting points are under absolute control of the operator, who can strike hard, rapid blows or light slow ones, or he can cause the cutting to occur at the upper or lower part of the stroke. The single lever which shifts the machine along the track is also within easy reach, as are also all the lubricators, adjustments, etc. Machines of this type and make have cut as much as 475 sq. ft. in 10 hours, although the average on large work is from 160 to 175 sq. ft. for the same time.

Another interesting machine intended for quarries and places where the output would not warrant the expense of the large machine just described is called the Bar Channeler. Briefly, it consists of a frame mounted on four adjustable legs. This frame has two long, cylindrical slides, on which are mounted a carriage holding a powerful air or steam drill and a small engine which feeds the carriage back and forth along the frame. In operation, the machine is set up, the frame given the desired inclination, which may be varied from vertical through all angles sired inclination, which may be varied from vertical through all angles combination of rapid and powerful blows from the cutting points, and the side movement of the feed, result in a narrow slot the length of the frame and 7½ ft. deep, which is so smooth that stone cut this way needs only facing to be ready for use in buildings or for other purposes.

The standard rock drills, of which the company has several of its small and medium sizes set up for operation, must not be neglected. Their construction is familiar to all mining men. The drills are mounted on the Sergeant universal tripod, which permits a rapid adjustment in any direction and which, while exceedingly light in weight, is unusually rigid, owing to the method of construction and clamping of the parts. Other forms of mountings for shafts and tunnels are also shown. This company yearly produces over 2,500 of these drills of different sizes.

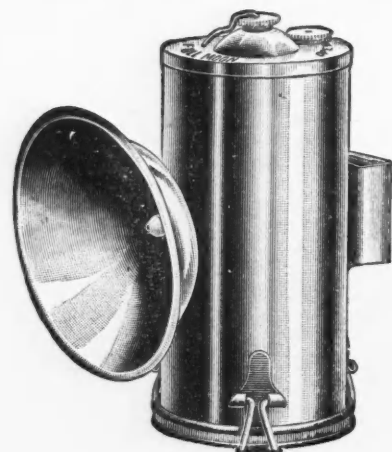
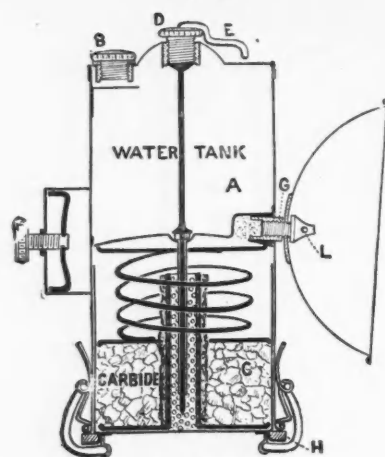


FIG. 1.

FIG. 2.
THE BALDWIN ACETYLENE LAMP.

the Standard Pneumatic Tool Company, the Chicago Pneumatic Tool Company, the Jeffrys Manufacturing Company, the Ball Engine Company, and the Bullock Diamond Drill Company. Both compressors take steam at from 100 to 120 lbs. and furnish air at from 100 to 105 lbs., the two machines having a volume of about 1,000 cu. ft. of free air per minute.

It is interesting to note that the compressors of this company were the first apparatus in the entire American Machinery Section to operate on opening day, April 14th, excepting the boilers installed by the Commission. They were also among the very first steam engines in the entire Paris Exposition to run with steam from the Administration mains.

Coming now to the mining machinery exhibited by this company, there is a large machine which they term a track-channeler; in other words, a machine running on a track, and intended for cutting a long, narrow, vertical slot in rock of any sort. Thirty-five of these were used on the Chicago Drainage Canal, where for miles they cut vertically through hard or uncertain rock to a depth of from 24 to 36 ft., in 3 steps of 12 ft. each. This machine consists of a fair-sized vertical tubular boiler, mounted on a heavy frame, in turn supported by four flanged wheels which run on a track made in sections. At one side and supported on a substantial bracket frame are the cylinder guides, valves and controlling mechanism. Steam passes over from the boiler through flexible connections to the cylinder and causes the piston to reciprocate, rapidly raising and driving down the cutting bars which are clamped to the guide chuck on the end of the piston rod. The

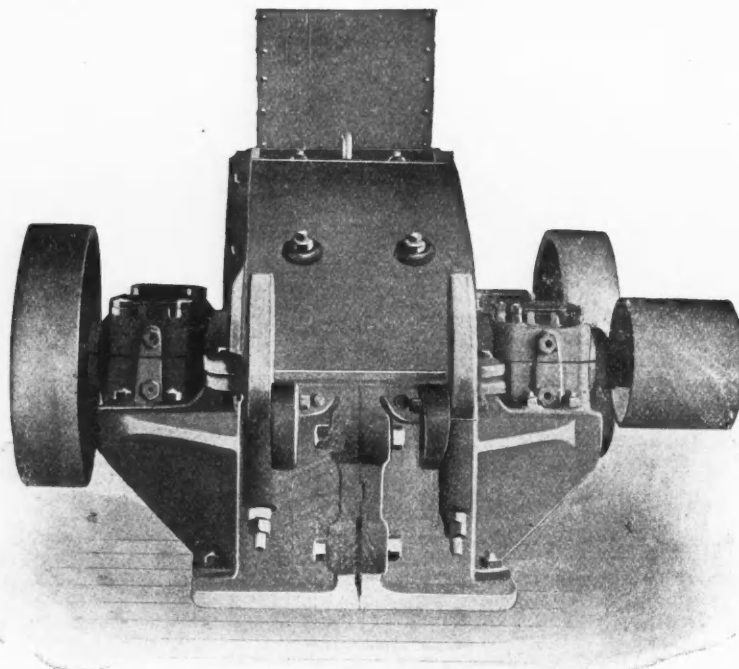


FIG. 1.—SIMPSON PULVERIZER, FRONT VIEW.

A pneumatic coal cutter, a type of which the company is turning out about 1,000 each year, which consists of a substantial cylinder mounted on wheels and provided with two handles, is also shown. In a general way, this machine may be compared with a wheel-barrow from the front of which projects the cutting tool. The operator holds the handles and guides the machine forward or from side to side and thus cuts under the coal, which is then broken down. The claims for this type are its simplicity, rapid and large output, the introduction of an appreciable amount of clean, fresh air into the heading and the absence of powdering, which always results from the use of milling or saw cutters. The machine is also very compact, light and inexpensive.

A variety of small parts, such as drills, drill sharpening tools, cutters, clamps, hoses, etc., complete this extensive exhibit.

THE BALDWIN ACETYLENE LAMP FOR MINES.

The accompanying illustration shows a portable acetylene lamp adapted for use in mines, made under the Baldwin patent, by A. H. Funke, of New York. Fig. 1 is an outside view and Fig. 2 a section of the lamp. The lamp as usually made is 5 in. high, weighs about 9 oz. and will burn 4 hours with one charge. A handle—not shown in the drawing—is attached by the catch shown at one side.

The construction is readily seen in the sectional cut, the upper chamber containing the water, the lower the carbide. The flame projects directly out from the center of the reflector. No glass is used to protect the flame from the wind, but curious as it may seem, it is impossible for the wind to blow them out. The great advantage claimed is that a reflector is never smoked or glass broken should the flame become too high, and the lamp never gets hot.

The bottom fastens on with three clutches, which make an extremely tight joint, but are easily loosened by the fingers; thus it is never difficult to open these lamps, which so often happens where the bottoms are screwed on.

By the automatic devices, the duct in the valve through which the water flows, is cleaned whenever the water is turned on. The same movement, by twisting the wire which runs down the water tube, cleans the tube of carbide, should any get in and stop the flow of water; and, by a special arrangement of the water tube and this wire, should the water valve be opened too wide, the flow is controlled automatically, and no more water will reach the carbide than is required to run the lamp, thus making the lamp safe.

The perforated tube, attached to the false bottom makes it easy to clean, for, by drawing up the tube, the old charge comes up as a solid mass, and can then be knocked off without soiling the fingers. The second diaphragm, attached to the wire spring, keeps the top of the lamp and gas pipe clean, a requisite point in a good lamp.

It is believed that a similar form of lamp could be adapted for use in gaseous or fiery mines by adding a proper hood or protector.

THE SIMPSON PULVERIZER.

The accompanying illustration shows a pulverizer made by the Simpson Machinery Company of Chicago, which is especially adapted for use on coal, lime, clay, shales, phosphates, gypsum, soapstone and similar material, and for certain classes of ores. Fig. 1 is an end view of the pulverizer, which the makers call the "compound hammer pulverizer"; Fig. 2 is a side view, with the casing removed, showing the internal construction.

The machine consists of two shafts around which are suspended swinging hammers, which fly outward by centrifugal force. These shafts are run in opposite directions and the hammers belonging to each side, when in action nearly meet each other at the center of the machine. It will be noted that when the hammers are swinging outward by reason of a high rate of speed, the machine resembles a pair of rolls, but with flexible instead of solid shells. As fast as the material is fed into the

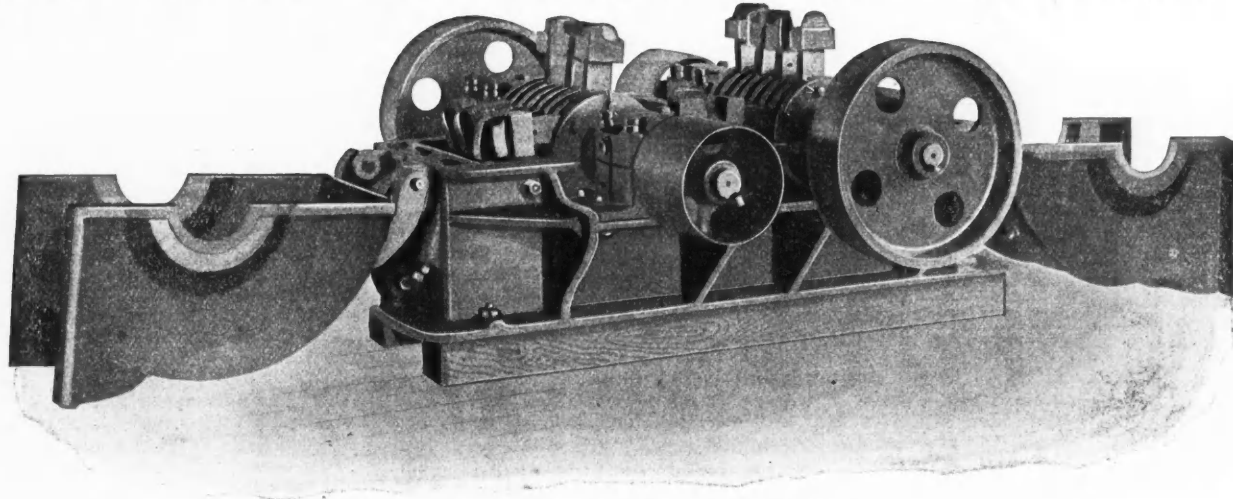


FIG. 2.—SIMPSON PULVERIZER, INTERIOR VIEW.

hopper of the machine it is broken up completely before it passes through the screen plates which are secured to lower parts of the machine, and which are shaped concentric with the path of the swinging hammers. It will be seen, therefore, that the material receives its initial crushing in passing between the two sets of hammers, and that a breaking plate or dead plate is unnecessary. The relationship or distance from one shaft to the other is capable of adjustment to suit the requirements of the material to be crushed. Provision has been made for taking up the wear of the hammers so that they may be extended 1/2 in. at a time until 1 in. of wear is taken up. This is a vital point in the machine and which will doubtless be appreciated by practical men. The material composing the hammers and screen plates is of the hardest description. The pulverizer is of substantial form and design and is showing excellent results in practice.

TO WORK PETROLEUM UNDER THE SEA.—A committee has been formed under the presidency of Mr. Devi, member of the Russian Mining Department, to decide the question of the exploration of petroleum under the sea, near Baku. The points to be decided are: (1) The suggestion of the Technical Committee for the preservation of the Baku oil-fields to reclaim that part of the sea by filling it in, so that the new petroleum plots may be joined to the old plots and so form one field, or to reclaim, by some special means, single spots forming islets not connected with the mainland. To ascertain the depth of the sea over the submarine petroleum deposits and the extent of that zone. (2) What measures should be taken to prevent accidents to workmen by fire, and also for securing the works on the submarine oil plots from destruction and from the access of the sea water into the tubes of the wells and the wasting of the oil from fountains. (3) What measures should be adopted to prevent the new works on the sea from interfering with the shipping entering or leaving the Port of Baku. (4) What should be the size of the new plots, taking into consideration the cost of creating the same. (5) Whether the plots shall be leased out by auction or the leases be granted to persons selected by the Ministers of Agriculture and State Domains.

The most important points are, of course, those contained in the first consideration, the method to be adopted for reclaiming the land. Special measures for safety would only be necessary in the event of the second alternative being adopted, that of creating separate plots divided from the mainland by a channel.

ABSTRACTS OF OFFICIAL REPORTS.

British Columbia Corporation, Limited.

The report of this company for the year ending September 30th, 1899, has only just been received. It shows receipts for interest, commission, etc., of £6,346. Payments for interest were £2,672; office and other expenses, £1,632; total, £4,304, leaving a balance of £2,042. The company has £117,190 stock and £46,900 debentures outstanding. The directors' report says: "The result of the year's operations, after providing for debenture interest and all working expenses, shows the total sum earned to be £2,042, which amount is carried to reserve account. After careful consideration of the value of properties taken over by the corporation and those held under mortgage loans, the directors have decided to increase the reserve provided to meet possible losses on realization of such properties by the sum of £4,360, thus reducing the general reserve account to £498. During the year several sales have been made of properties or portions of properties held by the corporation, and negotiations are proceeding relative to further realizations. Since the last report, debentures to the extent of £9,500 have been paid off, and it is expected that an equal amount will be repaid during the current year. Arrangements have been made whereby the working expenses will be further considerably reduced during the current year."

Homestake Mining Company, South Dakota.

This company owns gold mining properties in the Black Hills in South Dakota, which are operated on a very extensive scale, as is shown by the figures given. The report is for the year ending June 30th, 1900.

The total bullion from the mill was 227,695 oz., having a total value of \$3,583,726 (\$4.02 per ton milled), of which \$3,557,388 was in gold and

\$26,338 silver. The total bullion account was made up as follows: Mill bullion as above, \$3,583,726; concentrates, net proceeds, \$75,056; silicious ores, net proceeds, \$10,342; exchange, \$174; total, \$3,669,298. From this must be deducted mint charges amounting to \$10,499, leaving the net bullion account \$3,658,799. The income account may be stated as below in a form which we think somewhat clearer than that given in the report. The total receipt here shown was \$4.31 per ton milled; the total charges \$3.38, of which \$2.05 was for mining, \$0.80 for milling and \$0.53 for other expenses. The income account is as follows:

Bullion account, as above.....	\$3,658,799
Sundry receipts	93,415
Superintendent's drafts, less cash on hand.....	92,517
Total	\$3,844,731
Mining expenses	\$1,824,114
Deadwork	69,766
Milling expenses	713,636
Machine and repair shops	62,765
Tramway	26,799
Cyanide	76,250
Miscellaneous (assay office, freight, etc.).....	90,399
General expenses and taxes	53,585
Purchase of property	97,323
Total	3,014,647

Balance, profit for the year.....	\$830,084
Surplus from previous year.....	363,616
Total surplus	\$1,193,700
Dividends paid	1,175,000
Balance (superintendent's drafts and cash).....	\$18,700

The company had five mills in operation last year. The work done by each mill and the expenses charged to it are shown as follows:

Mill:	Mill costs.	Tons milled.	Per ton.
Homestake	\$199,118	266,740	\$0.75
Golden Star	205,266	265,565	0.77
Deadwood Terra	154,490	171,695	0.90
Highland	26,180	31,625	0.83
Amicus	128,582	155,960	0.82
Totals	\$713,636	891,585	\$0.80

Superintendent T. J. Grier's report says: "Repairs made necessary by the ordinary wear and tear to the plant at large have been well kept up, while the company's shops for taking care of its machinery have been greatly enlarged and much improved. By consolidation

there has been acquired the Highland Mine, with its 140-stamp mill and very fine hoist; the Black Hills & Fort Pierre Railroad, used for hauling wood, coal, mining timbers, etc., to the works; and the water, water-rights, flumes, ditches, etc., of the Black Hills Canal and Water Company; while by purchase, a considerable area of adjoining ground has been added to the property of the company. The important, extensive and expensive betterment to the property, which has been under construction for some months past, will soon be finished, when the increase in the company's net revenue to follow will begin. I mean a cyanide plant with a capacity of about 1,200 tons daily to treat the tailings from the mills, and a water system to increase the present deficient supply. The Ellison Shaft has been sunk from the 500 to the 600 level, the B. & M. Shaft from the 800 to the 1,000 level, the Golden Prospect Shaft from the 500 to the 600 level, and the Golden Star Shaft from the 900 to the 1,100 level. The ore developments at the greater depths attained are very encouraging, and insure a long life to the mine."

MINERAL COLLECTORS' AND PROSPECTORS' COLUMN.

(We shall be pleased to receive specimens of ores and minerals, and to describe and classify them, as far as possible. We shall be pleased to receive descriptions of minerals and correspondence relating to them. Photographs of unusual specimens, crystals, nuggets and the like, will be reproduced whenever possible. Specimens should be of moderate size and should be sent prepaid. We cannot undertake to return them. If analyses are wanted, we will turn specimens over to a competent assayer, should our correspondent instruct us to do so and send the necessary money.—Editor E. & M. J.)

201.—Determination of Monazite.—O. A. Derby, discussing the monazite sands of Prado, Bahia, Brazil, in the "American Journal of Science," states that a single granule of monazite, no matter how small, can be rapidly and securely identified by moistening it with sulphuric acid on a slip of glass and burning off the acid over a spirit lamp. The characteristic crystallization of cerium in double ball-shaped clusters of radiating needles or minute cucumber-seed-shaped isolated crystals, can usually be detected after this operation in the ring of evaporated material about the granule, but better after adding a drop of water and allowing it to evaporate in a desiccator. Another drop of water with a slight admixture of ammonium molybdate solution added to the same preparation gives on evaporation a very satisfactory reaction for phosphoric acid. The reagents are best applied by means of a small loop on the end of a very fine platinum wire, and an excess should be avoided, especially with the acid, as too large a drop is liable to run in a very annoying manner in the heating. The same reactions are given by the recently discovered cerium-aluminum phosphate, florencite of Hussak and Prior, but this can be distinguished by its form and cleavage when these are recognizable. The microcrystalline forms of cerium and yttrium sulphates are so familiar that a confusion with enotime is also to be guarded against. It has recently been found also that soluble silicates containing zirconium give very similar forms in the sulphuric acid test, but these are readily distinguishable by the absence of phosphoric acid. The Florence test by crystallizations in a blow-pipe bead requires from a half a dozen to a dozen grains of the usual size and is more successful with the salt of phosphorus than with the borax bead in which the presence of phosphoric acid appears to exercise a disturbing influence, although with patience the crystals characteristic of cerium can be obtained. When, as is usually the case, the grains are transparent, the micro-spectroscope will also usually give a very satisfactory test on a single grain of the usual size, by means of the absorption band of didymium. This can also be obtained by either reflected or transmitted light with an ordinary hand, or rainband, spectroscope, when a number of grains can be brought close together in balsam on a microscopic slide.

202.—Arizona Minerals.—F. H. H.—No. 1 is a silicious rock; the red is jasper, carrying iron pyrites. In the Lake Superior country such rock is frequently associated with great iron ore bodies. At Aspen, Colo., it occurs with silver ores. For convenience the rock may be called jasperoid. No. 2, the round black nodule, looks like tin ore, but is not as heavy. Its fracture shows it to be a much rolled bit of obsidian or volcanic glass. No. 3 is a much-altered rock hard to classify without microscopic examination and analysis. If it were a little softer it would be called a serpentine.

203.—Magnetite.—E. S.—The black glistening mineral from Chihuahua is magnetite. It breaks up into shiny flakes, has a micaceous aspect, due probably to movement of the vein walls after or during the formation of the mineral.

204.—Cinnabar.—J. S.—The sample of cinnabar you send from Texas is evidently high-grade ore. The deposits of Brewster County are stated to be rich, but in rather narrow pockety veins. A short sketch of the occurrence and distribution of quicksilver deposits would be too long for this column. We cannot give general directions for prospecting, as conditions differ at different localities. In general, quicksilver deposits occur in regions where sedimentary rocks have been much broken and disturbed. At Almaden, Spain, the rocks are old schists, quartzites and sandstones and the ores are in vein-like impregnations, some of enormous size. Volcanic rocks occur 5 or 6 miles away. At Idria, Austria, much disturbed Triassic schists, sandstones and dolomitic rocks carry quicksilver along numerous parallel fissures with no volcanic rocks near. At Huitzaco, Mexico, the ore occurs in metamorphic slates and limestones and is associated with eruptive rocks; but at Guadalucazar the country rocks are limestone and shales and there are no traces of volcanic action. At New Idria and New Almaden, Cal., much altered Tertiary shales and sandstones carry the ore. At New Almaden the ore deposition followed an eruption of rhyolite. At New Idria there are no eruptive rocks within 10 miles of the mine. The Texas deposits are stated to be in limestone and sandstone with no eruptive rocks within some miles.

QUESTIONS AND ANSWERS.

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert. Nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.—Editor E. & M. J.)

Pacific Coast Smelters.—Can you tell me what smelting works are located on the Pacific Coast of the United States, to which ore can be sent by ship conveniently? Do they treat copper ores, or lead ores, or both?—J. H. C.

Answer.—The Selby Smelting Company at San Francisco, and the Tacoma Smelting Company at Tacoma, Washington, have the smelting plants on the Pacific Coast which can be reached by water. These concerns take both copper and lead ores.

Graphite Associated with Gold or Silver.—Is graphite or plumbago ever found in association with gold or silver?—F. M. T.

Answer.—It is not uncommon to find graphite associated with gold and silver ores. In some mines in California, for instance, intercalations of graphite are found in the slates enclosing the gold-bearing quartz veins. A similar occurrence has been found in Alabama. There are other instances which could be quoted. Graphite is usually found in connection with slates or schistose rocks.

Lead Coated Sheet Iron.—Can you inform me whether any concern makes sheet iron lead coated to withstand acid fumes? If so, where are such plates made?—R. N.

Answer.—We do not know of any concern making such sheets as you describe. The nearest approach is found in the terne or roofing plates made by the American Tin-Plate Company. The heaviest plate of this kind is about 60 lbs. to the box of 112 sheets 20 by 28 in. This, it is claimed, is the heaviest which can be made, as the iron sheet will not retain or hold any excess of lead. These plates are made for roofing purposes and have never been tested for their resistance to acid fumes.

Sulphide Antimony Ores.—Can you, or any of your readers, advise me where I can obtain a supply of sulphide antimony ores carrying silver and gold?—H. F.

Answer.—In further answer to this question—which was published in the "Engineering and Mining Journal" August 11th, 1900—we have received the following from the Great Republic Gold Mining Company, of Seattle, Washington: "The ore from one of our mines—the Happy Thought Group in the Miller River District—runs high in antimony, carrying good values in silver and gold. We shall be glad to give further information."

Metallic Arsenic.—Is there any demand for metallic arsenic? The arsenic is found in matte carrying copper, silver and gold.—J. F. B.

Answer.—Metallic arsenic is used only as a reagent in the laboratory, and the demand for it is very small. The white arsenic of commerce is arsenious acid—As₂O₃—and the other forms of arsenic used in glass making and color making are compounds of arsenic and oxygen or arsenic and sulphur. We do not think that the quantity of metallic arsenic which can be sold would warrant any expense for separating it from other metals in the metallic form, or for reducing it to metallic form from fumes or salts.

Tunnel Rights.—Some 12 years ago a friend of mine located a tunnel claim according to United States law and did considerable work on it and about 500 ft. of tunneling. Two years later he died and no work has been done on the claim since. I wish to relocate the claim and do not know the best way. Do I, by starting work 500 ft. in, acquire the rights my friend forfeited, or do my rights begin at the 500-ft. point and continue for 3,000 ft.? How can I acquire possession of the old workings so as to have uninterrupted ingress and egress?—J. L.

Answer.—The whole question of mining tunnel rights is so complicated by conflicting decisions of the courts and by conflicts in the phraseology of the act of 1872, that in general it may be said that the only way to establish definitely what is covered by such a claim is through a law suit. So far as your question can be answered by direct appeal to section 2,323 of the Revised Statutes it is not difficult. That section says "where a tunnel is run for development of a vein or lode or for the discovery of mines, the owners of such tunnel shall have the right of possession of all veins or lodes within 3,000 ft. from the face of such tunnel on the line thereof not previously known to exist, discovered in such tunnel . . . but failure to prosecute the work in the tunnel for six months shall be considered as an abandonment of the right to all undiscovered veins on the line of said tunnel." As you say no work has been done for 10 years, the courts would probably hold that all rights which might have been acquired by the tunnel have lapsed. If you locate the tunnel again we do not think the fact that 500 ft. of work had been done 10 or 12 years ago would benefit your rights, but that you would be entitled to the rights stated above for 3,000 ft. from the mouth of the tunnel. If during the 10 years other parties have filed claims covering the ground and have made use of the tunnel, we think the court would give them a prior right—provided they had fulfilled the conditions in locating the claims that the act of 1873 requires. You do not acquire the rights your friend forfeited; the claim you file is for rights that exist at the time of filing or during the progress of work on the tunnel, as set forth in section 2,323. An attempt to secure uninterrupted ingress to a long-abandoned tunnel would insure a law suit if anything of value is at stake. For an authoritative discussion of tunnel locations see "The Mineral Industry," Volume VI.

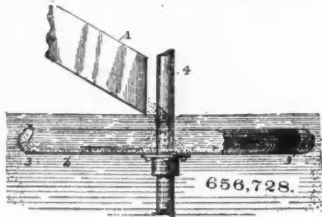
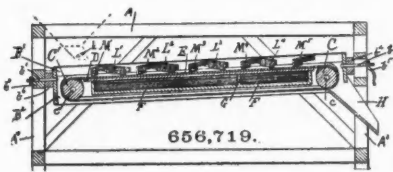
PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

The following is a list of the patents relating to mining and 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.

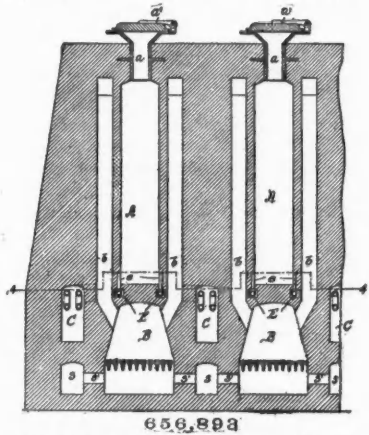
Week Ending August 28th, 1900.

- 656,674. ORE-CONCENTRATING AGITATOR. Albert H. Stebbins, Little Rock, Ark. The combination of a casing forming an agitating chamber, a throwing device mounted in the lower part of said chamber, the latter being enlarged above the throwing device, an exit pipe leading from said chamber, a feeding device, an air inlet for conducting a blast of air into said chamber below the feeding device and above the throwing device.
- 656,696. ARTIFICIAL STONE. Jesse W. Johnson, Buffalo, and Albert S. Hendrix, Thornton, Tex.; said Hendrix assignor to said Johnson. The process of manufacturing artificial stone having an ornamental surface, which consists in molding part of a body portion of Portland cement and coarse flint-sand in a plastic condition; then striking off the exposed surface of the last molded portion, upon which the ornamentation is to be produced, and allowing the material to set; subsequently engraving the characters forming the ornamentation in the surface of the last molded portion and allowing the stone to harden; subsequently applying to the unornamented surfaces of the stone a liquid coating of Portland cement and air-slaked lime and finally applying to the entire surface of the stone a mixture comprising flake zinc ground in oil, and linseed oil.
- 656,719. SEPARATOR. Gardner A. Gibbs, Livonia, N. Y. The combination of a movable carrier having a plane surface with a fixed path, said carrier being inclined transversely to its line of travel, and guiding means set diagonally to said line of travel and adapted to prevent objects on the carrier from passing under said guiding



means, whereby objects capable of rolling roll on the transverse downward incline of said carrier and off the same, and other objects are carried further forward on said carrier along said guiding means and are then discharged from the carrier.

- 656,728. PROCESS OF SEPARATING ORES. Harry C. Robinson, Cincinnati, Ohio. The process consists in rotating the materials on a submerged horizontally-rotating surface at a speed sufficient to develop centrifugal force only slightly in excess of that necessary to overcome the inertia of the heavier material resting on the support, whereby the conglomerate is subjected to a prolonged but gentle disintegrating action by the comparatively still water by which the lighter is lifted and carried off the support, and the heavier is gradually driven toward the periphery of the rotating support, a soft bank of sand being maintained at said periphery under which the heavier material sinks and is then protected from currents tending to lift it off of the support.
- 656,804. STONE SEPARATOR. Louis C. Bonnot, Canton, Ohio. The combination with a case, of a feed device arranged to force the material through a case, a larger perforated chamber into which the case discharges, said chamber having a downwardly-inclined portion leading to an opening in the chamber, and an outlet door arranged to close the opening.
- 656,893. APPARATUS FOR TREATING COAL AND ORES. Jeannot W. Keneval, Chicago, Ill., assignor to the Tennessee Coal, Coke and By Product Company, Harriman, Tenn. The combination of a horizontally-arranged elongated retort having means for charging and discharging the same, a combustion chamber beneath the retort,

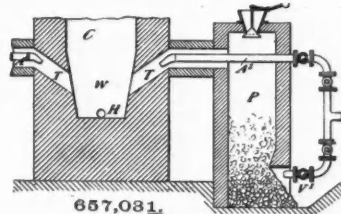
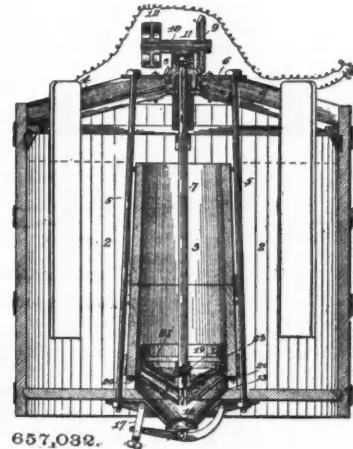
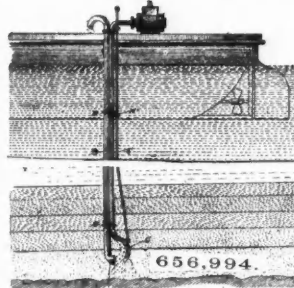


an elongated horizontal flue located adjacent to said retort and combustion chamber, a plurality of vertical flues communicating with the combustion chamber and arranged at the side of the retort, a plurality of return flues arranged at the side of the retort substantially the same distance therefrom as said vertical flues, and communicating with said vertical flues and said horizontal flue, a steam pipe located in said flue, and connection from the same into the retort.

- 656,930. ELECTRIC FURNACE. Wilhelm Borchers, Aix-la-Chapelle, Germany. The combination with the furnace and the oppositely-disposed electrodes arranged therein, of a water jacket on the discharge end of the furnace, and a chisel movably arranged transversely in the wall of the furnace opposite the discharge end of the water jacket.
- 656,964. KILN, BLAST FURNACE, ETC. Emile Gobbe, Jumet, Belgium. A kiln or furnace provided with a refractory lining and with vertical flues located between said lining and the furnace walls, said flues being in communication with the interior of the kiln or furnace above its grate bars, and tubes suspended within the furnace or kiln and communicating therewith at their lower ends.
- 656,982. ELECTROLYTICALLY TREATING SCRAP TIN. Edward D. Kendall, New York, N. Y. The process of electrolytically dissociating

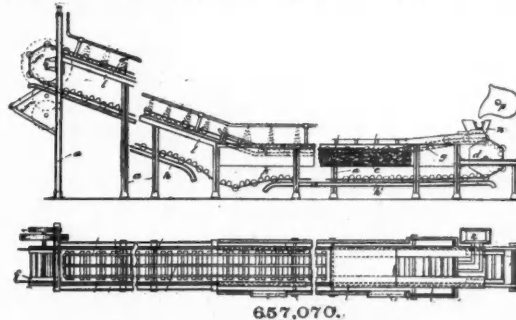
the iron and tin of so-called scrap tin-plate, which consists in the preparation of an electrolyte composed of an aqueous solution of a nitrate of an alkali metal, or a nitrate of an alkaline-earth metal; the introduction into said electrolyte of an anode consisting of a mass of scrap tin-plate, and the connections necessary to complete the electric circuit.

- 656,977. ELECTRIC LAMP FOR MINERS' USE. Leo Horwitz, Berlin, Germany. A miner's lamp, comprising two glow lamps, a hand switch, a battery, a casing therefor, contacting strips for the battery and casing, and an automatic switching device.
- 656,994. APPARATUS FOR REMOVING MATERIAL FROM BELOW THE SURFACE. Herbert F. Munn, New York, N. Y. An apparatus for removing low or bed-rock strata of material, comprising a pipe connected at one end with a supply of fluid under pressure, a nozzle at the lower end of said pipe, and movable relatively thereto, and a discharge pipe arranged for operation in conjunction with said nozzle, to force the loosened material through the discharge pipe.
- 657,012. APPARATUS FOR ELECTROLYSIS. Paul Schoop, Wildegg, Switzerland. An apparatus comprising a base of insulating material having a series of long narrow channels therein through which the solution to be electrolyzed is caused to flow, said channels being arranged parallel to each other and close together, double electrodes each extending from one channel into the next adjacent one and electrical connections with the electrodes at the ends of the apparatus from opposite poles of an electric generator.
- 657,025. AIR COMPRESSOR. Edward Huln, Trowbridge, England, assignor to Joseph Poynton Haden, same place. In air compressors in which the power is automatically thrown out of gear when the pressure in the receiver reaches a predetermined magnitude, the combination with the delivery pipes such as and leading from the compressor to the receiver of a relief valve in the delivery pipe connected to the automatic throwing-out mechanism to be operated thereby, and a check valve at the end of the delivery pipe.
- 657,030. PROCESS OF EXTRACTING BISMUTH FROM ORES CONTAINING BISMUTH OXIDES, ETC. John Ronald, London, England. The process consists in subjecting the crushed ore to the action of a solution of ferric chloride at about boiling temperature, precipitating the bismuth by means of iron, and then oxidizing the resulting ferrous chloride to transform it into ferric chloride.
- 657,031. BLAST AND CUPOLA FURNACE. Alleyne Reynolds, Sheffield, England. The combination with a furnace of blast or cupola type formed with tuyeres sloping inwardly and downwardly to the inner wall of the furnace; with an apparatus for producing gas located one at each side of the furnace and communicating with the furnace tuyeres by pipes, a branched pipe for conducting air under pressure both to the gas producer and inclined tuyeres to commingle with the hot gases as they enter the furnace.
- 657,032. APPARATUS FOR ELECTROLYZING ORES. Albion M. Rouse, Denver, Colo., assignor to one-half to William G. Shedd and Frank Brooks, same place. In an apparatus having an anode and a cathode suitably arranged, the combination of a tank having an



outer compartment, a tube located within said tank having an open upper end and provided at its lower end with communication from said compartment, a driving shaft projecting within said tube, inner and outer cups carried by said shaft, and wings arranged intermediate of said cups.

- 657,048. ENDLESS CONVEYOR. Alfred M. Acklin and William J. Patterson, Pittsburg, Pa. The combination with sprocket wheels and a frame having bearings therefor at or near its ends, of a chain passing around said sprocket wheels and provided with wheels or rollers and upper and lower tracks for said wheels or rollers, the latter of which tracks has a gap to permit expansion and contraction of the chain, said chain being free to move into and out of said gap as it expands and contracts.
- 657,069; 657,070; 657,071 and 657,072. APPARATUS FOR CASTING METAL. William J. Patterson, Pittsburg, Pa. In pig metal casting appa-



ratus, the combination with a suitable frame, of an endless connected series of traveling molds passing around the same, and two water compartments arranged in line and provided with tracks for said traveling molds, the tracks passing upwardly over a partition between the compartments.

PERSONAL.

Mr. Jos. R. Luxon has been appointed superintendent of Stratton's Independence, Cripple Creek, Colo.

Mr. William McMillen, of Nevada, has been appointed inspector of surveyors general and local land offices.

Mr. I. C. Miller, of Rawlins, has been elected president of the Ferris-Haggerty Copper Mining Company, of Wyoming.

Mr. H. C. Perkins, consulting engineer, returned to New York this week from a 5 months' business trip through Japan.

Mr. F. W. Miller, president of the Magnolia Metal Company, recently returned to New York after a 2½ years' business trip abroad.

Messrs. G. Vovinchrit and F. Scheffler, German mining engineers, have been inspecting the mines and mining and milling processes on the Comstock Lode, Nev.

Mr. A. F. Wuensch, mining engineer of Denver, left last week for a 3 months' trip to Mexico to look up mining investments in that country for a Denver syndicate.

Dr. G. M. Dawson, director of the Geological Survey of Canada, was in Rossland last week and visited the Le Roi and War Eagle mines. He next visited the Boundary District.

Mr. Emmet Boyle, mining engineer, late of the War Eagle-Center Star mines in Rossland, B. C., has accepted a position with the Esperanza Gold Mining Company of El Oro, Mexico.

Mr. W. S. Haskins, formerly superintendent of the Nickel Plate, Rossland, B. C., is now in Nevada City, Cal., where he is working a group of 10 properties in which he is personally interested.

Mr. Charles Fulton has resigned his position as tutor at the University of Wyoming to accept the professorship of mining and metallurgy at the South Dakota School of Mines, Rapid City, S. Dak.

Mr. T. C. Archer, formerly superintendent of the Iron Mountain Mine in California, recently returned to San Francisco from Alaska, but may go back to take charge of copper developments near Juneau.

Mr. Charles Fassett, of Spokane, Wash., is now on his way to Korea to superintend the installation of a cyanide plant on an extensive mining property recently purchased there by his brother, Mr. J. Sloat Fassett, of New York.

Mr. E. B. Sawyer, for some time past head assayer with the De La Mar Mines Company at Mercur, Utah, has accepted a position as chemist and assayer at the Portland Mining Company's cyanide plant at Deadwood, S. D.

Mr. Hennen Jennings, consulting engineer, with Wernher, Beit & Company, arrived in Boston this week from London, England. He accompanied Mr. John Hays Hammond. Mr. Jennings will visit Colorado and other Western mines.

Dr. James Kimball and Mr. Wood, of Tacoma, Wash.; Messrs. Harry Williams and D. Blackwood, representing Mr. Larsen, of Montana; Mr. White, of Denver, and his associate have all recently visited in the White Horse District in the Yukon Territory.

Mr. John C. F. Randolph, mining engineer of New York City, sailed from New York September 12th for London and India, taking with him Mr. J. A. Prout as foreman and Mr. E. J. Hall as assayer. He will be absent several months on professional business.

Mr. Thomas J. Hurley, vice-president of the Exploration Company, left New York for the San Juan, Colo., District last week to visit the Occidental and Natalie Mines, in which the company is interested. From there he goes to Guanajuato, Mexico, where the Exploration Company has recently installed one of the most complete reduction plants in the republic.

Mr. George Hardy, who recently resigned his position as superintendent and metallurgist of the Philadelphia Mining and Milling Company's mines at Andrews, N. Mex., has taken charge of the development of several promising gold, silver and copper properties in the State of Jalisco, Mex., in the interest of a Pittsburg, Pa., syndicate. His headquarters will be at Ameca.

OBITUARY.

John M. Desloge, superintendent of the Desloge Consolidated Lead Company, of St. Francois County, Mo., died at Battle Creek, Mich., on September 7th. In another issue we expect to give a brief sketch of Mr. Desloge and his connection with the disseminated lead mining industry of southeast Missouri.

Charles G. Barker, who died at Windermere,

England, on September 15th, was the senior member of the firm of Barber & Zeigler, wholesale coal dealers, of New York City. He was 53 years old. For several years he was connected with the Erie Railroad in the capacity of assistant president, the position being specially created for him by President H. J. Jewett. Mr. Barber leaves a widow, 3 daughters and a son.

SOCIETIES AND TECHNICAL SCHOOLS.

Michigan College of Mines.—At the recent graduation exercises 22 men graduated as mining engineers, while 20 took the degree of bachelor of science. The class includes 1 member from British Columbia, 1 from Russia and 2 from Mexico. Dr. Nelson H. Hulst, of Milwaukee, general manager of the Oliver Mining Company, delivered the address. The college now has a staff of 20 tutors, with 125 pupils.

INDUSTRIAL NOTES.

The Rand Drill Company, of New York City, was awarded 3 gold medals at the Paris Exposition for air compressors and rock drills.

The Baldwin Locomotive Works, of Philadelphia, recently booked an order for 4 locomotives from the Cuban Central Railroad. The contract, as far as known, is the first yet made by the Cuban company.

The Jury of Award at the Paris Exposition has granted the Bristol Company, of Waterbury, Conn., a silver medal for their exhibit of recording electrical instruments and have also given honorary mention for their recording steam and pressure gauges.

Among the foreign orders recently secured by the Bullock Electric Manufacturing Company is one for 800-Kw. direct-current and direct-connected generators for the street railway company at Alexandria, Egypt; also a large order which calls for many small generators for the Russian-Chinese Railroad Company.

Lane & Bodley, of Cincinnati, O., have completed the shipment of a large engine to Honolulu. The company recently shipped a large air compressor to a mining company at Johannesburg, South Africa, and an additional order from the same source has been received. The company also has recent orders for 5 heavy duty rolling mill engines.

The E. P. Allis Company, of Milwaukee, Wis., has received an order for an additional battery of 20 stamps to be added to the present 40-stamp equipment at the Camp Bird Mill, at Ouray, Colo. This company has also a contract for the complete smelting and sampling plant for the Boston & Wyoming Smelting Company, to be located at Grand Encampment, Wyo., consisting of a 100-ton blast furnace with blowers, crushers, rolls, etc., all to be operated by electric power.

The Magnolia Metal Company, of New York, held a convention of its traveling salesmen at the Murray Hill Hotel on September 7th, 8th and 9th. There were about 26 salesmen present who were appropriately entertained by the company. This convention will be held hereafter twice a year, and the heads of the different departments will meet every two months to discuss the business interests of the company. In the past 18 months, says President Miller, the company's business has been quadrupled.

The Bethlehem Steel Company, of South Bethlehem, Pa., states that on September 1st it received a telegraphic order for a propeller-shaft to replace one broken in the Plant Line steamship "La Grande Duchesse" recently. The order specified that shaft should be made of fluid-compressed open-hearth steel, forged under hydraulic pressure, annealed and rough-turned, and was booked for shipment September 11th. The shaft measured 32 ft. over all by 13¼ in. diameter, and the shipping weight was 15,455 lbs. It was taken in hand under emergency instructions and forwarded September 6th, 5 days in advance of requirements.

TRADE CATALOGUES.

The Allgemeine Elektricitats-Gesellschaft, of Berlin, Germany, has issued circular 22 describing the submarine cables the company manufactures.

The Robert Aitchison Perforated Metal Company, of Chicago, Ill., is sending out a handy little pocket book which shows a few of the sizes of perforated steel and iron, zinc, brass and copper plates carried in stock by the company. The pamphlet also contains tables showing the weights of plates according to gauge, etc.

The "Tic-a-toc" grease cup is described in a little pamphlet published by James L. Robertson & Sons, of New York. This cup is stated to be superior to centrifugal oilers, etc., as the

feed is positive, by a pendulum and ratchet, and can be closely regulated, the cup is not liable to get out of order and is especially adapted to feeding graphite lubricants.

The merits of spiral riveted steel pipe for water mains, hydraulic mining, smoke stacks or mine and tunnel ventilation are set forth in a little pamphlet published by the American Steel Pipe Works, of Chicago, Ill. The company states that it takes the greatest pains to have all joints in its pipe tight and that the pipe is coated with a mixture of asphalt and mineral rubber which is unaffected by salt water, acids or electrolysis. The pipe is recommended on the score of strength, tightness and durability.

"Globe" elaterite roofing material is described in the circulars sent out by the Western Elaterite Company, of Denver, Colo. This material is stated to be made with burlap centers and cloth top, with mica surface and paper back. It is described as acid, steam, sun and water proof, pliable, elastic and non-drying and to be adapted for flat or steep roofs and to require no painting. It is, therefore, recommended for mills, chlorination works, cyanide plants, acid factories or roasting ovens and as a substitute for corrugated iron, tin or galvanized iron.

A catalogue which contains considerable information of a practical nature, often not found in trade catalogues, is just issued by the George V. Cresson Company, of Philadelphia and New York. This 68-page pamphlet describes Buchanan ore crushers, granulators and plaster crushers; also revolving screens, stone elevators. Buchanan crushing rolls and light rolls, and the Buchanan magnetic separator now in use at a New Jersey iron mine. The company also manufactures Hartz jigs and a great variety of power-transmitting machinery. The company states that it makes strong claims for the superiority of its products, but is prepared to give reasons for its claims and calls attention to the great capacity and durability of its crushers and crushing rolls.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" 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 of any kind, and shall be pleased to furnish them information, catalogues, etc.

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, and have no pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

Mineral Oil Exports.—In August the United States exported 16,653,307 gals. crude oil; 1,592,139 gals. naphthas; 77,818,697 gals. illuminating; 5,136,817 gals. lubricating and paraffin; and 1,797,978 gals. residuum, making a total of 102,998,938 gals., against 100,220,318 gals. in the same month last year. In the 8 months ending August 31st, 1900, the exports aggregated 638,663,355 gals., as against 622,115,404 gals. last year, showing an increase of 16,547,951 gals. in 1900.

ALASKA.

Cape Nome.

Late reports from the gold fields are that the rains set in early in August and placer mining along the various creeks is active. The beach is practically worked out. Some good finds from along the creeks are reported and claims are being worked back in the hills. The railroad from Nome to Anvil City is in operation. It now seems likely that most of the men who desire will be able to get back before cold weather sets in and that the suffering this winter will be less than anticipated. The transportation companies have greatly reduced prices for the return trip and government transports will bring back many of the destitute. Reports from the Golovin Bay district continue favorable.

ARIZONA.

Cochise County.

Commonwealth.—The machinery for the new mill buildings this company is erecting at Pearce, comprising an 80-stamp mill, hoisting engine and other equipment and supplies, has been ordered from Fraser & Chalmers, of Chicago. Shipments of machinery from Chicago to Pearce have already begun.

Mohave County.

Silver Age.—This mine, near Chloride, has its shaft down near 300 ft. Drifting at this level shows good ore.

Wallapai Mining Company.—This company has a large number of men rebuilding its concentrator at the Tennessee Mine near Chloride. Development work underground continues and some good ore is being taken out.

White Hills Mining Company.—A fine strike of

silver ore is reported in the Occidental Mine of this company at White Hills.

CALIFORNIA.

Amador County.

(From Our Special Correspondent.)

Blue Lakes Electric Power Plant.—One of the dynamos at this plant is being rebuilt. Employment is given to a large number of men. The chief engineer of the Stanley Electric Manufacturing Company is in charge. The machinery for the new power plant is arriving daily.

Keystone.—The 40 stamps at this mine at Amador City are crushing steadily and two 5-ft. concentrators for each battery are being put in. W. A. Pritchard is superintendent.

Butte County.

(From Our Special Correspondent.)

Banner.—At this mine, 5 miles northeast from Oroville, 180 tons of ore are crushed every 24 hours by the 40-stamp mill. Each stamp weighs 1,200 lbs. and drops 110 times per minute.

El Dorado County.

(From Our Special Correspondent.)

Ribbon Rock.—The north and south drifts are in respectively 130 and 86 ft. Three 8-hour shifts are at work. This property is about 2 miles south from Placerville.

Rosebud.—The shaft at this mine near Fairplay, is down 125 ft. and a drift is being run on the 100-ft. level following a ledge of high-grade ore, which is from 12 to 20 in. wide. A small mill is to be erected.

Mariposa County.

(From Our Special Correspondent.)

Pinon Blanco.—At this group of mines 3 miles northwest from Coulterville, preparations are being made to resume work. Considerable development work, mostly tunnels, has been done on the property. The ore is said to be fair grade milling rock.

Nevada County.

Brunswick Consolidated Gold Mining Company.—Twenty-eight men are on the pay roll who receive a daily salary of \$80.75. There are 10 stamps dropping at the mill. During the week ending September 1st 70 tons of ore were delivered to the mill and the gold recovered from the plates was 16 oz.

Santa Clara County.

(From Our Special Correspondent.)

Government Inspector W. J. Russ has charge of the work of deepening the Alviso Channel. The dredger "Solano," Capt. J. G. Anson, is at present working alone, but the Bowers Dredging Company has arranged to put on the "Sucker," Capt. W. Schmidt. The work will be completed in about 3 months. There are about 200,700 cu. yd. of earth to be removed, the channel to be widened to 100 ft. and deepened to 20 ft. The dredgers will work day and night, throwing up 7,300 yd. per 24 hours.

Shasta County.

(From Our Special Correspondent.)

Arps Group.—A large body of copper-gold ore is said to have been developed at this group of 7 claims near Copper City. Development work has been going on for the past year and recently a crosscut run to the left from the breast of the tunnel cut the ore body over 25 ft. The property is owned by William Arps, R. M. Saeltzer and Joseph Kahny.

Siskiyou County.

(From Our Special Correspondent.)

The dredger at Hawkinsville is again in operation with a heavier steel scraper. No report of clean-ups as yet.

Dewey.—This mine, 8 miles from Gazelle, is now considered one of the best in the State. The 20-stamp mill and concentrators are in constant operation on high-grade ore. W. A. Monroe is the new superintendent.

Trinity County.

(From Our Special Correspondent.)

C. D. Galvin has employed S. F. Loughborough to take apart the big dredger on the Rogue River, Ore., and ship it to Weaver Creek near Weaverville. This dredger will be operated on the ground recently prospected with a Keystone driller. The Risdon Iron Works originally built the dredger for the Oregon placers, which turned out to be too poor to work.

Yellow Rose of Texas.—This property on Coffee Creek is showing up well. The mine is equipped with a Huntington mill and other machinery. The last clean-up from a 10-day run yielded \$2,500. The ore is high-grade. Geo. L. Carr is manager.

Tuolumne County.

(From Our Special Correspondent.)

Shawmut.—During the dry season only 30 men have been employed at this mine, 2½ miles northwest from Jacksonville. Important work is being done on the ditches and at an elevated point about 2 miles east of the mine, a storage reservoir is being constructed, which will be connected with the works by a 30-in. pipe line.

COLORADO.

Clear Creek County.

(From Our Special Correspondent.)

Empress Tunnel Company.—In drifting and crosscutting a new ore body has been opened in this property at Empire and values are running high in gold. The smelting and milling streaks show 5 ft. of ore.

Monarch Mining, Milling, Tunnel, Transportation and Power Company.—Colorado Springs people have organized this company to obtain advantage of various Colorado laws. The Freeland claims and the McClelland tunnel right and claims have been secured, and it is proposed to drive a 1½ mile tunnel from a point 4 miles west of Idaho Springs to cut the Freeland lode. The company has already expended \$30,000 in acquiring a 3-5 interest in the Freeland Mine.

New Era Mining and Milling Company.—The Great Eastern, Great Western, New Era, and 11 other claims have been consolidated with the Elgan Mill and all will be operated by this company. The capital stock has been placed at \$1,500,000. George S. Cooper, of Newark, N. J., is president; H. G. Mills, of Milwaukee, vice-pres.; J. N. Penrod, of Kansas City, treasurer, and J. R. Elgan, of Idaho Springs, Colo., secretary and general manager. The drift on the Great Western is now following several feet of pay ore. A crosscut of 65 ft. from this has cut another vein of 15 in. which runs about \$50 a ton. The shaft on the Great Eastern claim is to be sunk on the Great Western vein. The company is using air drills. The mill is treating 40 tons of crude ore per day by concentration.

Newhouse Tunnel.—This tunnel at Idaho Springs is working one shift with air drills, the balance of the time being taken up in removing the rock. The tunnel is 12 by 12 ft. and is passing through solid granite at the rate of 200 ft. per month. It is now into the hill for 3,350 ft., and while some veins are being cut their ownership is unknown and no information is given out. The Sun & Moon veins will be cut about October 25th. All veins cut are pitching north, but after 3 miles all of them in Gilpin County will be found pitching south or toward the tunnel. The company is working the big vein, which shows fully 30 ft. of pay ore.

Custer County.

Bassick Gold Mines.—A bad cave at the old shaft has temporarily stopped work at the Bassick Mine, near Rosita. The cave was above the 300-ft. level. A new hoisting plant is to be put in at the 500-ft. and mining is expected to resume shortly.

Fremont County.

United Gold Extraction Company.—The brick work on the power house of the great chlorination plant at Florence is nearly completed. In the roasting room there are 4 100-ton roasters and 2 coolers almost ready for use. In the chlorination room there will be 8 chlorination barrels, 7 of which have been completed. The sample room will have 2 sets of rolls and the crushing room 5 sets. The capacity of the mill will be 400 tons a day. The buildings are about completed. The machinery will be in place and the mill ready for operation in about 60 days.

Lake County—Leadville.

(From Our Special Correspondent.)

Leadville Ore Tonnage.—Shipments the past week have averaged 2,200 tons per day, a large increase over the corresponding week last year. This week a shipment of 4,000 tons of zinc ore, shipped by Jacobson & Company, of New York, goes to New Orleans by rail for Belgium. Most of this comes from the Maid, although the Moyer is now a heavy producer.

New Zinc Mill.—The new zinc mill of the A. M. W. will soon be in operation. It is the largest mill in the camp.

Boston Gold Copper Company.—Many improvements are being made on this pyritic smelter, the most important being the building of 2 new furnaces which will give the plant a capacity of 800 tons of ore per day.

Butcher Boy.—P. L. Kimberly, of Sharon, Pa., has a 5-years' lease on the Butcher Boy, Black Hawk and Fitzgerald claims, and a new shaft will be sunk 1,500 ft. and the territory explored. A magnificent plant of machinery is being installed. This group of claims is located on Ball Mountain, about 1 mile above the Ibez Group.

California Gulch Mining Company.—The water is under control, a station completed below the 500-ft. level and drifting has begun.

Devlin.—This property, owned by the Small Hopes Mining Company, is putting down a new shaft, where at the 250-ft. level a find of very high-grade carbonate has been made. Much prospecting has been done and the new strike will mean active development.

Highland Mining Company.—This property, which has lain idle for a long time, is in the gold belt and is to be started up. Bids are advertised for sinking the shaft 600 ft., which should be the depth to reach the ore plane. An assessment of 50c. a share has been made to

pay up all the old debts and to start the new work. This company represents the re-organization of the old Highland Chief Mining Company.

Modoc.—This Iron Hill property has resumed work and shipments will be 30 to 40 tons daily of high-grade manganese. This is the deepest oxidized iron mine in the district, the lowest level being 637 ft. deep.

Teller County—Cripple Creek.

(From Our Special Correspondent.)

The new electric railroad around the district will soon be open for passenger service. This is the district part of the Colorado Springs and Cripple Creek District railroad.

Acacia Gold Mining Company.—Good reports continue to come from this property, especially the Wrockloff lease on the Burns Claim. Ore is shipped from the Brady lease. The shaft house has been rebuilt by the Bankers' Leasing Company on the Morning Star Claim, and good things are looked for. The royalties received during August are given as over \$6,000. From present appearances the Wrockloff lease is one of the coming producers.

Gold Coin.—Work is pushed on the hoist and it will soon be ready. The hoist is the same as those recently installed on the Ajax, Strong and others. The new compressor has started. This is a Rand with Corliss valves, capable of running from 25 to 30 drills at this altitude. Work is also pushed on the new buildings. Since the fire a year ago a temporary hoist has been used.

Jefferson Mining Company.—The property of this company is operated by Denver men, who recently began work. The mine, which is well developed, having an 800-ft. shaft and over 2,000 ft. of drifting, lies between the Anchoria Leland and Half Moon properties and has been a heavy shipper. The Anchoria Leland vein passes through its ground.

Ophelia Tunnel.—Work has been resumed on this Gold Hill tunnel, a short distance south of Cripple Creek. Preparations are being made to put in a new compressor. The tunnel penetrates Gold Hill toward Anaconda, between 3,000 and 4,000 ft. It was started about 5 years ago by the Moffat people of Denver, but is now worked by outside capital. Mr. John Parfet, of Cripple Creek, is in charge.

Pharmacist Consolidated Mining Company.—At the annual meeting of this company in Cripple Creek the following directors were elected: C. N. Miller, W. J. Chambers, A. D. Shilling, A. Wagner and E. R. Whitmarsh. The meeting resulted in a victory for the Chambers-Miller faction. There has been considerable controversy between this and the Burns and Peck faction, and it is reported that all is not settled yet. Dr. Chambers was afterward chosen president, Mr. Shilling vice-president and Mr. Newcomb treasurer.

Strong Gold Mining Company.—The new hoist will soon be in working order. It is a double cylinder first-motion hoist with one reel for a flat rope, manufactured by Webster, Camp & Lane, of Akron, O. The cylinders are 24 by 18 ins. The shaft has also been fitted with a large double deck cage. A new shaft house and boiler room has been erected and one large boiler is in, but not yet in use. The new hoist is the same make and size as the one recently installed on the Ajax except the latter has 2 reels. The Strong is one of the large mines of the district and is now equipped for a heavy output. It is in Victor and adjoins the Portland property. The company is a close corporation, of which Mr. Wm. Lennox, of Colorado Springs, is general manager.

GEORGIA.

Lumpkin County.

Battle Branch Mine.—This old gold mine near Auraria is being opened up by E. E. Crisson. The old incline has been cleaned out and sinking on the vein is in progress. Good ore is being taken out, the vein being about 4 ft. wide.

IDAHO.

Ada County.

Golden Star.—This mine in Boise Basin has a shaft down 250 ft. cutting the Golden Fleece Vein. James Hutchinson is superintendent.

Last Chance.—This claim, near Quartzburg, is owned and operated by Mrs. O. J. Daly, George Fall and W. H. Barry. The 150-ft. shaft is down to water level, on a vein from 1 to 5 ft. in width, carrying average values of \$8 per ton, free, though with depth sulphurets are coming in, and the ore will probably turn base. During the last 3 years, with a force of only 4 men, this property is said to have produced \$30,000, much of which was run through an arastra. A 5-stamp mill is now handling all the ore.

North Star.—The big mill on the North Star, the Shaw Mountain property of the War Eagle Consolidated Mining Company, has started up. The Jordan gravitation process has been installed. This is the first quartz mill of the kind ever built in the northwest. The experiments made with the process are said

to satisfy the management. Recently the ledge in the North Star Mine, which the War Eagle Company has been developing so systematically and extensively for some time, was cut at a depth of 870 ft. At that point the ledge was found to be 8 ft. wide. Drifts have been run on the ledge for a distance of 105 ft. east and 127 ft. west. The rich ore shoot found in the upper workings dips westerly. The ledge was cut in the upper workings at a depth of 250 ft. There it was found from 18 in. to 3 ft. wide, the ore averaging \$75 or over per ton. In the lowest workings, 870 ft. down, the ledge had widened to 8 ft., but the ore is not so rich, running an average of \$25 a ton.

War Eagle Consolidated Company.—This company is operating placer and quartz properties in Boise Basin. At Quartzburg the company is working the Iowa and Yellow Jacket mines. The Iowa shows a fissure vein in granite opened by 2 tunnels, the lowest 944 ft. long, cutting the vein at a depth of 800 ft.; the ore at this level is said to be 18 ft. wide. The Yellow Jacket is developed by tunnels to a depth of 350 ft. The ore is a sulphide carrying some free gold. A new mill is now going up. The building is 90 by 110 ft., and the battery will be of 30 stamps, the engines being of the Corliss type, 18 by 24. There is a tram from tunnel entrance to the ore chutes into the mill, and on this cars will come direct from the mine, whence the ore will go into the crusher, then to the batteries, over plates, over Wilfleys, one to each five stamps, the middlings from two Wilfleys being combined and passed over Frue vanners, from there going over California tables, located in another building. A complete chlorination plant is being installed in a building 100 by 200 ft., the furnace being 14 by 70 ft., and the tanks of 50-ton capacity each. The concentrates, after coming from the California tables, are dried and then put into the roasters, and after roasting are cooled and run into the chlorination tanks. The liquid is run into precipitating tanks, and after precipitation the gold is fused into bars. Robert J. Anderson is general manager and H. L. Woodburn assistant general manager.

Idaho County.

Boston & Idaho Gold Dredging Company.—This company has 2 dredges at work on Moore Creek, 1 mile below Idaho City. Charles W. Gardner is general manager of the company and Rupert Waters superintendent. In the older of the dredges the dredged material is dumped into a grizzly 3½ by 21 ft. The material, of ½-in. and more in size, passes into the waste flume and is washed out onto the dumps directly. The finer material passes onto a double series of inclined plates, covered with cocoa matting and from there into a riffle sluice some 100 ft. in length, the gold-saving appliances being duplicated on each side of the grizzly. The matting is changed about every 12 hours when running under ordinary circumstances, the complete clean-up being made twice a week. Very little gold, it is said, gets into the sluices, the plates and matting saving nearly all. The ground being worked averages about 30c. per yard, the capacity of the plant being about 1,000 yds. per day, with 3 men to a shift of 10 hours. The rate of progress under ordinary circumstances is about 200 by 5 by 24 ft. per 24 hours, moving forward 5 ft. at a time, average depth of ground being 24 ft.

Mr. Joel F. Brown, chief engineer for the company, has constructed another dredge, which lately went into commission, with W. M. Nostrand in charge. The gold-saving appliances here are the same as those described in the initial plant, but instead of buckets there is a large scoop, with a capacity of 2 yds. of dirt, making 1 dip per minute. The bucket deposits its load in a hopper, whence it is hydraulicked into the grizzly. This is a double dredge, the bucket depositing a load on one and then on the other side. It has a total engine capacity of 240 H.-P. and a boiler capacity of 120 H.-P., with a digging capacity of 3,000 yds. per 24 hours. Its dimensions are 54 ft. wide, 65 ft. long, 10 ft. deep, being operated by 8 men and burning 10 cords of wood per day. When running full capacity it moves, per 24 hours, 450 by 5 by 2 ft. Both of these plants are equipped with electricity and work progresses day and night. The company owns 9 miles along the creek.

Elkhorn.—This property is worked under lease and bond by John Kinkaid, having in its equipment the first 5-stamp mill ever brought into the State. There has been over 6,000 ft. of development on the mine, which has been in operation since 1863. The mill is operated by water power, with Ed. Foster in charge. There has been no ore mined for some time. The vein is a contact, with a heavy tale gouge, which carries good gold values. It is a bull lead, in a porphyritic country, with granite as the base, the lead averaging some 4 ft. The free gold is visible to the eye in much of the material.

Shoshone County.

Standard Mining Company.—This company is putting in a new air compressor and electric plant at the mine near Wallace. The foundation is completed and some of the machinery

is on the ground. The new compressor will have a capacity of 50 drills, the present being only of 15 drills. The electric plant now in use simply furnishes light for the mine and the surface works, but the new one will also furnish power to haul the ore out of the mine and the empty cars back, taking the place of the 8 horses now used. Five hundred tons of ore per day come out of the mine, and the cars carrying 2,500 lbs. each are brought out in trains of 14 each through the ½-mile tunnel, one horse pulling a train out and taking back the same number of cars with timbers. The tunnel has a grade of 5 in. to 100 ft.

Wonderful.—William Williams and John W. Perglase, of Milwaukee, Wis., undertake to develop this group on Stevens Peak under a working bond for \$40,000. This is the group on which 16 ft. of galena was struck recently. The group includes three claims, the Wonderful, Oro Fino and Aguinardo, and the owners were John and Alexander Livingston, M. M. and John B. Taylor, E. La Proebsting, A. H. Featherstone, John Vodele, Peter Jackson and Nels Bergquist, of Wallace, and J. Johnson, of Burke.

MICHIGAN.

Copper.

Michigan.—At this mine at Rockland a Webster, Camp & Lane hoist, capable of reaching to a depth of 1,200 ft., is being installed at B shaft, also the boilers for the new pumping plant. A shaft is now 541 ft. deep and down nearly to the 4th level. B shaft is down 560 ft., to the 4th level. C shaft is down 340 ft. Work there is discontinued and the 100 miners employed are at A and B shaft.

The new mine is entirely upon the Calico lode and since work was started 2 years ago fully 5,890 ft. of drifts have been run. The Calico lode lies under the old Minnesota lode from which the Michigan, under its former name of the Minnesota, made such big returns in the early years. The old property was left in such shape by the tributors that it was thought best to sink an entirely new series of shafts. It is the intention to run a pipe into the old workings from B shaft and thus gradually draw off the water. Drifts will then be run across to the old workings from the new.

Rhode Island.—Shaft No. 1 is down below the second level, or 280 ft. Drifting is being carried on in both the first and second levels. No. 2 shaft is sinking below the first level, or 180 ft. from the surface and drifting at the first level is progressing. The Quincy lode is being worked. Each of the 2 shafts is provided with a Nordberg hoist which can work to a depth of 1,000 ft., while at No. 2 shaft there is a 10-drill compressor. This equipment will serve for the coming winter at least, as the work will be confined to sinking and drifting. A force of 52 men is now employed. The company has built a machine shop, etc., also 6 dwellings for employees and a large boarding house, and has under construction 7 more dwellings and a house for the resident agent. The property consists of 800 acres of land, traversed by 6 lodes, the Quincy or Pewabic, Boston & Albany, Osceola and Atlantic amygdaloids, Allouez conglomerate and the Mesnard epidote.

Trimountain.—At this mine rock and shaft-house at No. 1 shaft is expected to be up by October 15th. This rock house is 62 by 40 ft., and is on heavy stone foundations. The building will be 100 ft. high and equipped with crushers, steam stamp, etc., while 2 railroad tracks will pass through the building and the cars will load from chutes. A Fraser & Chalmers' duplex hoist, capable of hoisting from a depth of 1,500 ft., and a straight-line compressor, 14 by 20, are parts of the equipment at this shaft. The engine house is 24 ft. square, with an addition 24 by 16, for the compressor. The boiler house is 52 by 48 ft. and contains 3 locomotive fire-box boilers of 125 H.-P. each.

At No. 2 shaft a compressor house, 54 by 33 ft., has been completed, which contains a 35-drill Rand compressor.

At No. 1 shaft the skip way is completed to the second level and hoisting has begun with a 1½-ton skip.

Iron—Gogebic Range.

Tilden.—This mine, at Bessemer, recently discharged 100 men on account of the condition of the iron market.

Iron—Marquette Range.

Hartford.—At this mine, near Negaunee, the Oliver Mining Company has sunk the shaft from 200 ft. to 325 ft. and is putting in a new power plant, which comprises a 2-stage sand air-compressor that has a capacity of 20 drills. A new Prescott pump will also be put in.

MINNESOTA.

(From Our Special Correspondent.)

The monthly report of ore shipments from all Lake Superior ports for August shows shipments of 2,285,572 gross tons, and for the season to September 1st 9,838,709. This does not include Escanaba or rail shipments. Escanaba for the

season to September 1st shipped 2,528,000 gross tons, making water shipments 12,366,000 gross tons. It is estimated that the rail shipments of the year have been especially heavy, in all about 650,000 tons, so that a movement of ore from all ports of less than 2,400,000 tons for each of the 3 months of September, October and November will make the season's total fully 20,000,000 tons. This will permit a falling off of 650,000 tons a month from the figures for July. So far this year Minnesota mines have shipped 6,300,000 tons, or a trifle more than half of the total movement of water-borne ores. This is the first year the State has reached this point.

Shipments have fallen off materially since September 1st; boats have become bunched and are delayed several days at lower lake discharging docks; floods at mines caused trouble, and the movement of ore away from the lower lake docks is slow.

Iron—Mesabi Range.

(From Our Special Correspondent.)

Duluth.—This mine of the Consolidated Company, at Biwabik, has let a large stripping contract to John Runquist for the extension of the open pit. It will take all the fall and next year.

Elba Iron Company.—This company will sink another shaft the coming winter. The company is operating 2 Prescott pumps, of 2,000 gall. a minute each.

Fayal Iron Company.—A second cloudburst filled No. 3 open pit again, raising the water 22 ft. It will be well into October before this pit and No. 3 shaft are dry enough to work. Stock-pile shipments are nearly over, No. 1 has been shipped and No. 2 will be cleaned up by October 1st. Several names have been rumored as those for the manager of this mine, to succeed Geo. W. Wallace, among them Jas. H. Rough, of the Cleveland Cliffs Iron Company; Edwin Ball, who succeeded Wallace at the Minnesota Company's hard ore mines, and E. C. Mills. The position is perhaps the most prominent on the Minnesota ranges.

Mesaba Village Explorations.—Explorations have been underway in the immediate vicinity of Mesaba Station on the Duluth & Iron Range road since early in the year, the first being that of Messrs. Wallace, Moon, Hawkins and Vivian, who turned their operations over to the Minnesota Iron Company. This company has since continued the work, and has now decided to pay \$40,000, the first instalment of the \$480,000 for which the 4 disposed of their leases. The company is running double shift in many of its pits, and is finding much ore. An ore body nearly a mile long and in some places half as wide and covered by an average of about 50 ft. of surface has been opened, but its limits are yet unknown. It will be partly stripped during the winter and mining carried on next year. Shafts will also be sunk. There is an enormous body of ore in the deposit and of excellent grade, quite different from the general Mesabi formation. Other explorers have also found large deposits in the same neighborhood.

Sparta Iron Company.—This company's stripping operations, under way all summer, will be completed this week.

Stevens.—This mine of the Oliver Company will be stripped the coming winter, it is understood, and mined next year. The Duluth, Mesabi & Northern road will build there at once, and is surveying its line now.

There are explorations between the Stevens and Mesaba Station that will be pushed the coming winter, and to which roads will be built.

The n. ½ of the ne. ¼ of section 6 T. 57, R. 20, has been taken under lease and will be explored at once.

Iron—Vermilion Range.

(From Our Special Correspondent.)

Minnesota Iron Company.—It is reported that a new find of ore has been made in Montana shaft of this company's hard ore mine at Soudan, which is 100 ft. wide and unknown length.

The Duluth & Iron Range road is hauling about 180,000 tons of coal to the mines, the largest amount it has ever brought into the district. Three boats unloaded 9,000 tons at Two Harbors docks last week.

MISSOURI.

Jasper County.

Joplin Ore Market.—The top price for fancy-grade zinc ore was \$28 per ton, but the sales at this price were much smaller than the previous week. Three cars from the Pelican Mine on the ground of the United Zinc Company, at Joplin, was the only lot that brought \$28, the next best price being \$27.50 per ton for the Independence at Joplin and the Eagle ore at Belleville. The Oronogo ore brought an average of \$27 per ton. Lead sold all the week at \$23 per 1,000 lbs. The large production caused by the resumption of work at many mills during August and the addition of night shifts at others will soon create a surplus of ore if the demand does not materially increase. Following is the turn-in by camps

for the Joplin District for the week ending September 8th:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin.....	2,677,730	367,420	\$43,931
Cartersville.....	1,080,220	293,070	20,144
Galena-Empire.....	1,510,260	193,000	23,325
Hellville.....	591,210	6,950	3,143
Central City.....	100,630	1,120	1,183
Cave Springs.....	95,500	17,140	1,587
Carl Junction.....	202,600	.....	2,634
Granby.....	237,000	.....	3,684
Spring City.....	95,360	24,560	1,519
Webb City.....	498,010	41,370	6,923
Spurgeon.....	22,610	18,250	676
Aurora.....	1,079,700	15,580	10,603
Beck City.....	103,220	.....	1,367
Springfield.....	38,800	22,000	1,010
Oronoko.....	899,450	5,390	11,531
Roaring Springs.....	316,080	7,350	3,646
Carthage.....	171,020	.....	2,273
District total.....	9,758,520	1,038,490	\$143,814
Total 33 weeks.....	339,213, 00	39,356,420	\$5,679,848

During the corresponding week last year top-grade zinc brought \$43 per ton and lead \$27 per 1,000 lbs., the sales were less than last week by 2,314,150 lbs. of jack and 143,130 lbs. of lead, but the value was greater by \$44,093. For the 36 weeks last year the lead sales were less than this year by 6,205,132 lbs., but the zinc sales were greater by 31,808,000 lbs., and the value was greater by \$2,376,158. As compared with the previous week the lead sales were greater by 22,590 lbs., but the zinc sales were less by 243,890 lbs., and the value was less by \$2,942.

If reports can be believed, Colorado zinc ore is becoming a competitor of the soft Missouri zinc ore. George T. Nicholson, owner of a large gas smelter at Iola, Kan., claims that it makes as good metal as any Missouri ore; that he is using it in large quantities, and that his metal brings as high a price as any spelter made. He purchased last week 1,000 tons of zinc ore at Rico, Colo.

MONTANA.

Beaverhead County.

(From Our Special Correspondent.)

Gold Leaf.—A movement is on foot toward the consolidation of this property at Bannock, owned by the Western Mine Enterprise Company, with the Ennis Group and other properties in the immediate vicinity under one management.

Grasshopper Creek Dredges.—Three dredges are at work on Grasshopper Creek. The season has proved very successful, the managements say, and the clean-ups are satisfactory.

Fergus County.

New Mine Sapphire Syndicate.—A silver medal was awarded this company at the Paris Exposition for an exhibit of sapphires from its mines at Yogo.

Flathead County.

West Fisher Mining Company.—This company at Libby is arranging for the addition of the 30 stamps to its mill on the West Fisher. At present it has a 10-stamp mill which is working night and day continuously. Ed. Murphy, who put in the present plant, is manager.

Jefferson County.

(From Our Special Correspondent.)

Bell.—A new strike of 24 oz. gold ore is reported from this property located at the head of Middle Fork of Warm Spring Creek; 3 six-horse teams are soon to be hauling ore.

Congo.—This property, 4 miles from Boulder, is to be worked under bond by Sutton, Church & Herman.

Golden Sunlight.—The suit of W. J. Clark against the American Development Company for \$165,000 and interest amounting to a total of \$243,000, which was tried before Judge Smith in Helena and in which the plaintiff received judgment for the full amount, has been appealed to the Supreme Court. Clark had a bond on the property and made payments amounting to \$165,000. When, on the forfeiture of a \$50,000 payment, the company took possession of the property, Clark brought suit to recover. The report of the receiver for the American Company shows a profit of \$25,000 from operating this property since April, 1899. All that has prevented a reorganization with ample funds to develop both this group and the property owned by the old company at Gibbonsville, Idaho, is the Clark judgment.

New Smeltery.—It is claimed a new smelting plant is to be built in this county to work the Sadtler zinc process.

Rocky Bar.—This property at Wickes, owned and worked by the Daily Brothers, shows large body of low-grade concentrating ore. An ore dressing plant is being built. The ore is chalcocopyrite with a fair silver value.

White Pine.—This property, supposed to be an extension of the B. & G. on the Middle Fork of Warm Spring Creek, is again in operation by the owners, Latch Brothers & Leary, of Clancy.

Lewis & Clarke County.

(From Our Special Correspondent.)

Argo.—This property, situated in Hell Gate Canyon, 24 miles east of Helena, is being operat-

ed under a bond by Messrs. Carroll & Martin of New York. A tunnel is being driven on a body of quartz which contains about 6% copper. The vein is in slate and the ore is oxide and carbonate.

Mount Helena Copper.—An average of 13% copper taken from the 4 sides of the shaft from the surface to bottom, a depth of 50 ft., was secured by Messrs. Whitley & Green, of the East Helena smelter, when they took hold of this property. The mineral is mostly a carbonate and red oxide. Sinking will continue until a depth of 200 ft. is gained. The formation is a lime schist.

Peck Montana Mill.—The East Helena plant of this concern has been idle for some weeks, owing to a scarcity of ore and a desire to make some alterations.

Madison County.

In Madison Canyon, 6 or 8 miles from Norris, the electric power company has about 60 men at work on the flume. This flume is to be 10 ft. high, 14 ft. wide and 2,500 ft. long, and it is expected 1,600 H.-P. will be developed, which will be furnished to the mines of Red Bluff, Norris and the surrounding country. A number of men are engaged in getting out poles for the transmitting line.

Cowan Mill.—At the old dump of the Bozeman Mine, 2½ miles from Pony, J. F. Cowan, of Salt Lake, has set up a 10-stamp mill, formerly at the Columbia Mine near Pipestone. The mill will probably treat ores from the Old Joe Mine.

Gamet.—This company, at Pony, closed down temporarily its 20-stamp mill, owing to a shortage of ore. The Bozeman Mine will probably send its ore to this mill for treatment.

Madisonian.—This mine, near Norris, is now down 400 ft. and a station is being cut to install a large station pump. Owing to the large amount of water the management does not expect to start cross-cutting to the vein until the large pump is in place. The mine and mill are running with a full force of men.

Red Bluff.—This mine, managed by G. D. B. Turner, has erected a large gallows-frame and is building a large shaft house. The battery of boilers will be made up of 2 of 100 H.-P. and 2 of 60 H.-P. Plans are also completed for a 75-ton concentrating plant. In the mine the vein is being cross-cut at 300 ft.

Red Chief.—This mine at Red Bluff, under the management of Mr. Sherman, has the grading finished for a 35-ton concentrator, the machinery for which plant is purchased. L. D. Olds has charge of the construction work.

(From Our Special Correspondent.)

Madison Canyon Power Company.—O. B. Suhr, superintendent of this company, says that his company has 50 men employed at the canyon and that the work preparatory to installing the machinery is progressing satisfactorily.

Parrot Smelter.—Men are taking down the large smelter buildings at Parrot erected several years ago, when it was expected at that time to make a smelting town out of the place. The buildings have stood idle for a number of years, never having smelted a pound of ore. The material and machinery will be moved to Anaconda and placed in the new smelter now being built by the Washoe Company.

Silver Bow County.

(From Our Special Correspondent.)

Butte Reduction Works.—All the matte produced at these works is being sent to the Montana Ore Purchasing Works, where it is bessemerized. A converter plant will be added probably in the near future.

Nipper.—Butte papers state that in the District Court the Parrot Company recently filed a lot of objections to the July report made by Thomas McLoughline, receiver for a portion of this mine, and charges him with being incompetent and wasteful. The company also objects because his items of expenditure are not accompanied by vouchers and pay rolls and alleges that the returns of ore mined and shipped by him are too low. It is alleged that the items of credit in favor of the receiver made in the report are unjust and improper because they were incurred for the whole of the Nipper mine instead of the portion over which he is receiver. It is alleged further that the receiver is incompetent and wasteful and that thereby the values of the ore are destroyed, for which reason he should be allowed no compensation for himself or his assistants. The company objects to the report as a whole, on the ground that the receiver is turning all the ore he takes out over to the Montana Ore Purchasing Company, of which F. A. Heinze, one of the parties to the suit, is president and manager, and in that way is unjustly benefiting the Montana Ore Purchasing Company by paying it higher prices for treatment than could be obtained elsewhere. The Nipper is one of the richest mines at Butte, but is at present in the hands of a receiver as a result of a suit brought by the Parrot Company that the vein being worked through the Nipper shaft apexes on Parrot property.

Pennsylvania.—What ore is mined from this property is by the Heinzes and is hoisted through the Rarus.

NEVADA.

Storey County.

(From Our Special Correspondent.)

Gold Hill District.—The suit of Herman Scheel vs. Messrs. Foote, involving a question of disputed boundary lines separating the Umatilla and badger mining claims in Nigger Ravine, south of the Forman shaft, is on trial, without a jury, before Judge Mack, in the District Court of this county. The Umatilla is owned by Scheel and the badger by the defendants, against whom the plaintiff brought suit to restrain them from alleged trespassing on Umatilla ground. The case has now been postponed until October 4th.

White Pine County.

(From Our Special Correspondent.)

Chainman.—This mine in Ely District is being examined by L. F. Shepperd, W. J. Alexander and Fred D. Smith, who represent men from Elmira, N. Y., and Bradford, Pa. It is understood that the property has been bonded to the Eastern parties for \$250,000 pending this examination. The property consists of 5 patented claims, 2 10-stamp mills, a 25-ton cyanide plant, complete hoisting works, etc. The principal claim, the Chainman, has been opened to the 200-ft. level, with 1,000 ft. of levels and drifting. Over 100,000 tons of ore, averaging \$6 in gold, have been found blocked out ready for stoping.

Ely Mining and Milling Company.—This company is now erecting a 50-ton cyanide plant for working the ores from its mines. The mill will crush dry and the treatment is intended to be cyaniding only, with possible subsequent amalgamation of the tailings with recrushing. The mine on the Robust Claim, which is the best developed, is opened to the 150-ft. level and shows 50,000 tons of ore averaging \$12 gold. The county rock is lime and contains many caves. Near these caves are found the ore bodies, often of great size. The ore is a porous blue quartz, often showing no mineralization. George Marx is the general manager. The principal stock is held in Salt Lake City.

Pilot Knob Mines.—These copper properties, owned by Geo. Paul, of Ely, have been bonded to parties representing W. A. Clark, of Montana. The terms of the bond call for 2 shafts of 500 ft. depth before September 1st, 1900.

OREGON.

Baker County.

Cornucopia Mines of Oregon.—This company has completed arrangements to develop the water power from Pine Creek. The machinery is due to arrive at Baker City. The plant will comprise general electric generators and motors; a Lidgerwood hoist, Pelton water wheels, an Ingersoll-Sergeant 12-drill air compressor. The general electric machinery consists of two 250-H. P. generators, one 200-H. P. motor, and one 150-H. P. motor, the whole aggregating 200,000 lbs. in weight.

PENNSYLVANIA.

Anthracite Coal.

The superintendents of the Mineral Springs Company and of the Philadelphia & Reading Coal and Iron Company at Shamokin have been notified that if the men at the Cameron, Burnside and Henry collieries go on strike in sufficient numbers to cause the operations to be closed down, then the mules and iron shall be taken from the operations and the latter be abandoned. For some time the collieries had not been paying. If the 3 mines shut down 3,000 men and boys will be thrown out of employment.

At Indianapolis on September 8th the leading officials of the United Mine Workers voted to wait a little before calling upon the members of the union in the anthracite fields to cease work. President Mitchell was given power to declare a strike when he saw fit. Attempts at compromises made by various parties failed to bring about a change for the better, as the mine operators steadily refused to meet the representatives of the United Mine Workers on the ground that these representatives were better acquainted with bituminous than with anthracite mining and did not have the interests of the anthracite miner at heart. Miners throughout the anthracite region returned to work as usual on September 10th, and the outlook favored the operators, but on September 12th President Mitchell issued an order calling upon the miners not to return to work on September 17th, and to remain away from the various mines and breakers until the coal companies acceded to the demands of the Hazelton convention for an advance in wages, a complete change in the system of determining wages, reduction in the price of powder, recognition of the union, etc. Reports from the various mining towns are conflicting, but it is evident that a larger proportion of men are likely to go out in the Wyoming than in the Schuylkill or Lehigh regions. It is evident also that many of the older men do not want to go out, but that

the boys and young men are likely to go out quite generally, thus crippling the collieries. There are about 140,000 men and boys employed by the hard coal mining companies; how many will stop work is pure conjecture.

Green Ridge.—It is said that this colliery of the Union Coal Company near Shamokin is to be razed and a new one erected in its place.

Morea.—This colliery near Mahanoy City has been put into service by the Weston Dodson Coal Company, after 6 months' idleness. The plant has been undergoing extensive repairs, is now much larger, and employs 600 men and boys.

Bituminous Coal.

Webster Coal and Coke Company.—This company at Threnfeld has let the contract for a 500-ft. shaft to a Philadelphia contractor. The shaft will be 10 by 14 ft. and will tap the Lemon coal seam, increasing the capacity of the Ehrenfeld works about one-half. The shaft will be sunk on the hill north of Ehrenfeld. Under the place where the shaft will be sunk another vein of coal has been worked. There will be made an opening from the Lemon vein to the vein that has been worked below. The coal will be sent out by an electric haulage system, and with a plant for compressing air for the mining machines.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Black Hills Porcelain Clay and Marble Company.—B. R. Noble, Yale, Mich., president, and Isaac Bibbard, Rochester, N. Y., vice-president, of this company, will arrive in Custer September 15th with a party of Eastern men.

Globe.—David Jones, of Philadelphia, has arrived at Custer to begin work on this group. Ten men have begun work. F. W. Bush, formerly with the Vigilante Mining Company, is superintendent.

May.—The new vertical of ore on this property on Lightning Creek, west of Custer, at 30 ft. has widened. The ore is very rich. The shaft will be sunk 300 ft. W. W. Olds, of Custer, is general manager of the company.

Lawrence County.

Homestake Mining Company.—In July the gross production of 63,000 tons yielded \$269,112.

(From Our Special Correspondent.)

Cyanide Plants.—There are now in operation the following cyanide plants: The Deadwood plant, erected 6 years ago by the Gold and Silver Extraction Company, capacity 75 tons, now leased to the Northwestern Gold and Silver Extraction Company and is running principally on ore from the old Kicking Horse Mine; Halloran, McAllen and associates, of Lead, operating a new plant in the North Lead District, capacity 20 tons daily; Allen, Small & Soule, operating a 25-ton plant at Ragged Top on ore from their own and leased ground; the South Dakota Mining Company, running a 30-ton plant at the old Wilson stamp mill, at Central City, on ore from the Gunnison Mine, in the Portland District, J. M. Henton, Central City, being chemist in charge; Cook & Parker, of Deadwood, operating a 30-ton plant at the mouth of Blacktail Gulch, on ore from the Omega Mine, Terraville; Dead-broke Mine, owned by R. M. Maloney, 25-ton plant; Detroit & Deadwood plant on Annie Creek, crushing capacity 200 tons, tankage 65 tons, ore crushed dry, will treat company and custom ore, W. D. Parker chemist.

Of the new plants that will be completed in the next 60 days, there are the Homestake, daily capacity about 1,000 tons, to treat tailings, which contain about \$1.50 per ton gold and cost \$250,000, with C. W. Merrill, Lead, chemist in charge; the Cleopatra Mining Company is to have a new plant completed September 15th, crushing capacity 100 tons leaching, 75 tons, R. B. Hughes, Spearfish, general manager; W. E. Sharp, chemist; the Spearfish Gold Mining and Development Company, capacity 200 tons crushing and leaching 100 tons, company has 365 acres of ground at Ragged Top, with W. G. Moore, Colorado Springs, Colo., manager; O. N. Brown, chemist; the owners of the Wasp No. 2 and other mines in the Yellow Creek District are completing a 50-ton plant, leaching capacity at first 20 tons, R. F. Flinterman, Deadwood, chemist; the Portland Mining Company, of Clinton, Ia., which purchased the Baltimore & Deadwood stamp mill, is building a cyanide annex, capacity 75 tons, ore to come from Portland, N. W. Chapman, Deadwood, manager; at the Esmeralda Mine, in Blacktail gulch, the Shawmut Gold Mining Company is building a 40-ton cyanide annex, James Terry manager and J. M. Henton chemist, both of Central City; the Keystone Mining Company, Pennington County, has nearly completed a 30-ton plant at the Keystone Mill for ore from Keystone Mine.

Pennington County.

(From Our Special Correspondent.)

Big Bend Company.—Roesler & Johnson, of New York City, have in operation a new placer plant on Rapid River, 4 miles below Pactola, J.

C. Sherman, of Pactola, has 6,000 ft. of old river bed, which will be worked by the company. A steam dredge strips off several feet of the top. At pit is then sunk to bedrock and the pay gravel is elevated to the sluice boxes. A pump, capacity 4,000 gal. per minute, keeps the workings dry. The capacity is 1,000 yds. per day. The company employs 45 men. It is by far the biggest placer undertaking in the history of the Black Hills.

Lena.—It is stated that the Minneapolis owners of this mine, north of Hill City, have decided to continue development work.

Summit.—John Wise, of Hill City, will erect a small stamp mill on this group near Hill City. He has organized a company.

UTAH.

(From Our Special Correspondent.)

Bullion and Ore Shipments.—During the week of September 8th the several smelters sent forward 21 cars, or 889,569 lbs., lead-silver bullion; 5 cars, or 250,186 lbs., copper bullion. In the same week there were marketed from the different camps ore and concentrate products aggregating 104 cars, or 4,582,390 lbs., lead, silver and gold ores and 2 cars, or 78,908 lbs. copper ore, which were consigned to smelters outside of the State.

To Treat Zinc Ores.—The new plant of the American Smelting and Refining Company will have a department for treating zinc ores and the recovery of zinc. There is a great need for this.

Grand County.

(From Our Special Correspondent.)

A vigorous protest is being made by La Sal miners against the leasing of large areas of mountain slopes, for grazing sheep and cattle, where mining claims have been made. On Labor Day there was a large gathering of miners at Mill Creek and resolutions passed, copies of which were sent to the Secretary of the Interior, the Utah State land board and to the register of the United States land office at Salt Lake.

Juab County.

(From Our Special Correspondent.)

Tintic Shipments.—In the week ending September 8th there were sent forward from the 3 shipping points of the district 109 cars of ore, 6 cars of concentrates and 1 bar of bullion, contributed as follows: Centennial-Eureka, 32 cars; Mammoth, 17 cars, 1 bar bullion; Gemini, 12 cars; Swansea, 12 cars; Eureka Hill, 10 cars ore, 6 cars concentrates; Grand Central, 10 cars; South Swansea, 5 cars; Godiva, 4 cars; May Day, 2 cars; Joe Bowers, 1 car; Showers Consolidated, 1 car.

Centennial-Eureka.—Production continues above 30 cars a week. Below 800-level in new territory an ore body is cut which promises well.

Grand Central-Mammoth.—There is a likelihood of this trespass suit coming on for trial next month. From all that can be gleaned there is small chance for any adjustment out of court.

May Day.—Report has it there is a debt of \$10,000, which was used as a club in knocking down the shares. The promised ore outpouring is in order.

Utah.—Two cars of high-grade silver-lead ore were marketed this week from this Fish Springs claim, and regular shipments will follow. It is said the mine has not booked so well for the past 3 years as at present.

Piute County.

(From Our Special Correspondent.)

Annie Laurie.—Much progress is made in equipment. The flume—10,000 ft. in length—is completed, all the machinery for mine and mill is on the ground and everything will be under cover by October 1st. There are 70 men now employed. Manager L. C. Huck arrived at Salt Lake from Chicago on September 6th, and in company with Superintendent Walter G. Filer visited the property 3 days later.

Salt Lake County.

(From Our Special Correspondent.)

Bingham Copper and Gold.—Exploration is advancing well under the direction of Captain Duncan McVichie. A new ore body is cut showing higher copper values than the average.

Dalton & Lark.—It is understood that the Farnsworth option is off. A meeting of shareholders is called for September 17th to empower the company to sell all or any part of its holdings.

Darlington-Grizzly-Regulator.—W. H. Child makes known the bonding of the Grizzly-Regulator group and the Darlington and Harkness claims, at Alta, to Denver men for \$125,000, \$30,000 payable in October.

Midland.—At about 1,000 ft. in the tunnel cut a promising ore body. A 2-ft. seam carries \$80 gold, 100 oz. silver, while the whole tunnel face is in ore. Some months since Messrs. Hudson & McCormick gave up a lease on the ground. The Midland Company is fortunate in now working it.

Shawmut.—Mill is in commission and doing

fairly good work. First shipment of concentrates was expected September 8th.

United States.—Plans for a smelter are submitted to the Boston office and the report is out at this end that construction is liable to begin in the near future. But slight credence is accorded to this rumor.

Utah Consolidated.—Near approach of the smelter enlargement necessitates several betterments at the mine. The lower terminal of the tram at the railroad has to be enlarged to take care of the minimum production of 400 tons per diem. The 7th level is to be made the main working artery instead of No. 6, requiring a new terminal station at the mine, with ore bins, etc. It is said that development continues as favorably as in the past.

Summit County.

(From Our Special Correspondent.)

California.—A large shoot of base ore is cut in the winze from the upper tunnel. A layer of shale, which was thought to be the foot wall, was broken through, opening into another ore body 12 ft. thick. It is said to carry 35% zinc, 17% lead and 8 oz. silver, which would be a good concentrating product.

Park City Shipments.—In the week of September 8th the total smelter products marketed through the Mackintosh sampler was 3,294,000 lbs., made up as follows: Silver King, crude, 1,405,410 lbs., concentrates, 469,130 lbs.; Daly-West, concentrates, 605,407 lbs., crude, 452,260; Anchor, concentrates 203,340 lbs.; Loring Bros. concentrates, 98,740 lbs.; California, concentrates, 59,650 lbs. August shipments aggregated 13,930,390 lbs., compared to 15,561,867 lbs. for the same month last year. This is the first month in 1900 that there was a decrease.

Tooele County.

(From Our Special Correspondent.)

Consolidated Mercur.—August ore production was slightly below 1,000 tons per diem of \$7 ore. It is estimated the net yield was in the neighborhood of \$85,000. The new stock books have arrived and shares are being issued.

Overland.—Manager Duncan is expected back from Boston by September 10th, when the work of completing the mill will be hastened. He is confident that by treating 700 tons a day a substantial profit can be had from \$2.50 and \$3 ore.

WASHINGTON.

Ferry County—Republic.

(From Our Special Correspondent.)

Collins & Leary Gold Mining Company.—This company owns the Maud and Nelly claims, thought to be on the northeast extension of the Tom Thumb vein. The croppings are not well defined. A shaft is down 40 ft. on the Maud, on vein material 2 ft. wide, 18 in. of it being quartz that runs \$1.40 per ton. The croppings are being prospected for higher values.

Tulip.—The main working shaft is down 285 ft. below the adit level and 425 ft. below the apex of the vein. Levels have been opened 50, 100 and 200 ft. below the adit level. On the 50-ft. level drifts run north and south on the vein. On the 200-ft. level drifts and cross-cuts were well under way. A diamond drill has been prospecting in the mine for 2 months. A bore hole from one drift passed 15 ft. through quartz, the cores from which gave average assays of \$14 per ton. A strong flow of water prevents work and the hole has been plugged. The end of the north drift on the adit level ran into country rock, but the diamond drill showed stringers of quartz 235 to 300 ft. east of the drift. The vein at 500 ft. below the adit level is about 50 ft. wide and carries two fine bodies of ore. On the 200-ft. level a cross-cut is being driven, from which a raise will be carried up to connect with the 100-ft. level and thence to the 50-ft. level. From the 50-ft. level an upraise for a slope has been carried up on the vein 39 ft. and discontinued until the custom mills start. The average value of 68 mine cars of ore raised from it ran \$68.91, with 5 oz. silver to 1 of gold being about the average proportion throughout the mine. From the adit level, 50 ft. north of the shaft, an upraise has been carried up about 50 ft. on the vein, preparatory to stopping, the ore showing from 4 to 9 ft. wide, with an average of \$41.65 per ton. From 200 to 300 tons of ore are on the dump ready to ship. Ore can be broken after the custom mills start faster than it can be treated.

WEST VIRGINIA.

Taylor County.

Flemington Coal and Coke Company.—The strike at this company's mines, which began on July 3d, was settled through J. C. McK. Richardson, the company's mine superintendent and engineer. The pick miners accept a reduction of 5c. a car and the machine men a proportionate reduction. Day and contract laborers are to remain as before. The Flemington mines are owned by a New York company, of which J. D. Redding is president and S. L. Simpson vice-president and general manager.

FOREIGN MINING NEWS.

CANADA.

British Columbia—West Kootenay District.

Highland.—This English Company recently bought the Highland group on Woodbury Creek in Ainsworth Division, paying, it is said, \$100,000. It has contracted with the Bradley Engineering and Machinery Company, of Spokane, for a 150-ton concentrating plant. A tramway from the mine to the concentrator is to be completed within 30 days. The plant will include Gates crushers and rolls, picking tables for sorting, jigs, sizing trommels, hydraulic classifiers, rolls for regrinding of middlings and Hallett concentrators. The company is putting in 3 water-wheels, one for the main crushing and jiggling section, a separate one for the tables to give uniform speed and a third for the electric lighting plant. The entire cost of the plant, not including the tramway, will be about \$30,000.

(From Our Special Correspondent.)

Rossland Ore Shipments.—The shipments from Rossland mines for the 8 months and 6 days ending Sept. 6th amounted to 120,000 tons, valued at \$2,000,000. The daily shipments from these mines now amount to 1,000 tons.

Centré Star.—Ore shipments at this Rossland mine were resumed simultaneously from the dump and bunkers on September 4th. About 300 tons daily are being sent to the Trail smelter.

Le Roi No. 3.—The new bunkers at the Nickel Plate have been furnished and shipping facilities are complete. The foundation for the new electric compressor plant house is begun.

Mineral Tax.—The Provincial Government has decided to enforce the mineral tax of 2% on the net smelter returns of ore treated, notwithstanding the various protests made on behalf of the mining interests.

School of Mines.—The Dominion Government has granted the sum of \$2,500 under certain conditions for a school of mines to be established in Rossland.

British Columbia—Yale District.

Granby Consolidated Mining and Smelting Company.—A. B. W. Hodges, secretary of this company, informs us that the company's smelter at Grand Forks blew in August 21st with 1 stack and this stack has been treating since 300 tons of ore daily. A second stack is to be blown in within a few weeks. The company is making matte, which for the present is shipped to New York.

(From Our Special Correspondent.)

The British Columbia Legislature will be asked this session to charter a railway 4 miles long, from Grand Forks to Carson, B. C., on the International Boundary, there to connect with a projected railway, 30 miles long, to Republic Camp, Washington. Republic mine owners are supporting the proposed enterprise. If it is realized, then will be presented the anomaly of American ores being hauled into Canada for treatment. The siliceous ores of Republic, and the sulphide ores of the Boundary, metallurgists say, will flux admirably.

Similkameen District.—This district, 100 miles west of the Boundary District, is overrun with prospectors. The copper-gold ledges are said to be the largest in British Columbia. The only property on a shipping basis is the Nickel Plate on Twenty Mile Creek, owned by Marcus Daly. Some of the ore (free-milling) is reported to exceed \$100 a ton. The region, however, is remote from transportation. The Canadian Pacific has had survey parties engaged for the past 2 seasons making surveys through the district. The proposed route extends northwesterly from Midway, the present western terminus of the Columbia & Western branch through Princeton to Hope, a station on the main line. Copper Mountain properties now being developed are the Sunset, Lost Horse, Helen Gardner, Princess May, and Olympia. The Sunset is the only property in that vicinity that is equipped with a plant, owing to the cost of hauling in machinery over the mountains.

COAL TRADE REVIEW.

New York. Anthracite.

Sept. 11.

During the past week the threatening aspect of the labor situation at the collieries has overshadowed everything else, and there has been a wild scramble to get coal, more orders coming in than the companies can fill if there is a general stop of mining next Monday. The activity of the labor organizers has been noted in this column from time to time, and months ago attention was called to the very strong probability of a strike this fall. Those Eastern buyers who were wise and took advantage of low coastwise freight rates in July and August, now have the laugh on their dilatory brethren who waited till the very last before ordering coal. Moreover, those who buy coal now are expected to pay July 1st prices. The rush to buy has been

more marked at Philadelphia and New York than at Boston, since dealers here, being independent of ocean freight rates, have got in the way of waiting longer. Now they are in a hurry. The week's delay in calling the strike will enable a heavy tonnage to go forward, much larger than at first sight would seem possible.

The total August production was 4,919,000 tons, the largest month's output this year, and larger than any month in 1899 except October. The total production this year to September 1st is 30,953,100 tons, or an increase of 1,756,750 tons over the same period of 1899 and the largest amount ever missed in a corresponding period. Evidently coal has been stocked, but still the supply available, according to all reports is not large.

In the West dealers have notified consumers of the situation and there has been more buying. An advance of 25c. at the head of the Lakes has gone into effect. Chicago buying has not been as active as expected. Just what will happen by Monday no one, not even the most experienced men in the trade, can predict. There is said to be an undercurrent of resentment among the miners at the failure of the officials of the United Mine Workers to declare the strike on September 8th, as expected. Certainly there are some curious features about the way the officials have acted. President Mitchell declared Monday morning, at Chicago, that he would declare a strike Saturday unless in the meantime he heard from the mine operators, but on Wednesday afternoon, at Indianapolis, he sent an appeal for arbitration to the operators at 4 o'clock, and at 5.30 declared a strike to take effect next Monday. Such delay is not calculated to inspire allegiance among the more thoughtful miners.

The list price for free burning hard coal f. o. b. Perth Amboy is, broken \$3.50, egg \$3.75, nut and stove \$4.

Bituminous.

The demand for coal in the Atlantic seaboard soft coal trade is heavy, while the supply at shipping ports is light. This light supply is due chiefly to the short supply of cars, the railroads sending all the coal cars they can get hold of into the hard coal regions on account of the labor troubles there. Aside from this abnormal feature, however, the market for soft coal is very strong. The down east ports and those along Long Island Sound show the most vigorous demand, the requests from consumers being often urgent. New York Harbor trade is fair and all-rail trade shows improvement.

Car supply at the collieries, owing to the calls for transportation by anthracite shippers, is light and variable—about 25 to 50% of the total number wanted.

Transportation from mines to tide is wretched. We hear of cars being hung up along the lines for a month, while no shipper need expect cars to come through in less than a week or 10 days. This condition of things is likely to last until the outlook in the anthracite region has cleared and producers know what to expect.

Foreign trade keeps up well. Cargo shipments are steadily going to Europe without exciting particular comment. Freight rates are firm. We hear of an offer of a 3,100-ton ship at 18s. 6d. (\$4.32) for September loading from Baltimore, Philadelphia, Norfolk or Newport News for Havre, Bordeaux or Dunkirk; also a 3,200-ton ship for October loading from Philadelphia to Genoa or Marseilles for 21s. (\$5.04).

In the coastwise vessel market the supply of vessels at Philadelphia has held rates from that port down to 75c. to Providence, New Bedford and the Sound, and to 90c. to Boston and Lynn; \$1 to Newburyport and Camden and \$1.05 and towages to Saco.

Regular contracts take such a large proportion of the coal shipped that it is difficult to give current prices, but coal is quoted at \$2.25@2.50 per ton at the lower shipping ports and \$2.50@2.85 at New York Harbor ports.

Birmingham, Ala. Sept. 10.

(From Our Special Correspondent.)

In the coal market there have been none of the fluctuations which have recently characterized the iron market. Prices are firm and business good. All mines are running at their fullest capacities and several new mines are now being opened up in the district. The shipments of coal from Walker County to New Orleans are keeping up nicely and efforts are being made to increase the shipping facilities both by water and land. The Kansas City, Memphis & Birmingham Railroad is going to build a line through the Walker Coal-field and is preparing to compete for some of this business.

Cleveland, O. Sept. 12.

(From Our Special Correspondent.)

Some conditions developed to-day which are rather distressing to both the vessel owners and the shippers. One of the largest coal shippers in the northwest sent a letter of instructions to his agents in this city to send no more coal for 10 days at least. It is presumed that his dock space up there is limited and that the owner of the boats will be compelled to wait until the railroads can get some of this coal into the interior. It seems as if the lake conditions are

all about the same. Four ships have been laying at their docks here for the purpose of getting cargoes as they appear, but none have showed themselves as yet. The movement to Milwaukee is brisker than it has been, the supply of boats and the cargoes being about even. Vesselmen and shippers are so interested in the movement of boats that they have not stopped to talk freights and the same prices prevail as have been in existence for weeks—namely, 30c. from all important shipping points. The movement away from the mines is heavier than it has been, owing to the demand for domestic coal, which is becoming a feature.

Pittsburg. Sept. 12.

(From Our Special Correspondent.)

Coal.—It is not feared here that the threatened strike of the miners in the anthracite coal-fields, if it materializes, will affect the interests in the Pittsburg District. The United Mine Workers will not interfere in the operations of the mines unless coal is shipped East to fill contracts of the anthracite operators. This will not likely be done, as the Pittsburg Coal Company, the combination of railroad coal operators, expects to have all the contracts it can fill when the mills are in full operation again, and this from present indications will be within a week or two. At present nearly all the mines are in operation, most of the product going to fill contracts for the Northwest. The rivers rose slightly last night, but the water is not near a navigable stage. The officials of the Monongahela River Consolidated Coal and Coke Company, the river coal combination, which has an unusually heavy supply loaded, have not given up hope and are anxiously awaiting a resumption of navigation. The amount of coal shipped South this year is not up to the standard of other years. Navigation was not resumed last year until December 13th, and since that time about 65,000,000 bu. of coal have been sent to the Southern markets. About 80,000,000 bu. should have been shipped to date. There is awaiting shipment in coal boats and barges fully 25,000,000 bu., a larger amount than has been held at this port for a number of years, possibly since 1895, the year of the prolonged drought. There are ample facilities for moving this big stock of coal as soon as the rivers are navigable.

Connellsville Coke.—The production last week showed a slight decrease, while the shipments were somewhat greater. Standard Connellsville coke is still being held at \$1.75 for furnace and \$2.25 for foundry. Outside producers are selling furnace coke at \$1.50. Of the 20,420 ovens in the region 13,511 are active, 428 ovens having been put out of blast during the week. The production last week was 143,148 tons, as compared with 143,789 the previous week. The shipments aggregated 7,634 cars, distributed as follows: To Pittsburg and river tipples, 2,988 cars; to points west of Pittsburg, 3,299 cars; to points east of Connellsville, 1,347 cars. This was an increase of 229 cars, compared with the shipments of the previous week.

San Francisco. Sept. 8.

(From Our Special Correspondent.)

Coal receipts at San Francisco in August by water were 145,441 short tons, an increase of 17,878 tons over August, 1899. The increase was due chiefly to the arrival of three cargoes of Cumberland coal from Baltimore. For the eight months ending August 31st the receipts were, in short tons:

	1899.	1900.
Eastern, anthracite and bit.....	21,486	11,483
Oregon	64,435	25,790
Washington	411,183	443,567
Total domestic.....	497,104	480,846
British Columbia.....	309,771	386,307
Australia	104,993	102,127
Japan	6,350	6,100
Great Britain.....	43,062	44,273
Total foreign.....	464,176	538,807
Totals	961,280	1,019,653

These figures do not include coal from California mines and from Rocky Mountain mines by rail.

Foreign Coal Markets.

The English coal trade, at latest accounts, had not recovered from the disturbance caused by the Taff Vale strike, which temporarily closed the railroad which serves the more important Welsh collieries. Prices of coal, both for home use and export, have been high. Welsh steam coal on dock at shipping port is quoted at \$7.20 for lump, down to \$5.04 for steam coal. Good average bunker coal for steamers is \$6 per long ton on wharf. In Northern ports the quotation for Northumbrian steam coal is \$5.28@5.76. f. o. b. Tyne port. Bunker coal ranges about the highest price.

In France current quotations in the Nord and the Pas-de-Calais—the chief coal producing districts—are for lump, steam coal, \$6.80 per metric ton; nut \$6.50; washed, \$7; run-of-mine, \$4.60. Lower class coal can be had for \$4. To these prices from \$1 to \$1.50 must be added for freight to Channel ports, and from \$2 to \$2.75 to Mediterranean ports.

Atlantic freights are just now very high. Some recent charters noted call for \$5.04 per ton from Norfolk or Newport News to Genoa or Marseilles, and \$5.28 to Trieste. From Baltimore and Philadelphia recent charters are for \$4.32 to English Channel port, and \$5.40 to Mediterranean port. These rates are for steamers, and owners are not inclined to make repeat charters.

Roughly speaking, a freight rate of \$5 to a Mediterranean port would leave the shipper about \$3 a ton for coal at Norfolk and enable him to sell at the same price on wharf at destination as the English shipper, taking present English port prices.

SLATE TRADE REVIEW.

New York. Sept. 14.

The August shipping lists of quarrymen and manufacturers, especially in Pennsylvania, show an increased volume of business. The movement of roofing slate in that month exceeded the shipments in June and July. Blackboard manufacturers were particularly busy completing contract orders with educational institutions that were to reopen early in September. These blackboard shipments, as well as those of school slates, show a marked increase over any previous month in this or last year. There was also a slightly better movement in other manufactured slate.

The shipments of slate through Slatington and Walnutport, Pa., in August and the 8 months of this year were, as follows:

	Roofing squares.	School cases.	Black-board crates.
August	21,690	3,116	4,171
Eight months	126,923	14,282	11,656

As compared with the corresponding 8 months last year the roofing slate shipments show a falling off of 12,426 squares, but the school slates record an increase of 4,994 cases, while black-board shipments are less by 2,010 crates.

Concerning prices there is still much discussion among sellers. New price-lists of roofing slate dealers show a drop of 15 to 50c. a square in some Pennsylvania qualities, and from 10 to 25c. in Vermont sea-green. In fact, it is almost impossible to quote actual selling prices, as competition is so keen that buyers have the market pretty well in hand.

Export trade is unsettled by the high freight rates, which are 17s. 6d. to London and proportionately to other British ports. However, fairly large quantities of roofing slate are going to Germany. On the other side the Welsh quarrymen, especially those at Portmadoc, have lowered their prices still further, as orders are so few and competition with the foreign product so aggressive. The Carnarvon shipments of slate in June amounted to 6,591 long tons, or 681 tons less than June, 1899. In the quarter from April to June, 1900, the exports aggregated 20,514 tons, against 21,795 tons last year, showing a falling off of 1,281 tons. On the other hand, the Welsh production is increasing.

The list of prices per square for No. 1 slate standard brand f. o. b. at quarries in car-load lots, is given below:

Size, inches	Monsonville	Bangor	Bangor Kibboun	Alb'n, or Jackson Bangor	Chap'n Keys	Peach Bottom	Sea Gr'n	Unfad'g Green	Red
24 x 14	6.50	3.50	3.00	3.00	3.80	5.10	2.90	3.75	.....
24 x 12	6.60	3.50	3.00	3.00	3.80	5.25	2.90	3.75	.....
22 x 12	6.60	3.50	3.25	3.00	4.00	5.25	2.90	4.00	.....
22 x 11	6.50	3.75	3.25	3.00	4.00	5.25	2.90	3.75	.....
20 x 12	6.90	3.75	3.00	3.00	4.00	5.25	2.90	3.75	.....
20 x 11	6.80	3.75	3.25	3.00	4.00	5.25	2.90	3.75	.....
20 x 10	6.80	4.25	3.50	3.25	4.00	5.35	2.90	4.25	10.50
18 x 12	6.80	3.75	3.00	3.00	4.00	5.25	2.90	3.50	.....
18 x 11	7.00	3.75	3.00	3.00	4.00	5.25	2.90	3.75	.....
18 x 10	7.00	4.25	3.50	3.25	4.00	5.35	2.90	4.00	10.50
16 x 9	7.00	4.50	3.50	3.25	4.00	5.35	2.90	4.25	10.50
16 x 12	6.80	3.75	3.00	3.00	4.00	5.25	2.85	3.50	.....
16 x 10	7.00	4.25	3.50	3.25	4.00	5.25	2.85	4.00	10.50
16 x 9	7.00	4.25	3.25	3.25	4.25	5.35	2.85	4.25	10.50
16 x 8	7.00	4.50	3.50	3.25	4.25	5.35	2.85	4.25	10.50
14 x 10	6.60	3.75	3.25	3.00	4.00	5.25	2.70	3.75	10.50
14 x 9	6.60	3.75	3.25	3.00	4.00	5.10	2.70	3.75	10.50
14 x 8	6.60	3.75	3.25	3.00	4.00	5.10	2.70	4.25	10.50
14 x 7	6.40	3.75	3.25	3.00	4.00	5.10	2.50	4.25	10.50
12 x 10	5.75	3.00	3.00	3.00	4.00	5.10	2.50	3.25	.....
12 x 9	5.60	3.00	3.00	3.00	4.00	5.10	2.50	3.25	.....
12 x 8	5.50	3.50	2.85	2.85	4.85	4.85	2.50	3.50	9.00
12 x 7	5.00	3.25	2.85	2.85	3.25	4.85	2.25	3.50	9.00
12 x 6	4.80	3.25	2.85	2.85	3.25	4.75	2.25	3.50	8.50

A square of slate is 100 sq. ft. as laid on the roof.

IRON MARKET REVIEW.

NEW YORK, Sept. 14, 1900

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending				From Jan., '99.	From Jan., '00.
	Sept. 15, 1899.	Sept. 14, 1900.	F'ces.	Tons.		
An' racite & Coke.	233	262,300	197	225,425	9,034,817	10,929,048
Charcoal.	24	5,750	31	8,225	190,312	285,817
Totals.	257	272,050	228	233,650	9,225,129	11,214,865

The iron market shows an increasing volume of business, though it is still rather irregular, and prices are confused and uncertain.

In pig iron the most notable event was the sale of 3,000 tons Bessemer pig in Pittsburg at \$14.25, the lowest point reached yet. Foundry iron has sold in fair quantities. Steel billets have been quoted at \$17.50 Pittsburg.

In merchant steel business is improving decidedly, while there is a demand from shipbuilders for plates; they are also calling for angles and other shapes. Structural business is good.

The conference between the Amalgamated Association and the bar iron makers failed to reach any agreement on the wage scale. Leave was given to the members working in independent mills to continue for the present under last year's scale.

The rail makers will hold a conference next week to decide on contract rates for the coming year.

Birmingham, Ala. Sept. 10.

(From Our Special Correspondent.)

There is but little change in the local pig iron market. Domestic business is practically dead and iron is still accumulating in the furnace yards. It is now estimated that there are between 125,000 and 135,000 tons of iron in the furnace yards of this district. This, however, is not a very big stock of iron for the district to carry and if business would loom up so as to prevent further accumulations everything would move along. As it is, several furnaces have gone out of blast recently. Gadsden Furnace of the Alabama Consolidated Coal and Iron Company went out of blast this past week, making 2 furnaces of this company out now. The Sloss-Sheffield Steel and Iron Company has 3 idle, 1 in Birmingham and 2 at Sheffield; and the Tennessee Coal, Iron and Railroad Company has 5 out, 2 at Sheffield, 2 at Ensley and 1 at Oxmoor. Large stocks of pig iron are on hand at all these yards.

The pipe plant of the Central Foundry Company at Bessemer shut down this past week on account of a strike, caused by a reduction in the wages of the men of 6%. It is expected, however, that an adjustment will be made in a few days and the plant again resume operations.

In all 7,000 tons of pig iron are reported to have gone into the warrant yards of the district during the month of August and about 1,000 went out. There are now in the yards about 10,000 tons of iron.

While the domestic trade is not as brisk as it should be, iron operators are in receipt of more orders than formerly, but most of them are for export business. Trouble is being experienced in securing shipping room for the export iron. The ocean freight rate has increased from 50c. to \$1 per ton. Still some export iron is being moved. One interest is reported to have shipped 6,000 tons export during this past week. Export orders for 5,000 and 2,000 tons are also reported. The sales were made on the basis of \$11 for No. 2. Upon the most reliable information obtainable the present bookings for export are approximately 100,000 tons, which is equivalent to about 1 month's run of the Alabama furnaces.

Iron makers are still sore over the fact that the railroads will not help them out at this time by reducing freight rates to the point which obtained before the advance in iron last year. They claim that with the \$1 reduction in freight they could get into the field beyond the Ohio again and hold their own there and get a good amount of business.

The present quotations are: No. 1, foundry, \$12@12.50; No. 2, \$11@11.50; No. 3, \$10.50@11; No. 4, \$10@10.75; gray forge, \$9.75@10.25; mottled, \$9.75@10.25, and No. 1, soft, \$12@12.50; No. 2, \$11@11.50.

Cleveland, O. Sept. 12.

(From Our Special Correspondent.)

Iron Ore.—Shippers have made their appearance on the market during the week and have bid for tonnage for the movement of a limited amount of ore down the lakes. The conditions were extraordinary and the rate was made 70c., a drop of 5c. This is not to be taken as establishing a rate, but the market is very weak, owing to the lack of stuff to be moved. Boats are taking grain rather than accept ore at less than 75c., the new rates on wheat being equal to that figure. Other conditions, therefore, than the movement of ore itself will militate to the establishment of a higher rate for carrying ore from the head of the lakes. The movement from Escanaba and Lake Michigan ports is so light that a market can hardly be quoted. Some inquiries on ore for the first half of next year are being made, but it seems that this is more for the purpose of allowing the furnacemen to figure on the price to charge for their pig iron than for actual business in iron ore. The association prices have been quoted in every instance.

Pig Iron.—The market shows up a little better all the way around this week. The sales for spot delivery have improved greatly in the last week and also those for the future. The sales for the future are much larger than for spot delivery, ranging between 1,000 and 2,000 tons. There is some talk of business for the first quar-

ter of next year, but for the most part it is confined to the latter half of this season. The prices have been none too good of late, dropping to \$14.50 and \$14 on Nos. 1 and 2, both for immediate and for future shipments.

Bessemer iron is stronger, but this did not prevent another attempt to break the prices. The price is nominally \$16, for which most of the houses are holding, but some concerns have made a cut. There have been sales made as low as \$15.

Finished Material.—There is a decided improvement in the ship-plate market. Prices have gone up to 1.20, 1.25 and 1.30, with 1.25 about representing the market. The advance is due to the fact that the mills are now sold up to the limit of their capacity for the latter half of this year. Those who have no steel to run them now will have to depend upon the surplus of the plants. The announcement that the mills are all sold out for this year brought out the fact that a number of consumers have not filled their supply as yet and others had not laid in as much as they wanted. Some such a state of affairs now exists with reference to bars. The market is strong at 1.15@1.20 and sales are heavy, although the mills are not filled up to the limit of their capacity. The feeling in shapes is a little stronger than it has been. There is a better demand for billets, which are bringing \$18.

Old Iron.—The market hears of a more general demand. Heretofore sales were only made in stove and machine cast. Now they show a demand for almost every grade and the buyers are willing to pay good money for stuff.

Philadelphia. Sept. 1.

(From Our Special Correspondent.)

Pig Iron.—Our pig iron offices are rather dry of news. The crisis which buyers instinctively feel is coming has not arrived. The downward tendency in prices is still at work. The quotations given to-day are practically the same as last week. Investigation among consumers develops a degree of indifference, but the situation cannot much longer remain as it is.

Billets.—Buyers here have been discouraged by the refusal of makers to listen to offers. One or two Eastern parties are ready and willing to place large orders. It is believed that when the rail makers on the 20th fix prices of steel rails that we will know something more about billets.

Merchant Bars.—The bar iron market is active in a retail way, and there are inquiries this week from various sources, among them two or three car building concerns, for a good deal of common iron. One considerable contract was taken yesterday by a Schuylkill Valley mill at what looks like a drop.

Nails.—Hardware dealers report a good sale for nails.

Sheets.—No new business has come in this week. Large consumers here say there will be nothing lost by going slow.

Merchant Steel.—Mill agencies report failure to close some contracts which have been under consideration a long time. The reason given is that buyers are after concessions and makers are expecting to get outside current prices. The supply of corrugated material for average demand is light and mills will not make any unusual weights without orders.

Plates.—The strong demand West is reflected here in an absence of concessions. The plate market outlook has not been better for a long time, and every day sends some good business to the mills. The ship-building requirements promise to become a great factor next year. There are more ships wanted than existing yards will be able to build. Quarter-inch plates are taken at 1.30; shell, 1.45@1.50; flange, 1.60@1.70, and No. 1 charcoal iron plates, 2.40c.

Structural Material.—There is some office expectation that a new deal may be made regarding structural material, but there are no known grounds for it. Angles are 1.30; beams and channels, 15 in. and under, 1.60c.

Steel Rails.—There is no hurry in view of new quotations next week. Local railroad men say they think they are entitled to a \$10 drop.

Iron Rails.—Efforts are now being made to close a deal in old iron rails for Italy. They are hard to get. The usual quotation is \$14.

Scrap.—Our scrap people are all smelling around after scrap, to be ready for a demand that they say may get in any day. Choice railroad at \$14 and heavy steel scrap at \$12 would sell without much trouble, but brokers are finding it an uphill business to get what they want. Old car wheels and axles are salable, but it is seldom a lot is to be had.

Pittsburg. Sept. 12.

(From Our Special Correspondent.)

The most notable event in the iron market during the week was the sale of 3,000 tons of Bessemer at \$14.25, delivered in Pittsburg this month. This is the lowest price reached since the market was declared an open one. No contracts are being made for extended future delivery. While but one furnace of the Bessemer Furnace Association is being operated on Bessemer iron and three on foundry iron, the association has large stocks on hand and is able

to fill all requirements for some time to come. The Salem Iron Company has blown out its furnace at Leetonia, O., and it will be re-lined and put in blast again in about three months. The Shenango Furnace Company, an independent concern, started its furnace at Sharpsville, Pa., during the week. It had been out of blast for some time for repairs. The steel market remains unchanged and but little improvement is expected until after the election. There was great disappointment over the failure to settle the iron wage scale at the conference between representatives of the Amalgamated Association of Iron, Steel and Tin Workers and the Republic Iron and Steel Company and the American Steel Hoop Company, which adjourned at Detroit on Saturday afternoon. A strike was avoided by an arrangement to meet at some future date to be named by either side. The workers made the only concessions. The original demand was for \$5.50 a ton for puddling when bar iron sales average 1.5c. This was the base, the rate to advance with every 1/10c. increase in the price of bar iron. The manufacturers offered \$4.50 a ton for puddling at a bar iron price of 1c., that to be the base. The workers finally came down to \$5 a ton for puddling with bar iron at 1.4c. as the base. This was rejected and as a further concession they wiped out the new foot-notes to the new scale, all of which were of great advantage to the workers, and presented last year's scale in its entirety. This was rejected. It is believed that another conference will be called, or that the scale will be accepted by the combinations within the next week or 10 days. On Monday the Amalgamated Association sent out notices to about 20 independent concerns that had signed the original scale and have been operating the mills under it, that after that date they will not be required to pay more than last year's rates. The puddlers who have received \$6.12½ a ton for boiling during July and August will now get but \$5 a ton. The time and place for holding the conference on the wage scale for the tin-house men have been changed from Tuesday at Cleveland to Thursday at New York. The tin-house-men compose the Tin Workers' International Protective Association. This will be the second conference, the first having been fruitless, the representatives of the American Tin Plate Company having refused to treat with the committee, as it did not have discretionary power. Since that time, by a vote of the membership, the committee has been given authority to make a settlement and an agreement is confidently expected. The signing of this scale will remove all obstacles in the way of starting all the tin plate plants owned by the American Tin Plate Company and giving employment to fully 50,000 men engaged in the industry.

Pig Iron.—A sale of 3,000 tons of Bessemer was made during the week at \$14.25 and several small sales aggregating about 1,000 tons at a trifle higher figure, delivered in Pittsburg this month. The prices of foundry iron are about the same as last week, although in some instances it is said the rate was somewhat lower.

Steel.—There is but little doing in Bessemer steel billets. Some small sales were made during the week at \$17.50, a slight decline from last week's quotations. Open-hearth billets are still quoted at \$20. The minimum price for steel bars and plates this week is 1.10c., but much higher prices have been obtained for small lots.

Sheets.—Independent mills have established higher prices this week and have sold No. 27 at 2.75@2.80c. No. 28 at 2.85@2.90c. The American Sheet Steel Company continues to quote No. 27 at 3.10c. and No. 28 at 3.20c.

Ferro-manganese.—There is no change in the price of 80% domestic, the leading producer continuing to quote \$55.

New York. Sept 14.

The local iron market is, if anything, in better shape. In foreign trade we note shipments of \$35,000 worth of machinery to Japan, an order for 6 large pumps from Denmark and shipments to Australia of \$17,000 worth of steel rails, \$37,000 worth of agricultural implements and \$80,000 worth of manufactured iron.

Pig Iron.—Prices are lower, and the market is no stronger. We quote for Northern irons, tidewater delivery: No. 1 X foundry, \$16@16.50; No. 2 X, \$15.50@16; No. 1 plain, \$16@16.50; No. 2 plain, \$15@15.50; gray forge, \$14.50@15. For Southern irons on dock, New York: No. 1 foundry, \$16.25@16.75; No. 2, \$15.75@16.25; No. 3, \$14.75@15.25.

Bar Iron and Steel.—The market is quiet. We quote common bars at 1.20@1.25c. for large lots on dock; refined bars, 1.35c.; soft steel bars, 1.20c.

Plates.—There is a stronger feeling to the market and at least one Eastern mill has advanced prices \$2 per ton. We quote for large lots at tidewater: Tank, ¼-in. and heavier, 1.30@1.35c.; tank, 3/16 in., 1.35@1.40c.; shell, 1.40@

1.50c.; flange, 1.60c.; marine, 2.10c.; universals, 1.30c.

Steel Rails and Rail Fastenings.—Sales at current quotations are limited. There are inquiries from Mexico and South America for small lots. We continue to quote standard sections \$35 f. o. b. Eastern mills. Splice bars are 1.40@1.50c.; spikes, 1.70c.; fish plates, 1.30c.; bolts, 2.30@2.50c.

Structural Materials.—Demand continues fair. The new prices for large lots at tidewater are: Beams, 1.65c.; channels, 1.65c.; angles, 1.30c.; tees, 1.70c.; zebs, 1.65c.

METAL MARKET.

New York. Sept 14.
Gold and Silver.

Gold and Silver Exports and Imports
At all United States ports in July and year.

Metal.	July.		Year.	
	1899.	1900.	1899.	1900.
GOLD.				
Exports	\$2,606,457	\$3,269,159	\$30,159,781	\$33,709,841
Imports	2,895,469	4,944,764	26,283,116	21,570,631
Excess I.	\$289,012 I.	\$1,675,605 E.	\$3,876,665 E.	\$12,139,210 E.
SILVER.				
Exports	4,003,472	4,913,658	31,123,420	35,284,144
Imports	2,731,796	3,311,033	17,168,511	22,160,121
Excess E.	\$1,271,676 E.	\$1,602,625 E.	\$13,954,909 E.	\$13,124,023 E.

Gold and Silver Exports and Imports, New York
For the week ending September 13th, 1900, and for years from January 1st, 1900, 1899, 1898, 1897.

Period.	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	\$16,914	\$27,579	\$664,285	\$97,504 E.	\$566,116
1900..	36,405,169	1,760,807	27,427,219	3,544,138 E.	58,527,443
1899..	11,554,661	8,989,287	19,559,753	2,546,543 E.	19,579,581
1898..	2,743,808	77,096,211	25,594,056	2,257,394 I.	51,010,741
1897..	28,267,261	4,218,919	27,317,581	1,565,800 E.	50,600,133

Both exports and imports of gold were very small. Exports of silver were chiefly to London; imports were from the West Indies and Mexico.

The United States Assay Office in New York reports the total receipts of silver at 100,000 oz. for the week. Total since January 1st, 3,453,000 oz.

Average Prices of Silver per oz. Troy.

Month.	1900.		1899.		1898.	
	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.
January..	27.30	59.30	27.42	59.36	26.29	56.77
February..	27.49	59.76	27.44	59.42	25.89	56.07
March.....	27.59	59.81	27.48	59.64	25.47	54.90
April.....	27.41	59.59	27.65	60.10	25.95	56.02
May.....	27.56	59.96	28.15	61.23	26.31	56.98
June.....	27.81	60.42	27.77	60.43	27.09	58.61
July.....	28.23	61.25	27.71	60.26	27.32	59.06
August.....	28.13	61.14	27.62	60.00	27.48	59.54
September..			27.15	58.89	28.05	60.68
October.....			26.70	57.98	27.90	60.42
November.....			27.02	58.67	27.93	60.60
December.....			27.21	58.99	27.45	59.42
Year.....			27.44	59.58	2.76	58.20

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

Average Prices of Metals per lb., New York

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1900.	1899.	1900.	1899.	1900.	1899.	1900.	1899.
Jan.....	15.58	14.26	27.07	22.48	4.68	4.18	4.65	5.34
Feb.....	15.78	17.02	30.58	24.20	4.675	4.49	4.64	6.28
March.....	16.29	16.35	32.90	23.82	4.675	4.37	4.60	6.31
April.....	16.76	17.13	30.90	24.98	4.675	4.31	4.71	6.67
May.....	16.34	17.20	29.37	25.76	4.181	4.44	4.53	6.88
June.....	15.75	16.89	30.50	25.85	3.901	4.43	4.29	5.98
July.....	15.97	17.10	33.10	29.63	4.030	4.52	4.28	5.82
August.....	16.35	17.42	31.28	31.53	4.250	4.57	4.17	5.65
Sept.....		17.34		32.74		4.58		5.50
October.....		16.94		31.99		4.575		5.32
Nov.....		16.49		28.51		4.575		4.64
Dec.....		15.88		25.88		4.64		4.66
Year.....		16.67		25.12		4.47		5.75

Commencing with March 17th, the prices given in the table for copper are the averages for electrolytic copper; this is the case for both 1899 and 1900. The average price for Lake copper for the year 1899 was 17.61c. For January, 1900, the average price of Lake copper was 16.3c.; for February, 16.08c.; for March, 16.55c.; for April, 13.94c.; for May, 16.55c.; for June, 16c.; for July 16.16c.; for August, 16.58c.

Prices of Foreign Coins.

	Bid.	Asked.
Mexican dollars.....	\$.49½	\$.50½
Peruvian soles and Chilean pesos ..	.45	.46½
Italian sovereigns.....	4.85	4.88
Twenty francs.....	3.85	3.88
Twenty marks.....	4.74	4.80
Spanish 25 pesetas.....	4.78	4.82

Financial Notes of the Week.

Business continues rather dull, and the speculative markets are quiet. The Galveston storm and other incidents have furnished excitement, without seriously affecting trade. No further gold exports are noted and none are probable at present. Money in New York continues easy.

Imports and Exports of Metals.

Port.	Week, Sept. 12.		Year 1900.	
	Expts.	Impts.	Expts.	Impts.
*New York.				
Aluminum..... long tons	2		99	73
Antimony ore..... "		**105		2,097
" regulus..... "		**90		825
Chrome ore..... "				1,501
Copper, fine..... "	1,358	257	75,827	14,809
" matte..... "	71		3,303	202
" ore..... "		5,450		35,942
" ash..... "				93
Ferro-Chrome..... "				31
Ferro-mangan' se..... "		**125		532
Iron ore..... "				17,526
" pig, bar, rod..... "	1,219	**121	11,455	5,673
" pipe..... "	113		10,636	157
" plates, sheets..... "			889	18
Lead..... "	1,626	1,195	54,459	48,489
" ore..... "				9,700
" dross..... "				24
Manganese ore..... "				9,361
Metals, old, scrap..... "	97	**558	2,853	5,751
Composition..... "			1,636	185
Nails..... "	182		15,952	
Nickel..... "	71		1,669	108
" ore, matte..... "				5,393
§ Rail'd material..... "	398	**80	4,131	3,163
Rails, old..... "			4,538	513
Spiegeleisen..... "		**205		2,917
Steel bars, plates..... "	2,458	**299	25,461	13,113
" rails..... "	1,057		59,594	18
" wire..... "	316		19,501	23
" not speci'd..... "	650	**31	7,613	2,106
Tin..... "			705	18,785
" and black plates..... "			131	26,629
Zinc..... "			100	625
" dross..... "	5			596
" ashes, skim..... "	31			938
" ore..... "	1,800			20
†Baltimore.				
Chrome ore..... long tons				3,50
Copper, fine..... "	25	663	27,583	3,400
" matte..... "				155
Ferro-manganese..... "			945	4,223
Iron pig, bar, etc..... "			6,892	21,451
" ore..... "				310,746
" pyrites..... "				25,584
Manganese ore..... "			4,800	106,325
Metals, old & Rails..... "				2
Nails..... "				1,250
Pipe, iron & steel..... "	251			4,736
Silicon..... "				85
Spiegeleisen..... "				778
Steel, bars, etc..... "	2,088		28,524	3,471
" wire..... "	25		801	107
" rails..... "			64,770	
Tin..... "			40	251
" and black plates..... "				2,333
‡Philadelphia.				
Antimony..... long tons				14
Chrome ore..... "				3,650
Copper, fine..... "			2,765	31,095
" ore..... "				3,245
Iron, pig..... "			280	1,355
" ore..... "			6,350	152,470
" pyrites..... "				87,465
Manganese ore..... "			5,400	76,900
Spiegeleisen..... "				4,153
Tin..... "			25	453
" and black plates..... "			451	1,626
Zinc..... "				67
" ore..... "				2,507

Total United States.‡‡

Articles.	July, 1900.		Year, 1900.	
	Expts.	Impts.	Expts.	Impts.
Antimony..... long tons		75		858
ore..... "		52		1,650
Copper, fine, in all forms..... "	11,636	\$87,742	101,865	33,432
Iron, pig & bar..... "	15,892	24,819	94,047	66,787
" ore..... "	6,791	65,865	10,423	550,862
Iron & steel plates..... "	1,580	118	23,523	4,539
Iron & steel rails..... "	40,278	21	227,258	988
" wire..... "	5,489	204	50,457	1,086
Lead, in all forms..... "	7,909	8,939	51,041	55,009
Manganese ore..... "		38,033		241,555
and oxide..... "				1,488
Nickel..... "	259			7,071
Nails, cut..... "	1,009			19,971
" wire..... "	2,137			226
Quicksilver..... "	16			
Steel, billets, rods, etc..... "	9,169	2,770	48,600	21,285
Tin..... "	90	1,758	322	18,379
" and black plates..... "	6	6,311	401	39,155
Zinc..... "	657	59	14,534	610
" ore..... "	4,058		23,237	

*New York Metal Exchange returns. †By our Special Correspondent. ‡Not specified. ‡‡Monthly returns, Treasury Department. †Report of Mr. John Stanton. ‡ Week, September 4th. **Week, September 7th. Exports include domestic and foreign metals.

Import Duties on Metals.

The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, 4c. a lb. Lead, 1½c. a lb. on lead in ores; 2½c. per lb. on pigs, bars, etc.; 2½c. on sheet, pipe and manufactured forms. Nickel, 6c. per lb. Quicksilver, 7c. per lb. Spelter or zinc, 1½c. per lb. on pigs and bars, 2c. on sheets, etc. Copper, tin and platinum are free of duty.

The silver market has continued to show an upward tendency during the past week. There has been a good demand for shipment to China, both for prompt and forward delivery, but the market has been chiefly supported by orders from the Continent and the English Mint.

The statement of the United States Treasury on Wednesday, September 12th, shows balances in excess of outstanding certificates as below, comparison being made with the statement of the corresponding day last week:

	Sept. 5.	Sept. 12.	Changes.
Gold.....	\$68,531,731	\$72,454,447	I. \$3,922,716
Silver.....	11,796,203	11,171,255	D. 624,948
Legal tenders.....	26,374,738	25,207,650	D. 1,167,088
Treas. notes, etc.....	506,932	572,355	D. 24,577

Treasury deposits with national banks amounted to \$96,507,633, showing an increase of \$457,918 for the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending September 8th, gives the following totals, comparison being made with the corresponding weeks in 1899 and 1898:

	1898.	1899.	1900.
Loans and discounts.....	\$665,395,200	\$747,646,300	\$818,808,000
Deposits.....	731,902,100	834,139,100	906,281,400
Circulation.....	14,117,200	14,667,000	29,106,400
Reserve:			
Specie.....	137,766,500	161,083,200	179,291,900
Legal tenders.....	52,285,800	49,985,500	73,334,700
Total reserve.....	\$190,052,300	\$211,068,700	\$252,626,600
Legal requirements.....	182,975,525	208,609,775	226,570,350
Balance, surplus.....	\$ 7,076,775	\$2,458,925	\$26,056,250

Changes for the week, this year, were increases of \$1,959,000 in loans and discounts, \$2,794,500 in deposits, \$204,100 in circulation, and \$2,307,500 in specie; decreases of \$2,711,100 in legal tenders and \$1,022,225 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 date last year:

Banks.	1899.		1900.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ass'n.....	\$161,083,200	.....	\$179,291,900	.....
England.....	179,727,140	.....	180,333,755	.....
France.....	385,335,300	\$239,512,030	449,860,970	\$227,146,150
Germany.....	134,915,000	69,500,000	139,755,000	71,980,000
Spain.....	61,870,000	68,470,000	68,445,000	84,480,000
Aus.-Hun.....	152,775,000	52,970,000	188,680,000	49,116,000
Neth'l'ds.....	13,705,000	29,995,000	24,350,000	28,940,000
Belgium.....	14,490,000	7,245,000	13,950,000	6,975,000
Italy.....	77,715,000	6,925,000	77,490,000	8,345,000
Russia.....	468,255,000	26,090,000	394,490,000	38,275,000

The returns of the Associated Banks of New York are of date September 8th and the others are of date September 7th, as reported by the Commercial and Financial Chronicle cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to August 30th, 1900, are reported by Messrs. Pixley & Abell's circular as follows:

	1899.	1900.	Changes.
India.....	\$3,415,600	\$3,763,907	I. \$348,307
China.....	904,453	1,553,966	I. 648,513
The Straits.....	165,277	399,766	I. 234,489

Totals..... \$4,485,330 \$5,717,639 I. \$1,231,409
Arrivals for the week, this year, were £198,000 in bar silver from New York, £16,000 from Chile, £9,000 from the West Indies and £4,000 from Australia; total, £227,000. Shipments were £87,000 in bar silver to Bombay, £87,000 to Shanghai, and £32,500 to Hong Kong; also £23,292 in silver coin to Hong Kong; total, £229,792.

Indian exchange continues steady at 15.97d. per rupee, and the demand for Council bills in London has been larger than for several weeks past.

Exports of specie from San Francisco in August included \$113,371 gold and \$2,064,801 silver. For the eight months ending August 31st the exports were as follows:

	Gold.	Silver.	Totals.
Hong Kong.....	\$78,746	\$7,255,138	\$7,333,884
Shanghai.....	1,297,031	.....	1,297,031
Japan.....	15,863	63,530	79,393
Pacific Islands.....	1,180	5,000	6,180
Central America.....	15,175	6,450	21,625
Mexico.....	1,000	.....	1,000
Total foreign.....	\$111,964	\$8,627,149	\$8,739,113
Honolulu.....	258,000	53,800	311,800
New York.....	3,397,870	266,642	3,664,512
Totals.....	\$3,767,834	\$8,947,591	\$12,715,425
Totals, 1899.....	10,630,809	4,495,353	15,126,162

The silver shipments this year included \$1,638,949 in Mexican dollars in August and \$5,424,922 in the eight months; which compare with \$891,781 and \$1,550,115 respectively last year.

Other Metals.

Daily Prices of Metals in New York.

September.	Sterling Exchange.	Silver.		Copper.				Spelter.		
		Fine oz. Cts.	London. Pence.	Lake. lbs. cts. & lb.	Electrolytic @ lb.	London. £ & ton.	Tin. cts. & lb.	Lead. cts. & lb.	N. Y. cts. & lb.	St. L. cts. & lb.
8	4.87	62½	28¾	16½	16¾	.....	30½	4.32½	4.10	3.95
10	4.87	62½	28¾	16½	16¾	73½	30½	4.32½	4.10	3.95
11	4.86½	62½	28¾	16½	16¾	73¾	30	4.32½	4.10	3.95
12	4.86½	62½	28¾	16½	16¾	73¾	30½	4.32½	4.10	3.95
13	4.86½	62½	28¾	16½	16¾	73¾	30½	4.32½	4.10	3.95
14	4.86½	62½	28¾	16½	16¾	73¾	30½	4.32½	4.10	3.95

London quotations are per long ton (2,240 lbs.) standard copper, which is now the equivalent of the former 5 m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—The market is strong and active. A good export as well as domestic business is reported, and consumption remains very large. Business has not been confined to early deliveries, but transactions have been made for future delivery, indicating confidence in the maintenance of present values. We quote Lake Copper at 16½@16¾c.; electrolytic in cakes, wirebars and ingots at 16½@16¾c.; in cathodes at 16½@16¾c.; casting copper at 16½c.

The report of Mr. John Stanton, statistician for the producing companies, gives the output of copper in the United States in August, in long tons: Reporting mines, 17,667; outside sources, 3,400; total, 21,067 tons. Exports for the month were 13,861 tons, or 66% of the production. The reports of the foreign mines have not been received.

In London there has been decidedly more interest shown in speculative sorts and a fair business is reported at somewhat higher prices. The market closed last week at £73 for spot, £73 10s. for three months, opened on Monday 2s. 6d. higher and advanced on Tuesday to £73 15s. for spot, £74 5s. for three months. On Wednesday it was £73 7s. 6d. for spot, £73 17s. 6d. for three months; on Thursday £73 10s. for spot, £74 for three months, and it closes at £73 10s. for spot, £74 2s. 6d. for three months.

Refined and manufactured sorts we quote: English tough, £76 10s.@£77 10s.; best selected, £78 10s.@£79; strong sheets, £83 10s.@£84; India sheets, £83; yellow metal, 6½d.

Tin.—The market has been very dull and quiet. Under these conditions the somewhat larger arrivals have caused the premium on spot tin to be very considerably reduced, and we now quote prompt shipment at 30½c., September shipment at 30c.

The London market, which closed last week at £135 15s. for spot, £133 10s. for three months, opened at £135 2s. 6d. for spot, £132 for three months. On Thursday it was £135 15s. for spot, £132 5s. for three months, and the closing quotations are cabled as £134 15s. for spot, £132 for three months.

Exports of tin from the Straits Settlements for the six months ending June 30th are reported as below in long tons of 2,240 lbs.:

	1898.	1899.	1900.
United States.....	10,878	13,300	8,429
Europe.....	11,562	8,950	13,565
China and India.....	1,319	592	896
Totals.....	23,759	22,842	22,890

The total this year shows an increase of 48 tons over last year, but a decrease of 869 tons from 1898.

Lead.—The market remains unchanged, and we quote New York 4.32½@4½c., St. Louis 4.27½@4.32½c.

The European market is strong, Spanish lead being quoted at £17 15s., English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead continues quiet, and prices remain unchanged at 4.32½c. Argentiferous, as well as Missouri brands, are obtainable and selling in a retail way. Neither buyers nor sellers are making any special effort to trade.

Spelter.—The market is very quiet, and while consumers generally are not well supplied, the buying is not heavy in spite of the comparatively low prices. We quote St. Louis 3.95c., New York 4.10c.

The foreign market is again lower, good ordinaries being quoted at £18 15s., specials 5s. higher.

Antimony.—We quote Cookson's at 10c.; Hall's, 9½c.; U. S. Star, 9½c.

Nickel.—The price continues firm at 50@60c. per lb., according to size and terms of order.

Platinum.—Consumption continues good and prices are strong. For ingot platinum in large

quantities \$18.20 per Troy oz. is quoted in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 72c. per gram, showing an increase of 1½c.

Quicksilver.—The New York quotation continues unchanged at \$51 per flask for large lots, with \$52.50@54 asked for small quantities. San Francisco prices are again lower, \$48@48.50 being named on local orders, with \$43.50@44 taken for export. The London price has been lowered 2s. 6d., and is now £9 2s. 6d. per flask, with the same price named from second hands.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

	Per lb.	Per lb.
Aluminum.....	33@37c.	Ferro Titanium (2%)... \$1.00
No. 1, 99% ingots.....	31@31c.	Ferro-tungsten (3%)... 35c.
No. 2, 90% ingots.....	42c. up	Magnesium... \$2.75@3
Rolled sheets.....	20@23c.	Manganese (over 99%)... \$1.15
Alum-bronze.....	33@39c.	Mangan'e Cop (20% Mn)... 32c.
Nickel-alum.....	.....	Mangan's Cop (30% Mn)... 38c.
Bismuth.....	.....	Molybdenum (Best)... \$1.45
Chromium (over 99%)... 1.00	.....	Phosphorus..... 50c.
Copper red oxide..... 55c.	.....	Ferro-Molyb'dum (50%)... 70c.
Ferro-Titanium (100%)... 90c.	.....	Tungsten (Best)..... 32c.

Variations in prices depend chiefly on the size of the order.

LATE NEWS.

Merchandise exports from the United States in August were valued at \$103,262,479, or \$2,829,949 more than in July. For the eight months ending August 31st the statement is as follows:

	1899.	1900.
Exports.....	\$792,590,823	\$915,737,153
Imports.....	515,190,433	564,699,934
Excess, exports.....	\$277,400,390	\$351,037,219
Add excess of exports, gold.....	.....	20,790,727
Add excess of exports, silver.....	.....	15,395,949
Total apparent balance.....	.....	\$387,223,895

The merchandise exports this year show an increase of \$123,146,330, or 15.5%; while there was an increase of \$49,509,501, or 8.5%, in imports.

(Special Report of Rogers, Brown & Co.)

Buffalo, N. Y., September 13th.—There has been a marked improvement in the demand for all kinds of pig iron, both in the way of shipments and sales. This has not been confined to one special line of work, but covers almost the entire consuming field. Harvesting machine manufacturers, making up their estimates for next year, are covering for six months' requirements. The radiator, stove and heater manufacturers have largely worked off their over-production of high-cost stock and are finding an increasing demand for their goods, and now naturally covering on more iron. Pump manufacturers who have been busy right along are entering their full quota. Pipe works are now contracting more freely, as their selling price is as low or lower than can be looked for later, and many cities see the wisdom of buying now at the present low price. Last, but not the least, jobbing foundries in general are finding orders coming from those who have been holding back waiting for lower cost. There seems to be no let-up in the demand for foundry iron, and if it was not for the coming election disturbing the future outlook we would be experiencing a movement far-reaching. We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$13.25; No. 2, \$17.25; Southern soft, No. 1, \$18.25; No. 2, \$17.50; Lake Superior charcoal, \$19; coke malleable, \$17.

(From Our Special Correspondent.)

Chicago, September 13th.—Under the possibility of a strike and the bad effect it would have on anthracite coal in this market, the business picked up materially during the week, a larger tonnage having been closed than has been transacted in a long time; the market really needed a stimulus of the kind, for it had drifted into a rut wherein actual stagnation was only a matter of a short time longer. Dealers have bought to fill depleted stocks, the demand on them through the scare having compelled most of them to do so. Prices are firm, the circular rates being \$5.25 for grate and \$5.50 for egg, stove and chestnut.

Bituminous coal is in little better demand, though supply has not lessened the shipping interests pouring large quantities of coal into the market. Demurrage is now being paid and the prospect for soft coal trade is not encouraging. Prices are ragged and apparently are made more to get rid of surplus lines of coal than for present profit.

Pig Iron.—There continues much hesitancy on the part of consumers; the market, therefore, continues a waiting one, buying being done on a basis of enough for present needs, with few contracts made for iron beyond October. There are lots of inquiries, but little actual business, because most of them are offers made at a dollar or two below market prices. Most consumers expect prices to go lower and will hold off until the last movement.

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 330.)

New York. Sept. 15

Heavy Chemicals.—Increased sales of soda ash to the glass factories are reported. Domestic high test caustic soda in drums shows large sales at \$1.87½ per 100 lbs., f. o. b. works. Bicarb. soda is in better request for home consumption. Bleaching powder continues unchanged. Chlorate of potash is still weak. Permanganate of potash is lower, owing to the small consumptive demand and large stocks; 14c. per lb. is quoted for small crystals and 17c. for large. Imports at New York so far this year show an increase in alkali and bleaching powder, while bicarb. soda and sal soda show a falling off as compared with 1899.

Articles.	Domestic.		Foreign.
	F.o.b. Works.	In New York.	In New York.
Alkali, 58% 48%.	75@80 80@85	.....	90@95 \$1.00@1.05
Caustic Soda, high test....	\$1.85@1.90	.....	2.40@2.55
powd., 60% 70@74%.	.....	3.00@3.25 3.25@3.50	.....
98%.	.....	3.50@4.00	3.75@4.00
Sal Soda "conc. "extra	70@80, 1.45@1.75 1.25@1.37½ 3.25@3.50	.....	67½ 1.75 1.75@2.25
Bicarb. Soda, "extra	.....	.....	.....
Bleach Pdr., Eng. prime, other brnds.	.....	.....	1.80@1.87½ 1.50@1.75
Chl. Pot. Cryst. powd.	.....	8.75@9.00 8.75@9.00	9.75@10.00 10.00@10.25

Acids.—Orders for shipment are more plentiful for most acids. Export business in blue vitriol is almost featureless owing to the excessively high freight rates.

Quotations as below are for large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified.
Acetic, No. 8 in lbs. \$1.62½
Blue Vitriol. 5.00@5.25
Aqua Fortis, 36° 3.62½
Aqua Fortis, 38° 3.87½
Aqua Fortis, 40° 4.12½
Aqua Fortis, 42° 4.50
Muriatic, 15° 1.20
Muriatic, 20° 1.35
Muriatic 22° 1.50
Nitric, 36° 3.87½
Nitric, 38° 4.12½
Nitric, 40° 4.37
Nitric, 42° 4.75
Oxalic 5.75@5.87½
Sulphuric, 66° 1.20
Sulphuric, 60° 1.05
" bulk 50° ton 14.00

Brimstone.—New York imports this week were 2,031 tons. On September 6th a cargo of 2,500 tons Japanese sulphur arrived at San Francisco. The market in Sicily is firmer after the recent reaction. Shipments of best unmixed seconds are worth \$21.75 per ton, while spot is nominal at \$23@24, according to seller. Best thirds are about \$2 per ton less.

Pyrites.—The Pennsylvania Salt Manufacturing Company imported at New York this week 3,503 metric tons of copper pyrites from Huelva, Spain. Business is regular, consisting chiefly of contract orders. We quote: Mineral City, Va., lump ore (basis 42%), \$5 per long ton and fines \$4.40. Charlemont, Mass., lump, \$5.50, and fines \$5. Spanish pyrites, 13@15c. per unit, according to percentage of sulphur contents, delivery ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46%@51% of sulphur; American, 42%@44%.

Fertilizing Chemicals.—Leading ammoniacs continue to show a limited demand. Stocks are comparatively light, and producers are not disposed to press sales. The production of sulphate of ammonia in the United Kingdom in 1899 is officially reported at 208,481 long tons, against 196,357 tons in 1898, showing an increase of 12,124 tons in 1899. The yield in 1899 was distributed as follows: Gas works, 136,529 tons; iron works, 17,963 tons; shale works, 38,780 tons; producer gas, coke and carbonizing works, 15,209 tons. Sulphate of ammonia, foreign, is quoted to arrive at \$2.75@2.80, while domestic is worth \$2.80 f. o. b. Boston, Mass. Other quotations are unchanged as follows: High grade Western blood, \$1.90 per unit, f. o. b. Chicago; tankage, \$1.50 and 10c. per unit, f. o. b. Chicago; Calcutta bone-meal, \$23@25 per ton; domestic steamed ground bone, \$21@22; dried fish scrap, \$23 per ton f. o. b. factory; acid phosphate, 14@16%, 65@67½c. per unit; bone-black, spent, \$15@16 per ton; azotine, \$1.90@2 per unit.

Potash salts are quoted in large lots as follows: Muriate of potash, \$1.85@1.86½ per 100 lbs.; sulphate of potash, 90@98%, \$2.05½@2.08½; double manure salt, 48@53%, \$1.06@1.08½; Kainit (25% sulphate of potash), \$9.05@9.55 per long ton; sylvinit (35@37% potash), 38½@41½c. per unit.

Nitrate of Soda.—This market, although quiet, is firmer, owing to an advancing coast market. The scarcity of nitrate of soda at the oficinas, higher cost of coal and labor and the approach of the European season, combine to influence the price of nitrate of soda on the coast. Indications are that higher prices will prevail in the near future. Importers are not anxious sellers at present prices, feeling that the continued scarcity of vessel room on the Pacific will keep

ocean freight rates high. The increased cost of coal and higher running expenses of steamers point to continued firm freight rates. Some small sales of nitrate of soda have been made at \$1.80@1.77½, according to position. Large consumers are not inclined to pay present prices, and so business is moderate. There were no arrivals of nitrate of soda at New York this week, but the steamer "Prince John" arrived at Charleston with 6,200 bags. The steamer "Kelvindale" with 33,000 bags struck a rock at the entrance to Magellan, became leaky and was beached. Latest cable dispatch states that the vessel has arrived at Punta Arenas, that divers have been employed to examine her bottom, and that surveyors recommend temporary repairs.

The shipments to the United States in August are cabled as 18,500 tons, and loading on the West Coast of South America September 1st for this country, 5,500 tons.

Messrs. Mortimer & Wisner's monthly statement of nitrate of soda, dated New York, September 1st, gives the following statistics:

	1900.	1899.	1898.
	Bags.	Bags.	Bags.
Imp. into Atlantic ports from West Coast S. A., from Jan. 1, 1900, to date.	717,826	601,403	593,040
Imp. from Jan. 1 from Europe.....	2,063	.....	55,171
	719,889	601,403	648,211
Stock in store and afloat Sept. 1, 1900, in New York	9,498	39,012	70,881
Boston.....	.....	.....	.....
Philadelphia.....	.....	40,250	10,000
Baltimore.....	1,000	750	9,600
Norfolk, Va.....	.....	.....	.....
Charleston.....	.....	.....	.....
To arrive, due Dec. 15, 1900.	524,000	353,000	329,000
Vis. supply to Dec 15, 1900.	534,498	415,012	419,481
Stock on hand Jan. 1, 1900..	9,588	58,406	15,383
Deliveries past month.....	166,855	134,069	103,430
Deliveries since Jan. 1 to date.....	719,977	579,797	573,113
Total yearly deliveries....	.....	976,592	967,525
Prices current, Sept. 1.....	\$1.72½	\$1.61@1.62½	\$1.45

Phosphates.—A quiet market is reported with prices nominally unchanged. The shipments of Florida phosphate rock through Savannah in August amounted to 11,699 long tons, making a total for the eight months of this year of 75,659 tons, against 50,567 tons in 1899, showing an increase of 25,092 tons, or 33%. The Tennessee phosphate exports through Pensacola in August amounted to 12,252 tons, making 87,867 tons for the eight months, as against 78,470 tons in 1899, showing an increase of 9,397 tons in 1899. We are advised that the Tennessee Phosphate Company shipped in June, 5,908 tons to foreign ports, and 4,348 tons to domestic buyers, and in July 2,526 tons and 4,905 tons, respectively.

Phosphates.	Per Ton F. o. b.	C. i. f. U'n'd Kingdom or European Ports.	
		Unit.	Long ton.
* Fla. hard rock (77@80%)	\$7.50@8.00	7¼@8¼d	\$12.90@12.87
* Fla. land pebble (68@73%)	4.35	7@7¼d	9.80@10.15
* Fla. Peace River (58@63%)	3.00@3.50	7@7¼d	8.40@8.70
* Tenn. rock 78%, export.	4.00	7¼@7¾d	11.31@11.70
* Tenn. 78% domestic.	3.30@3.50	.....	.....
* Tenn. 75% "	3.00@3.25	.....	.....
* Tenn. 72% "	2.65@2.75	.....	.....
* So. Car. rock, crude.	4.00	.....	.....
* So. Car. rock, dried.	4.50	6¼d	7.80
* Algerian, rock... (62@70%)	.....	7@7¼d	9.39@10.03
* Algerian, rock... (53@63%)	.....	6¼@7¼d	8.10@8.70

* Fernandina. † Mt. Pleasant. ‡ At mines. § On vessels, Ashley River.

Liverpool. Sept. 4.

(Special Report of Joseph P. Brunner & Co.)

The market for heavy chemicals continues quiet, but with the exception of chlorine products the tone is healthy and prices well maintained.

Soda ash is very steady and makers decline to make any concessions. We quote spot range for tierces about as follows: Leblanc ash, 48%, £5@£5 5s.; 58%, £5 1s.@£5 15s. per ton net cash. Ammonia ash, 48%, £4 5s.@£4 10s.; 58%, £4 10s.@£4 15s. per ton net cash. Bags, 5s. per ton under price for tierces. Soda crystals are unchanged and selling at £3 2s. 6d. per ton, less 5% for barrels, or 7s. less for bags, with special terms for a few favored markets. Caustic soda is firm and a fair trade is passing, although not active. We quote spot range as follows: 60%, £9 5s.; 70%, £10 5s.; 74%, £10 15s.@£10 17s. 6d.; 76%, £11 5s.@£11 10s. per ton net cash.

Bleaching powder attracts little attention from buyers and hardwood is nominally quoted at £6 @£6 10s. per ton net cash as to market.

Chlorate of potash is quiet at 3¼@4d. per lb. net cash as to quantity.

Bicarb. soda is in moderate request at £6 15s. per ton, less 2¼% for the finest quality in 1

cwt. kegs, with usual allowances for larger packages, also special quotations for certain favored markets.

Sulphate of ammonia is quoted at £11@£11 2s. 6d. per ton, less 2¼% for good gray 24@25% in double bags f. o. b. here, and market quiet.

Nitrate of soda is dull at £8 7s. 6d.@£8 10s. per ton, less 2¼% for double bags f. o. b. here

MINING STOCKS.

Complete quotations will be found on pages 327 and 328 of mining stocks listed and dealt in at:

Boston.	Philadelphia.	Montreal.
Colo. Springs.	Salt Lake.	London.
Denver.	San Francisco.	Mexico.
New York.	Spokane.	Paris.
	Toronto.	

New York. Sept. 14.

In the copper group Amalgamated sold up to \$88½, then reacted to \$88, and closes around \$88½. Anaconda gained from \$44½ to \$45½, while British Columbia slumped from \$11¼ to \$10½. Union, of North Carolina, on interested trading went to \$3½, but closes at \$3.

Of the Colorado stocks, Isabella, of Cripple Creek, on heavy selling in Colorado Springs and a reduction of the quarterly dividend to 1c. from 3c. last June, slumped to \$1.05. Anaconda gold receded from 50c. to 40c. on sales. Damon, also of Cripple Creek, brought 22c.—the first sale in weeks. Cripple Creek Consolidated changed hands at 14c., Alamo at 13c., Creede & Cripple Creek 13c., Jack Pot 48@50c., and Mt. Rosa at 50c. Iron Silver rose from 63c. to 70c. on sales, while Adams brought 25c.

Larger trading is noted in Standard Consolidated, of California, at \$4.25@3.45. Brunswick was stationary at 25c.

In the Comstock section Consolidated California & Virginia sold at \$1.20@1.35, Ophir at 52@55c., Best & Belcher at 32c. and Yellow Jacket at 24c. Sierra Nevada gained 5c. at 35c., Savage 3c. at 10c. and Potosi 1c. to 24c.

Father de Smet, of South Dakota, sold at 45c. The Colorado Fuel and Iron Company has declared an 8% dividend on its preferred stock for the fiscal year ended June 30th, 1899, payable October 10th. Only 8% is still in arrears on this stock to cover the fiscal year ended June 30th, 1900.

The American Agricultural Chemical Company has issued its first statement, which shows net earnings of the constituent companies from the various dates of their absorption to December 31, 1899, after making conservative reserves for allowances of all kinds and charging to expense all renewals, amounted to \$1,045,539. After deducting two dividends on the preferred stock, paid October, 1899, and April, 1900, amounting to \$1,004,840, there was a surplus of \$40,699. Total earnings from January 1st to June 30th, 1900, amounted to \$1,579,199; less renewals, bad debts, repairs, allowances of all kinds, makes the net earnings for the six months \$839,320, and including the surplus on December 31st, leaves undivided profits June 30th of \$880,019.

The circular announcing the merger of the Asphalt Company of America into the National Asphalt Company says that each share of the former company on which \$10 has been paid will receive in securities of the National Company \$10 in 5% collateral gold certificates, \$7 in preferred stock, and \$10 in common stock. The collateral gold certificates will be secured by deposit of the Asphalt Company's stock and a sinking fund of \$50,000 per year will be provided. The National Company will use \$6,000,000 of collateral gold certificates, 84,000 shares of preferred stock, and 120,000 shares of common to acquire the Asphalt Company of America. It will issue 71,000 shares of preferred and 102,000 shares of common to acquire the stock of the Pennsylvania Asphalt Company; also 14,000 shares of the Gilson Company, 1,000 shares of New Jersey-Mexican Company; also 5,000 shares of the Manhattan Trap Rock Company—the latter companies controlling valuable properties and business. After the deal is concluded the priority of Asphalt securities will be, first, collateral gold certificates of the Asphalt Company of America.

The National Salt Company's stock has been admitted to the unlisted securities department of the New York Stock Exchange, namely, \$7,000,000 common stock and \$5,000,000 preferred stock.

Boston. Sept. 13.

(From Our Special Correspondent.)

The only feature in a dull and narrow market was Utah, in which there was a little excitement. Yesterday more shares of this stock were sold than of all the other mining stocks together. The price ranged around \$32. Other mining stocks were neglected, even insiders doing little or nothing.

In the dividend coppers Calumet & Hecla was quoted at \$740; Tamarack, \$220; Wolverine, \$42½. Very little was done in these stocks and the rest of the list furnishes no figures.

In the blind pool group Boston & Montana was quoted at \$319; Parrot, \$42½; Arcadian, \$19½; while Amalgamated had a curbstone quotation of \$38. Very little was done in this group, of which people are generally shy, fearing the

sudden turns which the inside interests can force if they want to.

In the smaller speculative business was almost dead, and for most of them it was hard to find a quotation. Isle Royale was called \$29½@ \$30; Centennial, \$16½; Franklin, \$15; Victoria, \$2.

The gold stocks were very quiet also. About the only ones mentioned were Centennial-Eureka at \$22, and Cochiti at \$8½.

In the miscellaneous list Federal Steel sold at \$35, while United States Oil was quoted at \$18@ \$18½. Dominion Coal was reported at \$41@ \$42, and New England Gas and Coke was a little lower, at \$12@ \$12½.

The Santa Fe Company expects to start up its smelter in a very short time. The force of men at work in the mines will then be nearly doubled. The development work is well ahead, but the work of taking out ore has not been pushed.

Of the 130,000 shares of Santa Ysabel Gold Mining Company stock, all but 2,000 shares paid the \$1 assessment, it is said. The stock certificates are now being distributed by the American Loan and Trust Company. Thomas C. Gorrie, the recently engaged superintendent, is making a thorough investigation of the property of the company before making any report.

The Geysers Mining Company, which has a shaft down 2,600 ft. at Silver Cliff, Colo., has issued a circular to the stockholders stating that the total indebtedness is about \$50,000. The assets comprise 17 mining claims, buildings, machinery, etc., which cost over \$250,000, and a shaft which cost \$1,000,000. In order to pay the indebtedness and provide funds for future operations \$250,000 will be necessary, and the proposition was made to form a new company with a capitalization of 500,000 shares of the par value of \$5 per share, to be non-assessable and all to be placed in the treasury subject to the order of the company. The date for the original subscription for the bonds has passed, and it is stated that the stockholders have not availed themselves of their privilege to any great extent, and that the matter of reorganization is still in doubt. The property was mortgaged for \$25,000, a little more than a year ago, and besides this indebtedness a large number of liens have been filed against the mine for labor performed and material furnished. The headquarters of the company are in Boston.

Colorado Springs. Sept. 10.

(From Our Special Correspondent.)

The feature of the week in mining circles was Isabella. This company cut the regular quarterly dividend from 3c. a share to 1c. The action is explained by the official statement that during the past 8 months the treasury reserve, which at the beginning was about \$650,000, has been reduced more than one-half by the declaration of 2 dividends amounting to \$135,000 and to extraordinary heavy expenses incident to extensive development. The public sold heavily, the transactions up to Saturday night amounting to 171,600 shares. The result was that the stock declined violently, touching \$1. It rallied to-day (Monday) to \$1.05, but sagged back during the day, to \$1.01.

The unfavorable impression created by Isabella is counteracted by Elkton, which made an advance touching \$1.95. The lowest point reached was \$1.85 and the closing quotation for the week \$1.88.

On Portland stock the highest point reached this week was \$3.50 and the lowest \$3.45. Outside the dividend-payers there was nothing of especial interest to report. The markets will not improve until Eastern markets show a better front.

It is reported that the reorganization of the Victor Gold Mining Company is soon to be effected on the same lines as Anaconda. The mine has paid over \$1,000,000 in dividends, but for the past year or two has been practically idle except for a little work by lessees. The ore shod could not be found on the lower levels. At present the company is in debt to the amount of over \$150,000. Considerable of the stock is held in France.

Salt Lake City. Sept. 8.

(From Our Special Correspondent.)

For another week the Utah mining share market has fairly maintained the improvement which was manifest the last days of August. Monday was a holiday and the business for the 5 days was 49,629 shares, which sold for \$37,838. The dividenders and investment shares are now traded in more than the speculatives.

Daly occasioned interest, steadily advancing to \$2 and closing strong \$2.26 bid, \$2.39 asked. Daly-West held firm, the closing bid being the top for the week. Dexter rules fairly firm, with apparent inside support. Four Aces is all forlorn and it would seem that the treasury cannot be further aided by assessments. Grand Central takes spasmodic spurts, with signs of softness. Joe Bowers evinces slightly better form.

May Day fluctuated between 41 and 46. It was active to-day at 45½@44½. Mercur holds at \$6. The old shares are being sent in for re-issue in Consolidated Mercur. Northern Light was active, showing more strength. Ontario is considerably inquired about, but the bids are too low

for any business. Silver King has moved above \$50. Star Consolidated is firmer and in demand, Sunbeam did business at 25 and the announcement of an assessment did not cause a slump. South Swansea slowly puts on a better front. Utah advances as the ore shipments increase. Valeo is considerably stronger. Yankee Consolidated ends the week 2 points higher than at the opening.

Dividends payable September 10th are: Silver King, \$75,000; Swansea, \$5,000. Daly-West pays the customary \$37,500 on the 15th.

The Geysers-Marion special shareholders' meeting adjourned to September 16th. Outstanding debt is \$13,000 and the directors, probably, will recommend the mines to go to sale, to be bought in for the benefit of shareholders willing to pay their pro rata. The forecast is not cheering.

At the Northern Light delinquent sale there were but 25,100 shares on which the assessment was not paid, which brought 3½ to 4%. It is said some high-grade ore is being sacked from a winze below the tunnel. Another 2c. assessment probably will follow shortly.

San Francisco Sept. 8.

(From Our Special Correspondent.)

The holiday, added to other influences, made the market a very dull one. Beginning to-day (Saturday) noon, the Exchange will be closed until Wednesday morning; and really many dealers seemed disposed to make the rest include this week also. There was nothing at all exciting in the news to stir matters up.

Some quotations noted are: Consolidated California & Virginia, \$1.25; Caledonia, 48c.; Ophir, 46c.; Silver Hill, 43c.; Sierra Nevada, 31c.; Best & Belcher, 28c.; Hale & Norcross, 25c.; Chollar, 20c.

The sales on regular call at the San Francisco Stock Exchange for the year to date compare as follows:

	1899.	1900.
January, shares.....	121,955	164,400
February.....	350,860	112,000
March.....	272,625	2-2,730
April.....	209,215	121,500
May.....	164,500	171,175
June.....	201,375	129,505
July.....	147,340	84,110
August.....	153,905	163,905
Total.....	1,621,255	1,199,245

The month of August showed a slight improvement over last year; but the total for the seven months shows a loss of 26% from 1899.

Business on the Oil Exchange was good, and the list of active stocks is increasing. Some quotations noted are: Kern River, \$20; San Joaquin Oil & Development, \$5; Home, \$3.95@ \$4; Buckhorn, \$3.75; Sterling, \$1.65; Twenty-eight, \$1.60; Rex, 75c.; Yukon, 63@65c.; California Standard, 35c.; American Fuel Oil, 31c.; Independence, 20c.; Caribou, 16c.

Paris. Sept. 2.

(From Our Special Correspondent.)

The Bourse remains quiet and speculation is anything but active. The season discourages it, as well as the many uncertainties of both home and foreign politics.

The main topic of discussion is the new Russian loan. It is quite sure that M. de Witte, the Russian finance minister, is here to ask for a large amount, the general belief being that an issue of 500,000,000 fr. is proposed. The terms, of course, are still unknown and it is possible that our leading bankers may discourage the offer of the bonds at the present time. It is more probable that they will take the chances—and the profits. The objection made is that Russia owes French investors some nine millions of francs already, and that it is not policy to make so large an addition to what is already a heavy load.

The South African gold stocks show very little movement, and prices have hardly changed. There is no speculation in them, and the holders seem to have made up their minds to keep their investments. The future, many think, must show some improvement, though the progress toward the end of the war and the resumption of work is discouragingly slow. The result is sure, however, the only question being the time.

Copper shares continue to show much strength. The new advance in the metal attracts much attention, and a great deal of nonsense is published as to the causes. Labored efforts to prove that the rise is chiefly the result of speculation and of the "American Trust" meet with too much credence from our buyers. The "Trust" especially is credited with many things, in a way highly amusing to those who know the facts.

The metallurgical shares are uncertain, and a downward reaction is quite possible. I have been for some time of the opinion that these shares are too high. It is true that the works are generally full of orders which will last them for some time; but we must remember that their expenses have been largely increased. Prices of raw material and fuel are very high, especially the latter, and wages are also at a high level.

The coal question remains a very pressing one and can be solved only by the purchase of

American coal. At least such is the belief of those best acquainted with the facts. It is quite probable, I am informed, that a number of cargoes from the United States will be received at French ports during the last quarter of the year. Arrangements have already been closed for a considerable quantity.

The production of coke in the two leading districts of France—the Nord and the Pas-de-Calais—was as follows for the six months ending June 30th, in metric tons:

	No of ovens.	Tons.
Nord.....	1,030	393,748
Pas-de-Calais.....	944	432,624
Totals.....	1,974	826,372

Imports of English and Belgian coke are still needed to supply the demand.

There are signs of increasing interest in the Exposition which may do something to make up for the disappointments of the early months. I fear, however, that the losses of the various auxiliary enterprises will hardly be overcome. The stocks of these companies remain very low. Azote.

ANNUAL MEETINGS.

Name of Co.	Locat'n.	Date.	Place of Meeting.
*Dalton & Lark.....	Utah.....	Sept. 27	Salt Lake City, Utah.
*Golden Star.....	Utah.....	Sept. 27	Salt Lake City, Utah.
Horn Silver.....	Utah.....	Oct. 2	Salt Lake City, Utah.
*Magnolia.....	Colo.....	Sept. 29	Colo. Springs, Colo.
Moon Anchor.....	Colo.....	Sept. 24	Colo. Springs, Colo.
*New Zealand.....	Colo.....	Sept. 29	Colo. Springs, Colo.
Sailor Con.....	Cal.....	Sept. 17	San Francisco, Cal.
*Sheep Rock.....	Utah.....	Sept. 24	Salt Lake City, Utah.

*Special meeting.

DIVIDENDS.

NAME OF COMPANY.	Latest Dividend.			Total to date.
	Date.	Per share.	Total.	
†Acacia, Colo.....	Sept. 15	\$.01	\$5,000	\$30,000
†Am. Steel & Wire, com.	Oct. 2	1.75	875,000	2,625,000
†Am. Steel & Wire, pf.	Oct. 2	1.75	700,000	5,600,000
Arizona Copper, ord.	Sept. 30	.84	132,943	
Calumet & Hecla.....	Sept. 28	20.00	2,000,000	71,850,000
†Cambria Steel.....	Oct. 1	1.00		
*Central Lead, Mo.....	Sept. 15	.50	5,000	187,000
Colorado Fuel & I., pf.	Oct. 10	8.00	160,000	
*Cordell Zinc, Mo.....	Sept. 15	.05	3,000	30,000
*Daly-West, Utah.....	Sept. 15	.25	37,500	495,000
*Doe Run, Mo.....	Sept. 15	.50	2,500	112,500
†Elkton Con., Colo.....	Sept. 20	.03	75,000	948,961
*Empire State, Ida.....	Sept. 15	.30	29,554	584,025
†Isabella, Colo.....	Sept. 15	.01	22,500	697,500
†Madoc, Colo.....	Sept. 15	.01	5,000	190,000
†National Lead, pf.....	Sept. 15	1.75	260,820	10,318,460
†National Steel, pf.....	Sept. 29	1.75		
†National Tube, pf.....	Oct. 1	1.75		
*N. Y. & Hond., Rosa'o	Sept. 15	.10	15,000	1,312,000
†Republic I. & S., pf.	Oct. 1	1.75	371,997	1,905,986
†Sloss Sheffield Steel & Iron, pf	Oct. 2	1.75		
†Standard Oil.....	Sept. 15	8.00	7,800,000	
*Smuggler, Colo.....	Sept. 15	.03	30,000	1,605,000
Wolverine, Mich.....	Oct. 1	2.00	120,000	510,000
Yreka, Cal.....	Sept. 1	5.00		

* Monthly. † Quarterly.

ASSESSMENTS.

NAME OF COMPANY.	Loca tion.	No.	Delinq.	Sale.	Amt.
Alliance Expl. & Mg.....	Cal.	3	Sept. 11	Oct. 2	.05
Belcher.....	Utah.	65	Sept. 14	Oct. 5	.10
Ben Butler.....	Neav.	5	Sept. 10	Oct. 2	.004
Best & Belcher.....	Neav.	71	Sept. 7	Sept. 28	.15
Blue Gravel.....	Cal.	1	Sept. 27		.05
Chollar.....	Utah.	52	Sept. 6	Sept. 27	.10
Clarissa.....	Neav.	2	Oct. 1	Nov. 10	.09½
Confidence.....	Neav.	35	Sept. 17	Oct. 8	.20
Dreisam.....	Cal.	4	Sept. 17		.10
El Rey.....	Utah	1	Aug. 30	Sept. 17	.05
Eureka-Swansea Ext.	Utah	2	Oct. 1	Nov. 1	.00½
Eutonia.....	Utah	3	Sept. 29	Oct. 13	.00½
Exchange.....	Utah	1	Sept. 1	Sept. 17	.01
Goleta.....	Cal.	2	Sept. 25	Oct. 25	.15
Gould & Curry.....	Neav.	91	Sept. 8	Oct. 1	.15
Hale & Norcross.....	Utah	5	Sept. 4	Sept. 25	.10
Independence.....	Utah	3	Sept. 1	Sept. 17	.01
Joe Bowers.....	Neav.	30	Sept. 7	Oct. 5	.01
Justice.....	Neav.	69	Sept. 22	Sept. 28	.03
Little Chief.....	Utah	4	Aug. 25	Oct. 15	.05
Mammoth Garfield	Cal.	1	Aug. 4	Oct. 2	.17½
Overman.....	Neav.	5	Sept. 6	Sept. 27	.05
Sailor Con.....	Cal.	5	Aug. 27	Sept. 15	.10
Savage.....	Neav.	101	Sept. 18	Oct. 8	.10
Shower Con.....	Utah	2	Oct. 1	Nov. 1	.02
Sunbeam.....	Utah	1	Oct. 25		.62
Tetro.....	Utah	14	Aug. 25	Sept. 15	.01
Utah Con.....	Neav.	34	Oct. 9	Oct. 30	.65

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing company names, locations, par values, and prices for various dates from Sept. 7 to Sept. 13.

BOSTON, MASS.†

Table of stock quotations for Boston, Mass., listing company names, par values, and prices for various dates from Sept. 6 to Sept. 12.

† Official quotations Boston Stock Exchange. Total sales, 17,474.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing company names, par values, and prices.

Total sales, 83,368.

PHILADELPHIA, PA.‡

Table of stock quotations for Philadelphia, Pa., listing company names, locations, par values, and prices for various dates from Sept. 6 to Sept. 12.

Total shares sold, 3,299. ‡ Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, Cal., listing company names, locations, par values, and prices for various dates from Sept. 6 to Sept. 12.

CALIFORNIA OIL STOCKS.*

Table of California oil stock quotations, listing company names, par values, and prices for various dates from Aug. 21 to Aug. 27.

* California and Producers Oil Exchanges. Total sales, 2,945 shares.

SALT LAKE CITY, UTAH.

Sept. 8.

Table of stock quotations for Salt Lake City, Utah, listing company names, shares, par values, and prices for various dates.

TORONTO, ONT.

Table of stock quotations for Toronto, Ont., listing company names, par values, and prices for various dates from Sept. 1 to Sept. 7.

Total shares sold, 96,830.

SPOKANE, WASH.

Table of stock quotations for Spokane, Wash., listing company names, par values, and prices for various dates from Week Sept. 6.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.:

Table of stock quotations for Colorado Springs, Colo., listing companies like Acacia, Alamo, Am. Con., Anaconda, etc., with columns for Par. val., Sept. 1-7, and Sales.

Colorado Springs Mining Stock Exchange. Total sales, 1,103,848 shares. * Holiday.

MONTREAL, CANADA.*

Table of stock quotations for Montreal, Canada, listing companies like Big Three, California, Can. Gold Fields, etc., with columns for Par. val., Week, Sept. 6, and Sales.

* Montreal Stock Exchange. Total sales, 56,650 shares.

MEXICO.

Aug. 31.

Table of stock quotations for Mexico, listing companies like Durango, Barradon y Cab., Candelaria de Pat., etc., with columns for No. of shares, Last div'd, Prices, and No. of shares, Last div'd, Prices.

DENVER, COLO.:

Table of stock quotations for Denver, Colo., listing companies like Acacia, Annanda, Arg. J., Cadillac, etc., with columns for Par. val., Sept. 1-7, and Sales.

Official Quotations Denver Stock Exchange. * Holiday. Total sales, 36,500 shares.

PARIS.

Aug. 23.

Table of stock quotations for Paris, listing companies like Acieries de Creusot, Firminy, Fives-Lille, etc., with columns for Country, Product, Capital Stock, Par value, Latest divs., and Prices.

LONDON

Aug. 31.

Table of stock quotations for London, listing companies like Alaska Goldfields, Alaska-Mexican, Anaconda, etc., with columns for Country, Authorized capital, Par value, Last dividend, and Quotations.

DIVIDEND-PAYING MINES.

Table with columns: Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid, Total to Date, Latest), Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid, Total to Date, Latest). Rows list various mining companies like Acacia, Etna, Alabama Coal, etc.

G., Gold. S., Silver. L., Lead. C., Copper. Z., Zinc. Q., Quicksilver. I., Iron. This table is corrected up to August 16th. Correspondents are requested to forward changes or additions.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

Table listing various chemicals, minerals, and rare elements with their current prices. Columns include item name, quantity, and price. Items include Abrasives, Borax, Bromine, Cadmium, Calcium, Corundum, Cement, Ceresine, Chlorine, Chrome Ore, Clay, Cobalt, Copperas, Cream of Tartar, Cryolite, Explosives, Fluorspar, Graphite, Gypsum, Iodine, Iron, Kaolin, Lead, Lime, Magnesium, Magnesium-Crude-pow'd, Marble, Mercury, Mica, Monazite, Nickel, Oils, Oxide, Potash, Potassium, Pyrites, Rosin, Salt, Silica, Silver, Sulphur, Sulphuric Acid, Talc, Uranium, Zinc, and Zirconium.

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to Aug. 27. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Reviews.