

THE ENGINEERING AND MINING JOURNAL AND



(Published Every Saturday at 253 Broadway, New York.)

Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LXIV. OCTOBER 16 No. 16.

RICHARD P. ROTHWELL, C. E. M. E., Editor
ROSSITER W. RAYMOND, PH. D., M. E., Special Contributor.
SOPHIA BRAEUNLICH, Business Manager.
THE SCIENTIFIC PUBLISHING CO., Publishers.

Subscriptions are PAYABLE IN ADVANCE. For the United States, Mexico and Canada, \$5 per annum; all other countries in the Postal Union, \$7.
The address slip on the paper will show date of expiration of subscription. When change of address is desired both old and new address should be sent.
NOTICE OF DISCONTINUANCE.—The JOURNAL is not discontinued at expiration of subscription but is sent until an explicit order is received by us, and all arrearages are paid as required by law. The courts hold a subscriber responsible until the paper is paid for in full and ordered discontinued. PAPERS RETURNED ARE NOT NOTICE OF DISCONTINUANCE.

Main Office: 253 Broadway (P. O. Box 1833), NEW YORK.
Telephone Number, 3,095 Cortlandt.
New York Cable Address—"ROTHWELL." (Use McNeill's or A B C 4th Edition Code.)
London Cable Address—"PULCINETTO."

Branch Offices: Chicago, Ill., Monadnock Building, Room 737.
Denver, Colo., Boston Building, Room 206.
Salt Lake City, Utah, 230 Atlas Building.
San Francisco, Cal., 207 Montgomery Street.
Birmingham, Ala., Chalifoux Building.
London Eng., Office, 20 Bucklersbury, 366 & 367. E. Walker, Manager.
English subscriptions to the JOURNAL may be paid at the London office at the rate of \$7 = £1 8s. 9d.; the publications of the Scientific Publishing Company may be bought at the rate of 4s. 2d. to the dollar, net.

CONTENTS.

Table listing articles and their page numbers: The Hartsfeldt Furnace... 451, British Columbia Ore Sales... 451, Mr. Ogilvie's Estimate of Klondike Gold... 451, Dredging River Beds for Gold... 451, The Dolcoath Mine, Cornwall... 451, The Nitrate Combination... 452, The World's Production of Nickel... 452, Gold Placers and Lodes... 452, New Publications... 453, Molybdenite... George E. Plummer 453, Low Grade Gold Ore... J. Bourne, Jr. 453, Mr. Ogilvie's Views as to the Klondike... 454, The Manufacture of Sulphuric Acid... 454, Nitrosylized Blast Furnace Slag as an Addition to Hydraulic Cement... A. D. Elbers 454, The Gold Deposits of Manchuria... 455, The Kraft Iron Works in Germany... 457, Some Auriferous Quartz Bodies in Alabama... W. M. Brewer 458, The Manufacture of Rosendale Cement... 459, Notes on the Action of Potassium Zinc Cyanide Solutions on Gold, W. J. Sharwood 460, Notes: Advantages of Galvanized Tank Steel, 456—Silver-Lead Smelting Works in Utah, 456—Castner-Kellner Alkali Process, 456—Belgian Coal Mines, 456—Uranium Ore in Colorado, 456—Turquoise in Nevada, 456—Phenomena in the North Staffordshire Coal Measures, 459.

Table listing various sections and their page numbers: Personal... 462, Obituaries... 462, Industrial Notes... 462, Trade Catalogues... 463, New Patents... 463, Machinery and Supplies Wanted... 464, Mining News: United States: Alabama... 464, Arizona... 464, Colorado... 465, Georgia... 466, Idaho... 466, Iowa... 467, Michigan... 467, Minnesota... 467, Missouri... 467, Montana... 467, Nevada... 468, New Mexico... 468, North Carolina... 468, Oregon... 468, Pennsylvania... 468, South Dakota... 468, Utah... 469, Wyoming... 469, Foreign: Canada... 470, Mexico... 470, Markets: Coal: New York... 470, Buffalo... 470, Chicago... 471, Pittsburg... 471, Shanghai... 471, Metals: Iron: Pig Iron Production... 471, New York... 471, Buffalo... 472, Chicago... 472, Cleveland... 472, Philadelphia... 472, Pittsburg... 472, Gold & Silver... 472, Prices, Statistics, Imports and Exports... 472, Foreign Coins... 473, Copper... 473, Tin... 473, Lead... 473, Spelter... 474, Antimony... 474, Nickel... 474, Platinum... 474, Quicksilver... 474, Minor Metals... 474, Chemicals and Minerals: New York... 474, Charleston... 474, Liverpool... 474, Manchester... 474, Valparaiso... 474, Meetings... 475, Late News... 475, Assessments... 478, Dividends... 478, Mining Stocks: List of... 479, Market Reviews: New York... 474, Boston... 475, Salt Lake City... 475, San Francisco... 475, London... 475, Paris... 475, Rossland, B.C. 475, Stock Quotations: New York... 473, Philadelphia... 476, Pittsburg... 476, Boston... 476, Baltimore... 476, Cleveland... 476, Aspen... 476, Colo. Springs... 476, Denver... 477, Helena... 477, San Francisco... 477, Los Angeles... 477, Mexico, B. C. 477, Salt Lake City... 477, Rossland, B. C. 477, London... 478, Paris... 478, Valparaiso... 478, Shanghai... 478, Current Prices: Minerals, Chemicals, etc... 480, Advt. Index 19, Advt. Rates 20.

We have received numerous letters lately with respect to the Hartsfeldt smelting furnace, these letters calling our attention to its failure in several places where persons have been foolish enough to try it. We have already said explicitly so much concerning this furnace and the claims of its promoter, that it does not seem to us necessary to say any more at present. It is another case where those who will not learn from a specific warning will have to do so from experience.

American ore buyers in British Columbia have now to meet the competition of foreign concerns, which may interfere with the practical monopoly that certain of them have had on some of these ores. Messrs. Vivian & Sons, of Swansea, have recently appointed an agent in Vancouver who is said to be offering higher prices for copper ore than has been paid heretofore in the American market, and will advance 75 per cent. of the value of consignments as determined by assay in Vancouver. Several lots of ore have been sent already to Swansea on these terms.

It was not very long ago that the entire mineral product of British Columbia came to the United States in the form of ore. Smelting works were erected in the province a little later, but the silver-lead and the copper matte were still sent to the United States for refining and further reduction respectively. Now, however, British Columbia is beginning to turn out its product in a higher state of completion. The Trail Creek works have installed a refinery and are now shipping gold in fine bars, while the Hall Mines, Limited (Silver King mine), is converting its product into blister copper, which is going directly to Wales. Incidentally it may be remarked that this company has one of the largest smelting furnaces in operation on this continent. With the entrance of Vivian & Sons into the British Columbia ore market, and a freight rate of only \$8.50 per ton from Vancouver to Swansea, American ore buyers will have to look sharply to the business.

River dredging for gold is a new development in the mining industry which has attained a good deal of importance during the last two or three years, and dredges are now working successfully in the United States, in Georgia, Montana, Idaho and California. They have been especially successful in New Zealand. The amount of gold won in this manner in 1897 will be considerable, and next year it is likely to be still greater, the success of the dredges now employed being well established, and there being undoubtedly a good many places where they can be put to work to advantage. The idea is by no means a new one. As long ago as 1885 a company was organized to exploit the bed of the Atrato River in Colombia in this manner, but owing to defective apparatus, or perhaps to some extent to mismanagement, the undertaking failed, although there is reason to believe that the bottom of that river is rich in gold.

A few weeks ago we referred to the statement in the newspapers accredited to Mr. Ogilvie to the effect that the Klondike placers might be counted upon to produce \$60,000,000, expressing it as our opinion that Mr. Ogilvie had probably never made such a statement, since there has certainly been no systematic examination of the alluvial deposits there which would serve as a basis for it. The last issue of the British Columbia Mining Record contains an interview with Mr. Ogilvie, who is now, we believe, on his way back to Dawson. In this interview Mr. Ogilvie disclaimed many of the statements in the daily press which have been coupled with his name, but he asserted, nevertheless, that \$60,000,000 would not be far wrong as representing the value of the gold in the placers. This is, of course, a mere guess, and the figure might as well have been put at one-half or twice that amount, in so far as any basis for it is concerned. It took Mr. A. D. Hodges, Jr., six months' steady work to make an examination of the Nueva California placer in Peru, a territory of 41 square miles, which had been worked by Indians for hundreds of years and was well opened for examination. Probably no engineer would undertake to make an equally thorough examination of the Klondike district in any less time.

We have referred on several occasions to the introduction of modern methods of mining and ore dressing at the Dolcoath mine in Wales. A recent report of Capt. Josiah Thomas enables us to see specifically something of what has been accomplished by these improvements. In the dressing works 28,717 long tons of ore were crushed and washed during the six months ending December 1st, 1895, at a cost for labor of £3,605, or 30-12 pence per ton; in the six months ending June 30th, 1897, there were treated 35,879 tons, at a cost of £3,473, or 23-23 pence; this saving in labor is about 23 per cent. Other improvements are now being carried out which will effect a still further reduction in cost in this department. The result of the various improvements at the mine has been to reduce the total cost per ton from 27 shillings 6 pence to 22 shillings 1-5 pence for the same half-years mentioned above, this saving amounting to 19-5 per cent. These economies have, of course, increased the quantity of ore which can be worked at a profit, and it is now estimated that at the present price of tin the reserves of payable ore amount to about 135,000

tons. With this demonstration of the effect of modern methods it will be strange if other Cornish mining companies do not follow quickly the Dolcoath example.

Late advices from England state that the Nitrate Combination will probably dissolve as soon as the new *oficinas*, which have been for some time making preparations to enter the field, begin production. These new concerns, which are better equipped than many of the old ones and can produce nitrate at a lower cost, will probably more than make up the quota of the companies which have become defunct during the depression which has lately existed in this industry. With this prospect and the refusal of the Salar del Carmen Syndicate to renew its connection with the combination the latter seems to be doomed. Prices have already become weak in view of the approaching disruption, and future business has been done in New York this week at \$1.60 per hundred pounds.

The first nitrate combination was formed in 1884 and lasted three years. The restriction in production which was brought about thereby improved the condition of the industry for a short time, but in 1891 it became necessary to reorganize the combination, which this time lasted until 1893. The next year the *Asociacion Salitrea de Propaganda* was formed for the purpose for extending the consumption of nitrate by the dissemination of literature in Europe and America concerning its advantages. This, however, did not accomplish all that was desired, and in 1896, with a good deal of difficulty, the combination was formed again, but there was never the unanimity in this third combination that there was in the previous ones, and it has been quite unable to avert the hard times which have forced most of the weaker companies to the wall during the past two years.

The World's Production of Nickel.

Contrary to preconceived opinions, the world's production of nickel in 1896 was larger than in 1895, which was unexpected, owing to the inactivity in the nickel market. The demand for this metal does not grow; the business is in the hands of a few concerns, and their productive capacity is far beyond the present requirements of the trade. Hence there are no longer great fluctuations in the price of nickel, and the course of the market is nearly devoid of interest.

The production of metallic nickel, including the metallic contents of that sold in the form of oxide, sulphide, sulphate, etc., in 1894-1896 was as follows (the figures being metric tons):

Year.	Prussia.	From New Caledonia ore smelted in France and England.	Total New Caledonia.	Canada.	Norway	World's total.	United States.
1894.....	322	1,900	2,422	2,226	90	4,734	1,916
1895.....	698	1,850	2,548	1,764	90	4,402	1,215
1896.....	822	2,150	2,972	1,541	90	4,663	1,677

The figures for Prussia are from the official report of the government statistical office. This metal was chiefly reduced from New Caledonia ore. Of the latter, that which did not go to Prussia was smelted in France and England, the figures for these countries being reported by the *Metallgesellschaft, Frankfurt-am-Main*. The Canadian figures are those of the Geological Survey of the Dominion. The production of Norway in 1895 and 1896 is estimated the same as officially reported in 1894. For purpose of comparison the production of metallurgical works in the United States is appended; it is not included in the world's total because this metal has already been counted as Canadian. There is no longer any nickel ore of domestic origin smelted in the United States, except what is being treated experimentally in Oregon and Nevada.

The world's production of nickel, as given in the above table, is probably overstated slightly, since Messrs. Base & Selve, which is the most important nickel smelting firm in Germany, have produced previous to this year some metal from oxide imported from the United States. Since the latter was derived originally from Canadian ores, its metal contents have been counted twice in the method of statistical computation employed here, once as Canadian, and once as Prussian; for the same reason the total for New Caledonia arrived at by adding the Prussian report to that which is smelted in France and England from New Caledonia ore is correspondingly high. The error is not, however, very important.

A unique feature of the nickel industry is the extent and variety of the journeying which much of the ore undergoes before it is finally converted into pure metal. The New Caledonia ore, after abortive attempts at smelting on the island, is now sent to Europe, part going to Great Britain (Scotland), part to France and part to Germany. In the form of oxide it may go from one of these works to another for final reduction. The Canadian matte is brought chiefly to Bayonne, N. J., for treatment,

but a comparatively small quantity has in previous years gone to Great Britain (Wales). Oxide made from Canadian matte is at times, however, exported from the United States to Europe and is there reduced to metal. Last year practically all of the Canadian matte was brought into the United States, the mines which formerly shipped to Wales being closed.

At present the world's production of nickel is considerably in excess of the consumption, we have strong reason to believe, and there must be a comparatively large accumulation of stocks. From this the inference is, of course, that unless there should be some sudden and unforeseen new demand for the metal the production must soon be largely restricted. Nickel mining is already about at a standstill in New Caledonia, where there is only one important mine (the *Si Reis*) now in operation; aside from this there was practically nothing done there in 1896, the exports for that year (37,467 metric tons, averaging about 8 per cent. nickel) being chiefly from accumulated stocks, of which there is an immense quantity on the wharves. The Canadian mines made a somewhat smaller output than in the previous year, but there is every reason to suppose that their metal can be produced more cheaply than that of New Caledonia. And recently Professor Vogt has asserted that by the introduction of modern methods of mining and smelting the old Norwegian mines are capable of making a large output at a cost which would not compare unfavorably with the Canadian. Notwithstanding this state of affairs the Nevada nickel mines are being exploited and attempts are being made to work the Oregon deposits, though in both those States operations must be comparatively expensive.

Gold Placers and Lodes.

"Where there are placers there are lodes," is a statement often made with the assurance of "where there is smoke there is fire." We hear it now frequently with reference to the new deposits of the Yukon. In this case it is almost entirely a matter of surmise, because there has not been yet any general exploration for lodes there, attention having been concentrated naturally upon the easily worked placers, and prospecting in the hills being difficult, for various reasons. There may be workable veins of gold quartz above the placers and there may not. There are vague reports as to the existence of some, but it does not follow necessarily, either in the Yukon or elsewhere, that where there are placers there are workable lodes.

A placer deposit of gold or tin is a natural concentration of mineral that once existed in solid rock. The erosion of wind and water acting through immeasurable time has worn down the earth's surface in many places to a marvelous extent. In this kind of disintegration stable minerals like gold and cassiterite, which are of much greater specific gravity than their original matrix, were concentrated in water-courses, just as they are now concentrated by man in sluicing. But nature has concentrated millions and millions of tons of material where man has to concentrate comparatively few.

The discovery of such a natural concentration, an alluvial deposit, does not, however, imply that its source will be found, or if found, that it will be workable, because the original lode may have been eroded entirely, and therefore no longer in existence; the placer gold or tin may have come from a dissemination in a great mass of rock which it would never pay to mine, or from innumerable veinlets which were never exploitable; or the auriferous debris may have been carried far from its original source by glacial action, so that no connection between placer and lode can be established. It is not to be inferred from these suggestions, however, that there are not cases where placers have led directly to mother lodes. Numerous instances can be cited where they have done so, and *vice versa*. The conclusion is simply that no general rule can be laid down, and the existence of rich placers does not in itself imply the existence of rich, or even of workable veins.

The placers of Breckenridge, Colo., were discovered at the time of the Pike's Peak excitement (1859) and have been worked more or less ever since, producing a good many millions of gold. Their origin from lodes near by can be traced with reasonable certainty, and some of these lodes have been worked profitably, but the production of the lodes has not yet been a tithe of that of the placers. At the head of French Gulch, which was very rich, there is an immense auriferous dike intersecting the slate country rock. The dike itself is generally low grade, but in the joint planes of the slate adjacent to it there are veinlets of exceedingly rich ore in which the wonderful specimens of wire and crystalline gold for which Breckenridge is famous are found. Both the dike and the veinlets in the slate have been worked, but so far neither of them profitably. There was a similar experience at Leadville, where the mines which were discovered at the head of California Gulch never yielded what the wealth of the gulch bottom was thought to indicate. In these instances nature in long eras effected probably a rich concentration of gold from an immense amount of very low grade material.

Phillips in the *Engineering and Mining Journal* for October 2d referred

to placers in the Southern States where the gold probably occurred originally in a general dissemination in the country rock. Ingalls found in Mexico promising prospects of loose cassiterite, where careful costeaning proved the non-existence of any lode from which they could have come, and inferred that they originated from depositions in joint planes and minute crevices, which inference was supported by underground explorations. The immensely rich placers of the American River and its forks in California did not lead to many important quartz mines, nor did those of Plumas, Butte and Nevada counties, while on the other hand the great quartz veins of Grass Valley, Nevada City and the rest of the Mother Lode were not accompanied by placers of corresponding value.

Although the evidence of direct connection between the richest placers and the richest lodes is largely negative, it does not follow that where the former are found the latter should not be looked for, and the fact remains that the two classes of deposits commonly occur in the same region. There is much reason to expect, therefore, that many lodes will be found sooner or later in the Yukon country, but their discovery may not be so simple a matter as is supposed by many, who seem to believe that all that is necessary is to follow the gold-bearing creeks to their heads to find the mother lodes from which the alluvial deposits have strung out.

NEW PUBLICATIONS.

LIGHT LOCOMOTIVES. Published by H. K. Porter & Co., Pittsburg, Pa. Eighth edition. Pages, 216; illustrated.

This is a new edition of the catalogue descriptive of the light locomotives manufactured by H. K. Porter & Co., Pittsburg, Pa. Besides containing full data as to these machines, it devotes about 70 pages to technical information relating to hauling capacity of locomotives in general, track laying and allied subjects which are of a good deal of value to an engineer for reference.

INFORMATION RESPECTING THE YUKON DISTRICT; FROM THE REPORTS OF WILLIAM OGILVIE, DOMINION LAND SURVEYOR. Ottawa, 1897. Published by the Department of the Interior, Government Printing Bureau. Pages 65.

This pamphlet has been brought out by the Department of the Interior of the Dominion of Canada in response to the general demand for information as to the Yukon District. It contains a useful map of Alaska and numerous well executed reproductions of photographs, giving an excellent idea of the character of the country. The text consists of an historical sketch of the Yukon District, a description of the means of access to it, account of Mr. Ogilvie's explorations, descriptions of the Yukon River, its affluent streams and the adjacent country, treating of its agricultural capabilities and its resources in timber, minerals, fish, game and fur. It also contains an extract from Inspector Constantine's supplementary report for 1895, and an extract from Assistant Surgeon A. E. Wilson's report for 1895 on the climate, health and diseases of the district. Although much of the information republished in this pamphlet is old, it is nevertheless without doubt the most reliable account of the Yukon region and its resources that has yet been published.

CORPORATION FINANCE. By Thomas L. Greene. New York: G. P. Putnam's Sons. Pages, 182; price, \$1.25.

Mr. Greene is well known as a writer who has given much time to the analysis of corporation reports and to criticisms of financial management. His present book, however, is not intended to enter into any work of this kind, but rather to give investors some idea of the methods now in use and to show them how they can best estimate the value of the different classes of securities which are offered to them. There are chapters on "Forms of Corporate Enterprise"; "Bonds and Stocks"; "Subsidiary Companies"; "Corporation Accounting"; "Examination of Railroad Reports"; "Public Policy toward Corporation Profits"; and on "Reorganizations and Receiverships." As by far the greater part of the securities offered to the public are those of railroad companies, the book is almost entirely devoted to that class of companies, and the references to mining and other corporations are very brief. A special chapter on mining companies and another on industrial or manufacturing corporations would have added very much to the value of the book. It is generally clear in its explanations and illustrations, and most of the ideas put forward in relation to accounts are good. Some exception may be taken to the form of the index, which is not a good one for ready reference. Upon the whole, however, the book is useful.

ACCOUNTS OF GOLD MINING AND EXPLORATION COMPANIES. By T. Donald. London, England: Effingham Wilson. Pages, 56. Price (in New York), \$1.25.

This is a brief and very practical treatise on mine bookkeeping. It does not go at all into the principles of accounting, but proceeds at once to apply those principles to the accounts of a mine, directing how they should be kept to show at any time the condition of the undertaking, its profits or losses, and the state of the property. The accounts dealt with are only those to be kept at the mine and for its manager, leaving out statements of capital, dividend payments and other matters belonging to the head office or financial management. The directions in the text are accompanied by numerous forms for books, accounts and statements to be rendered. These are generally good and satisfactory models, though the writer rather inclines to the English practice of making charges to capital more extensively than is usual in American mine accounting. The vexed question of depreciation is hardly dealt with at all, which may be explained by the fact that the work is intended for the mine bookkeeper, and such questions are left to be settled for him by the head office of his company. The explanations given with the forms are

brief; in some cases they are almost too much condensed, and a little more explanation would be acceptable.

EL MINERAL DE PACHUCA. Nos. 7, 8 AND 9 OF THE BOLETIN DEL INSTITUTO GEOLOGICO DE MEXICO. Mexico; published by the Institute. Pages, 183; illustrated.

This is a monograph on what is probably the most important silver producing district of Mexico at present, Pachuca and Real del Monte. It is composed of papers on the various subjects involved by several contributors. J. G. Aguilera writes the prologue; P. C. Sanchez, M. Rangel and I. O. Gonzalez prepare the historical summary; J. G. Aguilera and E. Ordóñez describe the physiography of the Sierra de Pachuca, their general geology and the mineral veins; P. C. Sanchez discusses the fault system, and E. Ordóñez contributes the description of the rocks; M. Rangel treats of the exploitation of the mines, and P. C. Sanchez of the pumping machinery, the unwatering of the mines of Pachuca having been hitherto a problem of a good deal of study, although the difficulties have now been overcome; M. Rangel and P. C. Sanchez, together with C. Castro, give an account of the metallurgical practice of the district, which is certainly the most recent description of the patio process of amalgamation that we have and is probably one of the most valuable. The book is well printed, although poorly bound, and contains numerous illustrations showing the character of the veins and various reproductions of photographs of rock sections and natural geological exposures, which are not entirely satisfactory. The appendix contains maps and geological sections of the district which are very well prepared. The book is certainly a valuable contribution to the literature of economic geology, and it is to be hoped that the Mexican Geological Survey will presently bring out similar monographs relating to some of the other mining districts of the Republic.

CORRESPONDENCE.

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

Molybdenite.

Sir: Can you tell me whether molybdenite or compounds derived from it have any uses in the arts? If they have any uses, are they in any way extensive or are they limited in extent? GEORGE E. PLUMMER, BOSTON, MASS., October 6, 1897.

[The demand for molybdenite is at present very small indeed. The entire consumption in the world amounts to only a few tons. Molybdenite is not an uncommon mineral and it can be supplied in considerable quantities, if needed.—EDITOR E. & M. J.]

Low Grade Gold Ore.

Sir: Please inform me as to the average grade of ore during the past year for the Treadwell mine, Douglas Island, Alaska, and the average grade of ore of the Homestake mines in the Black Hills; also what is the average grade of ore in the Spanish mine in California.

If not trespassing too much on your time, I should like to know the number of cyanide plants now in successful operation in the United States. J. BOURNE, JR.

NEW BEDFORD, MASS., Sept. 11, 1897.

[The yield of the Treadwell ore for the year ending May 31st, 1896, as reported by The Alaska Treadwell Gold Mining Company, was \$2.97 per ton. Since June 1st, 1890, the yield has ranged from \$3.49 to \$2.60 per ton, and the working cost from \$1.59 to \$1.08. The assay value of the ore is not stated in the reports of this company. The superintendent reported, however, that the average of the ore developed May 15th, 1886, in the lower levels of the mine was \$4.19 per ton.

The yield of the Homestake ore for the year ending May 31, 1897, was \$4.65, its assay value not being reported. We have no recent data as to the grade of the ore worked at the Spanish mine near Washington, Nevada County, Cal. Several years ago the yield per ton was said to be 85c, and a few years previous it was reported as 70c. Probably it does not vary much from these figures at present. The ore at this mine is the lowest grade of any worked at a profit in the United States.

We have not a complete list of the cyanide works now in operation in the United States. The process is most extensively applied in the the Mercur District in Utah, where there are six works in operation, most of them successfully, we think. There are large and successful works at Cripple Creek and Florence, Colorado; Marysville, Montana; De La Mar, Nevada; Bodie, California, and at several places in Arizona, besides many small works in various states. We think we are safe in saying there are at least 50 cyanide works, large and small, in operation in the United States at the present time.—EDITOR E. & M. J.]

Smelting Works at Vancouver.—Two promoters are endeavoring to erect smelting works at this place. One of them, W. H. Remington, of Salt Lake City, modestly asks the Vancouver City Council to pay a bonus of \$1 per ton on the output of the works which he will build. The other, Mr. J. H. Rothschild, of London, also desires aid from the city. It is not considered in Vancouver that these propositions are likely to result in anything.

The Production of Zinc Ore in New Jersey.—In our issue of September 25th, 1897, we fell in error in stating that the Sterling Iron and Zinc Company had shipped 78,080 tons of zinc ore in 1896, this being represented as the total production of the State. In fact the total shipments of zinc and franklinite ore from Sussex County, which means the total production of New Jersey, amounted to 76,623 long tons, against 63,740 in 1895. The Sterling Iron and Zinc Company shipped only a portion of the total, materially less than one-half.

MR. OGILVIE'S VIEWS AS TO THE KLONDIKE.

A reporter of the *British Columbia Mining Record* interviewed Mr. Wm. Ogilvie, the Canadian land surveyor stationed in the Yukon, and learned from him his opinions as to the Klondike placers, which are essentially as follows:

"Of course, all we have got to go upon at present are the extraordinary rich finds at Bonanza and Eldorado creeks. There are 100 claims on Bonanza and 40 on Eldorado that I do not doubt will produce a phenomenal quantity of gold in the next eight or ten years. They have found some very big prospects on Hunker Creek. Other creeks have not yet been explored. Of course, you may confidently expect that rich quartz finds will be made. In fact, I have tested specimens of quartz found in the country which returned over \$1,000 to the ton.

"The likelihood of distress and hardship during the coming winter is a question of food supply. There will be enough to feed, say, 4,000 people. If there are 4,500 in the country it means starvation for some of them. The idea of taking in supplies by dog train is utterly impracticable. The best dogs cannot haul for a long distance more provisions than are required for their own and their driver's use. As to hardships, there is a good deal of 'bosh' talked, naturally, by those who know nothing of the matter. The climate is severe, it is true, but men have resided in Yukon for 10 years or more and enjoy perfect health to-day.

"Both the Dyea and Skaguay trails are good if you want to get to the diggings early in the spring. But if you are not in a particular rush and prefer a more comfortable journey, the St. Michaels route up the Yukon River is to be recommended. By this route you will arrive at Klondike in July or August. River navigation is generally open for from two and a half to three and a half months in the year. The Hootalinqua River is navigable, I think, except in perhaps two places, where the channel might need deepening.

"During your stay in the country were you never tempted to acquire property with all this gold for the finding?" asked the interviewer.

"Well, no; I was not allowed by the regulations to stake out a claim for myself unless I first applied for permission, and this would have taken too long to get. I could indeed have bought interests cheap. In fact, I was offered on three different occasions half-interests in claims if I would give the owners an order on the store for \$200 or \$300 worth of provisions, but I always refused to do so, because, you see, I was acting as a sort of arbitrator in disputes between the miners, and I thought perhaps if I owned property myself my judgment might be biased."

THE MANUFACTURE OF SULPHURIC ACID.

E. Loew, in a recent issue of the *Zeitschrift für Angewandte Chemie*, reviews the systems in use for the production of concentrated acid from chamber acid, and groups the methods of concentration as follows: 1, by distillation; 2, concentration by means of air at a temperature when the acid possesses considerable vapor tension; 3, concentration by crystallizing the monohydrate from high-strength acids.

A variety of apparatus has been tried for the concentration of sulphuric acids by distillation, the stills being constructed of platinum, gilded platinum, glass, porcelain or iron, but those made of platinum continue to find most favor. The methods of concentration commonly employed are costly, inasmuch as the vessels in which the concentration is carried out become defective quickly.

It is well known that sulphuric acid may be concentrated by means of hot air, the chief aim being to saturate the air with aqueous vapor and allow the concentrated acid to flow off. It is not essential that the acid should be maintained at its boiling point, as concentration will take place at lower temperatures with absolutely dry air. However, the higher the temperature the better, as the vapor tension increases the nearer the boiling point is approached. The intensity of the work of concentration is determined by the difference between the absolute and maximum vapor tension of air and the vapor tension of the acid. The rate of concentration is determined by (1) the heating surface; (2) the volume, temperature and dryness of the air; (3) loss of radiation and conductivity.

To make a calculation of the rate of concentration the following conditions are presupposed. The acid to be concentrated has a temperature of 20° C., and contains 64.5% of monohydrate. The air leaves the apparatus saturated with aqueous vapor at 80° and 760 mm. tension. The acid formed is at its boiling point, and contains 95.6% of monohydrate. The air has a temperature of 20° at 760 mm. tension. From these figures the amount of heat required to produce 95.6% of acid from 64.5% may be calculated, and it will thus be found that 100 kilos. of acid require 49,500 cal. If, under the same conditions, the air should leave the apparatus saturated at 50.6°, 51,800 cal. would be required. On the other hand, saturated at 90° C., only 48,900 cal. are necessary.

The presence of carbonic acid in the gases, when obtained from a direct fire, has scarcely any influence on the figures quoted, whereas the presence of water, formed by the combustion of any material used for firing, would naturally be disadvantageous.

It is immaterial, theoretically, whether the heat be supplied by means of air or of sulphuric acid. When concentrating in lead vessels, the acid is heated to 130-150° C., and the air is allowed to heat itself and absorb aqueous vapor. By this means, however, it is impossible to saturate the air with aqueous vapor. Even under the most favorable conditions the air will only be so far saturated that its tension for steam is equal to the vapor tension of the hot dilute sulphuric acid. The temperature of 140° C. is rarely exceeded in lead vessels, at which temperature the tension of an acid of 60° B. is inconsiderable, wherefore it is advantageous to cover such vessels in, thus making it possible to allow the air to escape at a temperature of 80-90° C. In Kessler's apparatus the escaping air is caused to meet the acid to be concentrated, when it is possible for the air to have a higher tension than that of the acid to be concentrated, with which the air was last in touch. However, practically it is impossible to utilize the air in such a manner that it shall escape saturated with moisture, and it is therefore always necessary to employ an excess over the theoretical amount. This, however, still permits of a good utilization of the heat supplied and a production of an acid of any strength up to 98°.

NITROSYLIZED BLAST FURNACE SLAG AS AN ADDITION TO HYDRAULIC CEMENT.—III.

Written for the Engineering and Mining Journal by A. D. Elbers.

In the last article (Part II.) it was demonstrated that briquettes made of Portland cement and nitrosylized slag can become stronger than those made of the neat cement, whereas it is well known that the cohesive strength of cement gaged neat is always greater than that of any admixture of it with sand; and it remains now to be shown how the strength of mixes that consist of cement, nitrosylized slag and sand compares with that of mixes that consist only of cement and sand, the latter being in both cases admixed in the same proportions.

It has already been stated in the first article (Part I.) that the slag-admixture is apt to yield less favorable results—at least in the beginning—because three ingredients of different size cannot be dry-mixed as thoroughly as two; but there is a still weightier reason. When nitrosylized slag is only mixed with water it does not set at all, and its mass falls easily apart after the water has evaporated. As an ingredient of cement it is, therefore, not a cementing factor from the beginning, and it only acquires that property gradually, in the measure in which the lime and alkalis that dissolve out of the cement react upon it. Until these reactions are fairly under way the admixed slag is apt to have even a more unfavorable influence on the cohesive strength of the mass than the same quantity of sand would have, inasmuch as the finely pulverized slag must be more injurious as long as it is chemically inert than the much coarser sand. Thus a mix that consists of 80 parts cement, 20 parts slag and 300 parts sand cannot be expected to have greater initial tensile strength (say within 24 hours after setting) than neat cement that has been mixed with four parts of sand, inasmuch as the proportion in which the inert ingredients stand to the cementing substance may then be assumed to be still very nearly as 320:80, or in the ratio of 4:1. Later on the results turn, of course, more in favor of the slag-admixture; in 28 days the latter is apt to give as good results as the 3:1 mix of sand and cement, and thereafter the strength of the slag-mix is apt to increase much faster than that of the other, especially when the respective specimens are kept constantly under water, because the silicifying action of the slag is apt to continue after the cement has already ceased to yield gelatinous silica.

The results of the following sand-tests—though they are not satisfactory in all respects—tend to illustrate to some extent these conditions. The respective briquettes were tested for tensile strength on May 26th, when 19 days old; the resulting halves were kept in a dry place until September 15th, put under water for 20 days, and crushed on October 5th. Allowing for the serrated condition of the fractured stems the superficial area of the respective halves, added together, may be fairly estimated to have been equivalent to 4 sq. in. of sound surface. The resistance to crushing is stated separately for each of the briquette-heads, the first figure denoting the resistance of the shorter piece, and the second figure that of its counterpart.

TESTS WITH CEMENT B.

No.	Composition of Mixture.	Tensile strength in pounds per square inch after 19 days.	Resistance to crushing in pounds, for 2 sq. in.
5	1 part neat cement, 3 parts sand.	160	2775-2820
6	½ cement, ½ slag, 3 parts sand.	90	2340-2675

Taking the mean results of the crushing tests, the resistance to compression stands to the previously ascertained resistance to tension in the following ratio: No. 5, after 131 days, of which 38 days under water = 8½:1; No. 6, after 151 days, of which 38 days under water = 14:1. By referring to table B in part II. it will be found that the tensile strength of the neat cement B was only 310 lbs. per square inch after 19 days, whereas the 3:1 sand-test noted above (No. 5) gave 160 lbs., which is a rather high relative result. It is therefore to be presumed that the briquette of neat cement B must have been defective, and that the average of five or ten tests of the same material would have been higher. On the other hand, the resistance-ratio of 14:1 for No. 6, with only 5% of nitrosylized slag, seems to indicate that the average result of five or ten tests would have shown a much higher tensile strength than 90 lbs. to the square inch.

I admit that the tests which I have made with briquettes of standard size are of too limited extent to warrant the correctness of all my conclusions, but these tests have been preceded by a great number of other experiments, with cement-pats of various compositions, which were begun over a year ago.

Cyanide Works in Queensland.—There are now 40 cyanide works in the Charters Towers district and others are in course of construction.

Pyrite and Marcasite.—Although both these minerals are commonly considered to be FeS₂, A. P. Brown, in *Proc. American Phil. Soc.*, 1894, 225, considers marcasite to be FeS₂, and pyrite FeS₂, Fe₄S₈.

The Sicilian Sulphur Industry.—The Anglo-Sicilian Sulphur Company, Limited, which was organized last year to control the sulphur industry of Sicily and the manufacture of Chance-Claus sulphur in England, has just published its report for the year ended July 31st, 1897. The statements presented include expenses for the full twelve months, but the period of actual working was only about 10 months in Sicily and seven months in England. The gross profits amounted to £68,383, and after deducting all expenses and writing off £6,433 for good will, preliminary expenses, deficiencies, etc., a net profit of £42,920 remained, out of which a dividend of 6% was paid on the preference shares and 8½% on the common.

* No. I. appeared on page 661, *Engineering and Mining Journal* of June 26th 1897; No. II. on page 364, number for September 25th, 1897.

THE GOLD DEPOSITS OF MANCHURIA.

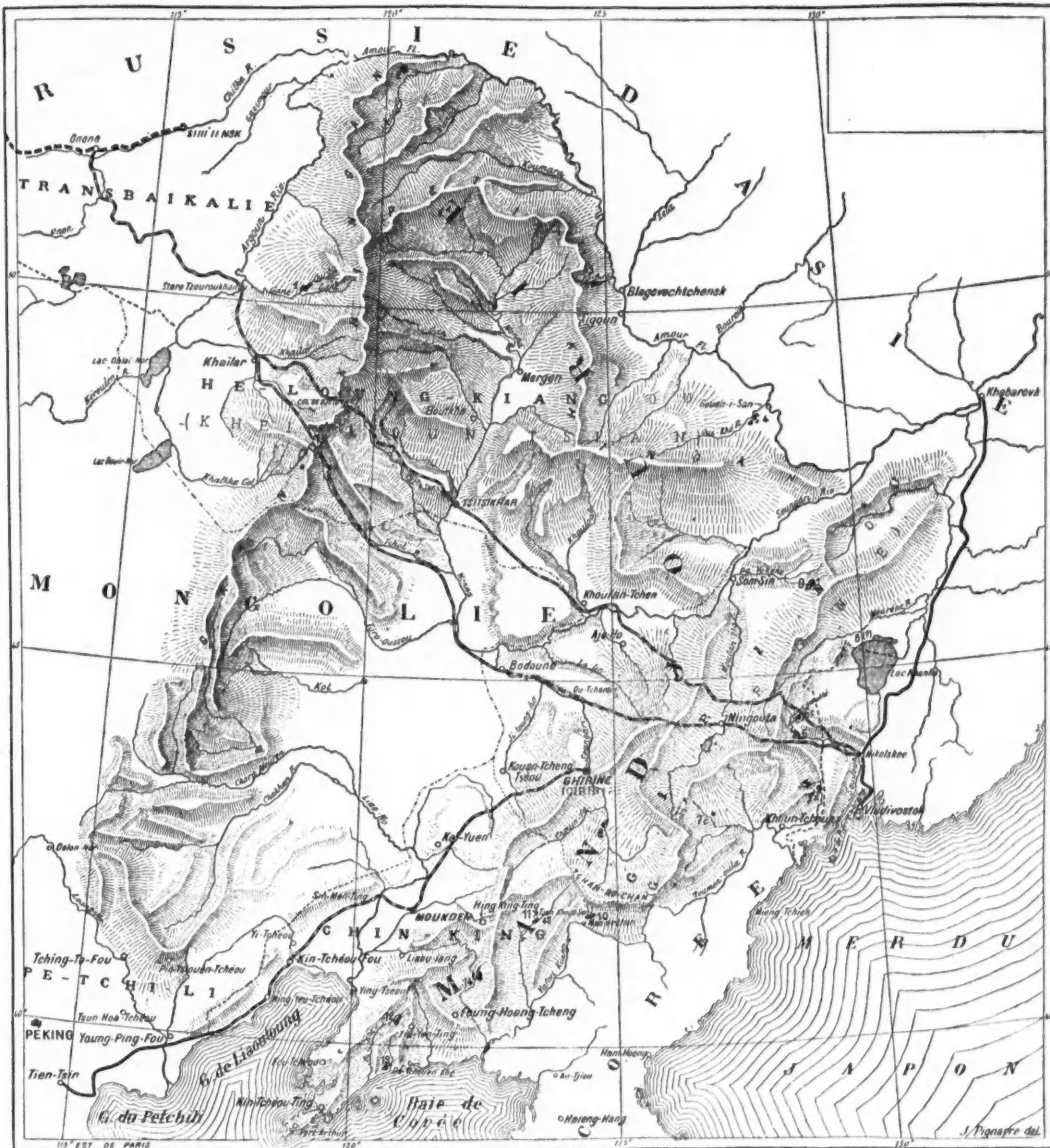
It has been for a long time known to the Russian engineers that there were many important deposits of gold-bearing sands in the tributaries which flow into the Amour River from the southern or Chinese side of the territory through which that river forms the boundary between Siberia and Manchuria. These were not accessible, owing to the strict prohibition of mining by the Chinese law, although there is no doubt that some of them have been from time to time worked by the Russian *staratieli* or prospectors who abound in the Trans-Baikal and the Amour province, and who have occasionally found their way across the line. Under the recent treaty by which the Russian government has acquired the right to build the eastern end of its Siberian line through Manchuria and under which it will, doubtless, in a few years come into complete control of that province, these deposits acquire importance, since they will before long be opened to exploration.

Some particulars with regard to these Manchurian deposits are given in a recent article by M. René de Batz in the *Genie Civil*, from which we

are naturally the districts adjoining the Russian territory. The brothers Boutine, the well-known Siberian explorers, report that the first and perhaps the most important deposits are found along the Ourga, a tributary of the Gana, which in its turn flows into the Argoun, the stream which unites with the Chilka to form the Amour. Some of the placers were shown by a hurried examination to be exceedingly rich.

Other valuable deposits are found in the Valley of the Joulouga, which flows into the Amour about 450 versts above Blagoviestchenk. These placers were invaded by Russian workmen as long ago as 1884, and it required a considerable force of Chinese to drive them out. Some years later, in 1888, the working of the mines was undertaken by a Chinese society at the head of which was Li Hung Chang. They are known by the name of the Mo-Khe mines, but little is known of their present condition. In 1890 nearly 500 miners were attracted by the discovery of gold in the valley of the Fa-Bira, a stream which falls into the Amour a little below Blagoviestchenk. The Russians were driven out by Chinese troops, and a garrison is still maintained to prevent any further working of these placers.

On another tributary of the Amour, the Oui-Khe, are found alluvial



MAP OF MANCHURIA AND THE UPPER AMOUR.

obtain also the map given herewith, which shows the lines surveyed for the Eastern Chinese Railroad, which is to be in reality the eastern end of the Siberian line. The location of that line as originally made followed the valleys of the Chilka and the Amour to Khabarovka, from which point the road is already completed through the Oussouri valley to Vladivostok. The map shows how much more direct the route through Manchuria is, and it has also the advantage of being a more southerly line and one less subject to interruption during the winter. It is well understood also, although not yet announced, that a branch will be built to the southward giving the road a terminus at Port Arthur or some neighboring point.

Although from time immemorial mining has been prohibited in China, within the past year there has been a departure from the ancient policy, and regulations have been promulgated by the Chinese authorities authorizing the search for gold in Chinese territory, prospectors and miners being required to obtain permits from the local authorities, paying an annual tax of 100 taels, and a royalty of two-fifths of all the gold obtained. These regulations, however, are only provisional, and will doubtless be superseded by others as soon as the Russian influence is well established in the country.

Some explorations already made by Russian travelers have given a general idea of the extent of the gold-bearing region. Those best known

deposits which have been worked by some parties under permits from the Chinese government. In 1894 it is said that 2,000 men were at work in these placers, and that a return of 72 poods (1,180 kg.) of crude gold was obtained. More recently, Colonel Pontiat, a Russian explorer, reported the existence of rich alluvial deposits on the Morena, not far from Lake Khanka, but no further explorations have been made. The Morena is in the extreme eastern portion of Manchuria and is a tributary of the Oussouri.

In the basin of the river Soui-foun, which falls into the bay of Peter the Great, not far from Vladivostok, the existence of gold has been recognized on the banks of at least three tributary streams, the Van-loung-gou-khe, the Ba-dao-khe-tsi and the Sao-Soui-foun. Placers are also known to exist and have been occasionally worked in the valley of the Youmen-Oula, which forms the boundary between Manchuria and Korea. On a neighboring stream, the Gubon, workings have been carried on in spite of official prohibition, but with the consent of the governor of the district and doubtless to his profit.

In the districts more remote from the Russian frontier the principal mines known are those of the upper Soungari, where the mines of Tsia-pi-gou are said to have been worked 130 years ago. At the present time the exploitation is carried on by a semi-independent Chinese community, reported to be very wealthy. The chief of this community during the

Japanese war equipped three companies of soldiers at his own expense and sent them to join the army under the command of his son-in-law.

Gold has also been found on the Vokene-khe, which flows into the Soungari at Sansin, about 450 versts southwest of Khabarovka. In 1889 the governor of Ghirina permitted the working of these deposits, levying a royalty of 10% on the gold obtained. Nearly all the neighboring population flocked to the placers, but as the permission was not confirmed by the authorities at Peking, troops were sent to drive out the prospectors. An attempt was then made to work the placers on government account, but it lasted only a very short time. In 1895, however, the Russian traveler Matioinine reported that a large number of Chinese, probably 5,000 altogether, were working the placers without any interference from the local authorities. He reported that at least 60 poods (982 kg.) had been extracted by the workmen, but no special authority for this statement was given. In 1896 one of the directors of the Chinese company operating the Mo-Khe mines obtained a concession covering all the alluvial deposits in the province of Ghirina, and endeavored to put a stop to the illicit working. He sent a force of 2,000 men to the district, but the result is not yet known.

Other alluvial deposits are reported in the mountain of Tchan-bo-chan and in the peninsula of Liao-doun. Some of these deposits have been worked on government account, but the results reported were exceedingly small. The English traveler Fulford reports that on one occasion his party came suddenly upon a placer where there were a large number of men at work who at once fled into the forest and concealed themselves there, fearing apparently that they would fall into the hands of the Chinese authorities.

Information with regard to the Manchurian placers is not generally very definite, except for the two great centers, Teai-pi-gou and the Joulouga. Some curious facts are known with regard to the social organization of these mining communities and the methods of exploitation, which are exceedingly primitive. The work is chiefly confined to the sinking of shafts through the overlying beds of turf and sterile gravel to the pay gravel. Galleries and crosscuts are excavated through the latter, often without any kind of timbering. The gold-bearing gravel is carried in carts or barrows to a sluice of a primitive sort which is supplied with water from the most convenient source. The miners keep the mass agitated as it passes through the sluice by beating it with sticks, and the gold is deposited in the riffles, while the clay and sand is carried away by the current of water. In the Joulouga placers, the soil being marshy, the work is carried on most easily in winter when the ground is frozen. The water necessary for washing is in summer drawn to the sluices by horses. In winter the snow and ice are thawed by stones previously heated in the fire.

As to the nature of the deposits, the only reliable facts known are of the Joulouga placers. The ground worked by the Russian miners, who called themselves the "Free Community of Miners of the Joulouga" from 1883 to 1886, occupied both banks of the stream for a distance of 12 to 15 versts, the width varying from 40 to 200 m. The surface clay and the sterile gravel vary in thickness from 1 m. to 1.75 m.; below this is a bed of sandy clay from 2 to 7 m. in thickness, under which the pay gravel is found, usually from 1.50 to 2 m. thick. The gold is unequally distributed and was found chiefly in pockets. If nuggets were found, their existence was generally kept quiet, but there is a tradition that one nugget was found weighing 5 Russian pounds (2,050 g.). As the cost of all the necessities of life at these mines was very high, it was not found profitable to work gravel yielding less than 5 zolotniks to 100 poods (21.33 g. to the cubic meter). The working was generally carried on by parties of nine men each and it is said that their earnings varied from 150 zolotniks (640 g.) of gold down to 10 or 15 zolotniks (43 to 64 g.) a day. When the placers were first discovered it was not uncommon to see a Russian pound or even 1½ lbs. (410 to 615 g.) obtained from a single cubic meter of gravel.

The Bertrand-Thiel Steel Process in Belgium.—It is reported that the Thy-le-Chateau Company has decided to adopt a modification of the Bertrand-Thiel steel process at the new works about to be erected near Charleroi, Belgium.

Swedish Iron Ore Trade.—This trade continues exceedingly brisk, there being an active demand, especially on export account. During the seven months ending with July the exports of ore from Sweden amounted to 739,492 tons, as against only 629,209 tons in the corresponding period of last year.

Italian Rail Contracts.—An order has just been placed by the general direction of the Mediterranean Railroad, with Chas. Cammell & Company, of Sheffield, England, for 3,155 tons of steel rails, at an inclusive sum of 635,227 lire, delivered. This is an average price of 201.34 lire (\$38.66) per ton, delivered.

Pig-Iron Production in Germany.—The output of the German blast-furnaces for the seven months ending July 31st was: Foundry iron, 614,024 metric tons; forge, 962,301 tons; Bessemer pig, 332,679 tons; Thomas pig, 2,002,569 tons; total, 3,911,573 tons. This is an increase of 275,992 tons, or 7.6%, over the corresponding period in 1896.

Advantages of Galvanized Tank Steel.—That galvanized sheets which are made of steel with the oxide formed in rolling removed, and then coated with spelter, are not more generally used in boiler or tank works, is because the advantages they possess are not fully understood, says the *Iron and Coal Trades Review*. It is, however, well for boiler makers to remember that the action of moisture, especially when impregnated with sulphur arising from soft coal, has a destructive influence on steel plates, rusting them rapidly, particularly in the lighter gages. This may be delayed by frequent painting or varnishing. A coating of spelter makes steel sheets impervious to moisture, and therefore the life of the metal is preserved almost indefinitely, especially where it may be painted with the ordinary preservatives from time to time.

The Maryland Brick Industry.—There are 96 firms engaged in the manufacture of brick in Maryland, most of them in the vicinity of Baltimore, though a good many are scattered throughout the State. The average working time in 1896 was nine months. About 152,000,000 brick are made in the State annually. The employees receive an average of from \$7.50 to \$10 per week.

Brick Making in Texas.—There are seven concerns in the vicinity of Houston which manufacture brick, the clay found there being of good quality. The annual output is about 25,000,000 brick and the industry gives employment to 600 men, which includes those who cut and furnish the 15,000 cords of wood consumed annually. The Houston brick are marketed in Texas and Louisiana.

Silver-Lead Smelting Works in Utah.—The Germania, which has five furnaces (two of 100 tons per day and more, and three of 50 tons) and two copper reverberatories, has at present two blast furnaces and one reverberatory in operation. The Pennsylvania, which has five blast furnaces of about the same capacity as the Germania, has only one in operation. The Hanauer Works, which have four blast furnaces each of 40 tons per day capacity, have three in operation.

Castner-Kellner Alkali Process.—An interim report of the company controlling this process states that the first installation in England has been at work without intermission since the annual meeting, gradually increasing its output up to its full capacity. The second installation of equal capacity—namely, 1,000 H. P.—will be in operation during the winter. The directors have entered into contract for the sale of all the bleaching powder that can be produced by the company for three years from July last.

Railroads in the Malay Peninsula.—United States Consul-General Pratt, at Singapore, in a recent report refers to an important railroad project which will assist in the development of the tin and other mines in the Malay Peninsula. The federated Malay States, which are under British protection, have negotiated a loan of \$5,000,000 for the purpose of building about 320 miles of railroad extending from a point nearly opposite Penang to Port Dickson. There are now 54 miles of railroad on the Peninsula, in three short lines.

Output of Coal in Kentucky.—Mine Inspector Stone reports that returns from 8 of the 11 counties comprising the Western district of the State show a decrease in the output for the first six months of 1897 of 32,505 tons as compared with the same time last year. The falling off is due to flooding of the mines in the early spring months and dull business. The Western district produces nearly 60% of the entire output of the State. The falling off in the Southeastern district is probably large also, as most of the mines have been idle since May 1st. The outlook for the second half of the year is more encouraging.

Belgian Coal Mines.—The total production of the Belgian collieries during the first six months of the present year amounted to 10,583,280 tons, against 18,386,550 tons for the corresponding period in 1896, showing an increase of 196,750 tons. According to M. Francis Laur, the average production of coal per year per man employed in Belgium from 1881 to 1890 was 175 tons. It varied considerably in the different districts, being 144 tons in the Borinage, 173 tons in the Center, 177 tons in Liege and 188 tons in Charleroi. The Belgian average was lower than that of any other coal mining country in Europe, the mean annual yield of France for the same period being 200 tons per man; Germany, 280 tons; England, 314 tons.

Uranium Ore in Colorado.—Two or three small shipments of pitchblende have been made recently by leasers from the dump of the Wood mine and underground workings on the Calhoun and Kirk veins, all in Leavenworth Gulch, Gilpin County, Colo. The ore from the Wood mine is massive and is generally mixed with patches and strings of pyrites. In the Calhoun and Kirk veins it occurs as pisolitic nodules, fibrous and radiated from a center, in earthy wad. Most of the ore recovered has gone to Denver for shipment to Germany. For further notes as to this very interesting occurrence of uranium ore reference may be made to a paper read by Dr. Richard Pearce before the Colorado Scientific Society September 9th, 1895, entitled "Some Notes on the Occurrence of Uraninite in Colorado."

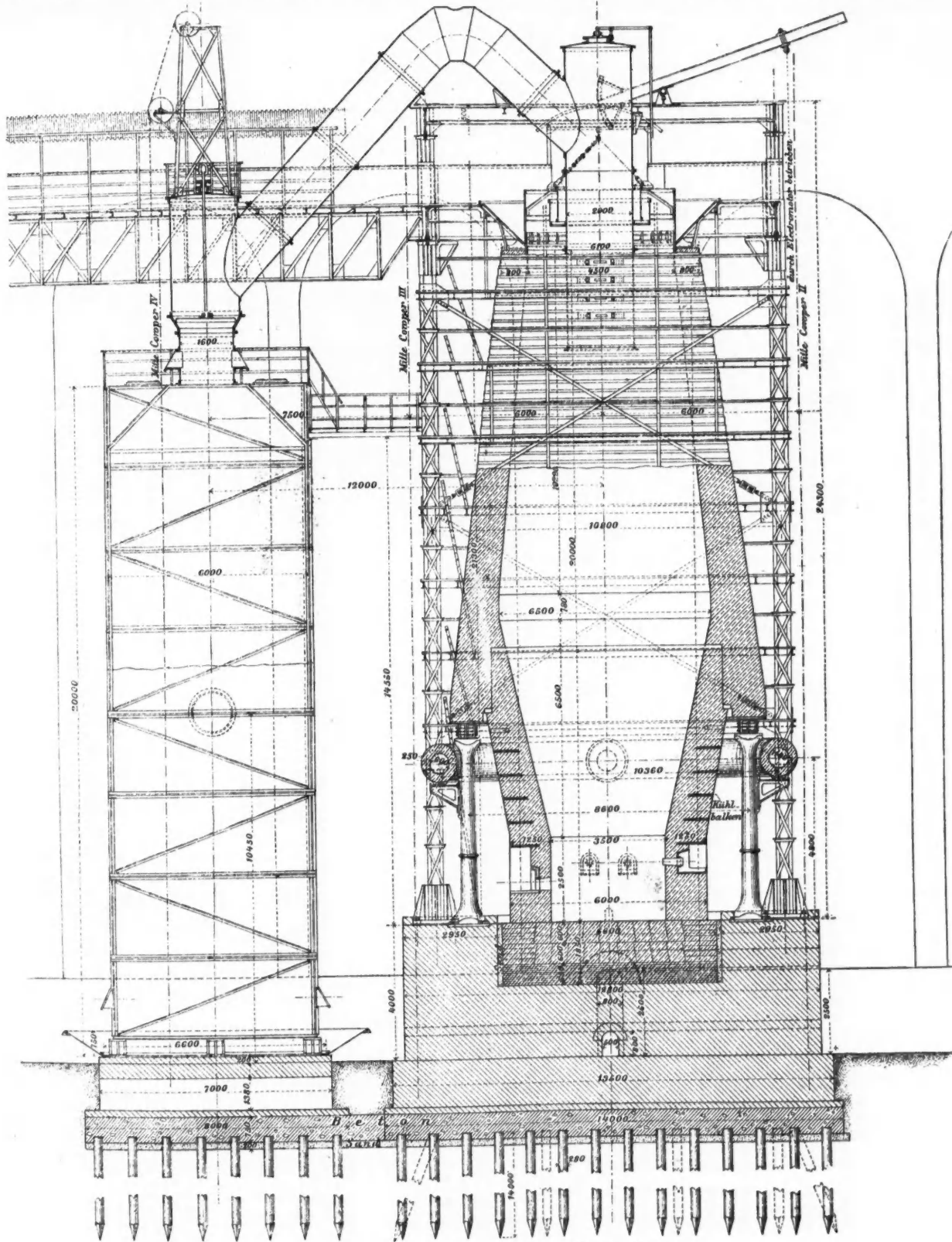
Turquoise in Nevada.—Turquoise has been discovered recently in Lincoln County, in Southeastern Nevada, at the foot of Sugar Loaf Peak. The country rock is mica schist. The zone in which the turquoise is found is about half a mile wide and a little more than a mile long. In this zone there has apparently been no fissuring, with the exception of the intrusion of one large dike which is about 250 ft. wide and shows clearly for 4,500 ft. in length. The largest and purest specimens of turquoise are found in this dike, sometimes showing on the surface, in nodules which vary from the size of a pin head to an average walnut. Mr. George Simmons, of Vanderbilt, Cal., from whom we have received this information, reports that he has found several prehistoric workings and numerous stone implements. All these old workings have been filled in and the only way to detect them was by the shrinkage of the loose earth and the numerous tiny particles of turquoise which it contained.

Two cross-cuts have been driven to open the turquoise-bearing rock, one at a depth of 35 ft. and the other at about 20 ft. A shaft, 25 ft. deep, has also been sunk, besides several 10-ft. holes. The turquoise from this place has been marketed at Denver, New York and Los Angeles. The largest of the stones sold up to date weighed 64 carats, with others ranging from 10 to 22 carats. Specimens of the stone which we have seen are of a rather light-blue color. Development work is at present being carried on at the property by four men, but it is expected to increase the force before winter.

THE KRAFT IRON WORKS IN GERMANY.

The latest completed blast furnaces in Germany are those of the Kraft Iron Works, which are situated on the left bank of the Oder River at Kratzwiek, six miles from the city of Stettin. The location of these works is in itself a new departure, since they are the first blast furnaces of any importance to be placed so near the coast, and at a considerable distance from the iron ore producing districts. They were built there, however, mainly with the view of competing for the trade of northern Germany and the seacoast cities, which is now largely sup-

ore bins are placed. These materials are unloaded from the steamers by four Hunt elevators and conveyors, which are operated by electric motors. The land upon which the works are built was originally a low meadow which was overflowed by the river at certain periods of the year. In obtaining a foundation for the works it was necessary to drive over 10,000 piles, ranging from 10 to 14 m. in length. The piles were driven down to a bed of hard clay, a little below the bottom level of the river. Over the ground surface a layer of sand 25 cm. thick was spread, and over this was another layer of clay which was carefully rolled, the top being composed of a layer of concrete, 75 cm. thick, into which the



BLAST FURNACE AT THE KRAFT IRON WORKS, GERMANY.

plied from England and Belgium. The raw materials to be used in these furnaces will be imported, the iron ore from Spain and Sweden and the coal from Great Britain. Raw coal will be brought and the coke will be made on the spot, a battery of 90 by-product coke ovens forming part of the equipment. The plant is described and illustrated in *Stahl und Eisen* for September 1st.

The works stand on a tract of low land on the banks of the river, so that iron ore and coal can be discharged upon the docks, adjoining which the

surface of the piles enter. The general level thus secured is 2.5 m. above the ordinary level of the river, and at a height to which no flood on record has ever reached.

There are two blast furnaces, and a section of one of these furnaces with the waste gas collector and purifier is shown in the accompanying engraving. The furnaces are not encased in iron plates, but are supported by cast-steel pillars below, as shown in the section, and are hooped with strong steel bands. Each furnace has six tuyeres. The charging

apparatus and the elevators which carry ore and coke to the top of the furnaces are all operated by electric motors. Each furnace has four Cowper stoves, each 23.5 m. high \times 6.5 m. in diameter. These are of the ordinary type and do not present any peculiarity of construction.

The waste gas collector, a section of which is shown in the engraving, is of the Langen bell type. The purifier is an iron chamber, 6.6 m. wide, 12.6 m. long and 18 m. in height, divided into six equal compartments, so that the gas is made to pass down one compartment and up the next throughout the whole six.

The second engraving, given herewith, shows a longitudinal section and a cross-section of one of the boilers which furnish steam for the power plant, the construction being very clearly shown by the drawing. The boilers are heated by the waste gas from the furnaces, which is conveyed to them in pipes, and is forced over a grate, upon which is kept a small fire, generally fed by waste and broken coke.

In addition to the machinery already mentioned there are the usual blowing engines and other appurtenances of the furnace, and also a coal mixing and breaking plant of the Schuchtermann-Kraemer type. There are also the necessary appliances for preparing the by-products from the coke ovens.

A feature of this plant is that all the machinery is operated by electric motors, the power being distributed from a central power-house. This plan has been carried out all through the works, and they are the first large works in Germany to be operated in this way.

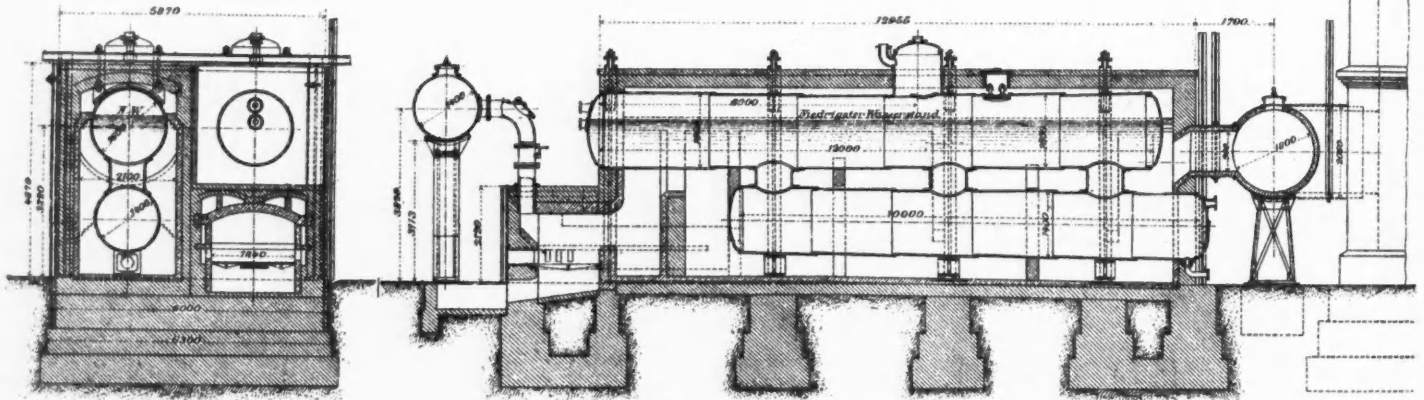
The works, which may be regarded as types of the latest German blast

Watts) which Dr. Wm. B. Phillips tested during the past spring, occurs.

Southeast of the stringer lead of gold-bearing quartz occurs another of the series of dikes of hornblende-gneiss or diorite of an average thickness probably of about half a mile, which extend through the entire gold belt of Alabama in a northeasterly direction and cross into Georgia, in Carroll County. Parallel to this on the southeast occurs a belt of gold-bearing schists averaging nearly a mile in thickness, and one of the most persistent belts of gold-bearing formations in the South. The ore bodies so far discovered in this belt are all absolutely free milling above water level, of comparatively low grade, and near the surface of such a character as renders a Huntington mill or some grinding machine better adapted for crushing the material than a stamp mill.

With regard to the Huntington mill, I would suggest as improvements a better method of oiling the rollers and also an increased plate area.

Another district recently examined in Alabama is the Goldville mining district, which was described in Bulletin No. 3, Alabama Geological Survey, by Dr. Wm. B. Phillips, who made a preliminary survey of that portion of the Alabama gold regions known as the "Lower Gold Belt." All the work in this district dates back to nearly 50 years, and no effort has ever been made to prevent the openings from caving in. Recently some prospecting has been done, giving an opportunity to examine the general features of the district and particularly that property described by Dr. Phillips as the "Uhrig pits," which was purchased some time ago by Capt. John Grant, of Atlanta.



BOILERS AT THE KRAFT IRON WORKS, GERMANY.

furnace practice, are now completed, and the first furnace went into blast August 21st last.

SOME AURIFEROUS QUARTZ BODIES IN ALABAMA.

Written for the Engineering and Mining Journal by W. M. Brewer.

I have, in several previous articles, referred to the extensive bodies of auriferous schist in Clay County, Ala., as promising profitable results if operated on a sufficiently large scale and systematically. A recent test made in this district has demonstrated one cause of many unsatisfactory operations in gold mining in the South. This is, that in the West, because of the colder climate, amalgamation is easier than in the South, but an amalgamator has to thoroughly learn his especial work before he is allowed to touch the plates; in the South the idea seems to prevail that amalgamators are born and require no teaching or experience. The consequence is that no matter how good the ore sent from the mine, much of the value is lost in the tailings from the mill. The great difficulty in this climate is to keep the amalgam on the plates hard enough to prevent scouring.

The occurrences of gold-bearing ores, either in the schists or in quartz in Clay County, are closely associated with four distinct belts almost parallel, composed of series of dikes of eruptive rocks, which, while not connected together along the line of strike, can be traced with great ease, the dikes appearing as lenticular stringers, with the lenses of varying dimensions, sometimes covering 40, 80 or even 200 acres, at other times having a limited area. The Northwestern boundary of this gold-bearing region is formed by the belt of Hillabee schist (Dr. Eugene A. Smith, State Geologist), itself an altered eruptive, which dips toward the southeast. Overlapping this schist occurs a belt of about three-quarters of a mile in thickness of mica-gneiss, probably of sedimentary origin and belonging to the Cambrian period. This also dips toward the southeast. Following the series in that direction we find, next, a narrow belt of eruptive hornblende-gneiss, the most northwesterly of the series of dikes referred to already. Parallel with this with the same strike and dip, occurs the body of auriferous quartz. This is apparently one of the stringer leads so often found in the South, and its extent has not been satisfactorily determined. The stringers of quartz aggregate in places a thickness of 20 ft.; portions of it yield values in gold, while other portions of it do not. A 10-stamp mill is being erected on the property, for the purpose of testing the grade of the quartz, and it is proposed to continue sinking the shaft until a depth of about 200 ft. has been obtained. Several open cuts have been made across this body on the surface, and the owners are apparently satisfied as to the extent and permanency of the gold-bearing quartz on their property. The coarse gold found in the gravel of a branch flowing along the base of the hill in which this body of quartz occurs established quite a reputation for the property during the days of placer mining in Alabama, but the body of quartz carrying gold was not discovered until the summer of 1896. It is in the belt of mica-gneiss referred to that the Ivey property (old Hollingsworth-

The belt of formation which is embraced in this district belongs to the semi-crystalline slates, designated as Talladega series in Alabama, by Dr. Eugene A. Smith, State Geologist, and as Ocoee series in Tennessee, by Professor Safford, State Geologist. The trend of this slate is about North 40° East, with the dip varying from about 20° to 65° toward the southeast. The slates are flanked on the southeast by a belt of gneiss and granite rocks. The belt has an average width of about 1½ miles, and on the northwest occurs a similar variety of slates, which are, however, unaccompanied by any gold-bearing quartz veins. The old workings extend from the north side of Hillabee Creek, in Tallapoosa County, in a direction North 40° East for a distance of five or six miles, and in a line almost as straight as though it had been located with a transit. Southwest from Hillabee Creek no discoveries of gold-bearing quartz have been made, but northeasterly veins of gold-bearing quartz have been discovered on both the east and west sides of the Tallapoosa River, in Randolph County. The extent and value of these have yet to be determined.

While the general geology of this belt is simple yet an examination demonstrates that there are local complications which make a study of the region interesting. As an illustration, on the Uhrig property a ridge of mica schist, or more properly, mica gneiss, has apparently been thrown up in the midst of the slates. The extent of this intrusive rock seems to be rather limited, only a few hundred yards wide, and in traversing a section about three miles to the northeast I failed to find any evidence of such mica gneiss. The schistosity of this has the same trend as the slates, which near the contact on the southeasterly side have a vertical dip.

From an examination of the workings, which comprised a crosscut tunnel run by the present owners about 125 ft., together with a large number of open cuts or trenches, excavated along the strike of the veins which had been originally opened some 40 or 50 years since, I found that these veins belong to the lenticular stringer variety, so general throughout the Southern gold-fields. The openings showed that a vast number of these lenses have been located parallel to each other in the mica gneiss formation. Most of the cuts had been carried down to a depth of about 40 ft., and all the ore has been mined from them to that depth. The tunnel has been run too long a distance northeasterly from the thickest portion of the quartz lenses and the consequence has been that about 100 ft. has been run through the slate, and only two or three very narrow stringers of quartz have been cut; beyond the slate the tunnel cuts the contact of slate and mica gneiss and also a thin vein of sulphuretted quartz. There is a very striking similarity between the mica gneiss and vein material exposed in the tunnel, and that found in the workings in the Pinetucky mine, in Randolph County.

Ore is being taken from the old workings, and recently there were some 40 or 50 tons on the dumps which belonged to a sugary variety of quartz, considerably stained with iron oxide, and apparently of partially free milling character; quite different in appearance from the thin vein cut in the tunnel. A 10-stamp mill was erected on this property soon after Captain Grant came into possession of it. This has been run until recently, when it was shut down for the purpose of introducing con-

centrating machinery. Prospecting work has been carried on in other portions of the property, which embraces some 1,300 acres of land. The thickness of the lenses varies from 6 in. to about 2 ft. The work of prospecting is to be continued.

In this district to the northeast, and beyond the Uhrig property, no work has been performed recently, and it is impossible unless the old openings are reopened to form any opinion as to the value of the properties. Judging from the outcroppings, there are innumerable stringers of gold-bearing quartz varying in thickness, and the question is whether the values contained are sufficiently great to warrant the removal of the quantity of country rock necessary to win the ore.

THE MANUFACTURE OF ROSENDALE CEMENT.

The value of the deposits furnishing the raw material for this cement was first recognized over 70 years ago. In 1823, while the Delaware & Hudson Canal was under construction near Rosendale, in Ulster County, New York, it was found that the dark blue limestone through which the canal was being excavated possessed hydraulic properties and, upon proper calcination would produce a hydraulic cement. Nearly 10 years later, in 1832, Watson E. Lawrence built a few small kilns, opened a mill and began the manufacture of the "Lawrence" brand of Rosendale cement at Lawrenceville, on the banks of Rondout Creek, not far from Rosendale. This mill was capable of producing 20 bbls. of cement per day. The present mills of the Lawrence Cement Company produce 5,300 bbls. of cement per day and about 1,200,000 bbls. per year. They are located at Binnewater and Eddyville, grinding the rock from 66 kilns.

The Ulster County deposits are mostly found within the limits of a narrow belt, scarcely a mile wide, skirting the base of the Shawangunk Mountains. The rock is taken from two beds, separated by sandstone. The upper of these is known as the "light rock" and the lower as the "dark rock," and the two are mixed together in the proportion found to

320 lbs. The product is subjected to an examination as regards fineness, setting qualities and strength, every half hour.

Copper in Rumania.—It is reported that deposits of copper ore have been discovered recently near Baile-de-Arama.

Fire-Clay in New Mexico.—Kaolin and fire-clays have been found in considerable quantities in several parts of New Mexico. The most important is situated near Socorro and is now being worked. A new discovery of a large deposit of fire-clay and kaolin in the suburbs of Santa Fe is reported.

Non-Corroding Soldering Fluid.—The *Iron and Coal Trades Review* states that a reliable soldering fluid, free from rusting properties, may be made with 4 lbs. of hydrochloric acid and about 4 lbs. of ordinary zinc cuttings; if old zinc is used a rather larger quantity will be required. It is best to add the zinc in two or three lots. When the acid is saturated—that is, when no more zinc can be dissolved—add a small quantity of oxide to color and filter through ordinary muslin. Having filtered, add 1 lb. of strong liquid ammonia, stir and then bottle. This preparation can be used as a soldering fluid and will not cause rust to appear on the articles on which it is used.

The Pelatan-Olerici Process.—The company controlling this process has now three mills in operation in the United States and Mexico. The largest is at De Lamar, Idaho, which has been described already in the *Engineering and Mining Journal*. There is a 10-ton mill at Poorman, Idaho, and one of the same size at Esperanza, Mexico. Five mills to use this process are in course of construction. The owners of the Carriz mine, on the Swan River, Summit County, Colo., are building a 30-ton mill, and the Jack Gold Mining Company, Summit County, is erecting



A ROSENDALE CEMENT QUARRY.

give the best results. The appearance of a quarry after the excavation of the cement rock is shown in the accompanying photograph.

At the Binnewater plant the quarries are located in the ridge directly to the rear of the mills. This location is unusually favorable. After the excavation and breaking of the rock it is conveyed to the kilns, and by means of a track passing over their tops is dumped at convenient points for charging them.

The process of calcination requires constant watchfulness and care, and only men of experience and skill should be employed as burners. The kilns are built of stone and lined with brick. The calcination is carried on by placing on the wood used for lighting the fire a thin layer of coal, over which a layer of stone from 6 to 8 in. thick is placed, then a thin layer of coal, etc. The coal used is anthracite, usually of pea or buckwheat size; it is placed on the rock in very thin layers, scarcely covering it. Each morning the previous day's burning is drawn from the bottom of the kilns. The product is then taken to the cracker-room, where it is crushed to a fineness varying from dust to lumps of the size of a hickory nut by what are known as crackers. These are made of cast iron, and consist essentially of a frustum of a solid cone called the core, working concentrically within the inverted frustum of a hollow cone, both being provided on their adjacent surfaces with suitable grooves and flanges for breaking the stone as it passes down between them. At the Binnewater mill there are eight of these crackers, driven by steam power.

After leaving the crackers the burned stone goes to an elevator boot, from which it is elevated to a conveyor and distributed to the different mills or grinders. It is ground so that at least 96% will pass a 50-mesh sieve. The ground cement is conveyed to a central reservoir, from which it is taken to the mixers, by which the cement coming from the separate grinders is thoroughly mixed and uniformity of quality is secured.

From the mixers the cement passes by chutes to the barrels in the packing room. As each barrel is filled, it is removed to the scales, where a man removes or adds sufficient cement to bring the weight exactly to

one of the same size; a 50-ton mill is going up in the Salmon River District, Idaho, and another of 50 tons capacity at Hillsboro, N. Mex.

Tin Mining in the Straits Settlements.—The annual report of the governor of the Straits Settlements shows that a climax has been reached in the tin mining industry, the feature of the year's trade in that colony being the practical interruption of a series of great advances in the export of tin owing to an end of the system of surface mining. It is doubtful, states the governor, whether, for some years at least, the large supplies of former years will be recorded. Yet, he adds, the Peninsula abounds in mineral wealth, and it is difficult to say what would be the effect of a stimulant in the shape of high prices and increased demands. In 1896 the total production was 53,114 tons, which was an increase of only about 400 tons. There was a large falling off in exports to the United Kingdom, but an increase in the quantity sent to the United States.

Phenomena in the North Staffordshire Coal Measures.—In his report of the Geological Survey, Sir Archibald Geikie, the Director-General of the Survey, draws attention to a singular disturbance in the coal measures of the North Staffordshire District, says the *Iron and Steel Trades Journal*. At Whitfield, over a considerable area, the Hollowlane coal is found to be absent, while on the dip side of this barren tract the seam is duplicated. At the Sneyd colliery the same phenomena are displayed by the Rough Seven-Feet Coal. South of the coalless area a space occurs in which the last-named seam is duplicated, then triplicated, and lastly, quadruplicated, the four repetitions of the same coal seam making a united thickness of 13½ ft. of coal. Each band lies directly on the other in its ordinary sequence without any parting, the roof above the highest band and the floor beneath the lowest being in their normal positions. These displacements are obviously due to thrusts following the dip of the strata.

Many other experiments confirmed these general results. Some of these, omitted to save space, were with solutions of varying concentration, the averages of which are here compared with the preceding:

Effect of varying strength of solution, no alkali being added:

Series	G.	E.	A.	L.	M.	H.
Mgms. K_2ZnCy_4 in 20 cu. cm. of solvent	31	62	124	186	248	2,250
Mgms. gold dissolved in 48 hours	2.13	2.04	2.18	2.60	4.10	4.10
from 5 sq. cm. sur- face	Beakers 1.8 cm. deep	8.61	9.53	12.67	12.56	10.91
	Tubes 7 cm. deep	2.13	2.04	2.18	2.60	4.10

A few experiments with varying temperatures indicated a marked increase in rate of solution with increased temperature, but no systematic comparison was attempted.

Another series of observations was made in tubes through which was led by a fine jet a continuous current of air, washed completely free

in the gold. Another specimen of gold, very carefully purified by the method used by Thorpe and Laurie for atomic weight determinations, was treated in the same way with 10 cu. cm. of a solution of the same concentration as in Series X, losing relatively much less in weight.

Series Z: Weight gold dissolved from 20 sq. cm. by 62 mgms. K_2ZnCy_4 in 10 cu. cm. of water, kept saturated with air:

Time, hours	50	72
Mgms. gold dissolved	15.8	24.72

The purer gold being less readily attacked.

GENERAL CONCLUSIONS.

The results of over 250 single observations lead to these conclusions:

- (1) The gold-dissolving power of a solution of potassium zinc cyanide increases rapidly with increased excess of oxygen; presence of oxygen being the most essential condition.
- (2) It increases somewhat with strength of solution, but this effect is small.
- (3) It increases with a rise of temperature.
- (4) Gold dissolves in the solution without forming any precipitate at first, but after a certain proportion of gold has dissolved a white precipitate begins and continues to form, gradually coating the metal and retarding further action. The amount of precipitate is not proportional to that of the gold dissolved, being relatively less when the amount of solvent is large; it consists of a somewhat variable mixture of the cyanide and oxide of zinc.
- (5) The solvent action of the double cyanide solution is less than that of a solution of simple potassium cyanide containing the same amount, or one-half the amount, of cyanogen in equal volumes.
- (6) It is increased by addition of caustic alkali, other conditions remaining the same, and the increase is greatest in solutions to which oxygen has the freest access.

The last conclusion is opposed to that arrived at by Wells, but an examination of his data (Exp. 7 to 13) shows a slight increase in the average effect in presence of potash; possibly so slight because those experiments were made in test tubes, exposing but little surface to air.

(7) The considerable increase in solvent power observed when caustic potash is added (always provided that oxygen is accessible), coupled with the superior effect of free potassium cyanide (see V. and VI.), is good evidence that some free potassium cyanide is formed upon such addition, and, therefore, that in dilute solutions (such as 0.3 to 0.6%, or 1/80 to 1/40 gram molecule per liter) potassium zinc cyanide is partially decomposed by caustic alkali, in accordance with the principles of chemical equilibrium between substances in solution.

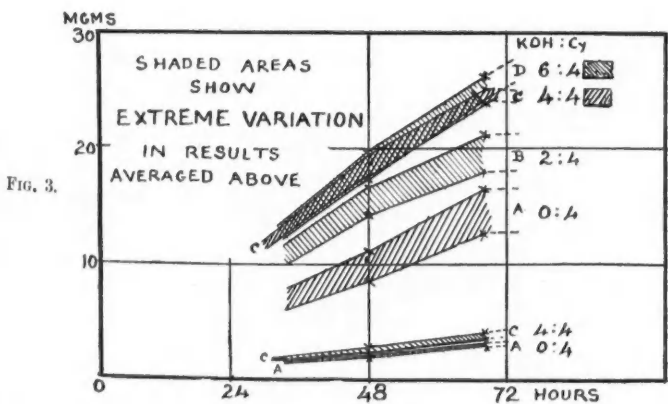
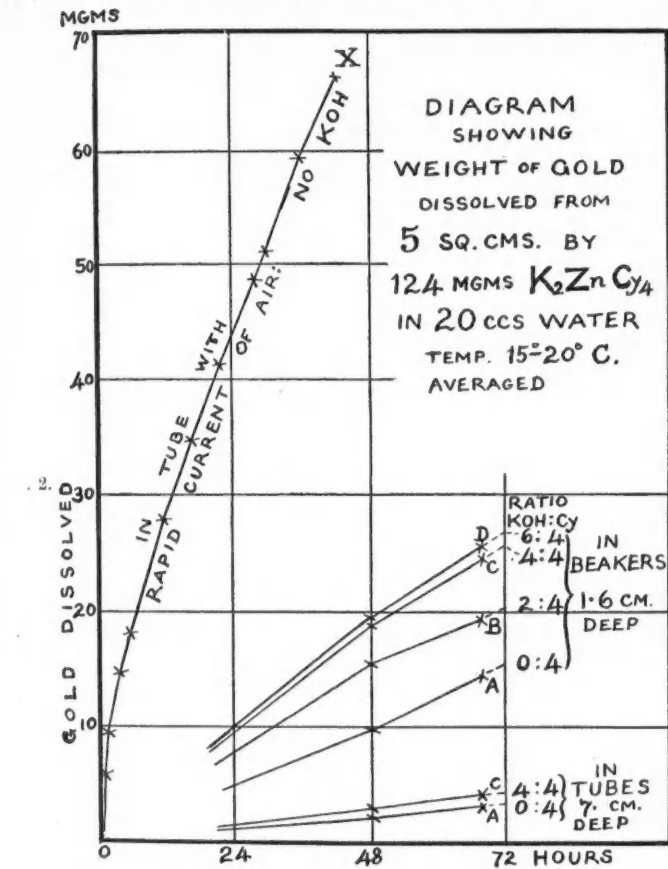
This is brought out more clearly by plotting to scale the average results of series A to D and X. In the lower diagram the shaded area shows the range between the extreme high and low results of the same series, the only "overlapping" occurs with the higher proportions of alkali; each successive addition of alkali producing a smaller increase than the last in the amount of gold dissolved, in agreement with the principles of equilibrium.

That a decomposition actually occurs to some extent between caustic potash and the double cyanide is further borne out by the observation, made in some experiments still in progress here, that on mixing their solutions there is a very slight fall of temperature; Ellis having shown (*Journal of Society of Chemical Industry*, February, 1897), that this reaction is likely to be accompanied by an absorption of heat.

The American Tin Plate Industry.—*The Iron and Steel Trades Journal* announces that the Welsh owners of the famous M. F. brand of roofing plate have made arrangements for the plate to be manufactured in the United States. M. F. terne have been for long held in high reputation as the acme of roofing plates, and while the demand for other brands of Welsh terne plates has fallen off in favor of the domestic product, there is a continued steady call in the United States for M. F. from the roofing trade. This plate has been hitherto manufactured at the Glanwalla Works of R. B. Byass & Co., Port Talbot, South Wales. In future it will be made at the works of the Ellwood Tin-plate Company, Elwood City, Pa.

A New Coal Discovery in Mexico.—There was discovered recently at Jiquilpan what seems to be an excellent quality of lignite coal. Three seams varying from 22 in to 61 in. in thickness have been exposed, but so far development work has been slow on account of the rainy season, which has been rather severe this year. With the discontinuance of the rains, which usually occur about October 1st, development work will be pushed, and by the end of the year it is hoped that it will have progressed so far that an intelligent estimate of the value of the deposit can be made. The deposit is only about 25 miles from the line of the Mexican Central Railway, and the intervening country being level, with great agricultural possibilities, there is little doubt that the Mexican Central Railway will build a branch to the mines if the development work within the next few months demonstrates that they are sufficiently valuable.

The Mineral Resources of Swaziland.—According to British Consular Report No. 1996, Annual Series, a good many of the gold mines were idle in 1896 and the Forbes Reef Company was the only one which made an important output. This company produced 21,913 tons of ore, which yielded 1,288 ounces of gold, valued at £4,344. The company has a 20-stamp mill which is driven by electrically transmitted power. The Pigg's Peak Company was engaged in construction and development work. This company has a 30-stamp mill also driven by electricity. Its ore, however, has proved refractory and it has been necessary to erect a cyanide plant, which it is expected will soon be completed. The Ryan Tin Company did a good deal of work during the year, and in the first six months produced upwards of 260 tons of black tin, valued at £45 per ton. During the second half of the year development work was vigorously carried on and about 20,000 tons of tin-bearing gravel was exposed. Machinery for treating this has been erected. Some tin lodes have also been discovered and further prospecting is in progress. Explorations for coal have been carried on along the Umbelosi River, where there are good indications of anthracite. The great drawback to working the tin and gold deposits of this territory is lack of transportation facilities.



from carbonic acid by three bottles containing strong solutions of caustic soda and barium hydroxide.

Series X: Weight gold dissolved from 5 sq. cm. by 124 mgms. K_2ZnCy_4 in 20 cu. cm. water, kept saturated with air:

Time, hours	1	2	4	6	12	17	22	28	30	36	42
Mgms. gold dissolved	5.7	9.35	15.7	18.0	27.9	34.8	41.4	48.8	51.36	59.4	65.1

Beyond this point a coating of precipitate retarded solution. When less frequently removed for weighing the rate of solution was considerably slower, viz, 15 mgms. in 24 hours; probably owing to interposition of a film of precipitate, though none was visible.

Series Y: Weight gold dissolved from 5 sq. cm. by 248 mgms. K_2ZnCy_4 in 20 cu. cm. water, kept saturated with air:

Time, hours	29	68
Mgms. gold dissolved	41.2	41 (retarded by precipitation).

When unwashed air was used a precipitate was sooner formed.

A slight black deposit was observed on the surface of those pieces of gold which had lost weight considerably; this was probably due to rhodium which was found to be present, no other metals being detected

* Compare the curve obtained by A. W. Warwick (*Engineering and Mining Journal*, June 29th, 1895, page 604, Chart III); in this instance 250 cu. cm. of a 1% solution of potassium cyanide, containing 100 mgms. of zinc, dissolved gold at a nearly uniform rate for 450 hours, after which the rate fell off steadily until solution practically ceased at 700 to 800 hours, a coating forming on the gold.

PERSONAL.

MR. A. H. S. BIRD is investigating several gold properties in Nevada.

MR. MARCUS DALY, of Butte, Mont., has returned from an extended Eastern visit.

MR. ROBERT M. THOMPSON, of the Oxford Copper Company, sailed for Europe, October 9th.

MR. HENRY BRATNOBER has returned from the Klondike to his home in San Francisco, Cal.

MR. R. C. CHAMBERS, of the Ontario and Daly mines, was in San Francisco the first part of the month.

MR. R. H. TERHUNE, metallurgist of the Hanauer smelter, Salt Lake, Utah, is at home after a month's outing in the East.

MR. E. S. HALL, of Denver, Colo., is examining the Revenue mine, in Madison County, Montana, in the interests of Colorado parties.

MR. F. E. V. BOND, of Saunders, Fielding & Bond, returned to New York on October 7th from a two months' trip to London, England.

MR. JOHN W. MACKAY is in Nevada for the purpose of examining the Silver Peak mines, it said, with a view to purchasing the same.

MR. W. F. ROBERTSON, mining engineer, has just returned to New York from a six weeks' stay in British Columbia on special business.

MR. GUSTAVE A. KORNBERG, a civil engineer of Butte, Mont., has returned from Europe and will make San Francisco his future home.

MR. ROBERT D. GRANT, manager of the Parrot Mining and Smelting Company, of Butte, Mont., is visiting his company's headquarters in Connecticut.

MR. I. N. PREYTON and SENATOR GEORGE TURNER have left for London, England, for the purpose of closing the sale of the Le Roi mine to British capitalists.

MR. R. A. WOOD, a mine specialist associated with a prominent London syndicate, is making a thorough examination of the entire Mercur gold region in Utah.

MR. E. C. HEGELER, of the Matthiessen & Hegeler Zinc Company, La Salle, Ill., returned on September 29th from Europe, where he has been spending six months on account of his health.

MR. JAMES V. UMBERGER, formerly New York manager of the iron firm of Matthew Addy & Company, has been appointed Eastern representative of Stevenson, Field & Company, of St. Louis, Mo., and Columbus, O.

MR. C. M. ROLKER, representing the Mining and Financial Trust Syndicate of London, was in Mercur, Utah, last week, and recently examined the Cresson group of mines, situated in Scorpion Gulch, about 2½ miles from Hailey, Idaho.

MR. JAMES E. YORK, the founder of the Ashland Iron and Steel Company, at Ashland, Wisconsin, and the Ironton Structural Steel Company, of Duluth, Minn., is in London, England, on business in connection with the Orinoco Iron Company of Venezuela.

MR. E. J. MCCAUSTLAND has been appointed an instructor in the College of Civil Engineering of Cornell University, Ithaca, N. Y. He was formerly City Engineer of Salem, Ore., and has had much experience in railway and mining work in California and Oregon.

MR. GEORGE D. BARRON has been appointed manager of the Grand Central Mexican Smelting Company, with headquarters at Aguas Calientes, Mexico, to take effect November 1st. This is the great lead and copper smelting plant, owned by the Guggenheim Brothers, of New York.

MR. NELSON P. HULST, it is stated, will have charge of the Carnegie Steel Company's mining operations in the Lake Superior region, including the Norrie and Tilden mines in the Gogebic range, as well as the mines on the Mesabi range. His title is manager of the Oliver Mining Company.

MR. C. H. HALL, agent of the Lake Superior mine at Ishpeming, Mich., for nearly 30 years has resigned. This mine has been a heavy producer in the Michigan iron ore region. Since Mr. Hall's connection with the mine there has been paid to labor and to merchants by his company \$11,375,836.

MR. G. KUNISAWA, of Tokio, Japan, is in the United States on a visit of inspection of American railway practice. He is First Assistant Engineer of the Imperial Railway of Japan, and has been in Europe for a similar purpose. Recently Mr. Kunisawa visited Pittsburg and held a conference with the Carnegie Steel Company on an order for steel rails for branch roads now being built by his company.

MR. ROBERT BROWNLEE has been appointed chief of the new bureau of mines established under the act of the last legislature of Pennsylvania. MR. E. S. SCHOFIELD will be the deputy superintendent. Both are coal men of long experience, and Mr.

Brownlee was recently superintendent of the Ralston mines. The Bureau will have charge of the coal mine inspection work of the State. At present there are 18 mine inspectors.

OBITUARY.

WILLIAM B. BEMENT, for many years at the head of the well-known machinery firm of Bement, Miles & Company, died in Philadelphia recently of hemorrhage of the lungs.

PROF. GUY V. THOMPSON, of Colorado State University, died recently of consumption, in Boulder, Colo. He graduated from the University in 1883. After that he took a post-graduate course at Yale, from which university he took the Ph. D. degree.

WILLIAM W. GRISCOM, electrical engineer, was instantly killed, September 24, by the accidental discharge of his rifle at Governor's Island, near Penetanguishene, Ont. He was born in Philadelphia in 1851, and graduated from the University of Pennsylvania in 1870. He was president of the Electro Dynamite Company, Philadelphia, vice-president of the Electric Storage Battery Company in the same city, and a director in several other well-known companies.

SOCIETIES AND TECHNICAL SCHOOLS.

MICHIGAN ENGINEERING SOCIETY.—At a recent meeting of the Board of Directors the following officers were declared elected for the ensuing year: President, Frank F. Rogers, Port Huron; vice-president, F. F. Hubbell, Manistee; secretary and treasurer, F. Hodgman, Climax; directors, Dorr Skeels, Grand Rapids; C. E. Greene, Ann Arbor; Wm. B. Sears, Saginaw. It was voted to hold the next annual convention at Port Huron December 28th, 29th and 30th, 1897. It was decided to invite the members of the Ontario Land Surveyors' Association to meet with this society at Port Huron. Every effort will be made to provide an attractive and instructive program.

ENGINEERS' CLUB OF ST. LOUIS.—At the regular meeting of October 6th an invitation to visit the new dam at Osage City was accepted. Henry Branch and Charles W. Hawkes were elected members of the club. The paper of the evening entitled "The Electrolysis of Caustic Soda," by Mr. A. L. McRae was then read. A process of manufacturing caustic soda from common salt by electrolytic methods was described and some figures given as to the cost of manufacture. This process has been used in England and Germany, but is not in use in this country. The paper described how the by-products, hydrogen and chlorine, may be utilized in heating the solution for concentration and in the manufacture of bleaching powder. Following this paper, there were exhibited a number of lantern slides showing types of water-works engines and sewage pumps. Mr. M. L. Holman explained the slides and pointed out the features of interest connected with each engine.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—A regular meeting was held October 14th. Mr. C. A. Alderman read a paper on the Chippewa Valley Electric Railway, a system of about 22 miles nearly completed. Power is to be furnished for 20 years at \$6 per horse-power. Mr. Alderman also described the late trip of the Western Society of Engineers to Niagara and the Lehigh Valley. Mr. Loweth exhibited the results of some paint tests, 20 odd samples of black and more or less rust-roughened plates of sheet iron which had undergone six months' exposure to locomotive smoke while suspended from the roof of the Union Depot train shed about 50 ft. above the tracks. The iron plates, new and bright, had each received one coat of paint and had been subjected to equal exposure. The red lead sample gave the best results. Next came the white lead, followed by the iron oxides and an asphaltum which was generally in much better condition than the graphites. An anti-rust specimen was the brownest spectacle of the lot.

LAFAYETTE COLLEGE.—Lafayette College, at Easton, Pa., will observe its Founder's Day this year on Wednesday, October 20th. It is proposed to make the exercises a tribute to the long and able services of Rev. Dr. Thomas Conrad Porter, whose retirement from active duty in the faculty occurred this year. He entered the college as a student in 1836; he graduated in the class of 1840, and has devoted his life to the culture of the natural sciences, especially botany and zoology. These branches, with geology, he has taught in Lafayette since 1866. The exercises will take place in the auditorium of Pardee Hall, and will, so far as now arranged, consist of addresses by Prof. Nathaniel L. Britton, of Columbia University, the director of the New York Botanic Garden; Prof. William B. Scott, professor of geology in Princeton University, and Dr. John M. Crawford, of the class of 1871, in Lafayette, lately Consul General to St. Petersburg. The Senior class numbers 57, and the new admissions 112, making a total enrollment of over 300 students.

MICHIGAN COLLEGE OF MINES.—At the opening of the college for the year 1897-98 the enrollment shows an increase of 27% over last year, or the largest it has been in the history of the college, not-

withstanding the introduction of tuition fees. This is all the more remarkable when it is taken into account that the preparatory course has been dropped from the institution, leaving that work to the standard high schools and preparatory schools of the country, so that every one enrolled this year is a regular student of the College of Mines. The course is a hard as well as interesting one, the student's whole time being taken up by the work if he takes the regular course in mining engineering. The class, lecture, and laboratory hours extend from 8 a. m. to 6 p. m. for six days in the week, and the college year continues for 45 weeks of actual work. Most of the practical work is done during the summer months, although the mining trips begin in December. Among the members of this year's entering class is a Japanese apprentice who has been sent here by the government of Japan to study new and advanced methods of mining and to make a specialty of metallurgy. The other foreign countries represented are Germany, South Africa, Scotland, Mexico and British Columbia. The outlook for the college is most flattering, and more room is continually in demand. Its location among the greatest copper and iron mines of the world is an excellent one for the study of mining in its improved forms and enables the college to give a practical training. The elective system which has been introduced is meeting with great success and is being watched with interest.

ENGINEERS' CLUB OF PHILADELPHIA.—At the regular meeting, September 18th, the election of George C. Davis and Johnson Hughes, Jr., to membership was reported by the tellers. After some discussion it was voted, on recommendation of the board of directors, to establish a standing committee of seven members, to be called the "Committee on the Relations of the Engineering Profession to the Public." It will be the duty of this committee to inform the Club of any public action or contemplated legislation, national, State or municipal, affecting the engineering profession as a body or the rights and privileges of engineers, and to perform such other duties concerning the relations of the Club to the public as may from time to time be referred to it.

Prof. J. M. Porter read a paper on the Delaware River Bridge at Easton, Pa. He described the history and engineering features of the old wooden bridge connecting Easton, Pa., with Phillipsburg, N. J., and of the steel cantilever bridge which was built to replace it. The old bridge was designed and erected by Timothy Palmer, of Newburyport, Mass., who was without doubt one of the leading bridge engineers of his time. At the time of its removal it was the oldest wooden bridge in Pennsylvania, and the second oldest in the United States, being ranked by the structure built by Theo. Burr over the Hudson at Waterford in 1804. The paper was illustrated by photographic views. At its conclusion the subject of this and other old bridges was discussed by Messrs. John C. Trautwine, Jr., Harrison Souder, F. Schumann, E. F. Smith, Joseph T. Richards and R. L. Humphrey.

Mr. John C. Trautwine, Jr., called the attention of the Club to several matters which had recently occupied the attention of engineers in the Philadelphia Bureau of Water, including a break in a 30-in. main, the character of mud deposit in a reservoir, and the method of calculating the pressure on a valve in a pass pipe through a reservoir embankment.

INDUSTRIAL NOTES.

The Alabama Rolling Mill Company is running its plant at Gate City, Ala., on full time.

No. 2 Henry Clay furnace of Eckert & Brother, at Reading, Pa., has recently been blown in.

The Pennsylvania Steel Company's open-hearth department at Steelton, Pa., is in active operation.

The Pennsylvania Bolt and Nut Company's entire plant at Lebanon, Pa., is being operated day and night.

Operations have been resumed by the Carney Point Powder Works, of New Jersey, with a full force of men.

The Union Iron Works is dismantling its old Floodwood, O., blast furnace and is removing it to Buffalo, N. Y.

The Star Iron and Steel Works, of Lindsay & McCutcheon, at Allegheny, Pa., have been put in full operation.

The National Tube Works Company has resumed operations in its puddling department after five months' idleness.

The Thomas furnace at Youngstown, O., has been re-started, after an idleness of about a year. The firm employs about 175 men.

The Trenton Iron Company has received a contract to furnish material for a wire tramway seven miles in length, to be built in the Chilkoot Pass, Alaska.

The National Steel Castings Company succeeds to the business of the Indiana Steel Castings Company, Montpelier, Ind. The capital stock of the company is \$200,000.

The Carnegie mills have recently added Eberhart's automatic gear cutters, 74 x 14 in., for their large

work, also a 30-in. one for spur, bevel and worm gear for their smaller work.

The Virginia Coal and Coke Company has awarded contracts to J. A. L. Minor & Company, of Bristol, Tenn., for the erection of 150 additional coke ovens at Stonega, Va.; work will commence at once.

The Tennessee Coal, Iron and Railroad Company recently blew in its Little Belle furnace at Bessemer, Ala. The company is repairing one more of its furnaces at Robertstown plant and one at Ensley.

The Empire Iron Works, of New York City, was incorporated at Albany, October 12th, with a capital stock of \$5,000. The directors are J. Charles Weschler, Jacob Albert and Charles Hoffman, of New York City.

The plant of the St. Louis Smelting and Refining Company, which has been idle for four years, has resumed operations, smelting only Missouri lead ores. Formerly it handled Western lead ores carrying gold, silver, copper, etc.

The Newberry (Mich.) blast furnace and the work of the Burrell Chemical Company are being removed to Manistique, Mich. Arrangements have been entered into with the Weston Furnace Company to make wood alcohol.

John R. Thomas and other Niles (Ohio) men, are interested in a project to manufacture coke extensively in the Mahoning valley. A report that they had secured a site between Niles and Mineral Ridge lacks confirmation, but a location is being sought.

The Plattsburg Foundry and Machine Company, of Plattsburg, N. Y., was incorporated October 12th, at Albany, to manufacture iron and machinery. The capital stock is \$6,000, and the directors are Sidney S. Whitteley, John Ross and M. Wever, of Plattsburg.

The Missouri Company, of St. Louis, has completed an order for six carloads of mineral wool for Quincy (Ill.) parties, and one of thirty cars for Chicago. Its output is something over a carload of wool per day, as a by-product of the smelting of lead ores.

The Shenango Valley Tin Plate Company has been organized to erect a 3-mill plant at New Castle, Pa. It is rumored also that the Standard Oil Company intends to erect a 24 mill tin-plate plant at Hites, station, on the West Pennsylvania Division of the P. R. R.

The Sullivan Machinery Company of Chicago, has opened an office at No. 412 Seventeenth Street, Denver, Colo. in charge of Mr. R. D. Hunt. They will carry in stock at Denver a full line of "Sullivan" rock drills with mountings for mining work, and also diamond drills for prospecting.

The McAlister Machine Company was recently incorporated at Memphis, Tenn., with a capital stock of \$10,000,000, by W. J. Crawford, R. F. Looney, T. C. Looney, Erasmus Crawford and E. B. Craig. The company proposes to manufacture machine guns for use on battleships, in armies, and coast defenses, etc.

The well-known firm of Henry R. Worthington, pump manufacturers, has opened branch offices in New Orleans, La., at Nos. 713-717 Perdido street, and in St. Louis, Mo., at 317 North Ninth street, the Century Building. The firm has now branch offices in all the leading cities in the United States, and is doing a profitable business.

The new pottery, situated at the junction of the Chattanooga, Rome & Southern and the Chattanooga Southern, beyond Fort Negley, Ga., is now completed so far as the building is concerned. The engine, boiler and part of the machinery have been set up. They are now building a kiln and are putting in a Chaser clay mill.

The Great Bluff coke works of E. A. Humphries, near Uniontown, Pa., have been closed, owing to the coal being exhausted. This plant was started in 1887 by Isaac Taylor, and was purchased by Humphries in 1889. This is the second coke plant in Dunbar township to be abandoned this year on account of the coal all being mined out.

Mr. H. F. J. Porter, general sales agent of the Bethlehem Iron Company, with headquarters at Chicago, has during the past six months been located at the works in South Bethlehem, Pa., during the absence in Europe of R. W. Davenport, second vice-president, and will have his headquarters there during the winter. His Western office will be in charge of his assistant, Mr. Erwin Nelson.

The New England Coke and Gas Company will have the following board of trustees: Robert C. Pruyn, Albany, N. Y.; Stephen Peabody, New York; William L. Elkins, Jr., Philadelphia, Pa.; William Flinn, Pittsburg, Pa.; Henry M. Whitney, Cohasset, Mass.; Henry F. Dimock, New York; William L. Elkins, Philadelphia, Pa.; George G. Haven, New York; Fred S. Pearson, Boston, Mass.; Emerson McMillan, New York; Richard Olney, Boston, Mass.; Robert W. Lord, Boston, Mass., and Almeric H. Pagot, New York.

The Canonsburg Coal Company of Pennsylvania has received five car loads of machinery to be used in fitting up the plant for the electric mining machines that the company intends to use in its mines. The machinery is from the Graham Foundry and Machine Company of Monongahela, Pa. It consists of two boilers, each 6 ft. diameter, 15 ft.

long, built by the Phoenix Iron Works, of Meadville; one 150 H. P. automatic high-speed engine by same company; one 150 H. P. tube generator, one 175 H. P. brass tube heater, and other appliances.

The Berlin Iron Bridge Company has a contract for furnishing and erecting the structural iron work of floor and roof of a cow-barn for the Connecticut Hospital for the Insane, at Middletown, Conn. The building is 50 ft. wide and about 200 ft. long. Under a portion of the building is a cellar for the storage of farm products. The floor of the barn proper over the cellar is supported by steel beams and brick arches. The roof and interior supports of the stalls are of steel. Every precaution has been taken to make this new barn fireproof and to make it a permanent, handy and economical structure.

Application has been made for a charter for the Shenango Tin Plate Company, organized at New Castle, Pa., to build and operate a 30-mill tin plate plant. The incorporators include W. E. Reis, John Stevenson, Jr., Wm. Patterson and Geo. B. Berger, who are identified with the Shenango Valley Steel Company, and its connected furnace, while some of them are interested in the New Castle Wire Nail Company, the New Castle Steel and Tin Plate Company and the New Castle Tube Works. The construction work has been let to the Shiffler Bridge Company, at a figure upward of \$90,000. The contract calls for two brick and steel buildings, the main one being 1,650 ft. long by 100 ft. wide, and the second, 700 ft. long by 60 ft. wide. They are to be completed by January 1st. The equipment includes three pairs of compound engines, each pair of 2,000 H. P.

TRADE CATALOGUES.

The Risdon Iron Works, of San Francisco, have just issued Catalogue No. 15, which treats of "Gold Dredging Machinery." Its appearance is timely, as enquiries for machinery of this class are just now increasing, and there is a great deal of practical interest manifested in the working of river beds and bars for gold. The catalogue gives a number of illustrations, with brief descriptions, of dredges built by the Risdon Works. It gives also a good deal of information as to the work heretofore done with dredges. It concludes with an account of dredge mining in New Zealand, where this kind of work was first carried on successfully and on a large scale.

NEW PATENTS.

UNITED STATES.

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

WEEK ENDING OCTOBER 5TH, 1897.

- 599,965. GALVANIZING MACHINE. Edwin B. Cook, Canton, O. Combination of a galvanizing pot, guide bars located within the pot and within the molten metal, and scraper bars formed of asbestos, the bars located adjustable horizontally to or from each other, the sets of scraper bars being spaced different distances apart.
- 599,973. HYDRAULIC APPARATUS FOR MINING PURPOSES. William G. Gaas and James Tonzé, Bolton, England. Patented in England March 25, 1897, No. 7,441. Combination with an expandable bar, of a series of rams made with rounded or dome-shaped tops and employed in conjunction with a series of separate and loose covers and a clip-protector.
- 599,990. EXCAVATOR. Frederick O. Kilgore, Minneapolis, Minn. Combination with a rotating mast and a boom support projecting therefrom, at an angle thereto, of an oscillating boom pivoted to the support intermediate of the extremities of the boom, an oscillating lever carried by the boom for manipulating a dipper or other device, and an oscillating engine carried on the same support as the oscillating boom and turning on a common center with the boom, for operating the oscillating lever.
- 591,008. BLOWING ENGINE. Edwin Reynolds, Milwaukee, Wis. This engine consists of a cylinder having port-controlling valves, each of which comprises a flat disk having a gradually diminished continuous wall on one side terminating at its small end in a hub a guide for this hub, a stem extending through the hub from the disk, and valve-operating mechanism in connection with the stem.
- 591,029. COMPRESSED AIR WATER ELEVATOR. Paul S. A. Bickel, Helena, Mont. Combination of an air-tight vessel having an inlet and an outlet for the liquid only, with means for raising and lowering the vessel in the liquid, means for closing the inlet at the lowest point reached, thereby securing the liquid and air therein, at the surrounding pressure, means for releasing the liquid therein under the force of the compressed air, as the vessel is raised, and a discharge pipe.
- 591,047. METHOD OF AND APPARATUS FOR STRIPPING COAL BEDS. Arthur J. Mason and Frank K. Hoover, Kansas City, Mo. The method consists in forming and maintaining an inclined working end-face, loosening the end-face, and hauling or scraping the material downhill upon the end-face to the receiving end of a conveyor located upon the bed of the excavation, and by the conveyor transporting the material to the dump; from time to time removing the conveyor to different sites on the working face in order to command all the loosened material upon the face within a desired short haul, in such a manner as to remove successive prisms from the end or working face and thus maintain the face at a desired constant and economical form.
- 591,065. BRICK KILN. Henry R. Vaughan, Belfast, Ire-

- land. Patented in England October 31st, 1895, No. 20,510. This kiln has two rows of chambers arranged side by side; three parallel flues extending longitudinally with the kiln, the intermediate flue having its middle section between the two rows of chambers, and its two end sections below the chambers, and each chamber having passage-ways communicating respectively with two flues nearest to the chamber.
- 591,087. PROCESS OF MANUFACTURING NITRIC ACID. Jean V. Skoglund, Brooklyn, N. Y. Assignor of one-half to Albert Winter, New York, N. Y. The method consists in conveying the nitric acid vapors into a chamber containing pieces of acid-proof material, causing such vapors to condense and run in thin films over such pieces of acid proof material, maintaining the temperature of such chamber at the temperature of the incoming nitric acid vapors, or nearly so, condensing the acid vapors and allowing the liquid to run back over such pieces of acid proof material for driving off impurities from the acid.
- 591,114. STONE-CUTTING OR CARVING MACHINE. August G. Edmund and Hannah Edmund, Seattle, Wash. Combination with a main frame having a stationary segmental rack, a vertical rotary shaft journaled in the frame, a secondary frame mounted to swing on the shaft, a screw-shaft journaled in the secondary frame, gear whereby the screw-shaft may be rotated in both directions, a gear-wheel carried by the secondary frame and engaging the rack, means whereby the gear-wheel may be rotated in both directions, a jointed arm loosely sleeved on the rotary shaft and having a hub portion which engages the screw-shaft, and a tool-operating engine mounted upon the outer section of the said arm and capable of a universal adjustment.
- 591,119. AMALGAMATOR. John P. Schmitz, San Francisco, Cal. Combination of a shaft, spring agitators, screw, spider frame, pins, brush and pipes.
- 591,137. AIR OR GAS COMPRESSOR. Stephen S. Miles, Cincinnati, O. Combination of a casing, a cylinder wholly inclosed in the casing and having an open end or mouth projecting into the casing and its other end provided with a flange that closes that end of the casing, a cylinder head that is bolted to the flanged end of the cylinder and also to the casing, there being an annular jacket space between the cylinder and casing and wholly surrounding the cylinder, an annular rib or partition between the casing and the inner end of the cylinder, the partition being provided with a passage for communication between the jacket space and the main interior portion of the casing, a pipe for admission of return gas to the annular jacket space and thence around the cylinder and to the casing through the passage in the annular partition, a plunger provided with an inlet valve to the cylinder, an exit valve in the head of the cylinder, and a pipe from the exit valve to a condenser.
- 591,141. PROCESS OF AND APPARATUS FOR ELECTROLYTIC EXTRACTION OF METALS FROM THEIR SOLUTIONS. Joseph W. R. Charde, Bethlehem, Pa. The process consists in subjecting such solutions to the electrolytic action of an electric current passing into the solution by a liquid amalgam anode, and separating the anode from its cathode by a porous partition.
- 591,153. ENGINEER'S OR SURVEYOR'S INSTRUMENT. Christian L. Berger, Boston, Mass. Combination with the object-glass and a focusing eyepiece, of a reticule frame, a plurality of reticules therein, in parallel planes, and means to simultaneously adjust all of the reticules in and with relation to the telescope.
- 591,204. COAL OR ROCK DRILL. George H. Bittenbender, Plymouth, Pa. Combination with the tube or socket, formed with a spiral thread on its exterior, the stationary bit, the adjustable bit provided with a series of holes, the pin passing through the socket and bits, and the lugs at the upper end of the socket, of the tube formed with lugs engaging with the lugs of the socket, and the spiral thread forming a continuation of the thread on the socket.
- 591,221. SUPPORT FOR AERIAL WIRE ROPEWAYS. Julius S. Lane, Westport, Conn. This tramway comprises means for the transportation of sand or minerals, and a series of supports for the means for transportation individually provided with means for their progressive raising as the dump is built up or increased in height.
- 591,283. POWER DEVICE FOR PUMPING WELLS. Joseph J. Kwis, Findlay, O., assignor to the Adams Brothers Company, same place. Combination with a drive-wheel having a toothed rim, brackets attached to the rims and pivot-pins adapted to receive surface rods or like devices, secured in the spaces between the teeth on the rim of the wheel and in the brackets.
- 591,284. PNEUMATIC DRILL. James H. Manning, Omaha, Neb. This machine is composed of a casing or shell having a plurality of cylinders. A crank-shaft extending at its opposite ends through the casing and journaled therein, pistons in the cylinders having their rods connected to the crank-shaft, a valve mounted upon the projecting upper end of the crank-shaft within a valve chamber at the upper end of the casing and controlling the ports leading to the outer ends of the cylinders, a pinion fast upon the projecting lower end of the crank-shaft, on the opposite side of the casing from the valve, a tool-holding shaft journaled in a support upon the under side of the casing beneath and in line with the projecting lower end of the crank-shaft, a gear fast upon the upper end of the tool-holding shaft, a spindle journaled in a support at one side of and parallel with the lower end of the crank-shaft and upper end of the tool-holding shaft, and a gear-wheel and pinion fast upon the spindle and meshing respectively with the pinion upon the lower end of the crank-shaft and the gear-wheel upon the upper end of the tool-holding shaft.
- 591,285. METAL FORGING MACHINE. Frederick G. Myers, Philadelphia, Pa. Patented in the South African Republic March 1, 1895, No. 358. Combination of a head, four radial dies therein, a driven ring and rollers mounted between the driven ring and the head and acting to force the dies toward a common center, each die having a shouldered V-shaped end beveled at the outer edge, forming, when the dies are closed, a cruciform channel enlarged at one end.
- 591,302. APPARATUS FOR MOLDING CLAY, ETC. Henry Sturm, Paris, France. Combination with a formative mouthpiece of a supporting frame, two frames movable toward and from each other on the supporting frame, two jaws supported by the movable frames to form prominence on the life transverse to its length; a lever arranged between the movable frames upon a fulcrum between its ends, which are provided with rolls; grooves formed in the movable frames at right angles to the line of their movement, the grooves receiving the rolls upon the ends of the lever and means for operating the lever to draw the movable frames toward each other and into co-operative relations with

the formative mouthpiece, then transversely in front of the mouthpiece to cause the jaws to form prominences on the tile transverse to its length, and finally away from each other, to uncover the mouthpiece and permit the completion of the tile.

591,355. CONCENTRATOR Howard L. Elton, Philadelphia, Pa. The concentrator comprises a casing having a water inlet, an ore inlet, an outlet at the lower end of the casing, valves controlling the inlets and outlet; a rotatable hollow cylinder situated within the casing having a closed lower end provided with a valve, the upper end portion of the cylinder extending through the top of the casing and leading to an outlet; openings in the sides of the cylinder, and an agitator carried by the cylinder.

591,355. PROCESS OF OBTAINING CAST TITANIUM. Henri Moissan, Paris, France. The process consists in subjecting an oxide or salt of titanium in presence of carbon to an electric arc produced by a current of from 1,000 to 2,000 amperes, and 60 to 70 volts, thereby fusing the titanium, which combines with the carbon, forming masses of metallic titanium.

GREAT BRITAIN.

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

WEEK ENDING AUGUST 21ST, 1897.

20,824 of 1896. Head, Wrightson & Company, Thornaby-on-Tees. Rotary tipplers for discharging coal.
12,015 of 1897. G. B. Reere & D. G. MacDonnell, Auckland, N. Z. Skeleton drum for supporting aerial ropeways.

WEEK ENDING AUGUST 28TH.

17,911 of 1896. B. & J. W. Thomas, Llanelly. Eliminating arsenic from metallic copper by treating it with a blast of compressed air in presence of a flux.
21,710 of 1896. J. Dunn, Glasgow. In screening coal a method for keeping the large coal out of contact with small, so as to prevent the grinding of the latter.
22,162 of 1896. J. C. Hamilton, Arnside. Making ordinary gunpowder flameless for blasting by mixing oxalate of urea with it.
23,587 of 1896. B. H. Thwarte & F. L. Gardner, London. Apparatus for utilizing the gases of blast furnaces for generation of motive power.

WEEK ENDING SEPTEMBER 4TH.

19,788 of 1896. A. C. J. Charlier, Glasgow. Use of gaseous sulphurous acid for converting oxide of lead into white which can be used as a pigment.
22,490 of 1896. T. Lewis, Glyvan. Lifting mechanism to be used as substitute for cams in stamp batteries.
23,716 of 1896. G. Harnegnies, Brussels, Belgium. Zinc white precipitated by magnesia from chloride of zinc.
8,736 of 1897. C. H. Foote, W. R. Walker, and E. A. S. Clarke, Chicago, U. S. A. Making spiegel on the spot at Bessemer plants and using it hot direct.
9,996 of 1897. W. Buddens, Berlin, Germany. Method of concentrating poor monazite sands.

MACHINERY AND SUPPLIES WANTED.

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

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

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

GENERAL MINING NEWS.

Gifford Pinchot, special forest agent of the Interior Department, thus replies to a query if the present regulations governing the forest reserves deprive miners of the right to take up and develop mining claims:

"The regulations issued under the law permit the development of mines under the same regulations which exist outside, with the exception that, where timber does not exist on a claim in sufficient amount to develop it, other timber may be used to the extent of \$100 stamptage value without charge. For larger amounts a permit is required from the Secretary of the Interior. The text of the law is as follows:

"Nor shall anything herein prohibit any person from entering upon such forest reservation for all proper and lawful purposes, including that of prospecting, locating and developing the mineral resources thereof, provided that such persons comply with the rules and regulations covering such forest reservations."

"Another section is as follows:
"All waters on such reservations may be used for domestic, mining, milling and irrigation purposes under the laws of the States wherein such forest reservations are situated, or under the rules and regulations established thereunder."

"The validity of existing claims and patents within the reserve is in no wise affected, while the settler is given the option of exchanging his claim or holding for the same area elsewhere outside a forest reserve, without cost to him, except that he must comply with the same conditions which would have been required on his original claim. Wagon roads may be constructed under authority from the Secretary of the Interior, and land may be occupied for schools and churches. There is no regulation prohibiting the ingress or egress of any person upon the forest reserves for any lawful purposes, and in general the regulations have been so framed as to allow every possible freedom consistent with the preservation of the forests."

OIL EXPORTS.—The Bureau of Statistics reports

the exports of mineral oils from the United States in September, 1897, as follows: Crude, 7,878,570 gals.; naphthas, 2,474,757 gals.; illuminating, 70,961,828 gals.; lubricating and paraffin, 4,896,709 gals.; residuum, 1,201,452 gals.; total, 87,413,316 gals., which compares with 80,942,500 gals. in September, 1896. For the nine months of 1897 the exports amounted to 732,986,421 gals., against 681,882,251 gals. in 1896.

NEW OIL WELLS AND PRODUCTION.—According to the Oil City *Derrick*, there were 455 new wells completed in the New York, Pennsylvania & West Virginia field during September, with a total daily production of 13,110 lbs.; there were 679 wells working on October 1st. The new wells completed in the Buckeye, O., field in September amounted to 216, with a daily output of 6,283 bbls.; 239 wells were drilling at the end of the month. The Southeastern, O., field completed 34 new wells in September, which had a daily capacity of 249 bbls., and at the end of the month 29 wells were at work. In the same month there were 55 new wells completed in the Indiana field, with a daily production of 2,010 bbls., and on October 1st 37 wells were at work.

ALABAMA.

It is announced that 15,000 acres of coal lands were recently purchased by a syndicate of New York capitalists, backed by the Illinois Central railroad. The coal lands lie principally within Marion county, on the Kansas City, Memphis & Birmingham railroad. The distance from these mines to the Illinois Central, at Holly Springs, Miss., where that system crosses the Kansas City, Memphis & Birmingham, is only about 100 miles. At that point the Illinois Central could have large coal depots established and locate a coal distributing point for practically its whole system. The sum paid for the tract is said to have been in the neighborhood of \$50,000 or \$60,000.

BIBB COUNTY.

ALABAMA MINERAL LAND COMPANY.—This company has leased to H. F. De Bardeleben 1,650 acres of coal land in this county for a term of 20 years at \$6,720 per year.

JEFFERSON COUNTY.

(From Our Special Correspondent.)

Messrs. Aldrich, Shook & Underwood, have completed the manuscript for a pamphlet which it is proposed to distribute among the members of the Armor-Plate Committee during their coming visit. I learn that this is one of the most comprehensive compilations of data and information which has ever been published relative to the resources and production of this district. It has been the object of the committee to anticipate every and any question which members of the board would consider as bearing vitally on the question at issue. Of course the matter of cost will be one of the main arguments and in this regard it is very generally rumored although not confirmed or denied by the officers of the Birmingham rolling mill that steel can be produced in Birmingham under favorable circumstance and conditions at less than \$12 per ton with the cost of iron on \$7 per ton. The second furnace at the steel plant has been completed and will be started at once.

The following companies operating coal mines in this district have voluntarily advanced the wages of miners 2½ cents per ton: McDonald Coal Mining Company, Carbon Hill; Standard Coal Company, Brookwood; Dora Coal Company, Horse Creek; Elliot & Carrington, Jasper.

Because of the general impression that this district is on the eve of greater prosperity some of the labor agitators are urging that a general demand be made for an advance in wages by the coal miners regardless of the contract signed agreeing to a sliding scale of wages based on the price received for pig iron. In consequence of the magnitude of the production of this district and the general rule of selling for future delivery which some of the companies follow the fluctuations on the prices will not affect the miners' wages as quickly as will be the case among the smaller producers who have been able to hold their iron during the depressed state of the market and are consequently now in a position to take advantage of the advance.

The rate of wages at the Pratt mines and at Blocton operated by the Tennessee Coal, Iron and Railroad Company, for mining coal for the month of September was reported by the miners' auditing committee after the examination of the sale books, invoices, ledgers, cash books, etc., at 37½c. per ton, with the contract allowance for coal under 4 ft., and at Blue Creek where the mines were operated by the same company at 28c. per car. The condition of the coal mining industry in both Jefferson and Walker Counties has been for the past week very good. All the leading companies having worked their men full time, a few companies are advertising for more miners and at America several miners were reported this week from Jellico, Tenn.

ALASKA.

SUM DUM.

BALD EAGLE.—In this mine at Sum Dum, says the *Alaska Mining Record*, the tunnel is now in 1,800 ft. and a body of ore ranging from 5 to 7 ft. in width has been opened out. It is the intention to extend this tunnel on into the Sum Dum Chief, the extension above, and there attain a depth of 2,000 ft. on the vein. In the near future a new plant of 10 stamps will be erected on the beach, a distance of two miles from the mouth of the working tunnel, the two to be connected by a tramway. Com-

pressor drills are at work in the mine workings. An upraise is now being run to connect the working tunnel with the upper levels. The mine will be in shape for stopping as soon as the new plant is completed and ready to receive the ore.

ARIZONA.

GILCHRIST COUNTY.

Four more mines in this county have been bonded by Mr. George T. Hoyt, of Los Angeles.

GILA COUNTY.

A group of nine copper claims, located in the heart of the Globe copper belt, adjoining the property of the United Globe on the north, has just been bonded to C. H. Cutting, an employee of the Old Dominion Copper Company. The bond runs 12 months; \$10,000 is the price to be paid, \$1,000 to be paid in cash. The bond stipulates that \$2,000 is to be spent in development work.

PIMA COUNTY.

NARRAGANSETT.—This mine, in the Santa Rita, near Rosemont, has been owned and worked by Mr. J. K. Brown since 1879. The main working shaft is down 115 ft. and a fine body of ore, averaging 26% high in copper without sorting, has been uncovered. Some 400 ft. of drifting has also been done on the claim. The last shipment of ore amounted to 18 tons.

ORO GOLD MINING COMPANY.—The company with its 10 stamp mill is turning out its regular supply of bullion and the mine is being so rapidly developed that more stamps will be required very shortly. The main shaft is now 150 ft. deep; there are two lesser shafts, a tunnel and considerable drifting and several crosscuts.

YAVAPAI COUNTY.

Two deeds of considerable importance were filed for official record a few days ago, the consideration being nominal in each. Both were from W. A. Clark, of Montana, and were executed to H. C. Elliott, of New York. One of them transferred title to one-sixteenth interest in Mr. Clark's right, title and interest in and to the lease and agreement held by him in the Equator mine, near Jerome. The other conveyed title to one-fourth of the West Champion mine, also near the same place. The property in question is that which has been in litigation for a long time.

CALIFORNIA.

CALIFORNIA MINERS' ASSOCIATION.—The San Francisco branch of this association recently made the following elections: President, T. J. Parsons; vice-president, W. C. Ralston; secretary and treasurer, Charles G. Yale. The annual convention of the State organization will begin in San Francisco on October 18th. The San Francisco delegates include A. J. Ralston, T. J. Parsons, Julian Sonntag, W. C. Ralston, S. W. Backus, Edward A. Belcher, S. K. Thornton, Andrew Harrigan, Hugh Craig, John Coleman, Edward Coleman, C. W. Cross, H. T. Lally, J. O'B. Gunn, Colonel George Stone, J. M. Wright, Charles Watt, B. T. Lacey, D. D. Pike, D. E. Hayes, I. S. Foreman, T. L. Ford, Louis Glass, P. George Gow, R. R. Grayson, S. J. Hendy, Robert McMurray, J. F. Halleran, C. H. Lindley, A. L. Scott, W. W. Montague, D. E. Miles, Henry Pichoir, S. Mooney, J. L. Rathbone, George Schmidt and Charles Allenbarge.

It is said that Hon. Jacob H. Neff, of Auburn, who has been president of the California Miners' Association since its organization, will decline the candidacy. At the coming convention resolutions will be adopted urging Congress during its winter session to pass the mineral lands bill, favored by the California miners as the best means of preventing the Southern Pacific monopoly from patenting as agricultural lands the mining sections within its government land grants.

BUTTE COUNTY.

(From Our Special Correspondent.)

On the ranch of William Evers, about 12 miles from Chico, on a flat near the river bank, a bed rock channel has been discovered which shows coarse gold and nuggets. The lead seems to be growing richer.

CONSOLIDATED GOLD MINES OF CALIFORNIA, LIMITED.—The Banner, Clarke, Coffee and Long's Bar mines, northeast of Oroville, owned by this company, are being developed on a large scale. In his report E. Henry, one of the directors who has been inspecting the mines, says: "There are 140,000 tons of profitable ore in sight in the Banner mine. The whole face of each drift and tunnel was cut down and a milling test of 650 tons was made, showing an average of \$4.50 per ton without the concentrates. The 10-stamp mill will probably be increased by 30 stamps very soon."

CALAVERAS COUNTY.

(From Our Special Correspondent.)

A suit was brought October 24 by the Lightner Mining Company against the Utica Mining Company in the Superior Court to recover \$200,000, alleged to have been taken from the claim of the plaintiff by the defendant. This suit has been expected for some time, but has been suppressed till the papers were filed.

CURTIS CONSOLIDATED GOLD MINES.—The properties of this company known as the Magnolia and the United States are located about one mile from Altaville. A two-compartment shaft is down 60 ft. on the vein and 2,000 ft. north another has been sunk which prospects well. About 1,000 ft. east another shaft started shows a good vein, which at 60 ft. assays on the average \$7.25 to the ton.

KERN COUNTY.

AMELIA.—This mine is distant 18 to 20 miles from Tehachapi by trail. The ledges range from 8 in. to 2 ft. Nearly 1½ miles of underground work has been done. The hoisting works have a capacity of 2,000 ft., but 408 ft. is the maximum depth of shafts as yet.

UNCLE SAM.—This group includes 12 claims. The Uncle Sam mine proper is worked through two tunnels 300 ft. long and 100 ft. apart. The tunnels are connected by winzes, showing about 6,000 tons of ore in sight which mills \$8 per ton in gold. There is a Briggs mill on the ground, capacity 10 tons in 24 hours, the expense of milling, with water and wood in abundance, being small.

(From Our Special Correspondent.)

ALAMEDA.—Shaft No. 5 at this mine in the Randsburg district is now down 100 ft. in rich ore. Shaft No. 4 shows a 5-ft. vein which mills about \$30. A concentrator is in operation.

LITTLE BUTTE EXTENSION MINING COMPANY.—This company has been incorporated with a capital of \$1,000,000, fully paid, with the following officers: E. Lee Allen, president and manager; J. C. Wood, first vice-president; W. J. Clark, second vice-president; H. C. Oakley, secretary, and the Farmers & Merchants Bank treasurer. The company was organized to work the Little Butte Extension and the Monkey Wrench mines, which it now owns. Sinking on the vein has been commenced.

KERN COUNTY.

(From Our Special Correspondent.)

The Union Construction Company has begun construction on the new railroad line from Kramer to Randsburg, a distance of 28 miles. As the weather is now cool and pleasant the contractors expect to have the road completed by December 1st.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

MARIPOSA ELECTRIC POWER COMPANY.—At a meeting of this company held at San Francisco October 2d, the following directors were elected: Capt. A. H. Ward, president; E. A. Wiltsee, vice-president; W. G. Luckhardt, secretary; Charles T. Lindner, electric engineer; Lansing Mizner, attorney. The plant of the company is located at Benton Mills. The dam, 320 ft. in length, will be located seven miles east of the power station at Broadhead Dam, and will have 300 ft. fall. Work on the ditch has commenced. It is the intention to furnish power and light to all the mines and towns in the vicinity.

NEVADA COUNTY.

NEVADA COUNTY MINERS' ASSOCIATION.—At the annual meeting, which was held September 30th, all the old officers were re-elected as follows: President, Fred Zeitler; vice-president, George Mainhart; secretary, W. F. Englebright; assistant secretary, J. F. Colley; treasurer, B. F. Snell. The old executive committee comprising the following was also re-elected: George C. Gaylord, Sherman W. Marsh, Geo. Fletcher, D. B. Marwick, J. S. McBride, E. T. Worthley, C. D. Eastin, O. K. Cloudman, D. McPhetres, W. L. Mobley and H. Schroeder. The selection of delegates to the State convention was left to the executive committee, and only those who will agree to attend will be chosen.

(From Our Special Correspondent.)

ENGLISH MOUNTAIN.—This mine, consisting of three full claims, located 20 miles west of Emigrant Gap, at an elevation of 8,000 ft., which has been idle since the fire in July, which destroyed the mill and the wire-ropeway, is about to be reopened by Dr. Daywalt, who will rebuild the mill at once and commence work on the mine.

LAST CHANCE CONSOLIDATED MINING COMPANY.—This company has been incorporated with a capital of \$500,000. Directors, P. E. Platt, W. F. Barnes, E. L. Hawk, C. H. Hubbard, A. D. West, C. W. Potterfield and G. F. Maydwell. Seven claims in Diamond Creek mining district, about nine miles from Emigrant Gap station on the Central Pacific Railroad, will be developed.

PROVIDENCE.—The shaft at this mine, one mile west of Nevada City, is down 1,780 ft., and machinery is being erected to sink 1,000 ft. deeper. Seventy men are employed and 40 stamps are crushing ore. A new air compressor is being added to the plant.

PLACER COUNTY.

(From Our Special Correspondent.)

HIDDEN TREASURE.—At these drift mines at Sunny South, four miles north of Michigan Bluff, a most complete electric mining plant has been installed to work the new ground known as the Dam claim.

MORNING STAR.—This drift mine, which has been declaring regular monthly dividends for many months, has declared the 82d dividend of \$7 per share. Hon. Jacob H. Neff is superintendent.

SHASTA COUNTY.

SPANISH MINE.—At this mine, owned by the Joshua Hendy Company, a tunnel has been run 450 ft. in lapping the ledge at a depth of about 200 ft. The vein is 4 ft. thick and is heavily charged with sulphurets and the ore on comparison appears to be identical in character with that of the Litsch & Painter mine adjoining.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

SPENCER.—This mine, 12 miles northwest of

Yreka, on Humbag Creek, has been bonded by Hollister parties for \$2,500. The property embraces eight claims and is opened by an incline shaft, about 250 ft. in depth.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

GREEN.—John I. Manier, superintendent of this mine near Soudsbyville, reports that in the south drift on the lower level a 4-ft. vein has been cut which assays very high. This mine is in the east belt, near the Soudsby and the Confidence mines.

COLORADO.

BOULDER COUNTY.

Salina, one of the oldest mining districts in this state, appears to be resuming activity in consequence of the investments that are being made in its properties. The new railroad is nearing completion, and this will no doubt stimulate mining operations to a greater extent.

BELLE.—L. H. Flanders, of Denver, has a bond and lease on this property. One tunnel is in 1,500 ft. Good ore is being shipped.

B. & M.—This shaft has reached a depth of 455 ft. Three shifts of miners are at work. Double shifts are also employed pushing development work in the west 370 level. In the bottom of the shaft a 5-in. streak of solid steel gray iron shows up and in the breast of the level there is said to be a streak of good smelting ore.

EMANCIPATION.—A new shaft house and new machines have been added to this mine and the old shaft sunk about 100 ft., making the total depth about 500 ft. Good ore has been taken out. E. J. Temple, of Boulder, one of the owners, is general manager.

GARDNER & OHIO.—This property is owned by the Zanesville (O.) Mining Company. A crosscut has been run from the Ohio vein to the Gardner, a distance of over 100 ft. Two veins have been cut; each is said to run over \$20 per ton. Most of the work has been done through a tunnel which is now in over 400 ft. The crosscut is 300 ft. in from the tunnel's mouth. M. H. Sammis, of Denver, is superintendent.

GOLDEN EAGLE.—This mine has been equipped with a new shaft house and a complete new plant of machinery, using compressed air drills to extend the tunnel.

INGRAM.—This mine is owned by St. Louis capitalists. Development work has been carried on for several months past. The shaft has been sunk over 100 ft., which now makes it about 600 ft., and drifts are being extended. Teams are busy hauling ore from the dump to the Delano mill at Boulder.

MELVINA.—This mine is now being operated by the Peabody Investment Company at Denver, of which D. G. Peabody is manager. The old shaft has lately been sunk 50 ft., making the total depth over 500 feet, and the ore bodies show improvement.

MODOC.—A new shaft is being sunk on this property west of the present working shaft.

SCOTTISH MILL.—H. M. Williamson, of Denver, has bought this mill and has had a force of men at work for months remodeling, putting in new machinery and new tables, and it is now ready for business. Over a hundred tons of ore are in the bins; an assay office has also been added.

WIRTH.—In this mine a No. 6 Cameron pump has just been installed, the capacity of which is about 75 gals. per minute.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

BRADDOCK BELLE MINING COMPANY.—C. J. George, of Pittsburg, has been at Idaho Springs recently completing arrangements for the more active working of the property under control of that company. Three adits were driven in mineral on the Elliott & Barber lode, and it now proposed to install a plant of hoisting machinery and sink a shaft below the bed of Clear Creek.

CHICAGO BELLE.—Manager Jaynes, of the company, operating this mine near Idaho Springs, is advertising for contracts to sink the shaft on that property 300 ft. deeper. He is also contracting the running of levels. The present showing is about 3 ft. of pay ore, some of it smelting ore.

HOT POT.—This mine, which is located in Virginia canyon, near Idaho Springs, has been sold to A. A. Pope, of the Pope Manufacturing Company of Boston, for \$20,000. It is the intention to sink the shaft and run levels on the present showing.

NEWTON MILL.—Mr. W. E. Renshaw has secured this property at Idaho Springs by purchase and has changed the plan of treatment of the ores from the mines of Clear Creek County. Two processes are to be introduced, amalgamation by crushing and automatically feeding the mineral to 50-drop stamps, the slimes passing through 60-mesh screens over the copper plates to the gilt-edge bumpers and the slimes passing on to two Wilfley tables. The concentrating part of the mill will treat ores by crushing, then to a separator, the coarser returning to rolls and returning. The finer then passes to other screens for sizing and to Wilfley tables adjusted for different sizes. The slimes then go to a new table that is being made under the direction of Mr. Renshaw.

PHILLIPS.—Eben Smith, the well-known Denver mine operator, has just returned from Europe and has given orders to start more aggressive operations

on this mine near Idaho Springs, in which he holds a half interest. A new steam plant is to be installed and the shaft will be continued deeper.

QUAKER MINING COMPANY.—This is a Pittsburg company, operating the Monte Cristo property at Idaho Springs. Adits have been driven on an ore shoot pitching down. A new steam hoisting plant is being installed for sinking on the showing.

EL PASO COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

ADVANCE GOLD MINING COMPANY.—This company, operating the Yellow Bird Claim on Gold Hill, south of town, has opened up a nice body of ore in a crosscut from the 150 ft. level and is becoming a regular shipper of good grade ore.

ANCHORIA-LELAND.—This company, on Gold Hill, has declared a dividend of 1c. per share for the month of September. This dividend will amount to \$6,000. For the month of September the company shipped 800 tons of ore to the Rio Grande Sampling Works.

ELKTON CONSOLIDATED.—The directors of this company have declared a dividend of 2c. per share, payable October 20th. This will amount to \$20,000, and they have also declared an extra dividend of 1c. per share, payable at the same time, amounting to \$10,000, making in all \$30,000 this month. This will make the total dividends paid by this company \$386,960.

JOHNSON LEASING COMPANY.—During the month of September this company, working the Half Moon, on Gold Hill, owned by the Matoa Gold Mining Company, shipped 315 tons of ore, aggregating in value about \$20,000. Improvements are being made and a large output is expected for October. The company has secured an extension of the lease for two years.

MAY QUEEN.—Within the past 10 days work has been commenced on the May Queen lode, on Womack Hill, east of town. The work so far consists of an open cut and shaft, sunk about 18 ft. on the apex of an apparent ore shoot near the bottom of the shaft. An upheaval of phonolite was encountered with a vein of between 5 and 6 ft. in width. A trial shipment of this was made to the sampler. One lot of seven tons gave a return of \$31 per ton and one lot of eight tons gave \$27 80 per ton. Both of these were shipped without sorting. The ore shows free gold. This sample shipment would indicate good value in the phonolite.

MOON-ANCHOR.—From this property on Gold Hill over 500 tons of ore were shipped to the Rio Grande Sampling Works in September.

ORIZABA LEASING COMPANY.—This company, operating on the Orizaba lode on the west slope of Beacon Hill, settled for a shipment of 120 tons of ore this week. The ore body is holding out in good shape.

GILPIN COUNTY.

(From Our Special Correspondent.)

Some good lode discoveries are being made in the northern part of the county, about 15 miles from Central City. This portion of the county has been neglected before, on account of the ground being patented for timber purposes, but this fall several prospectors have met with success, and others are now going into the vicinity. However, all work will soon be put a stop to, as its close proximity to the range will necessarily hinder any developments being carried on in the winter months.

ELDORADO.—English capital has become interested in the Eldorado on Quartz Hill; a plant of machinery has been put in place, and sinking operations commenced on a 50-ft. contract. During the past week shipments of ore from this property were made to the Denver smelters for a test run.

GILPIN TRAMWAY COMPANY.—This company is obliged to work night and day in order to handle the present large output of ore, as it is short of cars. Since its connection with such big producers as the Phoenix-Burrough (which alone ships 100 tons daily), Ophir, Kansas, Concrete and Hidden Treasure mines, the business on the lines of the company has greatly increased.

GOLD ROCK.—Eastern parties who are operating in Russell Gulch district intend to soon start up the Gold Rock (formerly known as the Springdale) property.

HUBERT.—The new gravity tramway, to connect this mine with the 30-stamp mill, also owned by the Vendome Gold Mining Company at Nevada City, is now completed, and when in operation will mean a considerable saving in haulage to the company. At its properties, the Hubert and Shafts mines, employment is given to 75 men, and their daily output is from 30 to 40 tons of both mill and smelting ore.

LITTLE KINGDOM.—The daily output of this property is very close to 1,000 tons of ore, of which 700 tons is milling, and the remainder is concentrating and smelting ores. This total shows at least a gain of 25% over the output at the commencement of the present year.

TOPEKA.—Henry P. Lowe, of Denver, is now looking after the interests of Eastern capitalists, who this past Spring paid \$300,000 for the Topeka mine in Russell district. A force of nearly 40 men is employed, some of whom are leasers, but the aim of the management is to still continue development work, rather than to at present gouge all the mineral in sight. With development work, shipments of a good grade of ore are being made.

LAKE COUNTY.

(From Our Special Correspondent.)

BIG SIX COMBINATION.—The lessees of this property, Gilroy, Van Camp & Young, are opening up their ore body and are shipping increased tonnage this month, averaging about 35 to 40 tons per day. Most of the ore comes from the Nettie Morgan shaft. The Big Six shaft under sublease is not shipping at the present time, but operations are being conducted with the diamond drill and as soon as the main ore chute is located sinking and drifting for the same will at once be commenced.

EQUATOR.—After considerable exploration work, this property, lying at the head of Iowa Gulch, comes to the front with a strike of valuable ore, and Denver parties, who are at the head of the combination which owns the ground, are pushing operations there and have added a good force of men this week. It is understood that a 13-ft. body of concentrating ore has been opened up, while in addition they have a streak of rich ore from which some valuable shipments are to be made at once. The property is operated by a tunnel which is in from 300 to 400 ft. and the vein opened up runs very well in gold. The strike is of importance as it opens up a new field where there is a large amount of virgin territory to operate in.

GOLDEN EAGLE MINING COMPANY.—During the past 10 days the leases operating on this property have been closed down, but it is believed that arrangements are under way for starting up in the near future. At a meeting of the stockholders of the company held in this city on October 6th, the following were elected directors for the ensuing year: J. B. Grant, Geo. W. Skinner, of Denver; J. H. Weddle, Chas. T. Limberg, Walter W. Davis, J. C. Stillwell, R. J. Allison, of Leadville. At the directors' meeting the officers were elected as follows: President, J. H. Weddle; vice-president, Geo. W. Skinner; secretary, R. J. Allison; treasurer, C. T. Limberg.

IOWA GULCH SECTION.—It is growing quite late in the season for any renewed activity in this section and it would appear that the Rex proposition and a few others in that neighborhood which were to have been operated will not be started up this season. At the same time there are a number of properties which are forging to the front at the head of the gulch and from recent strikes made up at the head of the Iowa section one hears considerable discussion concerning this ground and a number of patented claims which lie in the neighborhood have risen in value to a considerable extent during the past 10 days.

LEADVILLE & CHICAGO MINING COMPANY.—The management is sinking down this shaft steadily and it is thought that by October 15th a sufficient depth will have been attained and drifting will be commenced. The shaft will then be down about 450 ft.

MAB MINING COMPANY.—In my special telegram of Friday last I announced briefly the strike made in the Mab property and called attention to the importance of the new find. Up to this time not enough development work has been done to tell the exact strength of the strike, but enough has been done to demonstrate its value. Not only is the find important to the owners of the property, but to the entire Carbonate Hill area, as it proves the existence of a good ore chute at this depth. The Mab Mining Company was incorporated some 18 months ago by Denver and Leadville people. Its object was to sink a new shaft in new territory to open up if possible the rich ore shoots of the Mahala and Wolf-tone properties at a depth of about 1,000 ft. This was about the depth that the management figured it would be necessary to go to catch ore, and the strike just made has proven this theory to be correct. The Mab comprises over 30 acres of ground and it lies about 300 ft. from the Mahala line. After incorporation the company at once commenced work, and after going about 75 ft. the labor troubles stopped the work, which was not resumed until last March. Since that time the shaft has been going down steadily until last week, as announced in the *Engineering and Mining Journal*, sinking ceased in order to allow the placing of machinery. This being completed, sinking resumed the first of the week, and at a depth of 970 ft. an ore body has been encountered. Manager Nicholson at this time does not care to make any statement of the find until further development proves what the strike is. It is understood, however, that the ore is a rich lead value and fairly well in silver, with a small percentage of gold. Mining men who have been watching the work are unanimous in the opinion that the strike is one of the biggest and most important made for a long time in this section of the camp, Carbonate Hill.

SILVER DOLLAR GROUP.—Arrangements are under way for starting up this group of claims, which are well located to catch the rich gold ore shoot found in the Equator. The group includes the Silver Dollar, the Silver Chief, the Bertha and the Mary C., all patented property. The owners are at present in Denver arranging for the operating of the group.

MONTEZUMA COUNTY.

(From Our Special Correspondent.)

Two new companies were organized at La Plata, October 1st, the incorporators being the same in both instances, as follows: L. E. Moses, president and general manager; R. C. Reece, vice-president and superintendent; E. G. Donley, treasurer; E. H. Lunken, secretary. The names of the companies are

the Little Jane Gold Mining Company and the Grassy Hill Deep Mining and Tunnel Company.

BODIE.—Geo. Adams is working this tunnel under bond and lease, and recently struck a big vein of shipping ore.

GOLDEN ROSE.—Some very good ore has lately been encountered, returns from the first shipment netting the owners \$100 per ton, gold.

LILY BELL.—Bagby Brothers are shipping a carload monthly of \$200 gold ore from this property.

LITTLE JANE.—A half interest in this property has just been sold to the Grassy Hill Deep Mining and Tunnel Company, for \$10,000. Operations on the mine are to begin at once. A hoisting plant is to be erected and a shaft sunk on the ore shoot from the lower drift.

OUT O' SIGHT.—Geo. Bauer has let another contract for driving the tunnel 25 ft. further, when it is expected the vein will be reached.

SENATOR GROUP.—An Omaha company has purchased this group, and a large force of men will soon be put at work. The Senator is a gold and copper proposition, located near the head of Madden Gulch.

SAN MIGUEL COUNTY.

(From Our Special Correspondent.)

BELLE-CHAMPION.—Another rich strike has been made on this property, located in the Saw Pit District, owned by James McKay, of Pittsburg, Pa., and being operated under lease by James Blake and T. J. Lewis. The lessees put a shift of men to work on the lead higher up the mountain and to the east of the old workings, and within three days a blanket vein of carbonate ore peculiar to the district, 52 in. in thickness, was uncovered on top of the limestone stratum on each side of the vertical. The mineral assayed 22 oz. gold, 150 oz. silver and 30% lead per ton. Two carload shipments have been made from the new strike, and the returns were in conformity with the assay values. To the limited extent the new discovery is developed, the lessees are now shipping a car of mineral a day from the old and new workings, which will be increased as additional stopping ground is blocked out. The new strike is on a continuation of the Lizzie G. ore shoot, the largest and richest producer in the camp, and two new tunnels are now in course to tap the ore contact on intervening properties. A fresh vein has been imparted to the people in consequence of the strike, and more prospecting is being done in the district than for two years past.

GOLD RUN PLACER.—James McWilliams, of Telluride, and Frank W. Graham, a mining promoter, who a few weeks ago secured a lease and bond on this placer, have concluded a series of test runs of the tailings lying on it, which in places are 10 ft. deep. The tailings are principally from the Smuggler Union 50 stamp mill, located at the upper end of the placer, and assay from \$5 to \$16 per ton in gold and silver. The test runs demonstrated that from \$3 to \$5 per ton of the values in the tailings could be recovered and the lessees are now preparing to erect a \$10,000 plant for the treatment of them on an extensive scale. The plant will comprise two or three Huntington mills for the purpose of regrinding them, and below these will be several vanners and a large number of stationary tables covered with canvas and burlap set at an angle of from 10° to 15°, over which the tailings will run after leaving the vanners. There will also be plates for the purpose of catching the free gold values and it is the intention to concentrate about 40 tons into one.

H. M. H. GROUP.—Three to four feet of gold ore has been opened up by a cross-tunnel at a good depth on this group, lying a short distance above the Nellie mines, in Bear Creek. The owner, H. M. Hogg, had a five stamp mill constructed near the property this summer for the treatment of the product, and he now contemplates enlarging it to 10 stamps this fall, the building having been constructed with that object in view.

KEYSTONE PLACER.—Located about four miles down the San Miguel River from Telluride, owned by a New York Company, F. W. Pitcher, of that city, being one of the largest stockholders, is undergoing improvements preparatory to being put in active operation. The old dam, flume and buildings are being repaved, and in a short time the washing down of gravel with a strong hydraulic pressure will be commenced.

NEW YORK.—John Hartman, the owner of this property has transferred the working force from the White Woman, an adjoining claim, and is mining gold and yellow copper ore from a 12-in. pay streak. A carload of the mineral will be shipped to Denver in the next few days. Improvements will shortly be made to enable work to be continued this winter.

NORTH AMERICAN EXPLORATION COMPANY.—This company, which has been operating the Nellie and Ella mines, Bear Creek, under lease and bond since the first of the year, made a \$25,000 payment October 1st. The production of the mines averages from 70 to 80 tons daily, which is transported down over a Huson tramway a mile in length to the Telluride Power Transmission Company's 120 stamp mill in the same creek, for treatment. Thirty stamps are run on this ore besides what gold is saved on the plates. A ton of concentrates is obtained from 30 or 40 tons of mineral put through. The company is now erecting large new bunk and boarding houses, and other preparations are being made for the purpose of materially increasing the output.

A large cross vein was cut in the breast of the lower level, a distance of 1,800 ft. in from its mouth, a short time ago, which is believed to be that of the Star Gazer, bonded to this company. The lode was intersected at a depth of 1,500 ft. below the surface. The pay streak is 4 ft. wide on the surface and runs well.

SILVER KING.—Located in Alta basin at the head of Gold King basin, is now producing three carloads of high grade silver ore, which also carries gold and lead in consequence of the recent completion of an upraise connecting the lower tunnel on the vein with the upper workings. The high-grade pay streak is from 12 to 18 in. wide. The property is being worked under lease by Frank and Fred Horton, Morris Lehmand, Fred Kuster and Joe Piquard, business men of Telluride, with Frank Horton as manager, and it promises to become one of the largest shippers in the county, as the shipments will be increased as more stopping ground is opened up.

TOM BOY GOLD MINES COMPANY.—General Superintendent Harry B. Adsit recently commenced treating ore taken from above the levels being driven on the vein from the intersection of the mill tunnel cross cut, 450 ft. below the lowest of the upper workings. It is said the mineral is more refractory down here than in the upper workings, and not so much of the gold values are caught on the plates, but that it carries about the same values as above. The eight Huntingtons are grinding from 150 to 200 tons of ore each 24 hours, the bulk of which comes from the upper workings.

UNITED STATES & BRITISH COLUMBIA MINING COMPANY.—J. M. Dikeman, resident manager of this company, is rapidly getting the Allegheny 20-stamp mill, a quarter of a mile above Telluride, on the San Miguel River, in condition for operation by water power. It will run on mineral from the Greenback, Lucky Girl and Liberty Bell, in Cornet Creek basin, about two miles distant from the mill. The company this summer purchased the mill for a consideration of \$50,000.

GEORGIA.

CHEROKEE COUNTY.

(From An Occasional Correspondent.)

Pope Brothers have recently sold their gold mining property at Holly Springs to an Ohio syndicate, which intends to develop on an extensive scale. Operations will be begun immediately. The property includes 400 acres, on which two shafts have been sunk about 120 ft. each, cutting a vein of sulphuretted ore said to be 9 ft. thick.

LUMPKIN COUNTY.

KINGSBERRY.—The five-stamp mill has been completed and is ready for active operation. The scarcity of water is a drawback at present.

IDAHO.

ADA COUNTY.

Word has been received at Boise City, Idaho, that the old Lawyer mine, now known as the Newburg, and the Alice have been sold by their owner, Pat. Sheridan, to William Church, of Denver, for \$18,000.

Further news from Thunder Mountain, on the Middle Salmon, is that the dirt runs from 25c. to \$1 a pan, some being reported much higher. Several expeditions are understood to be in preparation to go to the scene of the rich discoveries.

LEMHI COUNTY.

ARLINGTON.—This claim of the Canadian King group, on the North Fork of the Salmon River, has been bonded for \$35,000 to the Hastings British Columbia Exploration Company. The property is gold-bearing and partly free milling.

ITALIAN.—This mine, at Salmon City, has been sold to W. E. Hubbard, of Salt Lake City, Utah, for \$50,000. The mine has been under bond for several months to R. W. McBride. Mr. Hubbard has started the mill and will add more machinery, putting in concentrators, stamps, etc.

(From Our Special Correspondent.)

BINGHAM PLACER MINING COMPANY LIMITED.—At a special stockholders' meeting held at the company's office in Salt Lake, Utah, on October 2d, the incorporation articles were amended placing the capital stock at \$275,000, share \$1, of which 50,000 shares are cumulative preference shares, carrying 10% interest, and after 10% has been paid sharing *pro rata* in the profits of the company; the balance, 225,000 shares, will be ordinary shares. All shares to be fully paid and non-assessable. This is a Utah company, organized in the summer of 1896. Officers are: Theodore Bruback, president; John W. Young, vice-president; W. S. McCormick, treasurer; S. T. Pearson, secretary; C. W. Watson, general manager, all of Salt Lake. The realty consists of 160 acres along Anderson and Dahlonega creeks, and there is a water right of 2,000 in. from Salmon River. It is said the past season's washing made a good showing. At present a shaft is being put down preparatory to drift mining and some extensive improvements are contemplated. An elevator, which shoots the dirt a considerable distance, is to be introduced as there is a lack of dump for a portion of the ground.

OWYHEE COUNTY.

(From Our Special Correspondent.)

ALPINE.—Two shifts are now at work on this mine. The mill run of 11 tons which was had in August went about \$100 per ton.

FLINT MINING COMPANY.—The mortgage given by this company last February to cover the attach-

ment made for labor performed has been settled in full by the payment of about \$2,800, and the mortgage was released.

HAYWARD.—At this mine, at Silver City, an 8-ft. ledge has been encountered which is said to assay \$750 per ton.

SHOSHONE COUNTY.

STEMWINDER.—Legal notices have been posted announcing the sale of the Stemwinder mine, mill and tramway on October 23d to satisfy a judgment aggregating \$101,388, together with costs and interest from March 10th last, the date of the judgment. It is understood to be a sale simply to quiet title, as the Bunker Hill & Sullivan Mining and Concentrating Company now owns the entire possessions of the old Stemwinder company, has moved the machinery out of the mill and been working the mine for months. The judgment was rendered on a mortgage for \$97,338 given by the Stemwinder Mining Company, which mortgage it is alleged was illegal, having been given after the company was insolvent. The Bunker Hill & Sullivan Mining and Concentrating Company acquired title by purchase from the receiver of the Stemwinder Mining Company.

IOWA.

POLK COUNTY.

CHICAGO & NORTHWESTERN RAILROAD.—This company has completed arrangements to move its Iowa coal mining interests to Des Moines. The company owns extensive mines at Muchachinock and Lone Creek, which are nearly worked out. It has recently bought 4,500 acres of coal lands, much of it within the limits of Des Moines, and all of which has been carefully prospected for coal. Shafts will be sunk in the spring, and it is expected 1,000 miners will be worked. The company will not enter the local trade, but consume all the coal produced.

WESTERN COAL COMPANY.—This company has petitioned the district court at Des Moines to appoint a receiver for its property. Recently John Smith, owner of the mine, began suit to recover royalties due. The company replied that the strike has forced it to postpone meeting its liabilities and it will be forced to suspend at this time if its creditors force the issue. Therefore it asks for a receiver pending litigation.

MICHIGAN.

COPPER.

It is reported that N. F. Leopold, of Chicago, representing New York parties, has concluded negotiations for the purchase of the Arcadian, the Edwards and the Sheldon-Douglas properties, situated near the Franklin, Jr. A force has been put at work on the Arcadian, and the pumps will soon be started up.

ATLANTIC MINING COMPANY.—At the new openings made by this company work is being steadily prosecuted, says the *Copper Journal*. At section 16 quite a force of men is employed under Captain Datson. They have reached a depth of 50 ft., and the amount of copper-bearing rock found is increasing. A pump is kept busy pumping out the water, and a dry-house is now being built. On the Five-mile hill, on Ontonagon road, a second opening has been made, and thus far is most encouraging. Considerable copper has been found which increases in richness as the opening deepens. The shaft sunk on the recently acquired property to the north of No. 1 shaft has proved fully up to expectations, and this week it is being timbered. A shaft-house will be built at once. The ditch for the laying of pipes from the compressor is completed, and next week drilling machines will be put in operation. The railroad will be extended to No. 1 shaft. It is expected that in about a month repairs on the No. 1 combination shaft and rock-house will be completed and everything in readiness for hoisting.

MANITOU COPPER COMPANY.—This company is to be organized to take the Six-Mile Hill property, near Portage Lake. The company will be made up of New York parties, Cameron, Currie & Co., of Detroit, Capt. W. A. Dunn and other Portage Lake people. The old Six-Mile Hill property was worked very little previous to last winter, when Capt. W. A. Dunn began exploratory work on the vein, says the *Copper Journal*. Despite adverse criticism, the captain kept up his work at the old property until he had proved that his option controlled a vein rich in copper. The present company has 800 acres of land at its disposal. Work is already being vigorously pushed under the direction of Captain Dunn, who will remain in charge until the company is fully organized and has time to make other arrangements. Two dwellings are being built for the men, a dry-house and other necessary buildings. For the present No. 1 shaft will be developed and a second shaft started about 900 ft. further up the hill, and the drifts will be extended north and south on the lode. At least 75 or 80 men will be employed at the new mine this winter.

IRON—MENOMINEE RANGE.

A new body of iron ore is reported discovered near Michigamme by Captain Curnon, of Vulcan. The property is a 40-acre tract owned by S. M. Stephenson and J. Flesheim, of Menominee, who propose to develop it at once.

MINNESOTA.

(From Our Special Correspondent.)

At a recent meeting of the officials of the Duluth & Iron Range Railway it was decided to make extensive improvements the coming winter, improvements that will cost probably not less than \$1,500,-

000, and will have a great effect in saving costs to the road. The chief work in this direction is the construction of 19 miles of line from the docks at Two Harbors northerly, connecting with the present main line about 17 miles from the point of departure, and avoiding all the heaviest grades that now interfere with traffic, and make the running of heavy ore trains down to Two Harbors somewhat dangerous and expensive. This line will be used in place of the present main line when completed. The steel for the 19 miles has been ordered. Four miles of double track will be built from Biwabik southerly, and other short stretches of track will be constructed. The equipment of the road will be increased by from 300 to 500 new 30-ton ore cars and a few locomotives, while 240 cars, that have not been in use for some time, will be rebuilt at the Two Harbors shops of the company and enlarged to 30 tons capacity. No. 2 dock, built long before the day of ships of a depth of 28 ft., will be rebuilt to meet present conditions and lengthened 180 ft., making it one of the largest and probably the finest, if the word better can be used where there are such complete docks as those at Duluth and Marquette.

The Bessemer Steamship Company, the Rockefeller syndicate, is still figuring with shipyards for the construction of additions to its fleet. It is announced that the new ships will be 475 ft. long, making them 50 ft. longer than anything now afloat on the lakes, and 25 ft. more than any others planned. Such ships should be able to carry not far from 7,500 net tons.

The Duluth, Missabe & Northern Road has had 150 men, aside from section crews, at work all summer in surfacing and bettering its line from the Mesabi to Duluth, and has done a great deal of excellent work. Work has been done about mines and stockpiles that makes the handling of cars far more expeditious than ever, and greatly assists in the pushing forward of ore.

According to the government's report of the Sault Canal, there have passed out of Lake Superior this season 8,529,712 net tons of ore. This, reduced to gross and giving the amounts from the Minnesota districts at 5,000,000, and from Ashland at 1,650,000, as they are, leaves about 1,000,000 gross gone forward from Marquette.

IRON—MESABI RANGE.

At present there are on the Mesabi about 400,000 tons in stock, and most of this will be carried over the winter. Of this, the Lake Superior group at Hibbing has 275,000 tons, the Canton, which has been idle all summer, 100,000, and the Cloquet about 10,000 tons. The Cincinnati's stock has been cleaned up and the mine closed for the winter. The Mahoning will soon discontinue shipments.

ADAMS MINING COMPANY.—This company, operated by the Consolidated, has completed the shipment of its 150,000-ton stockpile, and is now hoisting and shipping only from underground development work. About one train of ore every other day is its output.

FAYAL IRON COMPANY.—At this mine new No. 3 shaft is going down rapidly, and a 4,000-ft. railroad spur is being built. The company has just raised wages 10%. It will stock very rapidly during the entire winter. An underground electric light plant will be installed this winter for lighting the workings of the mine.

GENOA IRON COMPANY.—This mine is employing all available men and is getting ready for a great production. It is sure to become one of the notable mines of the Lake district, and a heavy producer.

NORMAN IRON COMPANY.—This mine has closed down for the season with an output of about 100,000 tons. The same company's Auburn mine, which is now running only 30 men, will close in a few days, probably.

OLIVER MINING COMPANY.—This company's Oliver mine, which closed two weeks ago, has resumed work, and will probably send out the product of one shovel till the close of navigation. It has put on some 10 men.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

CHANDLER IRON COMPANY.—The workings of this company have reached such a depth that, it is said, it will now be compelled to do the pumping for the Pioneer. It will be remembered that some two years ago the Pioneer, which is an extension of the Chandler vein, sunk below the lowest Chandler levels and was forced to drain the former mine and to care for much of its water. The contract seems, from present reports, to be on the other side now. With extensive shipments from the Pioneer, the pumping will naturally fall to it.

SECTION 26.—Sinking and development continues steadily here, and considerable excellent ore is hoisted to the little stockpile, which will assume very generous proportions by next spring.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The weather continued fine for mining all the past week, notwithstanding the drought, but there was a scarcity of water which greatly curtailed the output of many plants. The sales of zinc ore showed an increase of one car for the district, but there was a decrease of 15 cars of lead ore. This decrease of lead ore is accounted for by the sale of 600,000 lbs. at Galena, which had

been accumulating for a year and was all sold at once. In reality there was no decrease in the lead ore output. The price paid for lead ore was \$28 per 1,000 lbs. delivered. There was also about 200,000 lbs. of lead ore sold for \$31 per 1,000 lbs. delivered, but it was contracted for the preceding week. Three cars of zinc ore at Joplin sold for \$23 per ton, while ten cars sold for \$22.50 per ton. Oronogo, Stott City and Springfield products sold for \$22.50 per ton. There was a decrease of 50c. per ton for the low grades at Webb City and an increase of 50c. for the same grades at Galena. There is very little surplus ore, either lead or zinc, in the district.

Following are the sales of lead and zinc ores for the week ending October 9th:

Joplin, zinc, 982,290 lbs.; lead, 337,980 lbs.; value, \$20,353. Carterville, zinc, 1,449,080 lbs.; lead, 277,960 lbs.; value, \$21,841. Webb City, zinc, 625,090 lbs.; lead, 85,130 lbs.; value, \$8,676. Galena, zinc, 3,130,000 lbs.; lead, 567,760 lbs.; value, \$45,673. Aurora, zinc, 775,000 lbs.; lead, 26,500 lbs.; value, \$5,719. Stott City, zinc, 248,670 lbs.; value, \$2,860. Oronogo, zinc, 174,630 lbs.; lead, 3,840 lbs.; value, \$2,023. Springfield zinc, 88,000 lbs.; value, \$1,012. Belleville zinc, 13,680 lbs.; lead, 11,000 lbs.; value, \$415. District totals for last week: Zinc, 7,486,440 lbs.; lead, 1,290,140 lbs.; value, \$108,602. District totals for 41 weeks: Zinc, 267,831,530 lbs.; lead, 45,572,140 lbs.; value, \$3,399,291.

BANKERS' LAND AND MINING COMPANY.—This company expects to start up its large steam concentrating plant early in November. Last week work was commenced on tramways from six shafts that are being sunk near the plant. The company keeps 11 steam drills going day and night prospecting thoroughly the 720 acres which it owns. There are probably more men employed on this land than on any other tract in the district. Several pumps are running to drain the ground. The Kansas City, Pittsburg & Gulf Railroad is building a switch to the plant to haul tailings and coal to and from the plant.

BREMERMAN & COMPANY.—They have a lease on 40 acres of the Cully land, east of Alba, and at 52 ft., the drill penetrated over 50 ft. of zinc ore in flint, and the drillings that came out of the drill hole were very rich. They have struck the same body of zinc ore in three drill holes near the original strike.

DAVEY STUCKEY & COMPANY.—They have a lease on 80 acres of land near Smithfield, and in a drill hole they struck a body of ore at 28 ft., and went through 17 ft. of rich ore in open ground. The coming week they will sink a shaft and will soon commence hoisting pay dirt.

FAIRVIEW MINING COMPANY.—This company is drifting on a rich run of lead ore in slate ground, and last week with three men in the ground made and sold 14,530 lbs. of lead ore.

LUCAS.—A strike of rich zinc ore at the depth of 222 ft. on the farm of H. A. Lucas, two miles from Carthage. The strike was made Saturday while drilling for a well, and they went through 4 ft. of zinc ore by night. A shaft will be sunk near the drill hole.

MONTANA.

CASCADE COUNTY.

The Great Northern Railroad has commenced the survey of a branch line from Sand Coulee to the Cottonwood coal miners.

DEER LODGE COUNTY.

Owner Savary, of the Cable mine, denies that this property is about being sold.

GRANITE COUNTY.

A suit has been brought in the United States Court at Helena by Asa Bruce Bennett, a resident of Indiana, against the Bloomington Mining and Milling Company to recover on two promissory notes, one of \$5,000 and one of \$3,000, representing money he advanced to the company, with an agreement that if the company should cease to operate the property for a period of more than 60 days he should be entitled to recover the security mentioned in the mortgage. The Bloomington company owns the Bloomington claim and extension, the Annie, Lizzie, Jacob and Gold Star lodes on the slope of the Mount Powell range, and the Pilgrim placer lode, half a mile west of Royal Granite County.

GOLD COIN.—At this mine, 18 miles from Anaconda, 50 men are being employed and an additional 20 stamps are being added to the mill. Mr. James Roe well-known in Butte as a former boss in the Rarus, is underground superintendent at the Gold Coin, and Mr. Sedgley is the assayer.

JEFFERSON COUNTY.

DIAMOND HILL.—A cablegram has been sent from the head offices of this company, at Glasgow, Scotland, ordering a shutdown of the entire plant for a time. The reason given is that the power that was developed on Crow Creek is far short of the amount necessary to run the 120-stamp mill recently completed on the property. The discovery of the insufficiency of power was made after all the machinery had been put in and thus far, it is announced, the surprising result has been that at no time has there been power sufficient to run as many stamps as the mill contains. The owners believe they cannot work economically on half capacity and will endeavor to make other arrangements for power before continuing.

HIGH ORE.—Operations have been resumed by letting a contract for 300 ft. of tunnel work which

is to be continued from the main working tunnel, which is now 1,142 ft. in the mountain. This proposed extension of the tunnel will, it is estimated, cut the main lead at a depth of 700 ft.

MONTANA MINERAL LAND DEVELOPMENT COMPANY.—This company is in financial difficulties. An attachment of \$5,000 has been filed on its property, both real and personal, by Capt. J. Sheahan, who has been the company's superintendent at the Eva May mine for some time. The stock of this company is mostly held by Ohio parties.

MADISON COUNTY.

KENNETT.—A 60 stamp mill, with a capacity of 200 tons daily, will be at once built at some convenient point near the Kennett mine for the treatment of the ores from this property, says the *Virginia City Madisonian*. The work on this enterprise will be pushed to an early completion. The order for the machinery has been placed with Fraser & Chalmers, of Chicago. The mill-site has not yet been definitely decided upon, but a selection will be made within the next few days.

MONTANA MINING AND SMELTING COMPANY.—The new plant at Twin Bridges has been started up and runs satisfactorily.

MISSOULA COUNTY.

GOLDEN SCEPTER.—Judge Knowles on October 4th, in the United States Court appointed ex-Judge Henry N. Blake master in chancery to sell this property at Quigley in the foreclosure proceedings commenced some time ago. In the event that no one bids enough to discharge the liabilities of the company that have been standing in court, the terms of the sale are such that ex-Mayor Keith of Missoula, as trustee for the Majestic Mining Company, is authorized to bid it in and effect a settlement with the creditors.

PARK COUNTY.

Recent mining developments at Cooke City are quite encouraging, says the *Western Mining World*. Last week the lead in the lower tunnel of the Daisy was struck at a depth of 1,000 ft., showing a big body of rich ore carrying wire gold, which is characteristic of the vein from the surface. The vein was 30 ft. wide at the 360-ft. level, and probably maintains its width to the lower tunnel. The Daisy is owned by Aaron P. Bliss, of Saginaw, Mich. who has expended \$125,000 in its development. The vein was opened at the summit of Henderson Mountain, and prospects rich in gold for a long distance on each side of the Daisy claim.

SILVER BOW COUNTY.

St. Louis capitalists, it is reported, have arranged for the erection of a large power plant near Butte. The plant will be located in the valley of the Big Hole River, 45 miles from Butte, and will cost about \$2,000,000. The largest turbine wheels in the world will be used and the power will be sold to the Butte mining companies. The Leffel water wheel will be used, for which contracts have been closed.

F. Augustus Heinze, general manager for the Montana Ore Purchasing Company, has filed a suit against the Boston & Montana Mining Company for \$197,150, in which amount he alleges he has been damaged by reason of the defendant having taken ore from beneath the surface of certain lots in the Faussett addition in the eastern part of the city. The action contains five distinct demands, one of which is for \$14,000 for 1,400 tons of ore alleged to have been extracted from lots in the Faussett addition. The second is for \$39,000 for 3,900 tons of ore alleged to have been taken from beneath the surface of lots once owned by Paul Murphy. The third amount demanded is \$15,450 for 1,500 tons of ore alleged to have been scooped out of the lots formerly owned by Frank J. Ferguson and others. A sum of \$78,750 is demanded for 7,875 tons of ore alleged to have been taken out of lots once owned by W. V. Lawlor, and \$50,000 for ore said to have been taken from beneath the lots formerly owned by W. B. Lamphier. Plaintiff asks for a restraining order and for judgment for the amount stated together with the costs of the suit.

BOSTON & MONTANA MINING COMPANY.—The directors have voted to declare a quarterly dividend of \$3 per share, payable November 20th, to stockholders of record on October 31st. This dividend will require \$450,000, and will make a total of \$1,800,000 paid this year.

HESPERUS.—The famous Hesperus lode case, which has been a bone of contention in the Montana courts for the past 14 years, has finally been decided by the United States Circuit Court of Appeals at San Francisco, in favor of James A. Murray and his associates.

SPECULATOR.—Hon. Lee Mantle, United States Senator, has filed a complaint against P. A. Largey, in the matter of the disputed title to a sixteenth interest in the Speculator mine. The Speculator mine produces rich copper ore and while its output is only about 50 tons per day, yet the profit on mining this quantity is large.

NEVADA.

STOREY COUNTY—BRUNSWICK LODGE.

CHOLLAR MINING COMPANY.—The latest weekly official letter says that the stopes above and below the 300 level are yielding the usual quantity and quality of ore, with no special change in appearance for the week to report. On the 500-level the main south drift has been advanced 25 ft. since last report, and is now out a total distance of 572 ft. from the north line; the face is in porphyry. On the 600-level No. 1 east cross-cut has been driven 32 ft.; total

length, 93 ft.; the face is in stiff ground composed of porphyry and seams of quartz. No. 2 east cross-cut has been advanced 25 ft., total length, 82 ft.; the face is in porphyry. The main south drift has been carried 34 ft., and is now out 440 ft. south of the north line; the face is in a mixture of clay, porphyry and quartz giving low assays. They shipped during the week to the Nevada mill for reduction 67 tons, 750 lbs. of ore, assaying as follows: Top car sample, gold, \$32.35, silver, 30.99 fine ounces per ton; wagon sample, gold, \$22.34, silver, 20.06 ozs. per ton; battery sample, gold, \$18.37, silver, 20.66 ozs. per ton.

STOREY COUNTY—COMSTOCK LODGE.

BELCHER MINING COMPANY.—The latest weekly official letter says: "The north drift from the incline on the 1,200-ft. level is now in 340 ft., having been cleaned out and repaired a distance of 18 ft. during the week. Operations have been resumed on the 850-ft. level with a view of prospecting this section of the mine, where there is a large block of unexplored ground. An upraise has been started about 100 ft. south of the north line, which is now up 20 ft., passing all the way through quartz of a favorable character. There have been hoisted during the week and stored in the ore-house at the mine 30 mining carloads of ore, the average top car sample of which shows an assay value of \$25.39 per ton."

COMSTOCK TUNNEL COMPANY.—The annual meeting of the stockholders was held at its office, 45 William street, New York, on Monday, October 11th; there was a lively contest resulting in the election of the entire board of trustees headed by Franklin Leonard as follows: Franklin Leonard, Julius A. Stursberg, Gabriel Hirsh, George D. Hilyard, Avery F. Cushman, C. H. Badeau and Franklin Leonard, Jr. Mr. Leonard was supported by some of the larger and more prominent stockholders who had been favorably impressed by his record for economy and business management of the affairs of the company during his connection with it for the past two years both as president and superintendent. The result of the election will be to continue the policy and methods introduced by Mr. Leonard, as the new directors are in full sympathy with him. Several propositions, which, it is believed, will be of benefit to the company, will now be taken up and disposed of by the management.

NEW MEXICO.

GRANT COUNTY.

CONFIDENCE.—This mine, in the Mogollon district, is working about 70 men, and an abundance of ore is being extracted to keep the mill running steadily. Work is being pushed rapidly on the pipe line which is to furnish water power for the plant and to generate electric force for other work.

COPPER KING.—Weems & Anderson are working the Copper King and Gopher mines. They recently purchased the interest of John Gleason in the Gopher mine, and he is now working the Hornet mine.

PINOS ALTOS.—In this district M. W. Neff is developing some excellent lead ore in the Huson and Thomas mines. Thomas Jackson and James Brent have opened up a good body of copper ore on the Moorhead claim. The ore was found at a new place on the property and shows up from the grass roots. W. C. Chandler has 14 men at work on the Mountain Key mine.

SANTA RITA COPPER AND IRON COMPANY.—Preparations are being made for the filling of the large iron contract, 3,000 tons per month, which this company has made with the Pueblo Smelting Company.

SUNRISE.—Carl Abrahamson and Joseph Schlosser have about 200 tons of lead ore on the dump of the Sunrise mine.

NORTH CAROLINA.

ROWAN COUNTY.

(From Our Special Correspondent.)

HAMPTON GOLD HILL MINE, LIMITED.—This company, of London, England, has bonded its mines on Gold Hill to parties from South Carolina who contemplate erecting a smelting plant.

CABARRUS COUNTY.

(From Our Special Correspondent.)

It is reported that H. F. McCarty has completed the sale of W. P. Kinney and J. G. Surratt's gold mine at Lexington for \$20,000. It is said that Boston capitalists are the new owners, and will develop the property.

FISHER FARM.—Mr. S. F. Clouser, of Brooklyn, N. Y., has erected a five-stamp mill on the Fisher Farm mine to work free-milling ore. The quartz vein is 3 ft. in width with slate and quartzite walls, a strong contact vein. The mill is now running on ½-oz. ore.

ISENHOUR.—Dr. Woods and F. Betts are erecting a milling plant on this mine that will be ready to run on some high-grade ore in a week or 10 days. These gentlemen are from Pueblo, Colo. They are also working the Honeycut mine, two miles southwest of the Isenhour, by hydraulic and sinking on a quartz lode carrying free gold. The prospect looks very favorable.

GRANVILLE COUNTY.

GILLISS.—This copper mine is being operated. Several hundred men are employed and 40 carloads of ore are said to have been shipped this year.

MONTGOMERY COUNTY.

(From Our Special Correspondent.)

J. W. Scott, of Pittsburg, Pa., is operating his 10-

stamp battery on free-milling ore that has been mined during the past six months on contract. The ore body is composed of a mass of rich stringers traversing the decomposed altered slates. There are over 1,000 tons on the dump.

OREGON.

BAKER COUNTY.

A good deal of activity is reported just now in Baker County mines.

The Browning & Hannan arrastra in Grave Creek district is running day and night on good ore.

The Black Gold Channel Mining Company will put in 2,000 ft. of new hydraulic pipe on its mine in Foothills Creek district this season.

Charles Bronson and B. E. Loomish, a San Francisco capitalist, have bonded a large tract of placer ground on Bear Creek, below the Golden Fleece mine, from E. K. Anderson. Work on an extensive scale will be commenced shortly.

C. L. Mangum has sold to George Phillips, of San Francisco, his property on Silver Creek; he was interested in it with Mr. Stock, the consideration being \$11,200.

The sale of the Lou Simmons group of mines at Cornucopia to Montana parties, through the Hand Brothers, is confirmed.

PENNSYLVANIA.

ANTHRACITE.

DELAWARE & HUDSON.—The management has decided to hoist no more coal at No. 3 shaft. The coal which is now hoisted at that place will run out either through Coalbrook or No. 1. Miners are now working away from the mine under No. 3 shaft to the slope running to No. 1. This will be completed in about two weeks and after that the new operations will be begun. The coal mined nearest to Coalbrook breaker will be run out here, while what is mined near No. 1 will be run out at the tunnel.

LEHIGH & WILKES-BARRE.—This company has settled the differences with the breaker boys at the Audenried and Honeybrook collieries concerning wages, and from latest advices we learn that all have gone back to work.

UNITED MINE WORKERS.—This organization has established branches at Freeland with 160 members and at Drifton with 60 members.

BITUMINOUS COAL.

The Altoona *Tribune* says that Messrs. Cole & Kulp, who are putting down the shaft on the Owens tract near Philipsburg, with a view of tapping the B vein of coal, have just put the third pump in position and will now be able to handle all the water that will likely be found. They are now down about 35 ft.

ROCHESTER & PITTSBURG COAL AND IRON COMPANY.—This company has closed a contract with Cunningham & Company, Cincinnati, O., to erect at Punxsutawney, Pa., what will be the largest and most complete plant for washing coal in the United States. The contract includes an 800-ton Luhrig washer and a 2,000-ton washed coal storage bin, with all conveyors and elevators for automatically handling the coal from the time it leaves the tipples until delivered to car for shipment, or to the lorry for coking. The plant is to be so arranged that the fine coal under ½ in. will go to the coking coal storage bin, the balance going into separate bins as No. 1, No. 2 and No. 3 nut coal for shipment, bins of six carloads capacity being provided in the washer for this purpose, or the clean nut coals can be crushed, re-washed and sent to the coking coal storage bin if it is desired to coke the entire product. All bony coal is taken out of the coal and put into a separate bin to be used for generating the steam needed at the mine for hoisting, washing, etc. By this means, all elements physically united with the coal which would be deleterious in either the coking or nut coals are removed and used to the best advantage. The negotiations for this plant have been pending since early in the year. During this time Mr. Lucius W. Robertson has carefully investigated the various processes for washing coal in use in various places, and the final selection of the Luhrig process is counted as a triumph for the system. The success of the Alexandria washer at Crabtree, Pa., undoubtedly assisted in the final selection of the system. The contract calls for the completion of the entire plant February 1st, 1898, and the Link-Belt Machinery Company, of Chicago, which will supply all the machinery for the entire plant, is busily engaged on the plans. Ground will be broken at once. It is expected that some of the machinery will be ready to be shipped in 30 days.

NORTHAMPTON COUNTY.

FIDELITY SLATE COMPANY.—This company has put up another hoist in its quarry at Pen Argyl.

PELICAN SLATE COMPANY.—This company has increased its capital stock for the purpose of enlarging operations in its quarry at Wind Gap.

SOUTH DAKOTA.

LAWRENCE COUNTY.

The new air-compressor plant recently built at the Hoodoo and May shafts of the Union Hill Mining Company has now been started and the mining is now being done by air drills. A contract has been let for sinking the main shaft to the 200-ft. level.

EDGEMONT & UNION HILL MINING COMPANY.—The sum of \$250,000, it is said, has been appropriated by the directors of the company for the completion of the smelting and stamp mills at Edgemont and Galena. It is hoped to have them in operation by January.

UTAH.

(From Our Special Correspondent.)

In spite of the curtailing of work in silver mines where the lead content of the ores is only 20% or under smelters report an increased tonnage coming to hand. This is made evident by the fact that last week was a record-breaker in the shipments of lead-silver bullion East for the current year. Even though several of the regular producers have stopped their output—this week Centennial-Eureka follows Bullion-Beck in this respect—the present signs are that the heavy lead-yielding properties more than make good the loss in tonnage from the distinctive silver mines. On the whole, the general mining situation presents a less discouraging front than last week. As a consequence of the recent altered conditions, several local stacks are now running on a 25% lead charge, or even higher, which recalls the smelting work of 15 or 20 years ago. This naturally brings up the topic of the conflicting lead quotations, at present of absorbing interest.

Our lead silver mine owners were glad to read the *Engineering and Mining Journal* editorial, of September 25th, under the caption, "The Price of Lead and the Telegraph Quotations," for it treats of a truth that is felt. However, it provoked a smile, by intimating that producers can help themselves in this matter, for in the West ore products are marketed on terms determined by the smelters, or not at all, and it is futile to say otherwise. Just now this is a live topic, while lead is the chief mainstay of Utah mining. On inquiry it is learned that the Western Union Telegraph Company daily sends out the brokers' quotation and no other—which, by the way, is alleged to be furnished by one broker, representing the lead trust—because the majority of its patrons, the smelters, on being asked in the premises, so requested. This is the company's excuse, or reason, and answers the question implied in said editorial. It would be strange if the smelters desired otherwise. The Associated Press lead quotations, though of late from 20c. to 40c. higher, are rambling and would afford an unsatisfactory sliding basis for ore settlements. Some large shippers suggest that for each day, either the opening actual market quotation, or the ruling quotation at noon, should be adopted for all settlements. Then if the smelters readjust treatment charges to conform to this new and business like equitable basis, well and good; the producers would not feel dissatisfied, as they now do. Besides, in such a readjustment, Western mine owners believe they would receive at least a percentage of betterment; or, in other words, that the smelters would divide the profit, of course appropriating the larger share. That the matter may be further agitated, as it can do no harm and may result in good, is the desire of Utah lead producers.

SHIPMENTS FROM SALT LAKE.—During the week ending October 9th there were sent East: 36 cars, or 1,284,102 lbs., lead-silver bullion; 1 car, or 46,466 lbs., copper bullion; 1 car, or 12 tons, slag; 42 cars, or 900½ tons, lead-silver ore.

BEAVER COUNTY.

(From Our Special Correspondent.)

BEAVER LAKE COPPER.—The shaft is down 120 ft. and there are 95 ft. of drifts. Bottom of shaft is in good grade ore. A force of 14 men is at work. Management states a car of No. 1 copper ore will be shipped before November 10th.

HORN SILVER MINING COMPANY.—On October 4th this company received assays of 13¾ tons of ore which it had recently shipped to the Germania Lead Company. These assays show that the ore contained 26.35% of copper, 21.55% of lead, 7.9 oz. of silver and 0.02 oz. of gold to the ton. It has been some time since the Horn Silver ore carried as much copper. The company is now receiving \$80 per ton for the lead contents of its ore; this is \$22 more than the price paid at the opening of this year. The earnings in September, we understand, show a material advance from preceding months. The company has \$200,000 in its treasury, and this, together with other assets, makes a total of about \$600,000. The annual meeting was held in the office of the company, at Salt Lake, October 5th, resulting in the re-election of the old directorate: Allan C. Washington, Juan M. Ceballos, Theodore B. Moore, Bache McE. Whitlock, all of New York; John Sharp, F. W. Jennings and P. T. Farnsworth, all of Salt Lake. At a directors' meeting afterwards Allan C. Washington was chosen president, Juan M. Ceballos vice-president, Ambrose I. Harrison secretary-treasurer, and P. T. Farnsworth manager. No formal reports were presented, as those of the manager and secretary-treasurer are made up for the year ending December 31st.

ROLLINS.—After a siege of idleness work is just resumed. It is not generally known that the Rollins, in Lincoln district near Minersville, was the first mine in Utah, discovered in 1859, it shipped lead to Salt Lake the following year. It is now owned by a Mrs. Angle of Chicago. One great drawback is water, for this is a wet mine. However, in spite of this, it is said, the present owner proposes to carry on more serious exploration than has been undertaken for years. The vein is pockety and the ore runs in lead, silver and gold.

BOX ELDER COUNTY.

(From Our Special Correspondent.)

VIPOND MINES.—On October 4th a mill clean-up was made from a 14 days' run, treating 8 tons per diem, resulting in a bar of bullion weighing 99½ lbs., of which about a twentieth was gold, remainder silver. Manager J. H. Paris took the treasure

to Salt Lake the following day where he will secure the necessary supplies to run all winter. A force of 30 men will be employed, of whom 20 will be on development, as 3 men can easily keep the mill supplied with ore. The old Vipond mines, situate in Ashbrook mining district within less than a mile of the Idaho line, are now the property of the Salt Lake Mining Improvement Company. In three of the veins paying ore in quantity was recently found, one of which shows a strong 2-ft. seam, decomposed iron, carrying 94 oz. silver and \$12 gold. Though 60 miles from a railroad, this is a shipping proposition and has aroused new interest in this region. Mainly on account of its annual assessment work is being done on several near-by claims, which otherwise would be abandoned. The company will increase the mill's capacity to 50 tons per diem as early as possible next season.

CARBON COUNTY.

(From Our Special Correspondent.)

CASTLE GATE COAL.—The Pleasant Valley Coal Company is quite unexpectedly obliged to increase its working force and has sent to Eureka for 125 miners for its Castle Gate mine. This will prove a benefit to men recently laid off in the silver mines; it is due to the heated controversy waging between the Oregon Short Line and the Union Pacific, which throws all the coal business to the Rio Grande Western, and, as a consequence, orders are pouring in faster and faster. The indications are that the increased demand will continue throughout the winter, and this in addition to the usual winter increase.

JUBA COUNTY.

(From Our Special Correspondent.)

TINTIC RECORDS.—District Recorder C. H. Blanchard so far has failed to deliver the archives of his office to the county recorder, which the new mining law provides should have been done in June. The county recorder has now made another demand on him, to which a large number of miners urge him to pay no attention, as they desire to make another test case.

TINTIC SHIPMENTS.—During the week ending October 9th the following lots of ore were forwarded from the district: Bullion-Beck, 10 cars; Centennial-Eureka, 2 cars; Genuine, 11 cars; Carisa, 2 cars; Northern Spy, 1 car; Star Consolidated, 2 cars; Luzerne, 1 car, Hamburg, 2 cars; Uncle Sam, 5 cars. The concentrate products were: Eureka Hill, 5 cars; Sioux Mill, 2 cars, and the Dragon Iron sent out 25 cars of hematite for flux.

CENTENNIAL-EUREKA.—The shut-down, reported in Salt Lake papers, to occur October 15th, is not to be so sweeping as at first announced. Small shipments will continue, probably sufficient to meet running expenses. The working force will not exceed 40 men. All who have examined the mine recently state that the physical condition is excellent. The uncertain silver market is the cause for limiting the work almost entirely to exploration for the present. Again there is talk of a mill to treat the stores of medium-grade ores.

EMMA.—A car of 45% lead and 60 oz. silver ore was marketed the other day. State Treasurer James Chipman is one of the owners of this Fish Springs mine, which is in shape to take advantage of the strong lead market.

GODIVA.—Some weeks since a report got out that the Godiva was closed down, which is far from the truth. The shaft is nearing the 400 level, where a drift will be started to cut the carbonate ore body exposed by other workings. When this connection is made there will be some generous consignments of high grade.

HERCULES.—Two cars of 50% lead, 30 oz. silver and \$7 gold ore were sent from this Stockton mine the first week in October. Probably six cars will be shipped during the month.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

LITTLE COTTONWOOD RECORDS.—James T. Monk, who has been in jail for several months for contempt of court, for refusing to surrender possession of the records of Little Cottonwood mining district, last week brought them from their hiding place. It will be recalled that Recorder Monk proposed to test the constitutionality of the provision of the new mining law requiring district records to be turned over to the county recorder. Probably this is the last of this incident, which has occasioned much comment and notoriety.

WEST MOUNTAIN RECORDS.—A mass meeting of miners, held in Bingham, October 10th, decided that the district recorder's office should be continued for convenience and reference. Under the new Utah mining law the only official record of claims is with the county recorder, which does not meet the approval of old residents. How the miners propose to enforce their "resolved" is difficult to say.

GROW GOLD MINING AND MILLING COMPANY.—Annual meeting was held at office of the company in Salt Lake October 4th, resulting in the selection of the following officers and directors: Gill S. Peyton, president; L. M. Bailey, vice-president-treasurer; Clarence Barrett, secretary; R. T. Barrett, J. S. Graw. The realty consists of 10 claims on Goldconda Mountain, on which development is being advanced.

NIAGARA.—Final clean-up for the season takes place this week, when the cyaniding plant will close down for the winter. This is necessary, as the leaching tanks are not under cover. A cleaner metallic extraction was accomplished this year than ever before.

OLD JORDAN & GALENA.—Mill is running full capacity, 110 tons per diem, or about 55 tons concentrates. No crude ore is sent out, as the mill products are more profitable.

STARLUS GROUP.—A three-quarter interest in the Starlus, Amanda, Keystone and Remnant claims was purchased last week by O. S. Richardson, August Lenke and J. M. Page, of Chicago. Messrs. Lee, Jeffrey & Finel, of Bingham, the former owners, who now have one-quarter interest, state that besides the cash consideration their new associates supply a substantial reserve fund for exploration, which will be immediately begun. Starlus is looked on as very promising copper ground, particularly since the development in the Highland Boy.

SUMMIT COUNTY.

(From Our Special Correspondent.)

ANCHOR.—At the mill the three additional Wilfley tables are in place and never was the grade of concentrates so marketable. The drawback with Anchor ore is zinc, and it looks as though this is to be taken out, so there will be a good profit in these products. Face of drift on 1,600 level is showing stringers of lead, indicating that the ledge is not far off. By opening an ore chute at this horizon there will be 400 ft. of stopping ground above. Annual meeting is called for November 7th at company's office in Park City.

DALY WEST.—A new wire rope for the hoist was taken to the shaft-house a few days ago. This fact, coupled with a recent stir about the mill, where two Wilfley tables are being put in, are straws indicating that the present inactivity is not long to continue.

MORGAN SILVER MINING COMPANY.—At a special stockholders' meeting, held last week at Walker Brothers' bank, in Salt Lake, the incorporation articles were amended so as to empower the directors to levy assessments, "for the purpose of paying debts and expenses in carrying on the business of the corporation." Without loss of time the directors levied an assessment of 10c. a share payable November 8th and delinquent December 6th.

ONTARIO.—Base bullion, 40 bars, carrying 22,995 oz. silver, was sent forward last week. On October 6th 20 stamps, half the whole number, were hung up. After the clean-up, in about 10 days, 20 men will be relieved. With half the stamps dropping the capacity will be 30 to 40 tons per diem. The supply of ore, which was on hand when the order to close the mine came is getting low. Ore is still being brought to the surface from No. 3, and the final shut-down will not occur, probably, until about the middle of November.

SHEPPARD.—Some choice mineral is exposed in the lower tunnel and work in the shaft is suspended.

SILVER KING.—The pipe line from Shadow Lake, at the head of Thayne's canyon, to the mine is just laid. As soon as the Utah Central can handle the ore all Silver King shipments will go out over that road, rather than over the Union Pacific, as heretofore. Now that the ownership of the Central by the Rio Grande Western is practically accomplished the Union Pacific will not have plain sailing on ore traffic. The Silver King is one of the few mines that can double its output without making any serious inroad on the reserves, which are steadily augmenting.

TOOELE COUNTY.

(From Our Special Correspondent.)

BROOKLYN.—The shaft is down 115 ft. and cross-cutting will be started at 200 ft. J. W. Cory reports mineral carrying \$3.80 gold, which is a paying cyaniding Mercur product.

CHLORIDE POINT.—The mill is advancing rapidly toward completion, and everything will be ready for machinery within a fortnight. Meanwhile regular shipments of high-grade silver rock are maintained. This is one dry silver mine where there is no talk of a close-down; besides it has an oxidized gold ore zone to fall back on.

OMAHA.—After months of idleness there is likelihood of exploration being resumed. On October 6th a decision was rendered in the District Court in the suit of W. S. Fugate and Simon Hamberger against J. R. Walker, Jr., involving the ownership of 179,300 shares, which has served to tie up the property since early last winter. It is said that the best average grade gold mineral ground on the West Dip is in Omaha ground, and it is cheering news to learn that its worth is soon to be further tested. Had it not been for this litigation a mill would undoubtedly have been built this year.

ROSA.—The shaft at 80 ft. exposed an ore seam running 40% to 60% lead, 150 oz. silver, something unlooked for. Rosa is on the hill opposite Chloride Point. The extent of the find is being proven.

VERMONT.

RUTLAND COUNTY.

EVANS-PARRY SLATE QUARRY.—This quarry was recently sold at public auction and was bought by R. E. Lloyd, who intends to work the property on a large scale.

WYOMING.

UINTA COUNTY.

The strike at the Diamondville coal mine is now settled and the men have returned to work. The new Quealy mine, at Kemmer, has also begun shipping. About 300 men are employed at Diamondville and about 400 will be at work at Kemmer within a month.

FOREIGN MINING NEWS.

CANADA.

BRITISH COLUMBIA—TRAIL CREEK DISTRICT.

(From Our Special Correspondent.)

The ore shipments from the Trail Creek mines at present average about 1,300 tons per week. The total ore shipments to October 6th of this year are about 62,500 tons.

The total value of ore and matte shipped from this entire district up to October 6th for 1897 amounts to a fraction over \$6,000,000.

Exports reported from the port of Nelson for the month of September included 3,707 tons of ore valued at \$280,433, and 897 tons of copper matte, valued at \$433,792, a total value of \$714,225.

LILY MAYOR.—This company is installing a compressor plant. The development of the mine will shortly commence.

MONTE CRISTO.—Work has been resumed in this mine and in the crosscut on the ground of the Colorado. About 30 men are now employed. A new hoist has been installed.

RED MOUNTAIN.—This company has resumed work in the crosscut tunnel.

RED MOUNTAIN VIEW.—A force of men is at work on this property. There is a fine showing at the face of the tunnel.

SILVER BELL.—The new management of this property is doing some preliminary work to be followed by systematic development.

VELVET GROUP.—Captain Monish, the engineer in charge of this property, on Sophie Mountain, has a dozen men at work putting up cabins and cutting trails preparatory to development work.

WAR EAGLE.—The management of this company, under the direction of Mr. J. B. Hastings, is making considerable progress in No. 2 tunnel. The work of stoping has been carried on since shipments ceased, and there is already a considerable reserve of ore ready for shipment. About 90 men are at present employed, and nine air drills are constantly at work.

MEXICO.

LOWER CALIFORNIA.

FORTUNA GOLD MINING AND MILLING COMPANY.—Mr. B. L. Harding, the secretary, states that the property now owned by this company was purchased about 2½ years ago from a Mexican miner, named Manuel Corrales, for the sum of \$50,000. The property is situated in the Zaragossa mining district, in the territory of Lower California, Mex., about 70 miles from the California line, and about 50 miles east of Ensenada, the capital of Lower California, in the Guadalupe mountains, 4,100 ft. above the level of the sea. The property consists of six mining claims, the Tesora, Fortuna, Guadalupe, El Tambien, Yo Tambien and Galesburg. There are three extensions on the Tesora; two on the Fortuna, two on the Yo Tambien and three on the Guadalupe; all these are full Mexican size. The promoter of the company was Mr. George Lombard, and it was incorporated under the laws of Utah and Mexico. The officers are Charles B. Boynton, president, New York; Gay Lombard, vice-president and general manager, Ensenada, Mex.; B. L. Harding, secretary and treasurer, New York. The capital stock is \$1,000,000, fully paid and non-assessable. There are 100,000 shares with a par value of \$10. The company has already spent over \$100,000 in developing the Fortuna and Tesora properties and in equipping them with the necessary machinery to work them on a large scale and place them on a dividend-paying basis. During Manuel Corrales' time only an arrastra was used for working the ore, and this produced about one ton per day. This arrastra has been dispensed with, and in its stead the company has placed a Fraser & Chalmers' 10-stamp mill which will soon be increased to 20 stamps. The output of the 10-stamp mill is 18 tons a day. The mill is situated on Agua Dulce Creek, between the Fortuna and Tesora properties, and three-quarters of a mile from each. There is a down grade between these two properties which leads to the mill and on this teams are employed to carry the ore from the mines to the mill. The ore is stowed out and is carried to the surface on mine cars which dump it into the wagons. Not more than 200 or 300 tons of ore is left on the dumps. About 60 men are employed continually by the company, and these work in three shifts; two are employed 10 hours each in the dry shafts, and the other one eight hours in the wet shafts. The main shaft on the Fortuna is over 210 ft. deep and the property shows 2,500 ft. in drifts and stopes. On the Tesora a double compartment shaft has also been sunk which is now over 225 ft. deep, and there are over 2,200 ft. of drifts, crosscuts and stopes. Levels are run in on the ore every 50 ft. down in both properties. The ore is free-milling, and assays on an average \$22.50 per ton. It was in August, 1896, that the company first began to crush its ore. The bullion is shipped to the San Francisco mint. The cost per ton of ore worked is about \$1.90; this, however, does not include the expenditures already made for developing the properties. Additional machinery has been ordered from Fraser & Chalmers to increase the capacity of the plant. The net earnings in September amounted to about \$10,456, while the expenses were about \$12,000. Since the organization of the company 13 dividends have been paid by it, and in all these amounted to \$130,000; the last of \$9,000 was paid on October 1st.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, October 15.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending October 8th, 1897, compared with the corresponding period last year:

	1897.		1896.
	Week.	Year.	
Pennsylvania Railroad.....	87,023	2,695,281	2,738,176

PRODUCTION OF BITUMINOUS COAL in tons of 2,000 lbs. for week ending October 8th, and for years from January 1st, 1897 and 1896.

	1897.		1896.
	Week.	Year.	
Shipped East and North:			
Allegheny, Pa.....	49,249	1,561,809	1,785,169
Barclay, Pa.....	"	32,075	34,338
Beech Creek, Pa.....	60,470	2,388,186	2,246,046
Broad Top, Pa.....	10,708	350,918	295,184
Clearfield, Pa.....	73,714	1,927,398	3,569,493
Cumberland, Md.....	181,963	2,927,766	2,674,437
Kanawha, W. Va.....	1107,076	3,486,045	2,820,033
Phila. & Erie.....	325	187,721	61,348
Pocahontas Flat Top.....	"	"	2,696,412
To lb.....	386,511	13,661,918	16,083,510

	1897.		1896.
	Week.	Year.	
Shipped West:			
Monongahela, Pa.....	33,324	855,846	979,935
Pittsburg, Pa.....	33,756	1,474,122	1,467,143
Westmoreland, Pa.....	41,915	1,671,943	1,451,948
Totals.....	120,395	4,001,911	3,898,126
Grand totals.....	507,506	17,845,801	19,981,636

Production of coke on line of Pennsylvania Railroad for the week ending October 8th, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 114,200 tons; year, 3,521,096; year to corresponding date in 1896, 3,105,943 tons.

† For week ending September 30th. † For week ending October 2d. * Returns not received.

Anthracite.

The local anthracite coal market is in a stagnant condition, and in sympathy with other cities, prices continue weak. In the New England States we hear there is a little more doing among the dealers, as householders and others are beginning to lay in coal for the winter. In the West the demand is rather urgent, owing to limited arrivals of coal.

In consequence of the lack of transportation westward for the coal the mines are working in an irregular way. Nearly everywhere there appears to be a shortage of cars owing in great part to the heavy grain movement. The vessel service from Buffalo is also limited, and this has caused some complaint from operators who usually send their coal that way. The shipments to the Western cities show a material decrease the last two weeks owing to the scarcity of cars, and there seems to be a little accumulation at the mines in consequence of this. This shortage in transportation is felt more by those who are accustomed to make regular and heavy shipments of coal to the West at this season. Milwaukee, Wis., is said to be in need of both hard and soft coal at this time.

In regard to prices—a vital question to the coal operator as well as to the consumer—it would be untrue to say that the July circular is being obtained by all the sales-agents, as the orders taken by some of them show that prices have been set to suit the buyer in more than one instance. We are aware of offers having been made in New York of free-burning coal at less than was mentioned last week in this market report. Good stove coal was quoted very recently at as low as \$3.75 per ton on board, which is certainly a very deep cut into the "circular." Chestnut coal, we are informed, could possibly be had at less than \$3.40 per ton on board. Both of these prices are illustrations of how business is catered to by some parties. In certain western cities prices have been "shaded" as much as 50c.

To cite another case, that of Boston, it may be remembered by many in the trade that the dealers there put up their prices nominally 50c. Now we understand sales have been made in that market at not only 50c. less but at the lowest prices that have ruled during the whole year. Surprising as these facts may seem to some, it is nevertheless true that prices have been demoralized by a system of shopping among the coal people. How much lower sales have been made is a close secret between the sales-agent and the purchaser who were parties to the deal. To make a comparison between the prices that ruled for free-burning coal in September of this year and for the same month in 1896, Lehigh chestnut coal was 10c. less than last year, when it was quoted at about \$4.25. Stove coal was also 10c. less than the \$4.50 "circular" quotation in September, 1896. A gain of 2c. is shown in pea and buckwheat, however, and of 4c. in broken coal as compared with last year. There seems to be little doubt that the October prices will be materially lower than a year ago. The average gain in the prices of Lehigh coal as compared with September, 1896, was only about 0.02c. per ton. What other kinds of coal sold for during September can be surmised, as Lehigh coal always sells at higher prices than its competitors in the New York market.

The list prices established in July are as follows: Broken, \$4; egg and chestnut, \$4.25; stove, \$4.50 per ton alongside New York.

Bituminous.

The Eastern seaboard soft coal trade is quiet. It consists mainly of deliveries on old contracts which are believed to make up the maximum amount of such contracts in some few instances. Shoal-water port consumers in the far East have mostly their winter supply of coal on hand, but in some cases they are buying additional odd cargoes. This class of consumers as they near New York are, however, not as much filled up in their winter supply as those further east, and are therefore at work putting in stock as fast as they can procure it. It is believed that these consumers will have no difficulty in filling up their yards before ice makes. The tonnages coming forward are good, considering the state of the demand, and it is thought that the producers are able to take care of them.

There have been some reports of steamer business closed on the other side of the Atlantic for delivery on this side. If the reports of the terms of these contracts are true, it seems to be the consensus of opinion in the trade that they are of a thankless, unpaying character.

There is some transient trade doing which has helped the tonnage out to a small extent this week. Trade in the far East is slightly improved over what it has been, and all the business has been secured with difficulty. The Sound business is taking a little more coal than it did last week. The possibility of an advance in ocean freights from the lower ports has rather induced consumers to take more coal now when vessels can be procured at the prevailing lower rate.

New York harbor trade keeps steady; consumers are using a fair amount of coal and are ordering as their wants require.

All-rail trade is active and prices are stronger, but no advance can be shown in them, though there are reports that an additional 5c. has been asked in some cases.

Transportation from mines to tide is up to the demands of the trade, and the car supply is fairly good. In the coastwise market vessels at the beginning of the week were in better supply than during the latter part, and some orders that had been held on the books for a short time waiting available vessels to arrive were filled early this week. Freight rates are quoted stronger at the prevailing rates. The current rates from Philadelphia are as follows: To Boston and Salem, 65c.; Portland, 65@70c.; Providence, New Bedford and the Sound, 55c.; Wareham and Portsmouth, 70c.; Lynn, 75@80c.; Newburyport, 80c.; Dover, 90c. @ \$1 and towages; Saco, 85@90c. and towages; Bangor, 75c.; Bath, 70@75c. alongside; Gardiner, 70@75c. and towages. Five and 10c. above these rates are asked to the lower ports.

NOTES OF THE WEEK.

Coal receipts at San Francisco in September were 107,990 tons, against 107,454 tons last year. For the nine months ending September 30th, 1897, the receipts were: Eastern, anthracite and Cumberland, 12,047 tons; Oregon and Washington, 422,500 tons; Alaska, 1,000 tons; British Columbia, 333,774 tons; Australia, 183,880 tons; Japan and Tonquin, 2,207 tons; Great Britain, 70,691 tons; total, 1,016,105 tons against 940,934 tons in 1896.

Buffalo.

Oct. 14.

(From Our Special Correspondent.)

Nothing new has developed in the anthracite and bituminous coal business during the past week. Trade is fairly active at unchanged quotations. The supply is larger and assortment more varied. Manufacturers are comparatively busy although margins of profit are said to be very meager. Anthracite retail dealers are again united and say that they will maintain list prices. There are rumors floating around that a bituminous coal combination is about to be formed. Iron ore carrying records again broken; the steel steamer the *Amazon* loaded from Lake Superior with 6,306 gross tons last week. Coal freights have again advanced; vessels are now obtaining 40c. to Chicago and Milwaukee, 25c. to Duluth, and 40c. to Green Bay from Buffalo.

The shipments of coal westward by lake from Buffalo from October 3d to 9th, both days inclusive, aggregated 86,833 net tons, distributed about as follows: 27,800 tons to Chicago, 27,900 tons to Milwaukee, 17,600 tons to Duluth, 600 tons to Toledo, 5,600 tons to Superior, 3,200 tons to Ft. William, 300 tons to Bay City, 588 tons to Port Stanley, 600 tons to Green Bay, 1,600 tons Manitowoc, 350 tons to Vermillion and 700 tons to Cleveland. The rates of freight were as follows: 30@40c. to Chicago and Milwaukee, 30c. to Manitowoc, Sault Ste. Marie, Port Stanley and Vermillion, 40c. to Green Bay, 20@25c. to Duluth, 20c. to Ft. William, Superior and Toledo, 25c. to Bay City, Cleveland, Port Huron and Port age. Closing firm.

The movement of coal and iron ore each season through the Sault Ste. Marie canals to October 1st was as follows in the years named:

	1897.	1896.	1895.
Anthracite coal, tons.....	302,171	297,582	257,612
Bituminous coal, ".....	1,145,822	2,645,740	1,471,102
Iron ore, tons.....	8,589,702	6,811,765	6,574,495

One cent per net ton is said to be the cost of handling soft coal from gondola and hopper-bottom cars to vessels by the new dumping machines now in use at several Lake Erie ports.

Chicago.

Oct. 13.

(From Our Special Correspondent.)

Anthracite.—Coal is moving in a very dilatory sort of way, weather conditions continuing to effect the market adversely. Dealers both in and out of town are buying but little hard coal and until real cold weather sets in there will be no large buying. Shipments of coal to Missouri River points and other territory within a few hundred miles of Chicago continue quite large, owing entirely to the fact that the railroads have made an especially low freight rate and dealers are taking advantage of the same. The price of hard coal remains very low and circular rates are not in it, so to speak. They are grate, \$5.35; egg, stove and chestnut, \$5.60.

Bituminous Coal.—Soft coal has had quite a fair week's trade due entirely to the fact that there is supposed to be very little of it in the market and consumers are hustling to buy, fearing a shortage. Prices are firmer than they have been for some time, some grades of coal selling at a price a little higher than the regular nominal quotations.

Pittsburg.

Oct. 14.

(From Our Special Correspondent.)

Coal.—On Saturday the miners in the Pittsburg District received their first pay since they returned to work after the strike. Several operators did a little figuring for the purpose of finding out just how much money was paid out to the miners. They estimated the daily output to be 810 railroad cars, or 9,600 in the past two weeks. This represents 92,000 tons, and at an average price of 39c. a ton for run of mine coal would mean close upon \$76,800 paid out in wages. This does not include drivers or other laborers employed at the mines. The total pay roll will be very close to \$100,000. Coal prices are unchanged. The railroad mines are running to their full capacity, but are complaining of the scarcity of cars.

A big land deal up the Monongahela is reported. The Clark farm, located three miles south of Charleroi, was bought by Pittsburg and Eastern capitalists for a consideration of \$100,000. There are about 234 acres of farm land. James S. McKean, the leading mover in the purchase with R. R. Quay, and Messrs. Hubbard of New York, visited the place on a special car. It was learned that a \$5,000,000 iron and steel plant will be built; also tin-plate and other plants. The location is an ideal one for a new town. Senator Penrose is one of the interested parties.

Connellsville Coke.—The coke trade made another big jump this week. Nearly 1,000 cold ovens were fired up and production and demand both report big gains. The trade situation early in the week showed unmistakable signs of improvement, but there was nothing like what came piling in the last days of the week. Several furnaces have gone into blast recently; their requirements of coke are quite large, and are adding handsomely to the trade of the region. There are now 13,570 ovens in blast out of a total of 18,652 in the region, and next week will probably see 14,000 ovens in blast. A brisk iron business makes a booming coke trade. Jones & Laughlins are to build 153 new coke ovens on their Second avenue property, of the plant adopted by Henry Laughlin.

John Thomas, a prominent iron man, has leased land and will build 200 coke ovens at Niles, O. The demand for coke is showing increases every day, and the outlook is daily growing brighter. In the running order of the ovens in blast last week 7,376 ovens made six days, 5,614 ovens five days, 40 ovens four days, 240 ovens two days, and 50 ovens, the Smet-Solvay by-product plant, seven days. Shipments for the week amounted to 8,635 cars, an increase of 735 cars. The shipments were as follows: To Pittsburg, 3,250 cars; shipments West, 4,160 cars; sent East, 1,195 cars; total, 8,635 cars. The shipment in tons amounts to 146,995; increase, 9,745 tons. Furnace coke advanced to \$1.75, and \$2 coke is on the list.

The only drawback in the regions at present is the want of water, and some plants had to shut down for this season.

Shanghai, China.

Sept. 10.

(Special Report of Wheelock & Co.)

Coal.—Japan coal has experienced a still further advance, and as consumers are now compelled to pay a very high figure for their requirements, there was only a little business done the last two weeks at 7.10 taels for first class quality and 6.75 taels per ton for inferior kinds. There is very little doubt now but that the demand in Japan for all kinds has increased, as stocks there for sale for export are daily decreasing. At the present rate of exchange it is difficult to give a quotation for Cardiff coal, and there is absolutely no demand. The prices asked for Sydney Wollongong being prohibitive, all business in this is at a standstill. Quotations are as follows: American anthracite, 12 taels per ton; Sydney Wollongong, 10.50 taels; other sorts of Australian coal, 7 taels; Cardiff, 16 taels per ton.

Kerosene Oil.—The business done in American oil during the past fortnight was purely speculative, and, although a good many transactions took place, they were confined to a certain clique who have been attempting to bear the market owing to one or two natives having sold a good quantity short, and, from what we can understand, their endeavors to cover are as yet futile. Notwithstanding all this the deliveries have continued on a large scale. Stocks of American in godowns are 876,800 cases. Arrivals during the fortnight aggregated

323,000 cases. An equally large business has been done in Batum oil at slightly enhanced prices from those quoted last. The market is very strong, and we must see higher prices very shortly. Stocks of Batum oil amount to 675,000 cases.

The small quantity of Langkat oil that is here does not permit much business, though a little has changed hands. The market is firm in sympathy with other brands. Stocks are small, amounting to only 44,000 cases. Quotations are: American Devoo's, 1.75 taels per case; Batum, Anchor chop, 1.65 taels per case, Horse chop, 1.62½, and bulk oil, 1.50 taels per two tins; Langkat, 1.55 taels per case.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Oct. 15, 1897.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From Jan., '96.	From Jan., '97.
	Oct. 16, 1896.	Oct. 15, 1897.		
Anthracite.	26	15,150	21	14,850
Coke.....	81	94,650	127	133,050
Charcoal....	24	6,750	20	4,750
Totals	131	116,550	171	202,650
			7,344,379	6,386,726

While there is less surface excitement in the iron trade than was apparent a few weeks ago, the volume of business continues large and everywhere the mills and furnaces have gone to work or are getting ready to start. The pig iron production has steadily increased through September and the first half of October and is now at the rate of 200,000 tons a week, or over 10,000,000 tons a year. There has not been the spasmodic rush of 1895, when the object seemed to be simply to blow in every stack that could make iron at all, without regard to cost. Even in two years, conditions have materially changed; additions to our furnace capacity have been made by the erection of plants which can make iron on a great scale and at the lowest possible cost, and the control of ore and fuel supplies has been systematized by the larger companies. Almost any possible demand for pig iron can be supplied by the more modern plants, and there is little hope that any furnaces which are badly placed or out of date in their design and equipment can be run at a profit long enough to warrant putting them in blast.

That the increase in production has been fully warranted by the demand is shown by the fact that the unsold stocks of pig iron, which at the beginning of June approached 1,100,000 tons, have fallen to less than 700,000 tons. Not only has the increased output been taken up, but sales have been made of nearly 400,000 tons from surplus stocks. It is altogether probable that the rate of production will continue to increase for some time yet.

The demand for finished material of almost all kinds has also been large, and there are no signs of any break in the increase. Many of the mills report orders pressing for early delivery, and some of the Eastern mills which run on purchased billets have some trouble in getting their raw material as fast as they need it. Structural steel and bridge material are in growing demand. If earnings continue to improve as they have done recently, or even to hold up to their present level, it looks as if the railroad demands would be large, as many companies will be in a position to make needed repairs and renewals, which have been postponed as long as possible, and are now pressing for attention. Some heavy orders for rails are noted elsewhere, and other large contracts are pending and will probably soon be closed.

Notwithstanding the large business, prices show little change. While there has been a substantial, though somewhat uneven, improvement from the lowest level, the general range is still what we are accustomed to call low. For this the combined effects of increasing production and of existing long contracts at low rates are quite sufficient to account. The only change during the week was a rise in Bessemer pig, due to the final disposal of some large speculative holdings which have been depressing the market.

Shipments of Lake iron ore continue heavy, and it looks as if by the end of the navigation season the stocks at furnaces and on Lake Erie docks will be sufficient for any probable requirements through the winter. The shipments for the season will be the largest ever made. The Vermilion Range has been especially active this year; but the mines of the Mesabi and the older ranges have done their fair share of work.

NOTES OF THE WEEK.

The American Pig Iron Storage Warrant Company reports the following for the nine months ending September 30th:

Received, tons.....	1895.	1896.	1897.
Delivered, ".....	18,500	88,100	107,900
In yard, October 1st, tons.....	17,300	9,500	42,600
	112,400	184,800	265,100

For September, 1897, the receipts of pig iron amounted to 23,100 tons, and the deliveries to 8,300 tons.

The *Railroad Gazette* has been making a careful summary of the orders given for new railroad equip-

ment during the first nine months of the current year, and finds that they include contracts for 771 locomotives, 179 passenger cars and 27,700 freight cars. Taking into account the usual depreciation and the growth of business, the *Gazette* estimates that these orders cover only about one-third of the number needed to bring rolling stock generally up to its normal standard of efficiency. There should, therefore, be a large business in prospect for locomotive and car builders for the next half year, according to this most excellent authority.

New York.

Oct. 15.

Local sales agents are unanimous in their expression of confidence in the continued improvement in the iron trade, and the volume of business done and the prices realized have strengthened their belief.

The steel rail department has attracted most attention in the last two weeks on account of the advance in prices and the large orders which have been placed, notably an order for between 40,000 and 50,000 for the Pennsylvania Railroad Company, the work being divided among the Carnegie Steel Company, the Pennsylvania Steel Company, and the Cambria Iron Company. Two other lots aggregating nearly 30,000 tons were placed for export to Japan, the Illinois Steel Company being the recipient of the orders. This work was secured notwithstanding the high freight and competition from across the water.

The report of a large contract for cast iron pipe for Scotland being secured by an American firm, said to be Messrs. R. D. Wood & Company, of Philadelphia, in competition with Scottish manufacturers, caused a ripple of excitement. Mr. Walter Wood, one of the members of the firm, being at present on the other side, lends an air of truth to the report.

Among other material booked for export to Japan are 300 tons pig iron and 500 tons of bridge material.

Pig Iron.—The demand for pig iron continues unabated, especially Southern No. 2 Foundry and No. 2 Soft. The damper which has been on this market for the last two weeks in the shape of 50,000 tons, which has been held on speculative account, has been removed and agents predict an increased business and higher prices. Quotations are: Northern No. 1 X Foundry, \$11.75@ \$12 per ton; No. 2 X foundry, \$11.25@ \$11.50; No. 2 plain, \$10.75@ \$11, gray forge, \$10.25@ \$10.50; Southern No. 1 Foundry, \$11@ \$11.25 per ton; No. 2 Foundry, \$10.75@ \$11; No. 1 soft, \$11@ \$11.25; No. 2 soft, \$10.75@ \$11; gray forge, \$10@ \$10.25; Basic, \$10.50@ \$10.75. All prices are for tidewater delivery.

Cast-Iron Pipe.—Trade continues in good condition both in the amount of business done and prices obtained.

Spiegeleisen and Ferro-Manganese.—The market continues fair with steady prices. Quotations are: Spiegeleisen, 20%, \$19@ \$19.50; ferro-manganese, 80% domestic, \$45.50@ \$46, delivered at buyer's mill.

Steel Billets and Rods.—Activity and good demand with prices unchanged continue to be the main features of this market. Quotations are \$17.50 @ \$18 for billets at tidewater and \$22@ \$22.50 for rods at mill.

Merchant Iron and Steel.—Orders for merchant material are only received subject to daily changes in prices at buyer's risk. Orders aggregating 50 tons have been placed in the last few days. Quotations are: Common bar, 1@ 1.05c.; refined, 1.10@ 1.15c.; soft steel bars, 1.15@ 1.20c.; steel hoops, 1.30@ 1.35c.; steel axles, 1.40@ 1.60c.; tire steel, 1.15@ 1.20c.; spring steel, 1.35@ 1.40c.; links and pins, 1.50@ 1.60c.; cotton ties, 58c. per bdl. at mill.

Plates.—Business in plates continues in excellent condition with a steady demand at unchanged prices. We quote for universal mill plates 1.17½ @ 1.20c. For steel plates prices are: Tank, 1.17½ @ 1.20c., boiler shell, 1.25@ 1.30c.; flange, 1.35@ 1.40c.; firebox, 1.60@ 1.75c., and 2.25@ 2.50c. for locomotive firebox, according to quality. Charcoal iron plates are 2.25c. for shell, 2.75c. for flange and 3.25c. for firebox. Rivets are 2.25@ 2.50c. for iron and 1.75 @ 1.85c. for steel. Prices are for tidewater delivery in large quantities.

Structural Iron and Steel.—Although no large orders have been booked during the past week, still the amount of steady business done has strengthened the market and caused advances in most materials in this department. We quote for angles, 1.20@ 1.25c.; tees, 1.35c.; channels, 1.25c. The price of beams, New York delivery, is 1.25c. for ordinary sizes, 1.35c. for 20-in., and 1.35c. for 24-in., carload lots.

Steel Rails and Rail Fastenings.—The large volume of business transacted in steel rails has been the back bone of the iron market during the past week and prices have stiffened notably in standard sections, which have advanced to \$20 per ton. Quotations for steel rails are \$20 per ton for standard sections, and \$23 for girder rails. Lighter rails are figured on by reliable concerns as follows: 16-lb., 20-lb., 25-lb., 30-lb. and 35-lb., \$22; 40-lb. and 45-lb., \$20 f. o. b. mill.

Tidewater quotations for rail fastenings are: Angle bars, 1.20@ 1.25c.; spikes, 1.50@ 1.55c.; bolts, square nuts, 1.80@ 1.85c.; hexagon nuts, 1.90@ 1.95c.

Wrought Iron Pipe.—The change in discounts predicted in our last report has been put in opera-

tion. Discounts are as follows: For plain pipe, out of store: 1 1/2 in. and over, 78 and 10%; 1 1/4 in. and under, 72 and 10%. Galvanized pipe, 1 1/2 in. and over, 70 and 10%; 1 1/4 in. and under, 67 and 10%.

Nails.—Wire nails continue in good demand at unchanged prices. Carload lots are quoted at \$1.45@ \$1.50 f. o. b. mill, and \$1.65 on dock at New York. Smaller quantities from store are quoted at \$1.70. Cut nails continue firm, with the demand steady. Base quotations for carload lots are \$1.33 delivered at New York; \$1.31 at Philadelphia; \$1.35 at Boston; \$1.30 at Baltimore; \$1.33 at Albany, and \$1.27 1/2 at Buffalo. Small lots at New York are quoted at \$1.43@ \$1.45 from store.

Old Material.—The demand for old material continues good with prices having an upward tendency.

Buffalo, Oct. 13. (Special Report of Rogers, Brown & Co.)

The drought in the coke country is being felt here, and foundries seem to be more interested just now in getting sufficient fuel supply to keep them running than in iron matters. At the same time several fair-sized contracts have been made during the past week for delivery running through the balance of the year, and at present prices. The temporary drop in Bessemer, caused by the large offering of a speculator, has had no sympathetic effect on the local foundry iron market. In fact, if anything, the feeling here is firmer. Sales have not been quite so numerous, but incline toward larger amounts. Lake Superior charcoal has been rather active, as malleable and car wheel works are laying in their winter's supply. Shipments from local furnaces have been very heavy. Prices are very firm on the basis mentioned below, and are for cash f. o. b. cars at Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$11.25; No. 2 strong foundry coke iron, Lake Superior ore, \$10.75; Ohio strong softener No. 1, \$11.75; Ohio strong softener No. 2, \$11.25; Jackson County silvery No. 1, \$14; Southern soft No. 1, \$11.75; Southern soft No. 2, \$11.35; Niagara malleable, \$10.75.

Chicago, Oct. 13. (From Our Special Correspondent.)

Pig Iron.—The market remains rather quiet, with numbers of small sales but no very large ones. The aggregate sales of the week were about on a par with the preceding week, and on the whole footed up a very fair week's total. Prices remain the same, but they are seemingly very firm. There is said to be a 25c. advance asked for on orders for delivery beyond the first of the new year. Inquiry is large, and some of such is coming from consumers who were presumably stocked up for some time to come. Prices are: Lake Superior charcoal, \$13@ \$13.25; local coke foundry No. 1, \$11@ \$11.50; No. 2, \$10.75@ \$11; No. 3, \$10.50@ \$10.75; local Scotch foundry No. 1, \$11.50@ \$12; No. 2, \$11@ \$11.25; No. 3, \$10.50@ \$11; Southern coke No. 1, \$11@ \$11.25; No. 2, \$10.60@ \$10.85; No. 3, \$10.35@ \$10.60; Southern No. 1, soft, \$11@ \$11.25; No. 2 soft, \$10.60@ \$10.85; Jackson County silvers, \$12.50@ \$14.50; Ohio strong softeners, \$12@ \$12.25; Alabama car wheel, \$16@ \$17; Coke Bessemer, \$11.50@ \$12.

Bar Iron.—There continues to be a very good demand for bar iron. A number of fair-sized contracts were closed during the week, and there was a good run at smaller business. Car builders are still the chief factor in the market. Prices are firm, and are: Common iron, 1 1/10@ 1 2/10c.; guaranteed, 1 2/10@ 1 3/10c.

Steel Rails.—Business is being booked in a small way, and nothing very large in sales is noted. Rails are quoted \$20.50@ \$22.50, Chicago.

Billets and Rods.—Sales are mostly for small lots, the mills apparently not seeking large business for delivery this year. Billets are quoted \$18@ \$18.50; rods, \$25.50@ \$26.

Cleveland, Oct. 11. (From Our Special Correspondent.)

Iron Ore.—The Rockefeller fleet has ordered three ore carriers, a steamer 475 ft. long, and two barges, each 450 ft. long. This company will build two more. Ore freights are unchanged. Not enough ore for a good mixture is still available, the majority of ore houses being entirely sold up. Material can be had only from the Mesabi, the Gogebic and the Marquette ranges, and very little of that, in fact the season is virtually closed as far as selling is concerned. On the amount that remains prices have advanced from 25 to 50c. Shipments will exceed 11,000,000 tons.

Pig Iron.—While there has been a lull for a week or so, the market has not actually lost strength, and Bessemer is about \$10.90, early Cleveland delivery. No. 1 strong foundry is worth about \$11, Cleveland delivery.

Philadelphia, Oct. 15. (From Our Special Correspondent.)

Pig Iron.—Everything seems to indicate a near advance in pig iron. This week's business was largely made up of big orders, but even the larger consumers are not making as large purchases as the present condition of their order books warrant. The entire market has gained strength, largely from the activity in Western markets. Another fact which has contributed strength has been that since Monday there have been inquiries for large lots of material. Makers and agents are resting on their oars a little to see what comes of the

present threatening conditions. Bessemer is strong at \$12.50@ \$13; only small lots of phosphor and basic sold. Foundries are strong, because in canvassing around the fact is brought out that the larger customers will be obliged to make large purchases before long. No. 1 X Foundry is \$12@ \$12.50; No. 2 X Foundry, \$11.25@ \$11.75, and a good deal will soon be wanted; plain is \$11; standard mill, \$11.

Billets.—Telegrams and correspondence within 24 hours have revealed a very threatening condition in regard to billets. Representatives of Western concerns say that \$19.50@ \$20 will be the prices for 1898. Buyers recognize the strong upward tendency, but still believe that the great rush will soon be over and that with the enormous capacity no higher than present prices will be obtained or can be maintained.

Merchant Bars.—Retail quotations have been advanced \$2 to \$3 per ton on actual deliveries of retail lots and a further advance will be probably attempted. Steel bars are in good demand at 1 2/5@ 1 4/10c. A good deal of work is coming along.

Sheets.—Orders for refined sheets have been booked this week for December delivery at a trifle off last week's figures, for some unknown reason. The rush for material has partially subsided.

Pipes and Tubes.—Pipes are in moderate demand. The tube makers are having a good run of business, and a great deal of small shop work points to a continuance of the demand.

Nails.—There is a fair movement in both cut and wire nails, and there is no change in prices.

Merchant Steel.—The demand for all grades of merchant steel used at this season has improved since Monday, but in some cases full prices could not be maintained. The competition of storekeepers to send business to mills is very keen.

Plate and Tank.—Our sleuth hounds are on the track, they say, of some of the largest orders of the season. The business is bound to be placed, but until the bids are opened it will be impossible to say how the business goes. Shipyard and bridge as well as office building work is in sight and close at hand. The improving tone has made permanently higher prices assured, at least the cutting on large orders will be even less. Tank is 1 2/10c.; flange, 1 3/10c.; firebox, 1 5/10c. to 2 5/10c.

Structural Material.—To-day's reports point to orders next month of larger proportions at about 1 1/5c. for angles and 1 2/10c. for beams and channels.

Steel Rails.—Quotations to-day are given at \$22 at mill.

Old Rails.—There is quite a stir for old rails and prices have jumped a dollar. To day \$15 was asked for one lot. Old steel rails hang around \$11.

Scrap.—All kinds of scrap is picked up and generally at yard prices. Much of it runs for \$1@ \$2 higher. Iron axles are offered at \$16; old car wheels, \$10; axle turnings, \$8.50; heavy steel scrap, \$11; steel axles, \$12. There is quite a chase going on after scrap and a higher range of prices is probable.

Pittsburg, Oct. 14. (From Our Special Correspondent.)

Raw Iron and Steel.—A liberal increase in the production of pig-iron and heavy realizing sales of lots held on speculation have caused a slight decline for Bessemer on Valley iron; at the same time mill iron, foundry and steel billets are held firmly at the advance noted in our last reports. Generally speaking, the improvement is likely to continue and the firmness in prices is regarded as a favorable indication and as a promise of a continuation of better times. The situation in the West and South is considerably stronger than in the East, as higher wages, higher fuel and higher ores will increase the cost of producing Bessemer iron. It is hardly likely that there will be any further weakening in prices. Many of the large plants throughout the country have more orders booked than has been the case for a long time, and the heavy inquiries for steel billets and tin-plate bars give promise of increased business during the early months of 1898. The railroads are also likely to be heavy buyers about the beginning of the year, or perhaps they may postpone their orders until spring. Their action will have an important influence in the matter of prices, however.

Finished Iron and Steel.—There is a very active inquiry and prices are very firm, in all cases the advance before noted being fully maintained. Bar makers are very busy, and there is considerable activity being displayed among the sheet manufacturers. Most of the mills are sold ahead and are not inclined to contract for nearby deliveries. For muck bar the market is firm with an active demand; strong neutral commands \$19.25@ \$19.50. For sheet bars the firmness previously noted has been fully maintained, with sales \$18.75@ \$19; prices tend upward. For ferro-manganese the market is weak and prices nominal, \$45.50@ \$46. Steel billets are firm, the demand exceeding the supply. Prices last week touched \$17@ \$17.25 for late deliveries.

In wire nails the market shows no change and is active and firm; the talk of a nail syndicate is over. Wrought iron and steel pipe are firm and active at the advance. The plants are all running to their full capacity, pipes being shipped as fast as made.

Latest.—There is a moderate amount of activity and a reasonable volume of transactions going on. For Bessemer the market is weaker in the Valley. At the same time many Valley furnace-men are holding out for \$10. For late delivery sales were

reported at \$9.85. Pittsburg Bessemer is \$10.65@ \$10.75. Steel billets show prices well maintained, with sales for November-December delivery at \$17@ \$17.50. Sheet bars advanced 25c. Wire rods are unchanged. Skelp iron, sheared and grooved, advanced 2 1/2c.; skelp steel sheared declined 2 1/2c. The market at present is a waiting one.

Table with multiple columns: COKE SMELTED, LAKE AND NATIVE ORE, TONS, CASH, MUCK BAR, TONS, CASH, SKELP IRON, SKELP STEEL, SHEET BARS, BLOOMS, BILLETS, BARNDNS, STEEL WIRE RODS, OLD RAILS, SCRAP MATERIAL.

METAL MARKET.

NEW YORK, Friday Evening, October 15, 1897.

Gold and Silver.

Price of Silver per Ounce Troy.

Table with columns: October, St. Ex., London Pence, N. Y. Cts., Value of sil. in \$1., October, St. Ex., London Pence, N. Y. Cts., Value of sil. in \$1.

Eastern Exchanges have improved, and good demand for future silver has sprung up. Owing to scarcity of cash silver the spot price is ruling one penny higher than January figures.

The United States assay Office in New York reports the total receipts of silver at 96,000 oz. for the week.

Average Monthly Prices of Silver

In New York and London, per ounce Troy, from January 1st, 1897, and for the years 1896 and 1895.

Table with columns: Month, 1897, 1896, 1895, London Pence, New York Cents, London Pence, New York Cents, London Pence, New York Cents.

The New York prices are always per fine ounce, or ounce of pure silver; the London quotation is per standard ounce or for metal 925 fine.

Gold and Silver Exports and Imports

At all United States ports, August, 1897, and years from January 1st, 1897 and 1896:

Table with columns: Coin and bullion, Exports, Imports, In ores, Exports, Imports, Total excess, Exp. or Imp.

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

Gold and Silver Exports and Imports, New York.
For the week ending October 15th, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

Period	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Wk	\$3,311	\$786,352	\$762,384	\$27,847	I. 248,504
1897.	48,127,162	7,496,541	31,567,410	1,838,140	E. 70,359,891
1896.	40,417,348	57,108,436	31,071,031	2,231,207	E. 12,148,736
1895.	56,656,035	27,839,765	29,167,149	1,324,543	E. 58,658,876
1894.	82,432,600	14,378,414	26,073,694	1,249,196	E. 82,879,684

The gold and silver exported for the week went chiefly to London. Of the gold imported \$683,493 came from Germany, and the balance, together with the silver, came principally from Central and South America.

FINANCIAL NOTES OF THE WEEK.

Business continues to show a fair amount of improvement, and the signs all point to the continuance of this growth. The fluctuations on the stock market have had very little effect on general trade. The demand for money from the interior for business purposes has been large, and the New York balances have been correspondingly drawn down. Traffic returns continue good and factories are starting up all over the country.

There have been no further engagements of gold abroad for shipment to New York this week. Exchange is a little higher and London is borrowing money at somewhat higher rates than have prevailed for some time past. The Bank of England on Thursday raised its official discount rate from 2½ to 3%, and open market rates are higher.

It is understood that the answer to be given by the English government to the proposal for a new bimetallic conference will be decided on at the cabinet council to be held on Saturday of this week, October 16th. All sorts of rumors are current as to the result, but none appear to be based on anything approaching knowledge.

The Monetary Commission resumed its session in Washington on October 11th, when reports were received from the committees, and the discussion of that submitted by the committee on metallic currency was taken up.

Receipts of specie from Mexico at San Francisco, chiefly by rail, were \$3,626,752 for the quarter ending September 30th. For the nine months ending with September these imports compare as follows:

	1896	1897.
Silver dollars	\$4,918,899	\$5,429,474
Silver bullion	864,306	462,243
Gold	570,975	542,543
Total	\$6,354,180	\$6,434,260

The heavy receipts of Mexican dollars in the last quarter, in view of the great depreciation in value, are quite remarkable. These dollars are simply in transit for Japan and China. Gold bullion has been coming to hand from Mexico since October, 1894.

The statement of the United States Treasury, on Thursday, October 14th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	Oct. 7.	Oct. 14.	Changes.
Gold	\$148,797,879	\$149,975,655	I. \$1,177,776
Silver	13,069,333	13,952,669	I. 883,336
Legal tenders	43,573,325	43,597,265	I. 23,939
Treasury notes, etc.	18,884,119	14,676,132	D. 3,967,987
Totals	\$224,324,659	\$222,202,021	D. \$1,822,638

Treasury deposits with national banks amounted to \$17,753,376, a decrease of \$70,071 during the week.

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

Banks.	1896.		1897.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Assn.	\$68,450,400	.....	\$93,948,500	.....
England	187,582,715	.....	159,935,140	.....
France	389,721,260	\$247,272,214	392,184,500	\$241,247,100
Germany	201,470,000	.....	187,045,000	.....
Austro-Hun.	146,340,000	63,785,000	191,990,000	62,257,000
Netherlands	13,170,000	34,210,000	13,150,000	34,145,000
Belgium	19,830,000	.....	20,997,845	.....
Spain	42,140,000	52,090,000	45,135,000	53,015,000
Italy	61,490,000	11,445,000	62,645,000	12,385,000
Russia	435,850,000	.....	470,760,000	.....

The returns for the Associated Banks of New York are of date October 9th; the Bank of Italy, August 31st; the Bank of Russia, August 16-28th; the Banks of Spain and the Netherlands, September 25th; the others are of date October 14th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending October 9th gives the following

totals, comparison being made with the corresponding weeks in 1896 and 1895:

	1895.	1896.	1897.
Loans and discounts	\$506,606,000	\$456,393,400	\$571,731,100
Deposits	533,491,200	458,484,800	616,737,200
Circulation	14,307,300	20,235,800	15,820,200
Reserve:			
Specie	60,861,900	58,451,400	93,948,500
Legal tenders	86,687,800	71,770,000	73,721,360
Total reserve	\$147,549,700	\$130,220,400	\$167,669,800
Legal requirement	133,372,800	111,621,200	154,184,300
Surplus reserve	\$14,176,900	\$18,599,200	\$13,485,500

Changes for the week, this year, were increases of \$20,800 in circulation and \$1,583,400 in specie; decreases of \$262,300 in loans and discounts, \$2,616,000 in deposits, \$4,302,300 in legal tenders, and \$2,064,900 in surplus reserve.

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

	1896.	1897.	Changes.
India	£3,129,078	£4,373,576	I. £1,244,498
China	574,413	260,913	D. 313,500
The Straits	545,688	294,067	D. 251,619
Totals	£4,249,177	£4,928,486	I. £679,309

Arrivals for the week this year were £176,000 in bar silver from New York, and £19,000 from Chile; a total of £195,000. Shipments for the week were £129,250 in bar silver to India and £22,434 to China; a total of £151,684.

Indian Exchange has not been strong and the price of commercial bills has varied between 15-57d. and 15-63d. per rupee. The demand for remittances to India has been largely met by the recent heavy shipments of silver. This fact and the rise in the price of the metal has for the time stopped the buying of silver for Indian account.

The Imperial Government of Japan has advised Sadatsuchi Uchida, its consul at New York, of some of the experiences of the treasury upon the adoption of the single gold standard. The new currency law went into effect on October 1st, and in the week following the applications for gold currency in exchange for silver yen amounted to only about 950,000 yen (equal to about the same amount in United States dollars). Applications for Bank of Japan notes in exchange for silver yen amounted in the same time to about 2,600,000 yen. The money market in the capital is quiet. An imperial decree has been issued prohibiting the circulation of silver yen after April, 1898.

Prices of Foreign Coins.

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

	Bid.	Asked.
Mexican dollars	\$.45	\$.45
Peruvian sole and Chilean pesos	.40	.43
Victoria sovereigns	4.84	4.88
Twenty francs	3.83	3.87
Twenty marks	4.73	4.77
Spanish 25 pesetas	4.77	4.80

Other Metals.

Copper.—The market has been very quiet, and no business of importance is reported. The lower quotations received from London the beginning of the week have made manufacturers very cautious, and they evidently prefer to await further developments before entering into new contracts, as being more or less well provided with copper they are in no hurry to act. The exports for October have up to date been rather large and spot copper remains quite scarce. The Calumet Company is still holding Lake for 11½¢, but the smaller companies have shown a readiness to meet the market to a slight extent, and we have to quote Lake copper at 11½¢. This decline had a marked effect on electrolytic copper, and the few sales which were made, mostly for export, were at lower prices. Castings, wirebars or ingots we quote 10-75 to 10-80¢, and cathodes 10-50 to 10-60¢; casting copper 10-75¢; prices, however, are more or less nominal and very unsettled.

The following figures give the production (in tons of 2,240 lbs.) of copper in the United States and also by the chief foreign mines, with the exports from the United States, for September, and the nine months ending September 30th:

	1897.		1896.	
	September.	September.	September.	September.
Production fine copper, long tons	16,343	140,932	150,547	.....
Reporting mines, U. S.	1,700	10,860	8,300	.....
Pyrites and cuts de sources, U. S.	7,511	61,306	66,094	.....
Reporting foreign mines	24,984	216,058	224,941	.....
Total production, tons	10,980	89,220	100,190	.....

The September production and exports varied little from those in August. For the nine months the total United States output of 158,847 tons shows an increase of 7,495 tons, or 4-7%, over last year, while the exports increased 10,970 tons or 12-3%.

The London market has been very irregular, and in the main the disposition was rather to sell than to buy. The opening quotation on the 11th inst. was £48 7s. 6d. @ £48 10s., for spot, but values declined to £48 5s. @ £48 7s. 6d. on the following day. After that there was a reaction and a large business

was done, values advancing to £48 10s. @ £48 12s. 6d. for spot, but this improvement could not be maintained, and prices again close at about the lowest, £48 5s. @ £48 7s. 6d. for spot and £48 10s. @ £48 12s. 6d. for three months prompt. Business done in refined and manufactured sorts was at lower prices. We quote: English tough, £50 10s. @ £51; best selected, £51 5s. @ £51 10s.; strong sheets, £58 15s. @ £59; India sheets, £57 @ £57 10s.; yellow metal sheets, 5d.

Tin.—The demand continues very good, but all orders are eagerly competed for, and in consequence prices are rather depressed. We have to quote for spot and October 13½ @ 14c., and for futures 14 @ 14½c.

The London market is rather firm and shows an improvement for the week of about 15s., spot being quoted £62 17s. 6d. @ £63, and futures £63 10s. @ £62 13s. 6d. From advices received from the East it appears that full supplies may be expected to be shipped this month.

Lead.—Fluctuations have been rather large—much larger than usual. For some little time past not much business has been transacted, but the market kept comparatively steady. This week, however, some refiners who were getting tired of holding their stocks pressed sales, and from day to day lower quotations were established without much business being done, until on the 14th inst. transactions in round quantities were reported at 4c. New York, at which prices there remain further sellers. This is quite a material drop, and at the time of writing it is difficult to judge if the bottom has already been reached. The Western markets have also been flat, but prices at the parity of sales in the East have not yet been established, and lead in St. Louis is quoted at 3-85 @ 3-90c., although these prices are quite nominal.

The foreign market has not in any way been affected by the decline here, and Spanish lead in London is quoted at £13 8s. 9d. @ £13 12s. 6d.; English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Since our last report our market, in conformity with European and seaboard markets, has declined very materially. In the past few days consumers of pig lead have been quite shy, so that the market has naturally become very much depressed of its own

Imports and Exports of Metals.

Port.	Week, Oct. 7.		Year, 1897.	
	Expts.	Impts.	Expts.	Impts.
*New York.				
Aluminum, boxes	.....	.....	2,618	.....
Antimony ore, short tons	.....	155	.....	1,479
" regulus, casks	.....	.....	.....	471
Brass, old, short tons	.....	.....	522	100
Copper, fine, long tons	928	77	39,564	5,992
" ore, long tons	.....	.....	6,516	.....
" matte, " "	.....	.....	5,295	271
" sulphate, " "	.....	.....	4,686	.....
Ferro-chrome, " "	.....	.....	.....	5
Ferro-manganese, " "	105	.....	3,014	52
Iron ore, " "	.....	10	.....	19
" old, " "	.....	.....	52	.....
" pipe, " "	.....	.....	185	.....
" pig, bar, rod, " "	263	10	11,032	3,246
" pyrites, " "	.....	.....	.....	7,670
Lead, antimonial, " "	.....	.....	.....	100
" bullion, " "	8,100	2,139	29,477	57,975
Manganese ore, " "	.....	.....	.....	5,388
Nails, " "	217	.....	781	.....
Nickel, " "	14	.....	1,113	115
Rails, old, " "	1,112	.....	11,131	.....
Spiegeleisen, " "	.....	.....	15,335	11,658
Steel billets, rods, " "	20	92	15,692	16,094
Tin, " "	.....	530	1,216	8,699
" dross, " "	.....	.....	141	.....
" and black plates, boxes	.....	440	.....	262,111
Zinc, " "	.....	.....	3,193	.....
" dross, " "	54	.....	439	.....
†Baltimore.				
Brass scrap, long tons	.....	.....	9	.....
Chrome ore, " "	.....	.....	21	5,511
Copper, fine, " "	1,041	.....	32,597	.....
" sulphate, " "	.....	.....	1,779	.....
Ferro-manganese, " "	.....	.....	3,455	385
Ferro-silicon, " "	.....	.....	.....	231
Iron ore, " "	.....	.....	209,902	.....
" pig, bar, etc., " "	573	.....	3,533	2,670
" pipe, " "	20	.....	252	.....
Lead, " "	.....	.....	120	500
Manganese, " "	.....	.....	247	13,759
Rails, steel, " "	.....	.....	3,000	.....
Spiegeleisen, " "	.....	177	.....	1,831
Steel, " "	.....	.....	4,668	4,039
" wire, bundles	47	.....	.....	11,333
Tin, " "	.....	.....	.....	5,714
" and black plates, boxes	.....	.....	.....	19,687
Zinc, " "	.....	.....	.....	48
" dross, " "	.....	.....	135	.....
‡Philadelphia.				
Antimony, " caske	.....	.....	2,712	.....
Chrome ore, " "	.....	.....	300	.....
Copper ore, long tons	.....	2,188	.....	12,979
Ferro-manganese, " "	.....	.....	.....	48
Iron ore, " "	.....	3,150	.....	150,702
" pig, " "	.....	.....	.....	50
" pyrites, " "	.....	.....	.....	4,550
Manganese ore, " "	.....	.....	.....	36,580
Tin, " "	.....	.....	.....	613
" and black plates, boxes	.....	1,770	.....	47,677

*New York Metal Exchange returns. †From our Special Correspondent. ‡Week ending Oct. 9. § Week ending Oct. 14.

weight. To-day quotations are nominally 3.95c. for soft Missouri and 4c. for refined lead.

Spelter.—There is quite a good demand and deliveries are satisfactory. Nevertheless prices are somewhat irregular, 4 1/2@4 20c. New York, and 3 95@4c. St. Louis.

The foreign market has been dull, good ordinaries being quoted at £17 12s. 6d., and specials £17 15s.

Antimony is in fairly good demand, but prices are unchanged at 7 1/2@8c. for Cookson's; 7 1/2@7 1/2c. for Hallett's; 7 1/2c. for Japanese and 7 1/2c. for U. S. Star.

Nickel.—There has been very little business, but no change in prices can be reported. We quote for ton lots 33 1/2@36c. per lb., and for smaller orders 35 1/2@38c. London prices are 14@16d. per lb., according to size of order. The London price is about on a parity with New York, allowing for the duty of 6c. per lb.

Platinum.—Prices are firm at \$14@15 per oz. New York. The London quotation is 55s.@56s. per oz.

For chemical ware, best hammered metal, Messrs. Elmer & Amend, New York, furnish the following quotations, the prices given being respectively for orders of over 250 grams, for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 54c., 55c. and 56c. per gram. Wire and foil are 52c., 53c. and 54c. per gram.

Quicksilver.—The New York price continues at \$37.50 per flask. The London price is £6 15s., with £6 15s. quoted from second hands also.

Quicksilver receipts at San Francisco in September were 1,300 flasks; for the nine months ending September 30th they were 12,060 flasks, against 21,559 for the corresponding period in 1896. Exports by sea for the nine months were: British Columbia, 45 flasks; New Zealand, 30; Central America, 1,070; Mexico, 2,559; total, 3,704 flasks, as compared with 10,250 flasks in 1896. Last year's total included 2,500 flasks to New York and 3,000 flasks to Hongkong. Shipments overland this year have been large.

The Minor Metals.—Quotations are given below for New York delivery:

Aluminum:	Bismuth, 1/2 lb.	\$1.50@1.80
No. 1, 98% Ingots, 1/2 lb. 37@42c.	Phosphorus, 1/2 lb.	50@55c.
No. 2, 94%	Tungsten	70c.
Ingots, scrap, " 30c.	Tungstic acid	45c.
Hollow sheets, " 46c. up	Ferro-tungsten, 60%	69c.
Alum.—Nickel, " 35@40c.		

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

Average Monthly Price of Metals
In New York, for the years 1897 and 1896; in cents per pound.

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1897.	1896.	1897.	1896.	1897.	1896.	1897.	1896.
Jan.	11 75	9 87	13 44	13 02	3 01	3 08	3 91	3 75
Feb.	11 92	10 64	13 59	13 44	3 28	3 19	4 02	4 03
March	11 80	11 03	13 43	13 30	3 41	3 14	4 12	4 20
April	11 48	10 98	13 34	13 24	3 22	3 07	4 13	4 07
May	11 03	11 15	13 44	13 51	3 26	3 03	4 21	3 98
June	11 11	11 67	13 77	13 59	3 33	3 03	4 21	4 10
July	11 11	11 40	13 89	13 63	3 72	2 96	4 32	3 97
August	11 16	10 98	13 80	13 49	3 84	2 73	4 26	3 76
Sept.	11 30	10 66	13 98	13 15	4 31	2 77	4 18	3 60
October	10 66	10 66	12 94	12 94	2 80	2 80	3 72	3 72
Nov.	11 23	11 23	13 09	13 09	2 96	2 96	3 99	3 99
Dec.	11 28	11 28	12 96	12 96	3 04	3 04	4 14	4 14
Year	10 88	10 88	13 29	13 29	2 98	2 98	3 94	3 94

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements see page 450.)

New York. Oct. 15.

Heavy Chemicals.—The market was featureless last week and prices generally are unchanged. The imports of bleaching powder for the week ending October 8th amounted to \$8,896. Soda ash was also imported to the extent of \$5,623, and of caustic soda \$1,898 worth was received. Although sal soda is reported scarce on the other side, we imported nevertheless \$1,014 worth last week. Small quantities of bicarb. and carb. soda were also imported, the total value being \$295. Our exports of caustic soda, though small in amount, were made principally to Maracaibo and Laguayra. We quote: Caustic soda, 60%, \$2.10@2.20 per 100 lbs. Alkali, domestic, 58%, 65@67 1/2c. for 50-ton lots and over, and 70@80c. for smaller quantities; 48%, \$1@1.20 for jobbing lots. Foreign, 72 1/2@77 1/2c. Carbonated soda ash, 90@95c. per 100 lbs., for 58% basis of 48%. Bleaching powder prime brands, \$1.85@2.00; Continental F brand, \$1.85@1.90; other brands, \$1.70@2 per 100 lbs. Bicarb. soda, English, 1 1/75@2c. per lb.; American, bulk, \$1.50@1.55 per 100 lbs., according to brand. Sal-soda, English, 75@80c. per 100 lbs.; American, 65@70c. per 100 lbs. Chlorate of potash, \$9.37 1/2@9.75 per 100 lbs.

Acids.—Though the market shows little change generally, the demand for acids, especially sulphuric and blue vitriol, has been rather brisk. Acetic has also been in fairly good demand at unchanged prices. Some acid makers continue to report that they are sold ahead. The imports of oxalic acid during the week amounted to \$1,056, and of carbolic to \$1,211. Quotations are per 100 lbs. in New York and vicinity,

In lots of 50 carboys or over as follows: Acetic acid, commercial No. 8 (in barrels), \$1.40 @ \$1.50; in carboys, \$1.50@1.65; redistilled, 28%, in bbls., \$1.70@1.80; in carboys, \$1.90@2.05. Muriatic acid, 18°, 75@85c.; 20°, 85@95c.; \$1.15@1.25, according to make and quantity. Nitric acid, 36°, \$3.50@4; 40°, \$4@4.50; 42°, \$4.50@5.50. Oxalic acid, 87 ex-dock and \$7.25 ex-store. Mixed acids, according to mixture. Sulphuric acid, 68°, 70@85c. in carload lots, 10@15c. higher for small quantities. Chamber acid, 50%, \$6@6.50 per ton at factory. Blue vitriol, \$3.62 1/2@3.75, according to grade and order.

Brimstone.—The trade continues very quiet, but consumption just now is greater than for the corresponding period last year, in spite of the prevailing high prices. There was an arrival this week with about 3,500 tons. Quotations are \$21@21.50 on spot for best unimixed seconds, and \$21.25 to arrive, while thirds are \$1 less.

Fertilizing Chemicals.—The demand for the leading ammoniates is rather light just now, as is that for potash salts. Prices show some slight changes this week, as noted below: Sulphate of ammonia, gas liquor, \$2.17 1/2@2.20; bone, \$2.10@2.15 per 100 lbs. Dried blood, high grade Western, \$2.25@2.30 per unit New York; \$2 per unit f. o. b. Chicago. Azotite, \$1.65@1.70 basis New York. Concentrated phosphate (30% available phosphoric acid), 57 1/2c. per unit. Acid phosphate, 13% @ 15%, av. P₂O₅, 55@60c. per unit at sellers' works in bulk. Dissolved bone black, 17% @ 18% P₂O₅, \$16@16.50 per ton. Acidulated fish scrap, \$9.50@10, and dried scrap \$18@18.50 f. o. b. fish factory. Tankage, high grade, \$16.25@16.50 per ton, f. o. b. Chicago; concentrated tankage, \$1.55 per unit, f. o. b. Chicago; New York, \$2; low grade, \$13@13.50. Bone tankage, \$19@20; ground bone, \$21@23. Bonemeal, \$19.50@22.50.

Sulphate of Potash: 90%, New York and Boston, \$1.90; Philadelphia, Baltimore and Norfolk, 1 7/8@1 7/10c.; Charleston, Savannah, Wilmington and New Orleans, for 80@85% basis of 80%, 1 7/8@1 1/8c. in lots of 50 tons and upward.

Double Manure-Salt: Quotations for 48@49%, less than 2 1/2% chlorate, are 1 01@1 01 1/2c., to arrive, and 1 02@1 03c. on spot; basis of 48%. High grade, 90@98% sulphate of potash, 1 06 1/2@2 00 1/2c. to arrive; basis of 90%. In bulk 24@30%, 36 1/2@37 1/2c. per unit phosphate acid.

Muriate of Potash: We quote: New York and Boston, 1 75@1 78c. Philadelphia and Norfolk, 1 76@1 79 1/2c.; Charleston, Savannah, Wilmington and New Orleans, for 80@85% basis of 80%, 1 78 1/2@1 81c. in lots of 50 tons and upward.

Kainit.—Invoice weights, as taken at port of shipment, per ton of 2,240 lbs., testing 12 1/4% actual potash, equivalent to 23% sulphate of potash, \$3.80 @ \$8.90.

Nitrate of Soda.—This market is very weak, owing to the slack demand and to the probable breaking up of the combination on the coast. Prices tend downwards, and future business has been done at \$1.60 per 100 lbs., and near-by arrivals are offered at \$1.62 1/2. A steamer and a sailing vessel are expected to arrive during the latter part of this month with a total tonnage of 47,000 bags.

NOTES OF THE WEEK.

Shipments of Florida phosphate rock during September were distributed as follows:

	Domestic.	Foreign.
	Tons.	Tons.
Fernandina	2,411	22,213
Punta Gorda	935	3,929
Tampa	935	16,395
Savannah	3,041	17,188
Totals	3,346	59,526
Total, August	8,489	29,790

As compared with the previous months September shows a decrease of 5,143 tons in domestic and an increase of 29,736 tons in foreign shipments.

Charleston, S. C. Oct. 12.

(From Our Special Correspondent.)

The shipments of phosphate rock from this port for the month of September are given in the accompanying summary.

	1895.	1896.	1897.
Crude rock, long tons	11,102	7,689	11,515
Ground rock, short tons	370	.....	.....

Shipments this year show a considerable increase over 1896.

Liverpool. Oct. 5.

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

The demand for heavy chemicals has slackened off, while at the same time prices are well maintained. Soda ash is quiet, but steady. Owing to the low prices ruling in America, makers here are refusing to quote for the present for alkali for export to your side. Quotations vary according to export market, and the range for tierces may be called about as follows: Leblanc ash, 48%, £4@4 5s.; 58%, £4 10s.@4 15s. per ton, net cash. Ammonia ash, 48%, £4@4 2s. 6d.; 58%, £4 5s.@4 7s. 6d. per ton, net cash. Bags are 5s. per ton under price for tierces. Soda crystals keep moving off, and prices for barrels range from £2 7s. 6d. to £2 17s. 6d. per ton, less 5% according to export market, and 7s. less for bags. Special terms for American business.

Caustic soda is less active, but quotations are unchanged. We quote spot range as to market, as follows: 60%, £6 5s.@£6 10s.; 70%, £7 5s.@£7 10s.; 74%, £8 2s. 6d.@£8 5s.; 76%, £8 15s.@£9 per ton, net cash.

Bleaching powder is dull, and is a shade easier at £6 10s.@£6 15s. per ton, net cash, for hardwood packages, as to destination.

Chlorate of potash is rather slow, at 3 1/2d. per lb. for any position.

Bicarb. soda is in moderate demand, at £6 15s., less 2 1/2%, for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is not quite so firm, although holders quote £8 7s. 6d.@£8 10s. per ton, less 2 1/2%, for good gray 24@25%, in double bags, f. o. b. here as to quality.

Nitrate of soda is without special feature, and is steady at about £7 15s.@£7 17s. 6d. per ton, less 2 1/2%, for double bags f. o. b. here, as to quantity and quality.

Carb. ammonia, lump, 2 1/2d.@3d. per pound; powdered, 3d.@3 1/2d. per pound, less 2 1/2%.

Manchester, Eng. Sept. 25.

(Special Report of S. W. Royle & Co.)

Chemicals.—Sulphate of copper has been ruling firm, and large sales have been made for delivery during this year and the early part of 1898. Green coppers is quiet, but steady, as there is no accumulation of stocks. Acetates of lime are firm, but have not a large demand, as consumption is only moderate at present. Acetate of soda is dull and neglected. Acetates of lead remain unchanged in value, notwithstanding the great advance in lead; nitrate of lead is, however, dearer, and is tending further upwards. Yellow prussiates of potash and soda are more plentiful and have a slightly easier tone. Tartaric acid has advanced further. Oxalic acid is firm at convention rates. Carbonate and caustic potash are, on account of the present cheapness of raw materials, offered at lower prices for 1898 delivery, and this is inducing consumers to place their contracts. In the tar products branch the tone is fairly good. Solvent naphtha is steady and a moderate business is passing. Benzoles are latterly a little firmer and some good parcels have been placed. Cresote is easier, consumers being well covered and are now holding off. Crude carbolic is low and is about stationary; for crystal carbolic there is scarcely any demand at present. Pitch continues in an unsatisfactory position, with apparently little hope for early improvement; consumers are well bought and will not entertain further business except at inducing prices. Sulphate of ammonia has advanced and is in good demand.

Minerals.—Values of iron ore remain steady, and imports are heavy. Freight has recently advanced, and this may affect shipments. The imports during the eight months ended August 31st last show an increase in weight of 2,537,373 tons, and in value of £133,592 upon those during the corresponding period of 1896. Prices of Sicilian brimstone continue firm, and there has recently been an advance in values of the refined qualities; the imports during the eight completed months of this year are practically the same in weight as, but greater in value by £10,858, than those during the corresponding period of last year. Shipments of china clay from the mines are being steadily made for buyers' winter stock, but are somewhat affected by the higher rates of freight that are now asked. There is at present a good demand for cheap mica clays. In phosphates of lime there is no large business doing, but prices are somewhat firmer on account of higher rates of freight.

Valparaiso, Chile. Aug. 25.

(Special Report of Jackson Brothers.)

Nitrate of Soda.—A marked improvement in this article has taken place during the fortnight, quotations from Europe having advanced about 2d. per cwt. for October-November sailings. Add to this the fact that homeward freights have risen to 23s. 9d., it is satisfactory to see that the coast price for nitrate has also advanced from 5s. @5s. 2d. per quintal; although with the present outlook of higher freights we doubt that we will see much further rise, the demand having been principally for ship-ment on demand at less than current rates. We quote 95%, 5s. 2d.; refined, 5s. 3d., sellers, September-December deliveries. The price of 5s. 2d. per quintal with 23s. 9d. freight, stands in 6s. 1 1/2d. per cwt., cost and freight, without purchasing commission.

MINING STOCKS.

Complete quotations will be found on pages 476, 477 and 478 of mining stocks listed and dealt in at:

	Helena.	London.
Aspen.	Los Angeles.	Mexico.
Baltimore.	New York.	Paris.
Boston.	Philadelphia.	Rosland.
Cleveland.	Pittsburg.	Shanghai.
Colo. Springs.	Salt Lake.	Valparaiso.
Denver.	San Francisco.	

New York. Oct. 15.

There has been a fair amount of dealing in the dividend-paying stocks this week, but those of lesser importance seem to attract the most attention, especially on the Mining Exchange. Six of the Comstocks were traded in, and of these Consolidated California & Virginia lost 10c., opening at \$1.50 and closing at \$1.40, with sales of 350 shares; Crown Point rose from 80c. to 85c., which prices are more than half again the selling price three weeks ago. Mexican sold at 60c., which is 3c. less than last week. Yellow Jacket still rules at the high level of 77 to 80c., but at the close to-day it receded to 65c. Best & Belcher made one sale at 80c., a drop of 5c. since last week. There was little doing in the California stocks; Standard Consolidated sold at \$1.80, ex-dividend, while Brunswick Consolidated

has gradually been worked down to 10c. from the 20c. mark a few weeks ago. The Colorado stocks show a number of transactions, and the Cripple Creek group ruled fairly steady all through the week. Of the latter Portland sold at 78c., against 80c. last week, and 70c. the week before. Anaconda gold sold at 44c., which is 3c. less than last week. Of the other securities, Little Chief sold at 12@13c.; Mollie Gibson at 21@23c., which is somewhat less than a few days ago.

The Montana stock, Alice, sold at 31c., which is an advance of only 1c. since September 8th, when the last sale was recorded.

The Mexican for Lower California, stock, Fortuna, opened at \$11.12½, receded to \$11, and at the close rose to \$11.25 with sales of several hundred shares.

The Yukon stock dealt in on the Mining Exchange opened at 20c., receded to 16c., and at the close sold at 10½c., with dealings in several blocks of shares.

The Mining Exchange is doing little in the stocks of actual mines; its business consists principally of stocks that can be bought by the thousand for a few dollars.

Boston. Oct. 14.

(From Our Special Correspondent.)

The market the past week has ruled dull for all the copper stocks with the exception of Butte & Boston and Centennial, which have been the leaders in speculation, and have each been under bear pressure resulting in lower prices. Butte has declined from \$27½ to \$22½ on free selling, recovering in part to \$24½ and falling off again to \$23½, which was the price at noon to-day.

Centennial has been pressed for sale all the week. The early sales were at \$19½, with a gradual decline during the early trading to \$14½. Yesterday it opened at \$16½ and broke to \$13; to-day it improved to \$15, and closed at \$14½.

Old Dominion was fairly active and declined with the market from \$24½ to \$20½, with a later rally to \$22½. Boston & Montana declined from \$145 to \$140½, with recovery to day to \$142. The regular dividend of \$3 per share is announced. It was expected that an extra would be paid; the absence was a disappointment, and hence the decline.

The balance of the list declined more or less in sympathy with the leaders. Calumet & Hecla was off \$15— to \$14½; Quincy sold off from \$115 to \$113½, and Tamarack from \$134 to \$132—the dealings in each were light. Osceola sold at \$39½, declined to \$36½ and recovered to \$37½; Kearsarge declined from \$21 to \$17½, but was better to-day and sold at \$19. Franklin, after selling at \$21, declined to \$19½ and recovered to \$20. Atlantic was steady at \$24, with small sales. Tamarack, Jr., was fairly steady at \$16½@16, closing at the lower price. Wolverine declined from \$16 to \$14½, but recovered to day to \$16½. Tecumseh sold at \$3½@3; Arnold at \$3½@4, and Allouez at 75c.@81.

The gold stocks were not much in evidence this week. Gold Coins declined to \$2, Pioneer to \$5½, and Santa Ysabel from \$15 to \$13. A small lot of Merced sold at \$7½. Napa Quicksilver was quoted at \$6½ for a sale of 1,000 shares.

3 p. m.—The market improved generally after the noon hour with the exception of Wolverine, which sold off to \$16. Butte advanced ½ to \$24, Centennial to \$15½, Old Dominion to \$23½, Franklin to \$21, Tecumseh to \$4 and Pioneer to \$6. Boston & Montana advanced to \$143, but Atlantic lost \$1 to \$23. Arnold was up to \$4 and Osceola to \$38.

Salt Lake City. Oct. 9.

(From Our Special Correspondent.)

Discouraging word from London foretelling England's probable answer to the French and American representatives relative to a monetary conference has added to the depression both of silver mining and the stocks of these mines. Contrary to expectations, and as is usual at this season, there is practically no outside support to this market, while locally there is no money for speculation. Under these circumstances it is a favorable sign that shares, generally, hold their own as well as they do. In the golds, from top to bottom of the list, there is no decline, while several of the lead silvers have advanced and are stronger than last week. The sales of the past six days were smaller than at any time since midsummer.

On October 11th the customary Mercur dividend of \$25,000 will be declared, payable October 20th. The shares hold about as usual, one day apparently a shade weak and the next day strong. Geysers-Marion has somewhat recovered, and its champions are more pronounced on the merits of the mine. No fault is to be found with the new management, which accounts for the speedy recovery. Sacramento is firmer and there is a rumor of a dividend this month. Northern Light is again in favor and appears to be regaining the ground lost by the recent bear movement. Dexter is quietly inquired for and is more strongly held.

Swansea has opened another ore body, which ought to assure dividends for several months. The \$5,000 for October will be paid on October 11th inst. South Swansea continues about the same; at a meeting of the directors held on Monday, a dividend of 5c. per share was declared payable October 21st. This amounts to \$7,500.

Horn Silver has received no attention since the annual meeting on Tuesday last. President Washington, in an interview the next day, being asked as to probable resumption of dividends, remarked: "We think it well to make no promises. The mine is earning money and later, if it appears desirable, dividends will come as a quiet surprise, which is better than making glowing promises."

Silver King pays its usual \$37,500 dividend the first of the coming week, without any trumpet blast. It is unquestionably the strongest stock on this market, and deservedly so. Daly West has moved up a little, due to the prospect of soon resuming work at the mine. Ontario and Daly are weaker.

Bullion-Beck holds its own better than was predicted, when the announcement was made that no more ore was to be mined from October 1st. The same is true of Centennial-Eureka, which is to curtail production from this date. Large holders of each of these old favorite shares seem well content as to the future.

Four Aces did business at 2½c., several thousand shares changing hands. Another shipment is promised shortly. Dalton sold at ¾c. and Galena at 50c. on to-day's call. Other shares present no features worthy of comment.

San Francisco. Oct. 9.

(From Our Special Correspondent.)

Quite a contrast to last week's quiet and rather weak market was presented on Monday, when there was a brisk demand all around and prices began to go up rapidly. It was the liveliest opening for a long time. On Tuesday there was some reaction, but on Wednesday the market was up again on favorable reports from the Chollar, the Belcher and the Crown Point. This excitement helped all the other stocks to a general rise.

Thursday brought a general break in prices, the whole list going down rapidly. Belcher dropped from \$2.15 to 90c., Crown Point from \$1.65 to 85c., and there were other falls almost as heavy. For a time the excitement was great, and business was heavy. The whole affair was part of the same manipulation which earlier pushed up stocks to so high a level.

Toward the close of the week matters quieted down considerably, and at the close business was rather dull. Some people think that the dullness results from the action recently taken by two of the leading banks of this city, requiring mining stock brokers to make all their deposits in coin, instead of checks, as heretofore allowed. The banks are the Nevada Bank and the Anglo-Californian Bank. Most of the mining stock brokers have their accounts with those banks, or do very little business with the other banks. The banking officials give no reason for their action, but inferences may be drawn as one pleases.

To-day the Comstocks were quoted at the following prices: Alpha, 16c.; Alta, 20c.; Andes, 27c.; Belcher, 67@68c.; Benton, 90c.; Best & Belcher, 69@70c.; Bullion, 12c.; Caledonia, 40c.; Challenge Consolidated, 46c.; Chollar, 70c.; Consolidated California & Virginia, \$1.45; Confidence, \$1; Consolidated Imperial, 3c.; Consolidated New York, 3@4c.; Crown Point, 70@73c.; East Sierra Nevada, 5c.; Exchequer, 5c.; Gould & Curry, 60c.; Hale & Norcross, \$1.15; Julia, 4c.; Justice, 29c.; Kentuck Consolidated, 8@9c.; Lady Washington, 5c.; Mexican, 55c.; Occidental Consolidated, \$1.30@1.35; Ophir, \$1; Overman, 16c.; Potosi, 60c.; Savage, 55@54c.; Segregated Belcher, 15@16c.; Scorpion, 6c.; Sierra Nevada, \$1.10@; Silver Hill, 7c.; St. Louis, 18c.; Union Consolidated, 53c.; Utah, 24c.; Yellow Jacket, 73@72c. For Eureka Consolidated 20c. was bid; Standard Consolidated sold at \$1.80.

The annual meeting of the Mayflower Gravel Mining Company is called for October 18th.

The California Debris Commission has received new applications to mine by the hydraulic process from Sam Ahtye, in the Emerton Mine, near Gibsonville, Sierra County, to deposit tailings in Slate Creek, and in the Doherty Mine, near Table Rock, Sierra County, to deposit tailings in Slate Creek; from Victor Montre, in the Grizzly Canyon Mine, near Pike City, Sierra County, to deposit tailings in Grizzly Canyon; from B. F. Atkinson, in the Homestake mine, No. 2, near Sierra City, Sierra County, to deposit tailings in the impounding basin of the Homestake Mine, and from C. R. Scott et al., in the Gold Nugget Mine, near Gibsonville, Sierra County, to deposit tailings in Canyon Creek.

London. Oct. 6.

(From Our Special Correspondent.)

The feature of the stock market has been the revival of West Australians. There has been quite a boom, more especially in companies belonging to Hannans district, or Kalgurli, and many of the shares have been pushed up to extraordinary prices. There is no especial reason why such a boom should arise, that is, so far as actual news of discoveries is concerned. The explanation of the movement is to be found in the fact that the professional element are leaving the South African section in disgust and are forced to try something else. The increased attention paid to West Australians has had the natural effect. People mistake it for an increased demand for West Australian shares on the part of the public, and get the idea that there must be some cause connected with the gold-fields themselves. So they come in and buy for a rise. There appears to be really no reason why prices should go up, for there is absolutely no news from the colony to warrant a rise.

The South African section has been very lifeless, though the quotations of shares in the gold mining companies have not suffered. The delay in granting the expected concessions has practically driven away the professional element. Besides, the state of general trade in the Transvaal seems to be getting pretty bad, chiefly for the same reason, and the public revenue is decreasing. A rumor was sprung on the market to the effect that Rothschilds had promised a large loan for the Transvaal government,

the stipulation being that the mining reforms should be passed at once. This tale is not a very probable one. Perhaps the only enlivening feature of the South African market has been the announcement of the position of Barnato Consolidated. This company has not had a cheerful existence so far, and the death of its founder put it back into the shade. The interests of the company vary in value naturally, but the holdings which hold out immediate promise are these in Ferreira Deep and Jumpers Deep. Of the two perhaps the latter is the most valuable, as the company is to start crushing with 100 stamps in December. The shares are now being sold at \$5 each, so the Barnato Consolidated should have reaped a profit.

There is at present some disposition to consider that the time has come to commence once more the flotation of new mining companies. This week we have had several, four new West Australian companies and one for Klondike. The latter is called "The British Klondike Mines and Finance Company, Limited," and it is promoted by Mr. A. E. Walton and his circle, who already have Cripple Creek and British Columbian companies. The capital is £100,000, but nothing is said in the prospectus by means of which one can gain the least idea of the intentions of the directors.

Paris. Oct. 3.

(From Our Special Correspondent.)

There has been movement on and life in the mining stock market, but it was much divided, and presented few salient points.

Strong demand continues for the metallurgical shares and the prices continue high. The reports which are now beginning to come in for the first half of the year show good profits, and have increased the demand. The Russian group generally show further gains in price.

The copper market is not strong, but it has not affected prices, which are rather better than last week. The only exception is Boleo, which is a little lower. Evidently there is a belief that the present prices of copper and the heavy demand for the metal will continue.

Nickel continues its extraordinary improvement, for which it is difficult to find any sufficient cause.

There has been a little more movement in the South African shares, and more attention is being paid to them.

The movement of gold and silver in France for the eight months ending August 31st is reported by the Ministry of Commerce as below:

	Imports, francs.	Exports, francs.	Difference, francs.
GOLD:			
1897.....	161,816,062	40,519,503	Imp. 124,296,499
1896.....	255,979,821	85,660,629	Imp. 170,319,192
SILVER:			
1897.....	122,371,635	119,876,114	Exp. 27,544,479
1896.....	119,946,513	61,630,311	Imp. 58,915,202

Imports of minor coins—bronze, nickel and copper—were 67,500 fr. face value, against 73,800 fr. in 1896; exports were 2,508,300 fr., against 219,600 fr last year.

The Colonial agitation promises to be a feature of the coming year, and Colonial mines will be in demand. I think that some will be found for the public.

Rossland, E. C. Oct. 6.

(From Our Special Correspondent.)

The arrival here on Monday last of two distinguished Canadian statesmen, Sir Charles Tupper and Sir Mackenzie Bowell, of Canada, accompanied by some other notable gentlemen, is regarded here as an event of much importance and these gentlemen and their associates are to be entertained at a banquet. Sir Charles Tupper's interest in mining properties, in this camp especially, are understood to be quite large. He is at the head of the New Gold Fields of British Columbia, the syndicate that recently purchased the Velvet group on Sophie Mountain. It is understood that Sir Charles Tupper has already invested a large amount of money in Kootenay mining properties.

An important strike is reported in the tunnel of the Iron Colt where a considerable body of gold copper ore has been encountered. This company has recently been pushing development work, and although its management is inclined to be very sanguine of its prospects, the discovery made the other day must be recorded as genuine, though the full extent of it remains to be determined. This discovery and the opening of the Sunset No. 2 as a mine, together with the presence here of distinguished visitors and very fine weather, have helped very much to improve the business outlook of the community, and now a very confident feeling prevails.

MEETINGS.

Chrysolite Silver Mining Company, annual meeting at the office, Room 91, No. 80 Broadway, New York City, on November 3d at 12 o'clock, noon.

LATE NEWS.

MR. W. B. COGSWELL, of the Solvay Process Company, Syracuse, N. Y., has returned from Europe.

MR. H. A. KELLER, of San Francisco, recently completed an examination of the works of the Boston & Nevada Copper Mining Company at Yerington, Nev. He is now examining copper mines on the Illinois River, Southern Oregon.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Alice, Anaconda, and others with columns for location, par value, and prices for various dates from Oct. 9 to Oct. 15.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Aetna, Alouez, Anaconda, and others with columns for location, par value, and prices for various dates from Oct. 8 to Oct. 14.

Official quotations Boston Stock Exchange. *Bid and ask quotations. Total sales, 110,233.

BALTIMORE, MD.*

Week ending Oct. 14.

Table of stock quotations for Baltimore, MD., listing companies like Atlantic Coal, Big Vein Coal, and others with columns for location, par value, bid, and ask prices.

Official quotations Baltimore Stock Exchange

CLEVELAND O.*

Table of stock quotations for Cleveland, O., listing companies like Aurora, Chandler, and others with columns for par value, bid, ask, and company name.

*From our special correspondent.

ASPEN, COLO.

Oct. 8.

Table of stock quotations for Aspen, Colo., listing companies like Agnes C, Argenta, and others with columns for location, capitalization, par value, bid, and ask prices.

COLORADO SPRINGS, COLO.†

Table of stock quotations for Colorado Springs, Colo., listing companies like Alamo, Anaconda, and others with columns for par value, bid, ask, and company name.

Official quotations Colo. Springs Mining Stock Association. Total shares sold, listed, 261,370; unlisted, 118,500.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stocks, listing companies like American Coal, Col. Fuel & I., and others with columns for par value and prices.

Official quotations. New York Stock Exchange, mining, 2.0 shares; other stocks, 607.5 shares; Consolidated Stock and Petroleum Exchange, mining, 29,335 shares; Mining Exchange, 290,000 shares. Total shares sold, 381,460. * Bid and ask quotations. † Bid and ask quotations.

PHILADELPHIA, PA.†

Table of stock quotations for Philadelphia, Pa., listing companies like Cambria Iron, Choc. & Gif. Cfs, and others with columns for location, par value, bid, and ask prices.

Official quotations Philadelphia Stock Exchange. * Bid and ask quotations. Total sales, 13,091.

PITTSBURG, PA.*

Oct. 13

Table of stock quotations for Pittsburgh, Pa., listing companies like Allegheny, Carborundum, and others with columns for location, par value, bid, and ask prices.

Official quotations Pittsburgh Stock Exchange.

STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colorado, listing companies like Acacia, Adie C., Alamo, etc., with columns for par value, bid, asked, and sales.

LOS ANGELES, CAL.

Table of stock quotations for Los Angeles, California, listing companies like Amargosa, Arrow Lake, C.H.G. & M. & Co., etc.

Official quotations, Los Angeles Mining and Stock Exchange. Bid and ask quotations. Total sales, 168,600 shares.

SALT LAKE CITY, UTAH.

Week ending Oct. 9.

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Alliance, Anchor, Annie, etc.

From Our Special Correspondent. Utah companies. Mines in Vanderbilt, Cal. Mines in Tuscarora, Nev.

ROSSLAND, BRITISH COLUMBIA.

Oct. 6.

Table of stock quotations for Rossland, British Columbia, listing companies like Abe Lincoln, Alberta, Big Bird, etc.

From Our Special Correspondent.

HELENA MONT.

Week ending Oct. 7.

Table of stock quotations for Helena, Montana, listing companies like Am. Dev. & M. Co., Bald Butte, etc.

Special Report of Samuel K. Davis. Total shares sold, 5,350.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, California, listing companies like Alpha Con., Alta., Andes, etc.

Official telegraphic quotations, San Francisco Stock Exchange.

MEXICO.

Week ending Sept. 28.

Table of stock quotations for Mexico, listing companies like Allanza, Amistad y Concordia, Angustin, etc.

NOTE: In most of the older Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Many newer companies have a nominal par value, usually \$50 or \$100. Prices are in Mexican dollars.

STOCK QUOTATIONS.

LONDON. Oct. 1. Table with columns: NAME OF COMPANY, Country, Authorized capital, Par value, Last dividend, Quotations. Lists various mining companies like Alaska-Mexican, Anaconda, etc.

PARIS. Week ending Oct. 1. Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Divs. last year, Prices. Lists companies like Acleries de Crenset, Ansin, etc.

VALPARAISO, CHILE. Aug. 28. Table with columns: NAME OF COMPANY, Location, Capital paid, Sh. Val. paid up, Last Dividend, Prices. Lists companies like Arturo Prat, Caracoles, etc.

SHANGHAI, CHINA. Sept. 10. Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Price. Lists companies like Jelebu Mfg. & Trad., etc.

† Dividend pending. ‡ Ex-dividend. | Rights pending.

DIVIDENDS.

Table with columns: NAME OF COMPANY, Current Dividends, Paid since Jan. 1, 1897, Total to date, NAME OF COMPANY, Current Dividends, Paid since Jan. 1, 1897, Total to date. Lists companies like Aetna Con. Co., Alaska-Mexican, etc.

ASSESSMENTS.

Table with columns: NAME OF COMPANY, Location, No., Dinq., Sale, Am. Lists companies like Alaska, Alamo, Alpine, etc.

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

ALPHABETICAL INDEX TO ADVERTISERS.

(-) Indicates every other week or monthly advertisements.

Table with columns A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z. Each column lists advertiser names and their corresponding page numbers. Includes entries like 'Denver Fire Clay Co', 'Raymond Lead Co', 'Sagmuller, G. N.', etc.



A COMPOUND THAT YOU WANT. THE A. B. C. ALKALI WATER PURIFIER.

The Very Best of all Compounds for Boiler Treatment.

We are after the Mine Trade. Engineers write us. Send us a gallon jug of your feed water, expressage prepaid. We examine and report on same. Our analysis is guaranteed. Our compound is a pure chemical, and we make it to fit every emergency. Our trade with the mines is growing fast.

THE J. H. PARSONS CHEMICAL COMPANY, 1511-13-15 MASONIC TEMPLE, CHICAGO, ILL.



METALS PERFORATED AS REQUIRED. FOR MINING SCREENS OF ALL KINDS. STANDARD SIZES PERFORATED TIN AND BRASS ALWAYS IN STOCK.

MINE TELEPHONES MUST BE SUPERBLY BUILT.

FOR UNDERGROUND WORK THEY MUST BE DAMP-PROOF AND INCORRODIBLE. THAT'S THE KIND WE MAKE.

FOR ALL KINDS OF WORK THEY MUST "COME UP STRONG AND STAND UP LONG." THAT'S THE KIND WE MAKE.

FOR THE PROTECTION OF THE USER THEY MUST BE FREE FROM INFRINGEMENT.

THAT'S THE KIND WE MAKE.

GET OUR CATALOG. CONNECT YOUR MINE, MILL AND OFFICE.

THE STROMBERG-CARLSON TELEPHONE MFG. CO., 76 W. JACKSON BUILDING, CHICAGO.

REPORT BOOK FOR MINING ENGINEERS.

BY A. G. CHARLETON.

A very complete blank form of report designed to enable mine purchasers or mine owners to obtain a comprehensive report upon properties they wish to acquire or sell, and of great service to mining engineers, either as a guide or as a note-book for actual use while making their examinations.

Bound in Leather. Pocket Size. Price, \$2.00.

THE SCIENTIFIC PUBLISHING CO., 253 Broadway, New York.

DON'T ORDER MINING SCREEN

Unless You Get

THE TYLER

Double Crimped.

THE

ONLY MAKE!

With the wires thoroughly crimped both ways. "We have originated," others have imitated.

THE W. S. TYLER WIRE WORKS CO., CLEVELAND, O., U. S. A.

MANUFACTURERS OF
Extra Heavy Iron, Steel, Brass,
Copper and Phosphor Bronze

WIRE CLOTH.

Write us direct for information.

Colorado concerns will find a stock of our screens at
Hendrie & Holthoff Mfg. Co.,
DENVER, COLO.

Main Offices and Works of **THE W. S. TYLER WIRE WORKS CO.** corner
St. Clair Street and C. & P. R. R.
Crossing, Cleveland, Ohio.

CYANIDE BLEACHING POWDER.

MINERS' CHEMICALS.
FUERST BROS. & CO., 2 Stone St. New York.

VOLLMER AND BEATON,
Lead Burners and Chemical Plumbers.

Practical experience in the erection of Acid Chambers, Glover and Gay Lussac Towers, and all lead work in connection with Chemical Works, Copper Works, Smelting Works, Chlorination Works, etc. Twenty years' experience.

JOHN VOLLMER, 16 Oregon St., Roxbury, Mass.
D. A. BEATON, Box 84, Woburn, Mass.

MIDLAND RAILWAY

OF KENTUCKY
—THE SHORT LINE BETWEEN
CINCINNATI AND FRANKFORT
—AND—

Frankfort, Georgetown and Paris.
C. D. BERGAW,
General Passenger Agent.

ZEITSCHRIFT FÜR PRAKTISCHE GEOLOGIE

mit besonderer Berücksichtigung der Lagerstättenkunde.
In Verbindung mit einer Reihe namhafter Fachmänner des In- und Auslandes herausgegeben von **Max Krahmann.**
Monatlich ein Heft von etwa 40 Seiten mit Übersichts-karten, Profilafeln u. s. w.
Preis des Jahrgangs von 12 Heften M. 18.—
Probhefte und Prospekte stehen auf Verlangen gern zur Verfügung.
Verlag von **Julius Springer** in Berlin N. Monbijouplatz 3.

Industrial and Economic Engineering.

Responsible attention given to the planning, arranging and erection of buildings, the installation of machinery for mills, chemical and other manufacturing works. Plans and specifications for Furnaces, Retorts, Distilling or Subliming and other Process Apparatus.
Specialities: White's Evaporation Water Cooler; White's Brimstone and Sulphur Apparatus.

EDW. F. WHITE, M.E. 116 Liberty St., N.Y. City

ALL THE CUTS

Published in the
Engineering and Mining Journal

ARE FOR SALE

AT REDUCED PRICES.

Half Tones, 20 cents per sq. in. minimum price, \$2.00.
Line Etchings, 7 cents per sq. in., minimum price, 75 cents.

Orders should be sent in as soon as possible after cuts appear in the paper, as all cuts must be disposed of shortly after publication.

THE SCIENTIFIC PUBLISHING CO.
253 Broadway, New York.

CLASSIFIED LIST OF ADVERTISERS.

Air Compressors and Rock Drills.
 American Diamond Drill Co.
 Rock Drill Co.
 Bullock, M. C. Mfg. Co.
 Burleigh Rock Drill Co.
 Clayton Air Compressor Works.
 Colorado Iron Wks. Co.
 Davis, F. M., Iron Works Co.
 (See Diamond Drills.)

Amalgamators.
 Bucyrus Steam Shovel & Dredge Co.
 Colorado Iron Works Co.
 Fraser & Chalmers.
 Gates Iron Works.
 Laidlaw-Dunn-Gordon Co.
 N. Y. Diamond Drill Co.
 Newark Iron Works Co.
 Philadelphia Eng. Wks., Ltd.
 Rand Drill Co.
 (See Diamond Drills.)

Anti-Friction Metals.
 Besly, Chas. H., & Co.
 Chester Steel Cast. Co.
 Illinois Sm. & Ref. Co.

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

Assayers and Chemists' Supplies.
 Answorth, Wm., & Co.
 Baker & Adamson.
 Baker & Co.
 Becker, Christian.
 Bullock & Crenshaw.
 Chur, Walter.
 Denver Fire Clay Co.
 Elmer & Amend.
 Fair Drug & Assay Supply Co.
 Fuert Bros. & Co.
 Henry Hill Chem. Co.
Attorneys, Corporation.
 Curtis, Smith.
 McColl & Hamilton.
 Besly, Chas. H., & Co.
 Illinois Sm. & Ref. Co.
Bankers and Brokers.
 Azulay & Co.
 Benson, Wm., & Co.
 Bonbright, W. P. & Co.
 Breitung, E. N.
 Dabney & Parker.
 Dignowity & Co. C. L. Grant, S. & Co.
 Hendrie & Bolthoff Mfg. Co.
 Jeffrey Mfg. Co.
 Link Belt Machinery Co.
 New York Belting & Packing Co., Ltd.
Belt Lacing.
 Bristol Co.
Blasting Caps.
 Metallic Cap Mfg. Co.
Blasting Batteries, Caps and Fuses.
 au, J. B. & Co.
 Macbeth, James & Co.
Boilers, Steam Engines.
 Colorado Iron Wks. Co.
 Davis, F. M., Iron Works Co.
 Denver Eng. Wks. Co.
 Fairbanks, Morse & Co.
 Fraser & Chalmers.
 Lambert's Hoisting Engine Co.
 (See Machinery.)
Brattic Cloth.
 Besly, Chas. H. & Co.
Brick Machinery.
 Freese, E. H., & Co.
Bridges.
 Berlin Iron Bridge Co.
 Gillette-Herzog Mfg. Co.
 (See Machinery.)
Brimstone Apparatus.
 White, Edw. F.
Carbons.
 New York Diamond Drill Co.
 Lexow, Theodor.
Chain and Link Belting (See Belting.)
Chemical Engineers.
 Dunbar, R., & Son.
Chemicals.
 Baker & Adamson.
 Bullock & Crenshaw.
 Elmer & Amend.
 Fair Drug & Assay Supply Co.
 Fuert Bros. & Co.
 Har-son Chem. Co.
Chemical Plumbers.
 Vollmer & Beaton.
Coal.
 Maryland Coal Co.
 Potts, F. A., & Co.
 Sticks, Conyngham & Co.
 Ward & Olyphant.
Coal Cutters (See Machinery.)
 Ingersoll-Sergeant Drill Co.
 Jeffrey Mfg. Co.
 Link Belt Machinery Co.
Coal Washing Machinery.
 Jeffrey Mfg. Co.
Compressed Air Shop Tools.
 Clayton Air Compressor Works.
Compressors.
 Clayton Air Compressor Works.
 Ingersoll-Sergeant Drill Co.
 Laidlaw-Dunn-Gordon Co.
 Newark Iron Works Co.
 Rand Drill Co.
Concentrators, Crushers, Pulverizers, Separators, Etc.
 Allis, Edw. P., & Co.
 Blake, Theo. A.
 Bradley Pulverizer Co.
 Colorado Iron Works Co.
 Davis, F. M., Iron Works Co.
 Denver Eng. Works Co.
 Fraser & Chalmers.
 Fries Vanner Concentrator.
 Gates Iron Works.
 Hendrie & Bolthoff Mfg. Co.
 Krupp, F.
 Link Belt Machinery Co.
 McCully, R.
 Raymond Bros. Impact Pulv. Co.
 Steiman Foundry & Mach. Co.
 Surman, J. L., & Co.
 Walsburn-Swenson Co.
 (See Machinery.)
Contractors.
 (See Machinery.)
Conveying Belts.
 Robbins Conveying Belt Co.
Copper Creators and Producers.
 American Metal Co.
 Arizona Copper Co.
 Atlantic Mining Co.
 Balbach S. & Ref. Co.
 Baltimore Cop. Wks.
 Bath, H., & Son.
 Bridgeport Copper Co.
 Canadian Copper Co.
 Copper Queen Mfg. Co.
 Detroit Cop'r Mfg. Co.

Corrugated Iron.
 Berlin Iron Bridge Co.
Crucibles, Graphite, Etc.
 Baker & Co.
 Denver Fire Clay Co.
 Dixon, Jos. Crucible Co.
 N. Y. Diamond Drill Co.
 Newark Iron Works Co.
 Philadelphia Eng. Wks., Ltd.
 Rand Drill Co.
 (See Diamond Drills.)
Cyanide.
 Fuert Bros. & Co.
 Roessler & Hasslacher Chemical Co.
Cyanide Paste.
 Fuert Bros. & Co.
 Roessler & Hasslacher Chem. Co.
 Williams Mfg. Co.
Diamonds.
 Lexow, Theodor.
Diamond Drills.
 American Diamond Rock Drill Co.
 Bullock Mfg. Co., M. C.
 Lexow, Theodor.
 Sullivan Machinery Co.
 (See Air Compressors and Rock Drills.)
Draughtsmen.
 Young, Wm. B.
Drawing Materials.
 Altender Thec. & Son.
 Besly, Chas. H., & Co.
 Buff & Berger.
 Gurley, W. L. E.
 Keuffel & Esser Co.
 (See Engineering Instruments.)
Dredges.
 Bucyrus Steam Shovel & Dredge Co.
 Lambert's Hoisting Engine Co.
 Marion Steam Shovel Co.
Dryers.
 Brown, Horace F.
 Cummer & Son Co.
Dump Cars.
 Colorado Iron Wks. Co.
 Davis, F. M., Iron Works Co.
 Denver Smk. Works Co.
Educational Institutions.
 Arizona School of Mines.
 Chicago School of Assaying.
 Columbia University.
 Columbian University.
 International Correspondence School.
 Lehigh University.
 Mass. Inst. of Technology.
 Michigan Mining School.
 University of Arizona.
Electrical Batteries.
 Macbeth, James, & Co.
Electrical Machinery and Supplies.
 Besly, Chas. H., & Co.
 Chicago Edison Co.
 Denver Eng. Wks. Co.
 General Electric Co.
 Jeffrey Mfg. Co.
 Lambert's Hoisting Engine Co.
Excavators.
 Brown, Horace F. & Conv.
 Jeffrey Mfg. Co.
 Lambert's Hoisting Engine Co.
 Link Belt Mach. Co.
 Nelsonville Foundry & Machine Co.
 Roberts Mfg. Co.
 Vulcan Iron Works.
Fire-Brick and Clay.
 Chur, Walter.
 Denver Fire Clay Co.
 Standard Fire Brick Co.
Flourishers.
 Fuert Bros. & Co.
Gas Engines.
 Hercules Gas Engine Works.
 Union Gas Engine Co.
 Weber Gas and Gasoline Engine Co.
Gas Works.
 Pollock, Wm. B. & Co.
 Wood, R. D.
Gauges, Recording, etc.
 Bristol Co.
Gearing.
 Besly, Chas. H., & Co.
 Chester Steel Cast. Co.
 Fraser & Chalmers.
 (See Machinery.)
Greases, Graphite, etc.
 Besly, Chas. H., & Co.
 Dixon, Jos., & Co.
Heavy Machinery.
 Colorado Iron Works Co.
 Davis, F. M., Iron Works Co.
 Denver Eng. Works Co.
 Fraser & Chalmers.
Hose, Rubber, Etc.
 New York Belting & Packing Co. Ltd.
Injectors.
 Jenkins Bros.
 Lunkenheimer Co.
Insulated Wires and Cables.
 Okonite Co., Ltd.
Insurance Companies.
 Hartford Steam Boiler Inspect'n and Ins. Co.
 Mutual Life Insurance Co.
Iron Ore.
 Spanish-American Iron Co.
Lead Burners.
 Vollmer & Beaton.

Lead Linings for Chlorination Tubs.
 Raymond Lead Co.
Link Belting. (See Belting)
 Link Belt Machinery Co.
Locomotives.
 Burnham, Williams & Co.
 General Electric Co.
 Hunt, C. W., Co.
 Porter, H. K., & Co.
Lubricators.
 Detroit Lubricator Co.
 Lunkenheimer Co.
Machinery.
Dealers in Mining, Milling and Other Machinery.
 Allis, Edw. P., & Co.
 American Diamond Rock Drill Co.
 Bacon, E. C.
 Besly, Chas. H., & Co.
 Billin, Chas. E. & Co.
 Blake, T. A.
 Brown & Pulverizer Co.
 Bullock, M. C. Mfg. Co.
 Caldwell, H. W., & Co.
 Colorado Iron Works Co.
 Davis, F. M., Iron Works Co.
 Evans & Herzog Mfg. Co.
 Fairbanks, Morse & Co.
 Fraser & Chalmers.
 Gates Iron Works.
 Gillette-Herzog Mfg. Co.
 Hamilton, Mfg. Co.
 Hendrie & Bolthoff Mfg. Co.
 Hodge, C. J.
 Ingersoll-Sergeant Drill Co.
 Jeffrey Mfg. Co.
 Jessop, W., & Sons, Ltd.
 Lambert Hoisting Engine Co.
 Lagerwood Mfg. Co.
 Krupp, F.
 McCully, R.
 Meacham, Ir. Wks.
 Mine & Smelter Supply Co.
Manganese Steel.
 Taylor Iron & Steel Co.
Metal Dealers.
 American Metal Co.
 Am. Zinc-Lead Co.
 Baker & Co.
 Bath, Henry & Son.
 Besly, Chas. H., & Co.
 Bridgeport Copper Co.
 Elliott's Metal Co., Ltd.
 Eureka Co.
 James & Shakspeare
 Johnson, Matthey & Co.
 Lambert's Wharf Co.
 Lawson Bros.
 Matheson Smelting Co.
Metallography Works and Ore Purifiers.
 Fraser & Chalmers.
 Mathiessen & Hegeler Zinc Co.
 Montana Ore Purchasing Co.
 Orford Copper Co.
 Pass, C., & Son, Ltd.
 Phelps, Dodge & Co.
 Picher Lead Co.
 Raymond Lead Co.
 Spanish-American Iron Co.
 Stern, Julius & Co.
 Tod, William, & Co.
 Vivian, Ynger & Bond.
Metallography Works and Ore Purifiers.
 Fraser & Chalmers.
 Mathiessen & Hegeler Zinc Co.
 Montana Ore Purchasing Co.
 Orford Copper Co.
 Pass, C., & Son, Ltd.
 Phelps, Dodge & Co.
 Picher Lead Co.
 Raymond Lead Co.
 Spanish-American Iron Co.
 Stern, Julius & Co.
 Tod, William, & Co.
 Vivian, Ynger & Bond.
Mine Cars.
 Colorado Iron Works Co.
 Denver Eng. Wks. Co.
 Fairbanks, Morse & Co. Co.
 Gillette & Herzog Mfg. Co.
 Hendrie & Bolthoff Mfg. Co.
 Hunt, C. W., Co.
 Nelsonville Foundry & Machine Co.
 (See Machinery.)
Mine, Mill and Smelters' Supplies.
 Besly, Chas. H., & Co.
 Denver Eng. Wks. Co.
 Denver Iron Works.
 Lambert's Hoisting Engine Co.
 Lambert & Hasslacher Chemical Co.
 (See Machinery.)
Mining and Land Transactions.
 American Dev. & Mfg. Co.
 Detroit Copper Mfg. Co.
 Eureka Co.
 Isabella Gold Mfg. Co.
 Smuggler-Union Mfg. Co.
Nickel.
 Canadian Copper Co.
 Orford Copper Co.
Ore Cars.
 Colorado Iron Works Co.
 Gillett & Herzog Mfg. Co.
Ore Crushers.
 Brown, Horace F.
 Colorado Iron Works Co.
 Cummer & Son Co.
 Dunbar, R., & Son.
Ore Feeding Works.
 Colorado Iron Works Co.
 Hunt, C. W., & Co.
 Montana Ore Purchasing Co.
 Orford Copper Co.
 Lehigh & Co.
Packing and Pipe Coverings.
 Brandt, Randolph.
 Jenkins Bros.
 Robertson, J. L., & Son.
 Fraser & Chalmers.
 Harrington & King Perforating Co.
Peroxide of Sodium.
 Roessler & Hasslacher Chemical Co.
Phosphor-Bronze.
 Phosphor-Bronze Smelting Co.
Pile Drivers.
 Bucyrus Steam Shovel and Dredge Co.
 Ingersoll-Sergeant Drill Co.
 Lambert's Hoisting Engine Co.
 Billin, Chas. E. & Co.
 Fairbanks, Morse & Co.
 Evans & Herzog Mfg. Co.
 Porter, H. K., & Co.
Platinum.
 Baker & Co.
 Johnson, Matthey & Co.
Plumbage (See Graphite.)
 Atlantic Dynamite Co.
 Ingersoll-Sergeant Drill Co.
 U. S. Trade Review
 U. S. Code
 Mining Investor.
 Mining Journal.
 Scientific Pub. Co.
 So. African Mfg. Jour.
 Zeitschrift für Praktische Geologie

Pumps.
 Billin, Chas. E. & Co.
 Cameron, A. S., Steam Pump Works.
 Clayton Air Com. Wks.
 Denver Eng. Wks. Co.
 Fairbanks, Morse & Co.
Pyrites.
 Fuert Bros. & Co.
Quarrying Machines.
 Ingersoll-Sergeant Drill Co.
 Rand Drill Co.
 Sullivan Machinery Co.
Quicksilver.
 Sungs Co.
Railroads.
 Atchison, Topeka & Santa Fe Ry.
 Chicago & N. West. R. R.
 C. B. & Quincy R. R.
 C. C. & St. L.
 Denver & Rio Grande R. R.
 Denver, Leadville & Gunnison Ry.
 Florence & Cripple Creek R. R.
 Illinois Central R. R.
 Richard H. & Co. of Kentucky.
 Rio Grande Southern R. R.
 Southern R. R.
 U. P. D. & G. H. R.
Railroad Supplies and Equipment.
 Burnham, Williams & Co.
 Hunt, C. W., Co.
 Porter, H. K., & Co.
Regulators, Dampers, Heat, Etc.
 Eddy Valve Co.
 Jenkins Bros.
Rock Drills. (See Air Compressors.)
Roofing.
 Berlin Iron Bridge Co.
 Phelps, Dodge & Co.
Rubber Goods.
 New York Belting & Packing Co., Ltd.
Scales.
 Fairbanks, Morse & Co.
Screens.
 Alcolon, H., Perf. Metal Co.
 Colorado Iron Works Co.
 Denver Eng. Wks. Co.
 Fraser & Chalmers.
 Gates Iron Works.
 Harrington & King Perforating Co.
 Link Belt Machinery Co.
 Ludlow Saylor Wire Co. (See Machinery)
 Tyler, W. S., Wire Works Co.
Second Hand Machinery.
 McArthur Bros.
 Robertson, J. L., & Son.
 Chester Steel Cast. Co.
 Corum Steel Works Co.
 Colorado Iron Works Co.
Shovels (Steam).
 Bucyrus Co.
 Marion Steam Shovel Co.
Smelting and Refining Works.
 Balbach S. & Ref. Co.
 Baltimore Cop'r Wks.
 Bridgeport Copper Co.
 Con. Kas. City S. & R. Co.
 Elliott's Metal Co., Ltd.
 Gillette-Herzog Mfg. Co.
 Matheson Smelting Co.
 State Ore Smelting Co.
Steam Pipe Castings.
 Wycokoff, A., & Son.
Steel Rails, Castings, Rails, Drill Steel.
 Bethlehem Iron Co.
 Chester Steel Cast. Co.
 Jessop Wm. & Son.
 Crescent Steel Co.
 (See Metal Dealers.)
Sulphur Apparatus.
 White, Edward F.
Tanks.
 Billin, Chas. E. & Co.
 Colorado Iron Works Co.
 Denver Eng. Wks. Co.
 Fairbanks, Morse & Co.
 Gates Iron Works.
 Williams Mfg. Co.
Telegraph Wires and Cables.
 Okonite Co., Ltd.
Telephones.
 Stenberg-Carlson Tel. Mfg. Co.
Tests.
 Besly, Chas. H., & Co.
 Pratt & Whitney Co.
Tubes.
 Besly, Chas. H., & Co.
 Williams Bros.
Turkey-Rubber.
 New York Belting and Packing Co. Ltd.
Turbine Water-Wheels.
 American Impulse Wheel Co.
 Leffel, Jas., & Co.
 Pelton Water Wheel Co.
 Stillwell-Bierce & Smith Valle Co.
Valves.
 Eddy Valve Co.
 Fairbanks Morse, & Co.
 Jenkins Bros.
 Lunkenheimer Co.
 Powell, Wm., Co.
Ventilators.
 Bullock, M. C. Mfg. Co. | Tod, Wm., & Co.
 Fraser & Chalmers.
Volcanic.
 Weston Electrical Instrument Co.
Vulcanite Smery Wheels.
 New York Belting and Packing Co. Ltd.
Water-Wheels.
 American Impulse Wheel Co.
 Leffel, Jas., & Co.
 Pelton Water Wheel Co.
 Stillwell-Bierce & Smith Valle Co.
Well Drilling Machinery.
 Sullivan Mach'y Co. | Williams Bros.
Wharfage.
 Lambert's Wharfage Co.
Wheels, Car.
 Chester Steel Cast. Co.
 Taylor Iron & Steel Co.
Wire Cables.
 Alcolon, H., Perf. Metal Co.
 Harrington & King Perforating Co.
 Tyler, W. S., Wire Works Co.
Windmills.
 Fairbanks, Morse & Co.
Wire Ropes and Wire.
 Besly, Chas. H., & Co. | Phelps, Dodge & Co.
 Broderick & Bascom | R'bing, J. A. Sons & O
 Rope Co. | Ropeway Syndicate
 California Wire Wks. | Trenton Iron Co.
 Cooper Hewitt & Co.
 Hunt, C. W., Co.
Wire Rope Tramway.
 Brown, Horace F. & Conv.
 Macbeth, James & Co.
 Colorado Iron Works Co.
 Colorado Iron Works Co.
 Denver Eng. Wks. Co.
 Fraser & Chalmers.
Wood Water Pipe.
 Wycokoff, A., & Son.

POSITIONS VACANT

Free Advertising.

Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE, whether subscribers or not.

The labor and expense involved in ascertaining what positions are open, in gratuitously advertising them and in attending to the correspondence of applicants, are incurred in the interest and for the exclusive benefit of subscribers to the ENGINEERING AND MINING JOURNAL.

Applicants should inclose the necessary postage to insure the forwarding of their letters.

1541 WANTED—CONTRACTOR'S FOREMAN on work within 100 miles of New York. One thoroughly experienced and familiar with all the latest methods of working rock drills, blasting and using steam shovels and railroad track work. Send copy of references and state salary required. Address H., ENGINEERING AND MINING JOURNAL.

1542 WANTED—STEAM DRILL REPAIR man to take charge of all repairs on fifteen Sergeant drills. Send copy of references and state salary wanted. Address L., ENGINEERING AND MINING JOURNAL.

1544 MEN WANTED FOR BRITISH Guiana, familiar with diamond drills. Address, stating experience and references, X. Y., ENGINEERING AND MINING JOURNAL.

1545 WANTED—SUPERINTENDENT FOR Sulphuric Acid Works. Give particulars. Address ACID, ENGINEERING AND MINING JOURNAL.

1546 WANTED—CHEMIST AND METALLURGIST with special experience in working zinc ores, as well as erection and management of plant for that purpose. State previous experience. Address ZINC, ENGINEERING AND MINING JOURNAL.

1547 WANTED—A THOROUGHLY COMPETENT mining engineer, who has had experience in Alaska, and desires to join an exploring expedition that will start for the Yukon on March 1st, 1897. Address ALASKA ENGINEERING AND MINING JOURNAL.

1548 THERE IS A VACANCY ON THE staff of the ENGINEERING AND MINING JOURNAL. Applicants should have had experience in mining and in editorial work. Address EDITOR, ENGINEERING AND MINING JOURNAL.

1549 WANTED—A COMPETENT ENGINEER to take charge of the construction of a railroad, where a permanent situation may be secured, if references, work and business connections are satisfactory. Address RAILROAD AND MINE, ENGINEERING AND MINING JOURNAL.

1550 ACID MAKER WANTED BY A large Southern fertilizer factory located in South Carolina. Applicants must be sober, reliable, with good ability to handle labor, burn lead and obtain best yield sulphuric acid. Address, stating family, salary expected and references, B. F., ENGINEERING AND MINING JOURNAL.

1551 WANTED—A THOROUGHLY PRACTICAL and competent mining engineer; one who understands assaying and surveying; must have a practical knowledge of placer mining; to go with large prospecting party to Alaska next March. Best of references required. Address G. No. 26, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

Advertisements for SITUATIONS WANTED will be charged only 10 cents a line.

A MINING ENGINEER, AGE 26, DESIRES position; has energy, executive ability, experience in management and direction of large forces of men and familiar with business methods. Thorough assayer, chemist and bookkeeper. Address THOROUGH, ENGINEERING AND MINING JOURNAL, No. 15,094, Nov. 6.

HAVE 20 YEARS' EXPERIENCE IN MINING and treating gold and silver ores; technical education; American, and familiar with Spanish and German; desire position as superintendent, manager or assistant, and will make examinations in the U. S. or Spanish-America; London and American references. Address J. L. P., care Geo. Bond, 433 Drexel Building, Philadelphia, Pa. No. 18,113, Oct. 23.

COMPETENT MAN DESIRES POSITION AS foreman or assistant superintendent; 16 years' experience on California and Alaska ores; amalgamating, concentrating and assaying; references. Address E. NEWBE G, Mills College, California. No. 18,112, Nov. 6.

A MINING ENGINEER, ENERGETIC, TECHNICAL education, experienced in the management of men, 10 years' practice in charge of mines, desires position as manager or superintendent; speaks Spanish; excellent references. Address FILON, ENGINEERING AND MINING JOURNAL, No. 18,097, Nov. 6.

WANTED—POSITION AS MANAGER OR Superintendent by a mining and metallurgical engineer with technical education and 16 years' experience in Colorado. Specialty—Fine concentration. Highest references. Address G. S. A., ENGINEERING AND MINING JOURNAL, No. 18,107, Oct. 23.

MANAGER OR MINE SUPERINTENDENT of extended experience, just returned after two years of successful operating in Central America, desires position with a strong company, either in prospect development or in established mining. Is a good organizer and fully posted as to details in mining both in the Northern countries and in the tropics. Best of testimonials and references. Address EXPERIENCED, ENGINEERING AND MINING JOURNAL, No. 18,108, Nov. 20.

WANTED—POSITION AS ASSAYER OR mill man; eight years' experience; first-class references; is fair draughtsman; understands amalgamation and concentration; will go anywhere; would take charge of small mill and do the assaying. Address WADE, ENGINEERING AND MINING JOURNAL, No. 18,109, Nov. 27.

WANTED—POSITION AS MANAGER OR Superintendent of Mine by a mining and metallurgical engineer of 18 years' experience, graduate of technical college; Rocky Mountain region preferred. Address W. M. C., ENGINEERING AND MINING JOURNAL, No. 18,116, Oct. 30.

A MINING ENGINEER WITH A SUCCESSFUL record is open to an engagement as superintendent and manager; in the prime of life; full references given; can organize and manage men, and is thoroughly posted in designing and operating machinery and in all construction. Address "RECORD," ENGINEERING AND MINING JOURNAL, No. 18,117, Oct. 30.

WANTED—POSITION AS SUPERINTENDENT or assistant of chemical works by chemist having several years' practical experience in the manufacture of commercial acids, etc. Address EXECUTIVE, ENGINEERING AND MINING JOURNAL, No. 18,119, Nov. 13.

MINING ENGINEER, THOROUGHLY practical with all modern methods of treatment in complex ores, and the economical and best practice of underground work, who can equip to the best advantage prospects where the initial outlay must necessarily be limited and show results (if any profit possible), offers his services to such concerns, or to those where the management is unsatisfactory, or to owners, bondholders or others who are interested in mines that are closed down without sufficient definite reason, or from lack of practically qualified or technical knowledge, mismanagement, or suspended prior to the introduction of modern mechanical and scientific improvements in methods which now render some such mines economical business propositions. By good direction mines which were worked by obsolete methods can be made to pay. Excellent bank and other references; 12 years manager in Colorado, Montana, Mexico, Arizona and California. Surveyor, Assayer and thorough knowledge of all the essentials of economic mine management. Address MINE MANAGER, ENGINEERING AND MINING JOURNAL, No. 18,120, Oct. 23.

A MINING ENGINEER, FAMILIAR WITH most Western mining camps, including British Columbia, their production and facilities, also with the large copper, lead carbonate and concentrating centres of the Southwest and Central and South America, wants position as ore buyer with reliable smelting and refining concern. Address SILICA, ENGINEERING AND MINING JOURNAL, No. 18,121, Oct. 23.

A MINE MANAGER OF EXTENSIVE PRACTICAL knowledge in gold, silver and copper mining and milling, wants similar position. Is a first-class "all round" man. Last position, manager for well-known New York concern operating active paying gold mine in Montana. Salary not less than \$400 per month. Speaks Spanish, Venezuela, Honduras or the Western States preferred. Can erect and run furnaces or wet and dry plants and cyanide mills. Address D. M., ENGINEERING AND MINING JOURNAL, No. 18,122, Oct. 23.

\$7,800 GIVEN AWAY TO PERSONS making the greatest number of words out of the phrase "Patent Attorney Wedgerburn." For full particulars writhe the National Recorder, Washington, D. C., for sample copy containing same.

CONTRACTS OPEN.

WATER-WORKS.—Sealed proposals will be received by the Mayor and Alderman of Statesville, N. C., until 2 p. m., Friday, October 29th, 1897, for constructing a system of water-works, and for furnishing the materials for the same. Plans and specifications will be on file, and may be seen at the office of the Mayor, and copies of specifications, forms, etc., may be obtained from the Mayor after October 1st, 1897. The right is reserved to reject any or all bids.

ELECTRIC LIGHT.—Sealed bids will be received at the City Hall, in Somerset, Ky., until 10 a. m., on December 13th, 1897, to light the streets of said city by means of electricity, and to furnish commercial lights by electricity to the citizens thereof. Said bids will be awarded to the highest and best bidder, the right to reject any and all bids being reserved. Full information can be had by application to the Mayor or City Clerk.

TOBIN BRONZE.—Sealed proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock m., October 26th, 1897, and publicly opened immediately thereafter, to furnish at the New York Navy Yard a quantity of cleaning paste, putty, litharge, wood filler, Tobin bronze, sheet lead, cotton waste, lamp wick, copper tubes, brass grommets, fire clay, bag duck, cotton braid, tinned corned beef and rice. Blank proposals will be furnished upon application to the Navy Pay Office, New York. EDWIN STEWART, Paymaster-General, U. S. N.

DAM AND RESERVOIR.—Sealed proposals for building an intake dam and gate house and a distributing reservoir will be received by the Water Commissioners at the Town Hall, Westfield, Mass., until 12 o'clock noon, October 27th, 1897. Each bid must be accompanied by a certified check for five hundred dollars (\$500) payable to the Board of Water Commissioners of the town of Westfield, as a guarantee of good faith, in the usual manner. Plans can be seen and blank forms of specifications, contract and proposals obtained at the office of Town Engineer, Town Hall, Westfield, Mass. The Water Commissioners reserve the right to reject any and all bids.

SEWER SYSTEM.—Sealed proposals will be received by the Board of Sewer Commissioners of the village of Tottenville, Richmond County, New York, until 3 p. m., Monday, October 25, 1897, and then publicly opened, for a sewer system for said village. Bids will be received for the whole system complete. Approximation of quantities: 21,500 lin. ft. 8-in. pipe sewer, average cut 11 ft.; 3,330 lin. ft. 10-in. pipe sewer, average cut 11 ft.; 1,160 lin. ft. 12-in. pipe sewer, average cut 11 ft.; 380 lin. ft. 15-in. pipe sewer, average cut 7 ft.; 120 lin. ft. 16-in. cast-iron pipe, tarred and coated; 120 lin. ft. 12-in. cast-iron pipe, tarred and coated; 150 lin. ft. 10-in. cast-iron pipe, tarred and coated; 124 brick manholes, 22 flush tanks, Miller special design (6-in. siphons), 4 lampboles. Plans and specifications may be seen at the office of the Clerk of the Board of Sewer Commissioners of the village of Tottenville, New York. Commissioners reserve the right to reject any and all bids.

PUMPING ENGINE.—Proposals will be received at once by the Paducah Water Company, of Paducah, Ky., for furnishing one 4,000,000-gal. vertical compound pumping engine. PADUCAH WATER COMPANY.

(Continued on Page 21.)

THE ENGINEERING AND MINING JOURNAL

ADVERTISING RATES. (NONPAREIL MEASUREMENT.)

Table with columns for Lines, Inches, Regular Edition, One Month, Three Months, Six Months, Nine Months, Twelve Months. Includes rates for 1/2 Column, 1/4 Column, 1/8 Page, 1/16 Page, and Full Page.

ADVERTISING RATES IN £ s. d.

Table with columns for PER INSERTION, Series of 13, Series of 26, Series of 52. Includes rates for HALF-INCH, ONE INCH, TWO INCHES, THREE INCHES, FOUR INCHES, QUARTER-PAGE, HALF-PAGE, ONE PAGE.

SPECIAL POSITIONS.

Front page, double regular rates. Back outside page, 80 per cent. above regular rates. Page facing editorials, 50 per cent. above regular rates. Page facing market reports, 25 per cent. above rates. Inside front cover, 50 per cent. above regular rates. Inside back cover, 25 per cent. above regular rates.

LANDS AND MINES FOR SALE.

J. F. CROSETT,
Secretary, Gold Mining Exchange,
No. 628 Sacramento Street, San Francisco, Cal.
GOLD MINES FOR SALE.
On Pacific Coast. Correspondence solicited.

**KLONDIKE IN MISSOURI.
LEAD MINES.**

For particulars on gilt-edge properties for sale or lease
Address **E. HEDBURG, M. E.,**
Joplin, Mo.

FOR LEASE.

On reasonable terms, two patented mining claims at
Leadville, Colo., adjoining several of the largest pro-
ducers of the camp. Two thousand feet on shafts and
drifts. Plant on mine complete in good order and prop-
erties now in operation. Address OWNER, P. O. Box
12, Leadville, Colo.

**FINE COPPER PROPERTY
FOR SALE.**

Lode, 150 feet wide; Shaft, 104 feet; Drifts, 110 feet;
all in ore. 12,000 tons in sight. Average assay, 8 per
cent. copper, 31 gold, 10 ozs. silver. Lime and porphyry
contact. Claims 9,000 feet on lode, 600 feet wide.
Situated in Nevada, nine miles from railroad. Paying
flux and water power at hand. Shipping ore 24 per
cent., \$5 gold, 20 ozs. silver. Address NEVADA,
ENGINEERING AND MINING JOURNAL.

FOR SALE.

One of the finest Gold Properties in Virginia.
Average assay over \$18.00 per ton. Tract, 763
acres. Three veins. Title good.
L. W. ZERR,
Morrisville, Virginia.

DIVIDENDS

SABELLA GOLD MINING COMPANY.
COLORADO SPRINGS, CO., June 10, 1897.
DIVIDEND NO. 11.
A dividend of ONE-HALF CENT PER SHARE
(\$11,250) has been declared, payable June 25th, 1897, to
stockholders of record June 15th, 1897.
The stock transfer books will be closed June 15th,
1897, at 3 o'clock p. m., and will be reopened on the
morning of June 25th, 1897.
PERCY HAGERMAN,
Vice-President and Treasurer.

SMUGGLER-UNION MINING CO.,

804 Boston Building, Denver Colo.
Mines at Telluride, San Miguel Co., Colorado.
DIRECTORS:
J. A. Porter, President; Richard Pearce, V.-Pres.;
James B. Grant, A. Eilers, Wm. A. Bell,
Wm. D. Bishop, Jr.,
A. H. Fowler, Sec'y & Treas.

**THE
MINERAL
INDUSTRY.**

Its Statistics,
Technology
and Trade

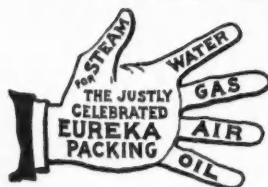
in the United States
and other Countries

VOL. V.

Edited by
RICHARD P. ROTHWELL.

For Further Particulars See Page 2.
PRICE \$5.00.

SCIENTIFIC PUBLISHING CO.
253 Broadway, New York.



ONCE TRIED,
ALWAYS USED.
TRY IT.
For Other Goods:
Indicators,
Separators,
Pneumatics,
Heaters.
Send for Catalogue.
**JAS. L. ROBERTSON
& SON,**
204 Fulton St., N. Y.
12 Pearl St., Boston

**MACHINERY AND SUPPLIES
FOR SALE.**

MACHINERY

FOR SALE—CHEAP FOR CASH.
Hoisting Engines, Air Compressors, Rock Drills,
Rock Crushers, Dump Cars, Chauling Machines,
Steam Pumps, Steam Shovels, Light Locomotives,
etc., all in good condition.
WILLIS SHAW,
506 N. Y. Life Building, CHICAGO.

FOR SALE.

One 50-ton Silver-Lead Water Jacket Furnace, Boiler,
Engine, Blower, Rock Breaker, Scales, Shafting, Pul-
leys, Belting, Tools and all fittings and fixtures com-
plete and new, built by Fraser & Chalmers; also one
16" x 42" Hamilton Corliss Engine; one 12" x 20" double
cylinder Hoisting Engine. Will be delivered f. o. b.
W. E. DAME, Cerrillos, N. Mex.

MISCELLANEOUS WANTS.

SECOND-HAND RAILS.

If you have any Rails which are in good
condition to relay—or if only good to be
used as scrap—write us we buy both
kinds.

ROBINSON & ORR,
No. 419 Wood Street, Pittsburgh, Pa.

**JULIUS STERN & CO., NURENBERG, GERMANY,
METAL MERCHANTS.**

Want Agency for Pig Lead, Copper and Aluminium.
References: Ladenburg, Thalman & Co., New York.

CHEMISTS WANTED.

Applications for three positions will be received.
Address
CIVIL SERVICE COMMISSION,
City Hall, Brooklyn, N. Y.

CONTRACTS OPEN.

Continued from Page 20.

DREDGING—U. S. Engineer Office, 905½ East
Main St., Richmond, Va. Sealed proposals for deepening
and widening channel of James River, Va., and for
constructing, repairing and revetment of windmills will
be received here until 12 m., October 27th, 1897, and then
publicly opened. Information furnished on application
here to H. D. Whitcomb. **CHAS. J. ALLEN, Lt. Col.
Engrs.**

SEWERAGE SYSTEM—Sealed proposals for
constructing a complete system of sewerage in the City
of Savannah, Ga., will be received by the Committee
on Drainage until 12 o'clock noon, Eastern time, Nov-
ember 15th, 1897. The right to reject any or all bids is
reserved. The work will consist approximately of
forty miles of pipe sewers with all necessary appurte-
ances. Complete plans and specifications are now in
course of preparation, and will be ready for inspection
by contractors proposing to bid for the work, at 12
o'clock noon, Eastern time, November 1st, 1897, at the
office of the City Engineer, Savannah, Ga. Address
**COMMITTEE ON DRAINAGE, Care of Clerk of
Council, Savannah, Ga.**

SUBWAY—Sealed bids for building Section 11
of the subway will be received at the office of the Com-
mission, 20 Beacon street, Boston, Mass., till 12 o'clock
M., of Thursday, October 28th, 1897. Each bid must be
accompanied by a certified check for the sum of \$2,500.
The section is under and near the site of the old Boston
& Maine Station at Haymarket Square. A portion of
the subway will be an open incline with concrete and
granite side walls, and the remaining portion will be
covered. The covered structure will consist of a com-
bination of steel and masonry. Some of the items are
estimated to be as follows: 14,000 cu. yds. earth exca-
vation; 210 tons iron and steel, furnished by Commis-
sion, to be set in place; 6,000 cu. yds. concrete, stone
and brick masonry; 22,000 lin. ft. of piles in place.
Plans can be seen and specifications and forms of con-
tract can be obtained at 20 Beacon street, fifth floor. A
bond will be required for the faithful performance of
the contract in a sum of 20% of the amount. The Com-
mission reserves the right to reject any and all bids and
reserves the right to award the contract as it deems for
the best interest of the city of Boston.

PUMPING MACHINERY—Sealed proposals
will be received at the office of the Commissioners of
Water-Works of the City of Cincinnati, O., until 12
o'clock noon of Tuesday, November 30th, 1897, for the
construction, delivery and erection of three self-con-
tained vertical triple-expansion crank-and-fly-wheel
pumping engines, each of thirty million (30,000,000) U. S.
gals. capacity in 24 hours, and boilers adequate in
capacity for the operation of the three engines, in ac-
cordance with plans and specifications on file in the
office of the Chief Engineer of the Commissioners of
Water-Works. The same to be paid for as stipulated
in the form of contract for the performance of the
above work, and which form of contract is on file in the
office of the Commissioners of Water-Works. Copies
of the specifications, form of proposal, forms of bonds
and form of contract can be procured by application to
the Chief Engineer. Proposals must be accompanied
by general plans and specifications sufficient to
fully and distinctly show and describe the proposed
pumping machinery, boilers and their connections, as
required by the specifications. Bidders must enclose
their bids in sealed envelopes, and deposit the same
with the Clerk of the Commissioners of Water-Works,
before Tuesday, the 30th day of November, 1897, at 12
o'clock, m., and such sealed envelopes must have en-
dorsed thereon the nature of the bid and the name and
address of the bidder. Each bid shall be accompanied
with a bond in the sum of \$10,000, signed by two sure-
ties, for acceptance of the contract, if awarded by the
Commissioners of Water-Works; or the bidder may de-
posit with the Commissioners of Water-Works, in lieu
of such bond, a certified check or bank certificate of de-
posit, payable to the order of the Commissioners of
Water-Works, or cash equal in amount to the bond as
above required. Bidders must furnish satisfactory
evidence of their ability to build the class of engines
required. Bidders must use the printed forms, as none
other will be received. The Commissioners of Water-
Works reserve the right to reject any and all bids.

SEWERS—Sealed proposals will be received by
the Board of Public Works of the city of St. Joseph,
Mich., until 2 p. m., November 9th, 1897, for the con-
struction of about eleven thousand (11,000) lineal feet of
sewer. Plans and specifications can be seen at the of-
fice of the city clerk of St. Joseph, Mich., or at the office
of the consulting engineer, A. V. Powell, Room 615
Chamber of Commerce, Chicago, Ill.

LOCKS—U. S. Engineers Office, Custom House,
Cincinnati, O.—Sealed proposals for building locks
numbered two, three, four and five, Ohio River, will be
received here until 2 p. m., October 28th, 1897, and then
publicly opened. Information furnished on application
to Mr. WILLIAM MARTIN, Davis Island Dam (P. O.
Box 670, Pittsburg, Pa.) or to W. H. HEUER, Maj.
Engrs.

MACADAMIZING—Sealed bids or proposals
will be received at the Court House, in Somerville,
N. J., on Wednesday, November 17th, 1897, at 11 a. m.,
for macadamizing two roads in Somerset County, N. J.
For details apply to **JOSHUA DOUGHTY JR., County
Engineer.**

SUBWAYS—Sealed bids for building Section
11 of the subway will be received at the office of the
commission, 20 Beacon street, Boston, Mass., till 12
o'clock, m., of Thursday, October 28th, 1897. Each bid
must be accompanied by a certified check for the sum
of \$2,500. The section is under and near the site of
the old Boston & Maine Station, at Haymarket Square.
A portion of the subway will be an open incline with
concrete and granite side walls, and the remaining
portion will be covered. The covered structure will
consist of a combination of steel and masonry. Some
of the items are estimated to be as follows: 14,000 cubic
yards earth excavation; 210 tons iron and steel,
furnished by Commission, to be set in place; 6,000 cubic
yards concrete, stone and brick masonry; 22,000 lin. ft.
of piles in place. Plans can be seen and specifications
and forms of contract can be obtained at 20 Beacon
street, fifth floor. A bond will be required for the
faithful performance of the contract in a sum of 20%
of the amount. The Commission reserves the right
to reject any and all bids and reserves the right
to award the contract as it deems for the best interest
of the City of Boston.



If you visit New
York City, call at
the headquarters
of the Mining
Industry—at the
office of the Engineering and
Mining Journal, 253 Broad-
way, New York—you will find
your home paper on file there.

THE AMERICAN EXPLORATION COMPANY

32 LIBERTY STREET, NEW YORK CITY.

W. H. NICHOLS, Pres.

S. H. STEELE, Sec'y and Treas.

Reliable Examinations and Reports Made on All Kinds of Mining Properties

Address correspondence to W. H. NICHOLS, JR., Managing Director.

FRED. F. HUNT,
77 Pine St., New York,
ANALYST AND ASSAYER.
Weighing, Sampling and Assaying of Ores, Mattes,
Lead Bullion and all Mineral Products.

STUDENTS

Instruction in Assaying, Chemistry and
Mineralogy for Business Men.
SIMONDS & WAINWRIGHT,
CHEMICAL & MINING ENGINEERS & ANALYSTS.
Laboratories, 20 Platt St. (cor. of Gold), New York.
Assays, Analyses, Experimental Research and Consultation.

NICKEL

GRAIN—for Anodes, German-
Silver and Steel.

THE CANADIAN COPPER CO.,
201 Perry-Payne Bldg., Cleveland, O.

LAMBERT'S WHARFAGE CO.,

Prince of Wales Dock, SWANSEA.
Ores, Mattes, Regulus and Bars Received and
Prepared for Market.
Copper, Lead, Tin, Spelter and Pig Iron Received
Weighed and Sampled and Warrants
issued against same.
N. B.—Warrants are on the Accepted List of the London
Metal Exchange.
Regular lines of Steamers from America, Europe, etc.
Consign Goods to Lambert's Cranes,
Prince of Wales Dock, Swansea.

The Mountain Copper Co.,

LIMITED,
PRODUCERS OF
ELECTROLYTIC COPPER,
Wire Bars, Cakes or Ingots.
M. C. C. BRAND.
MINES: KESWICK, CAL. SMELTING WORKS: ELIZABETH, N. J.
SAUNDERS, FIELDING & BOND, Agents,
66 Beaver Street, New York.

THE AMERICAN METAL CO.

LIMITED,
50 Wall Street (P. O. Box 957), NEW YORK.
Security Building, ST. LOUIS, MO.
COPPER, COPPER ORES AND MATTES, TIN, LEAD,
SPELTER, ANTIMONY, NICKEL, ALUMINUM.
ADVANCES MADE ON CONSIGNMENTS.
Agents for Henry E. Merton & Co., London, Birmingham
Manchester and Glasgow; Metallgesellschaft, Frankfurt-on-
Main; Williams, Foster & Co., Ltd., Swansea, Eng.; Societe
le Nickel, Paris, France; Balbach Smelting & Refining Co.,
Newark, N. J.

The Orford Copper Co., COPPER AND NICKEL.

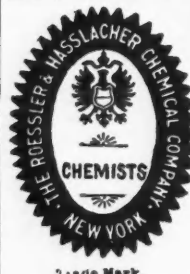
Copper Ore, Matte or Bullion purchased. Advances
made on consignments for refining and sale.
Specialty made of Silver-bearing Ores and
Matte and Nickel Ores and Matte.
Sell INGOT AND CAKE COPPER and Wire
Bars, Malleable Nickel, Shot, -lates, Ingots,
Bars, Sheets, Wire. Best quality for Anodes, Ger-
man Silver and Nickel-Steel.
President, ROBERT M. THOMPSON.
Office: 37 and 39 Wall Street, New York.

THE BRIDGEPORT COPPER CO.

BRIDGEPORT, CONN.
Refiners of Copper. . . .
Argentiferous Material treated
on favorable terms.
Advances Made on Consignments . . .

W. F. ROBERTSON,

27 THAMES ST., Cor. Greenwich St., NEW YORK,
**Mining Engineer,
Metallurgist and Assayer**
Ores, Mattes, Lead Bullion, and all Furnace
Products Sampled and Assayed.



CYANIDE

PEROXIDE OF
SODIUM
And all other Mining Chemi-
cals.
The Roessler & Hasslacher
Chemical Co.,
100 WILLIAM ST., NEW YORK

LEDOUX & CO.,

9 Cliff Street, New York.
Assayers and Engineers.

ORES, BARS, BULLION AND ALL FURNACE
PRODUCTS SAMPLED AND ASSAYED.
Public Ore Yards and Sampling Works.
ADVANCES OBTAINED ON CONSIGNMENTS. PRINCIPAL
BANKS AND METAL BUYERS ACCEPT OUR
CERTIFICATES AS FINAL.
ASSAYERS BY APPOINTMENT TO NEW
YORK METAL EXCHANGE.

RICKETTS & BANKS,

104 JOHN ST., NEW YORK.
ORES TESTED.

Complete Ore Milling and Testing Works
for making practical working tests of ores to determine
the Best Method of Treatment. Milling, Metal-
lurgical and Chemical Processes investigated.

ASSAYS AND ANALYSES.

Assayers by appointment to New York Metal Exchange.

JAMES & SHAKSPEARE,

ENGLAND.
1 Metal Exchange Buildings, London, E. C.,
AND
17 Irwell Chambers West, Liverpool, Eng.

METALS, MATTES AND MINERALS.

Cable Address, METALLURGY, LONDON.
Use A B C, Bedford McNeill, or Lieber's Code.

HENRY BATH & SON,

London, Liverpool and Swansea,
BROKERS.

All Description of
Metals, Mattes, Etc.
Warehouses, Liverpool and Swansea.
Warrants Issued under their Special Act of
Parliament.

NITRATE OF SODA.
Cable Address: - BATHOTA, LONDON.

VIVIAN, YOUNGER & BOND,

117 Leadenhall St., London, E. C.

Copper, Tin, Lead, Spelter, Antimony, Silver
Bullion and all kinds of metals.
Best terms for Copper Mattes, Lead and Silver
Ores, Silver-Lead Bullion, Etc., Etc.
Tinplates, Galvanized Iron, Railway Material,
Etc., Etc.

Cable Address: "BOND," London.
Telegraph Codes Used: Bedford McNeill's
A B C 4th Edition, Moreing & Neal's.

BALTIMORE COPPER SMELTING AND ROLLING COMPANY

(The Baltimore Copper Works)
Office: KEYSER BUILDING,
BALTIMORE, MD.
Ingot Copper. Sheet Copper.

LEWISOHN BROTHERS,

P. O. Box 1247. 81 and 83 FULTON STREET, NEW YORK.
Advances made on Copper, Matte and Ores.
Agents for the following Mining Companies: Boston & Montana C. C. & S. Mining Co.
Old Dominion Copper Mining & Smelting Co.; Arizona Copper Co., Ltd.; Tamarack
Mining Co.; Osceola Consolidated Mining Co.; Butte & Boston Mining Co.; Kearsarge
Mining Co.; Tamarack Junior Mining Co.

FIRST QUALITY IN ALL LINES.

STEAM { ENGINES,
HOISTS,
PUMPS,
BOILERS. } **GASOLINE** { ENGINES,
HOISTS,
PUMPING PLANTS. }

FAIRBANKS STANDARD SCALES.

Mining and Dump Cars, Patent Pressed Steel Wheels,
Windmills, Tanks, Pipe, Valves, Etc.

FAIRBANKS, MORSE & CO.,

Chicago, St. Paul, Minneapolis, St. Louis, Kansas City, Denver,
Omaha, Indianapolis, Louisville, Cincinnati, Cleveland,
San Francisco, Los Angeles, Portland, Ore.

HIGH GRADE HOISTING ENGINES AND DRUMS.

We have some of the heaviest plants in the world in Iron, Copper and Silver Districts of United States.
OUR CORLISS ENGINES ARE DESIGNED EXPRESSLY FOR HOISTS.

Cable Address: "BULLOCK"

OTHER SPECIALTIES.

Diamond Core Drills.
Rock Drills and Air Compressors.

DENVER BRANCH:
925 17th Street.

M. C. BULLOCK MFG. CO.

1170 W. LAKE STREET CHICAGO U. S. A.