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THE Panama Canal uses about 100,000 tons of coal a year, and buys almost exclusively the best so called "smokeless" Welsh coal. Owing to the great number of engines at work on some sections of the canal and the heavy atmosphere, the "smoke nuisance" is very great, and the use of anthracite has been suggested. Probably grate or egg size would be preferred.

The present cost of English coal delivered at Colon is about 24s.—say $6—per gross ton. If any of our coal producers, either of bituminous coal or anthracite, finds that he can compete at this price, and will write us to that effect, it will give us pleasure to put them in communication with the proper parties, and thus we hope be instrumental in extending our American markets.

It appears to us that among the soft coals, some of those of Kentucky or West Virginia, or such coal as that of Blocton, Ala., might have an advantage over our standard Eastern coals in freights.

IT speaks marvels for the enlightened confidence which the readers of the ENGINEERING AND MINING JOURNAL have in its lightest assertions, that when it was announced last week in an unpretending "note," that the tunnel to drain the valley of Mexico is to be "9520 *miles* long," and that "1000 *miles* of it are already completed," but few questioned the accuracy of this statement, though we confess it must have proved a rather heavy call upon their faith as it was first upon our own credulity. When our attention was first caught by this statement, we thought with one of our correspondents, "Great Scott what a tunnel," and there promptly followed such a display of rhetorical dynamite, directed against every one (except, of course, the real sinner, ourselves), as has been supposed by some to have kept this city in the nineties ever since. Upon calmer consideration, rejecting the timidly-suggested explanation that the Printer's D., or some other D., had "changed feet into miles" by a simpler method than that given in the books, it was apparent that since the JOURNAL says 9520 MILES, *miles* it must be, and our philosophic soul sought the explanation.

Why shouldn't a tunnel be 9520 miles long? and why should Mexico not have such a tunnel? Can any one deny the practicability of the first or the propriety of the second proposition? and since they can not be denied they should be admitted. What if none of our readers has seen the 1000 *miles* of completed tunnel, does that prove it don't exist? Perhaps Boss SHEPHERD's tunnel at Batopilas may be one end of it; and what if, after exploring in depth all the mineral districts of Mexico, the other end should open in London as another correspondent suggests; there would certainly be nothing unreasonable in that; in fact we incline to this belief ourselves, for what could be more appropriate than to have an underground concealed conduit through which British gold should flow *into* Mexican mines.

Our distinguished, though incredulous, correspondent, J. H., Jr., who, quoting "the total length of the tunnel is 9520 *miles*, of which there is already completed a trifle less than 1000 *miles*," says: "Great Scott! Let us hear more about this!!!" will, we hope, acquire more faith. The story, if it does require an unusual exercise of this, is no tougher than that about Jonah swallowing the whale, which all truly good men should accept.

BUILDING A LOCOMOTIVE IN SEVENTEEN HOURS.

The "record" in rapid machine work has again been lowered. Heretofore the Baldwin Locomotive Works, of Philadelphia, have held the first place with the record of an engine built in 24 hours, but the Pennsylvania Railroad Company has now taken the palm by constructing a full-sized (110,000 pounds) anthracite-burning locomotive at the Altoona shops in 16 hours 55 minutes. The work was commenced on the morning of the 18th June, and in five minutes less than seventeen hours the engine was turned out ready for use. It is to run on the New York division of the Pennsylvania Railroad. This feat is, we believe, quite unrivaled in locomotive building.

THE NETTO PROCESS, FOR MAKING SODIUM AND ALUMINUM.

There has been some exchange of compliments between Mr. CASTNER, whose sodium process was described in this journal of May 29th, 1886, and the officials of the new Alliance Aluminum Co., which claims to be able to make a very cheap sodium, and through this aluminum. Certain experiments at Essen have lifted this process out of myth into reality, and we now have very credible assurances that aluminum may be placed upon the market at about $2 a pound. The price at which the new company is offering it is, however, $5 per pound. As the metallurgy of the metal is further investigated in the light of these practical operations, we may expect continual improvements to reduce its cost and admit it to new and important uses. The statement made in our columns last week that aluminum could be produced by this new process of Prof. NETTO at less than 1 s. per pound was an oversight, and should have read sodium, not aluminum. Prof. NETTO employs a sodium-reduction method, the cheapness of which, as in the case of Mr. CASTNER'S important discovery, depends upon the cheap manufacture of metallic sodium, which is prepared at the works of the Alliance Company as follows:

Pure caustic soda is melted in a pan, and then ground coke is stirred into it; 100 pounds of the mixture are ladled at a time into a long narrow retort, lying in a furnace. The carbon effects the reduction of a part of the soda, metallic sodium being distilled off and caught in a condenser, while carbonate of soda is left in the retort.

For the manufacture of the aluminum pulverized cryolite is fluxed with common salt and melted in a reverberatory furnace. When liquid it is run into a ladle, and ingots of solid sodium are forced to the bottom and held there until completely volatilized, which is effected in a few moments. The reduction is accomplished by the gaseous sodium displacing a part of the aluminum in the molten cryolite. The slag is skimmed off, and the remainder poured into an iron crucible to cool. When the mass is turned out a solid ingot of aluminum is found at the bottom. As it takes about 3½ pounds of sodium to reduce one pound of aluminum, the entire expense of making the metal is calculated at 6s. per pound. The metal is said to be almost pure, and the company promises to produce it in large bulk, a thing never accomplished hereto-

fore. Mr. CASTNER advertises it 97½ per cent. pure at 20s., but has declined to give two-day options on half-ton lots at that price. It is only fair to state that Mr. CASTNER claims interference with his invention in this new process.

Both the Castner and Netto processes of making aluminum involve the use of sodium, and therefore appear to us to make that cheap production of aluminum which is essential to its general use absolutely impossible.

It is to some direct process which will make aluminum from its ores without the intervention of necessarily costly intermediary elements that we look for the final solution of the problem, and, if we mistake not, this is already fairly in hand. What is wanted is not alluminum at $5 a pound, nor even at $2, but at 10 or 20 cents a pound, and this can never be accomplished by either of the sodium methods mentioned.

THE APPROPRIATION FOR THE COLLECTION OF MINERAL STATISTICS.

There is certainly no other department of our Government that gives as quick and full a return for the money expended on it as that devoted to the collection of mineral statistics. The Geological Survey has done and is doing magnificent work which is of immense value to the country, and it well deserves the liberal appropriations which Congress makes for its support. But for some reason the Division of Mineral Statistics and Technology, whose work has a more immediate and extended practical value to the business men and other taxpayers of the country, is limited to the most inadequate and paltry appropriation of $8000 a year. Can any one conceive of collecting the mineral statistics of this vast country from thousands of sources, which have to be carefully investigated, of organizing and directing the work of an army of assistants and correspondents scattered over every part of the country, collecting and elaborating the results of this army's work, and editing the same for $8000 a year?—an amount scarcely more than should be paid as the salary of the head of this important and responsible work.

It is needless to say that this work of collecting the statistics of our mineral industries in the really efficient manner in which it has been performed both by Dr. DAVID T. DAY, the present head of the division, and by his predecessor, Mr. ALBERT WILLIAMS, has been accomplished in a great measure through the gratuitous assistance of engineers throughout the country, and even where compensation was allowed, it had to be so utterly inadequate that it scarcely paid the clerical work of the assistants.

That the government of so great and rich a country should subject the head of an important office to the humiliation of asking engineers and other gentlemen to give their services gratuitously, to enable him to present statistics of the most important industry (after agriculture) in this country is simply shameful. And when we consider the appropriations of hundreds of thousands of dollars to be expended each year on the useless work of dredging some unknown creek, where there is neither commerce nor population, the neglect of this indispensable work is disgraceful.

The collection and elaboration of reliable statistics of the production of minerals and mineral products is of the utmost practical importance to many great industries, and this record, more than any other one publication of the government, impresses foreign peoples and governments with the immensity of our natural resources, the extent of their development, and the energy and skill which have accomplished these marvelous results. This knowledge is the forerunner and foundation of more extended commercial relations, and our present administration, which has certainly done more than any previous one to encourage and build up foreign trade, should not neglect the work of collecting the data which proves American superiority in many departments.

We trust the absurdly inadequate appropriation for the work of the Division of Mineral Statistics will be largely increased, thus permitting this now excellent work to be extended, and made still more thorough and valuable.

The work of collecting the mineral statistics for the census of 1890 should be intrusted to this Division, and the appropriation for this and next year should enable the vast amount of preparatory work to be commenced, so that our next census report shall give not only full information concerning our mineral resources, but give it so promptly that it will have more than historic value, which has heretofore been the case.

ELEMENTS OF WEAKNESS IN THE TIN AND OF STRENGTH IN THE COPPER MARKET.

The bears having succeeded in their assault on tin, are now attacking copper. We believe they will find it more difficult to materially depress its price. The conditions of the production and consumption of the two metals are widely different. About 55,000 tons of tin suffice for the wants of the world; of this 9000 tons come from English mines, 7000 tons from Australian mines, and 33,000 tons come from extensive placers in the Straits and the Dutch East Indian Possessions. The last source of supply is most elastic. Its extent is enormous, and its product can be marketed at short notice, almost without the aid of machinery. Chinese labor, as abundant in quantity as the tin, is procurable on demand at low wages. A rise in price is therefore immediately followed by an increase in production, and a fall in prices involves only the discharge of so many laborers in order to reduce supplies. The uses of tin are, moreover, few, and for these cheaper metals can be substituted, at the expense and generally without the knowledge of the consumer of the manufactured article or alloy.

Increased production, and reduced consumption, therefore, rapidly followed the recent rise in tin, with the inevitable result.

The bears predict the same series of events in the case of copper, and, in order to help natural laws, are using the newspaper press on both sides of the Atlantic as freely as they did when describing so graphically the "deluge of copper" during the depression.

Copper can not, however, be produced on call like tin. As regards the existing mines, it may be taken for granted that the low prices stimulated production to the utmost capacity of the plants, and that enlarged facilities can only be provided slowly and expensively. Any mine which was making any profit during the depression was compelled to strain its resources in order to swell the small tonnage profit to as large an aggregate as possible. The small new mines, which the higher price may call into existence, will not be able to market much copper for a year to come.

High prices have now prevailed for nearly nine months. None of the suspended mines are yet sufficiently reorganized to put any considerable quantity of copper on the market, and we hear of only half a dozen which are making serious preparations to do so. Of course new mines will be opened, and would have been opened if copper had stopped at 10 cents, or had risen only to 12 cents; and it goes without saying that some mines which would not pay at 10 cents will pay at 16 cents, and that every augmentation of price, if sustained, will augment production from new sources. But the accession to the market from poor mines, or even from good new mines, will not suddenly overwhelm it. The rich surface ores of all large deposits now known in this country have, with very few exceptions, been extracted, and been extracted rapidly, and with disastrous results to the market, and that without the aid of much machinery or large smelting plants. Lean deeper ores of old mines, or the lean surface ores of unexploited deposits, can only be rendered marketable by the expenditure of much money and much time.

Capital is becoming less excitable and less credulous, and values have become so shifting that money for the purpose of developing lean mines is not easily obtained.

What effect the increased price may have on consumption is still a question unsolved. The consumers on both sides the Atlantic object to the rise, and are drawing from any and every source in preference to the stores of the *Société*. The *Financial News*, in a prophetic article on the collapse of the Syndicate, tells how certain English railroad companies are removing and selling the brasses from idle machinery, so confident are they that the metal will be replaced at half the price within a short period. We should think the Syndicate would draw comfort from such a fact, for if floating stocks have run so low that resort has to be had to such extreme measures to meet requirements, the day is not far distant when the trade must apply to the Société for the supply of its demands.

It is true the published statistics show a rapid increase in stocks or "visible supply" of copper in Europe, until this now stands at 71,000 tons, a larger figure than ever before known, and of this nearly 29,000 tons have been added within the past five months, during which the Société has been maintaining prices. This increase in visible supply has not come from increase in production only, for many of the heaviest producers, like the Calumet and Hecla, Anaconda, the Arizona mines, Rio Tinto, and most of the other Spanish mines have not increased or have actually decreased output. Nominally the increase in stocks is due to decreased deliveries, which show a decline of 12,000 tons during the five months of this year. Nevertheless, these figures do not demonstrate a reduced consumption, for it is admitted everywhere that manufacturers have been working up old stocks and utilizing the neglected accumulations of old stuff that was not touched while copper was cheap. These sources of supply appear now to be nearly exhausted, so that we may expect deliveries to more nearly equal receipts from this time on.

The vast increase in the demand for copper for electrical purposes is likely to more than compensate any reduction in other uses, in this country at least, nor is the present price of copper so high as to greatly lessen consumption in any direction, though we believe it to be too high for the interests of the Société itself. Sixteen cents was not formerly regarded as a high price. Consumption increased on both sides the Atlantic under such prices when copper was even less essential than it now is, to certain branches of trade; and we cannot therefore suppose that the same price should now paralyze consumption as completely as the copper bears pretend. There is, however, a point where prices will react very sensibly

on consumption. Whether that point be sixteen cents, or more or less, the near future will show, for the methods of the European manufacturers cannot much longer disguise the real demands of the consumer.

We must attribute to M. SECRETAN sagacity enough to gauge the capacity of trade, to recognize the limit of repletion, and not to use his power, when the market is under his control, unmercifully, which is always unwisely. It is possible to do an unpleasant thing pleasantly. M. SECRETAN, we fear, has not shown the happy faculty of doing that. Some of the conditions introduced into the contracts of sales imply that he doubts the integrity of some of those with whom he deals, and the gusto with which the annual report of the Société anticipates the transfer of the metal market from London to Paris may have been very gratifying to French feelings, but was very irritating to British pride and liable to excite British opposition. When the transfer has been made the fact will speak for itself, and the profit and glory will be recognized and well deserved; but gloating over it before it has been accomplished will not facilitate the operation. The Société has undertaken a stupendous task, in the prosecution of which all the arts of diplomacy, as well as the great command of capital which the Société wields, will be called into requisition.

That our copper miners are profiting immensely by the high prices now ruling and the certainty of getting remunerative figures for the next two years is unquestionable, nor do our manufacturers object to high prices if they can be assured of their permanency. It is equally true that to the consumers of copper in several departments of industry the advance in price is of little moment; in other departments, however, the increase in price will certainly restrict consumption.

That the copper miners are entitled to a profit upon their investment does not appear to occur to some of the critics of the Société. The basis of 12 cents a pound for Lake copper is probably as low a price as will allow of fair profit to such a number of mines as can supply the world's requirements, and we are convinced that the interests of the copper syndicate, or rather of the *Société des Métaux*, will be best served by keeping the copper market as low as the contracts entered into will permit. Instead of advancing from 16½ cents it would be better to reduce the price gradually until it no longer offers a great premium for the opening of new mines

We cannot share the views of those who look for an early collapse of the syndicate. The sales which all our mines have made are guaranteed by thoroughly responsible banking houses, and even should the Société be overwhelmed, which is quite improbable, these banks would take the copper to the end of the three years, according to their guarantee. The copper market rests therefore on a foundation very different from and infinitely more secure than the tin market, whose late decline has encouraged the bears.

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.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents

The Management of Some Pennsylvania Natural Gas Companies.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Until now I have remained silent and listened often to the "slings and arrows" of the critics on gas stocks mildly suggesting an occasional rebuke or correction of their errors of fact or of judgment. But after the exhibition of bad manners and bad temper, made by prominent officers of the Philadelphia company, at and outside of the late annual meeting, I am compelled to speak out and ask some questions which would have been put at the aforesaid meeting had it not been evident there that nothing but evasion or insolence would have resulted. At that meeting every questioner who dared open his mouth was treated in the "Tray, Blanche and Sweetheart" style, and given to understand and feel that he had better kept quiet and ask no questions of his masters. Now, to be brief, I should have asked of Mr. Westinghouse the following questions; and whilst I use the personal pronoun, I would have him understand that it is in an impersonal sense, as I write wholly to represent a constituency holding, at least, ten thousand shares of the Philadelphia Company stock.

First. How comes it that one million dollars (truly, a goodly sum) were given for charter and patents? The duplicate of the charter, word for word, was offered to Mr. Westinghouse, and sold afterwards for forty thousand dollars. As for the patents, will any sane person undertake to say that they have any intrinsic or mechanical value approximating such a tremendous sum?

Second. Why pay one hundred and two thousand dollars per annum for official and clerical work? Does any business man think it necessary? Is there any massive mental work required which calls for salaried men, drawing pay ranging (I am told) from five thousand to fifteen thousand dollars each per annum?

Third. With $75,000 paid out in one year for "interest, discount and commissions," representing a loan of over a million dollars, what is the sense in continuing dividends at the rate of 12 per cent?

Fourth. Were the commissioners paid for selling stock? It is currently reported that $250,000 of the stock was sold at $47.50 per share, drawing 12 per cent, to pay off Drexel & Company's loan, drawing 6 per cent or less, whilst the market value of said stock was at least $48 to $48.50 per share. Is this charge true, in whole or part?

Fifth. Can any good reason be given for a company with over a million of debt, building a house costing over a quarter of a million as an investment?

Sixth. Will any of the above-named high-priced officials tell us how they intend to pay off the indebtedness of the company with a surplus of only 1½ per cent per annum after paying the 12 per cent dividend?

Seventh. Is it the intention to squeeze customers into paying double present rates, and in some cases double that again, in order to keep up high salaries and dividends?

Eighth. Will the officers give to the stockholders an account of all stock sales by the company, to whom made, and at what price, net, to the company?

Ninth. From the statements in the annual report, would it not be wise to discontinue dividends until the enormous debt is, at least, reduced to figures less startling?

Tenth and last. Is there not great danger of disaster to the company unless a wise economy in expenditure is soon inaugurated, and a *real cash surplus* be commenced?

The talk by officers and directors about brokers "bulling and bearing" the stock is nonsense. The brokers only represent buyers and sellers; and when these are absent they usually say nothing. I know of no one—considered a responsible broker—who does not wish to see Philadelphia and Chartier gas stocks selling at or above par, and as for the insinuation that "they know nothing of the financial condition of the gas companies," both Mr. Schmertz and Mr. Byers, two directors who thus glibly talk in their interviews in the newspapers, might learn something occasionally by consulting these same brokers, and perhaps they do. The brokers know quite as well as they how to decipher a cooked-up statement, and they don't require a government bank inspector to call around periodically and tell them what is a good security and what is not. Will these gentlemen please show their superior acumen by pointing out to the stockholders wherein the writer hereof is mistaken in the above criticism of their management?

I know of my personal knowledge of the brokers, or some of them,—those best known—standing like a rock and breasting the fiercest knd of a panic in gas stocks, by risking their last dollar in endeavoring to sustain the market price, only to learn that the stock which caused the break came from a source very near to the fountain head, right within the range of vision of two of the directors who now talk irrationally about the brokers. Dare they deny it?

My purpose in writing this article is solely that the management of natural gas companies may be brought to a realizing sense of the necessity for economy in the conduct of their affairs. They must, surely, by this time have learned that it costs money to produce and deliver gas to consumers, and further, that the proportion of profit left after legitimate expenses are paid is not extraordinary by any means. I am not a "Bear" on gas stocks. I believe the supply will last for many years to gladden the hearts and hearthstones of our people; but enough has been shown to abundantly prove that, like any business, a proper prudence in expenditure must be shown to make success certain.

A rigid paring down in the salary lists, and a lopping off of extraneous and extraordinary expenses in almost every direction, will tend to greatly restore an impaired confidence, at least, in the value of the stock, and besides, and better than this, it will be an honest step taken toward a reduction of a debt, now and always too large. Since the above was written, I learn from a semi-official source that there are indications of a return of reason, and that notice has been served that salaries must come down in the Philadelphia company, while rumors fly that a syndicate is about to relieve the company of the new building on Penn avenue, which was to cost a cool third of a million. I trust this may be all true, and it cannot come a minute too soon. SCALPEL.

BELATED LETTERS.—II.

The Anniston Region, Alabama.

Since the publication of my last letter, I have received from a leading blast-furnace manager at Birmingham a friendly correction of its statements as to the proportion of foundry-iron made by the furnaces of that district. He says that while he does not know the state of affairs with other concerns, he knows that, working under very disadvantageous circumstances, he has made, for a considerable period, 59 per cent of foundry-iron on one furnace, and 49 per cent on another, and he feels sure that others have done as well, if not better. Moreover, he says that the Birmingham mill irons sell very readily; that little or no white or mottled iron is made, and that the tendency is to run to silver-gray irons when the furnaces get out of order; but that even these irons form but a small percentage of the product.

This authority is unimpeachable and conclusive, so far as the statement goes; but it leaves still the possibility that my impression was not altogether mistaken as to the general situation. If that impression should be disproved by the actual statistics of the whole Birmingham district, it would furnish another illustration of the extreme difficulty of arriving at general conclusions through the superficial survey of a traveler. Perhaps I attached too much importance to the off-hand conversation of various iron-masters, and to the corroborative circumstance that many Birmingham furnaces were reported to be largely oversold on foundry-iron, and to be canceling contracts for it which they had been unable to fill. One blast-furnace manager, who professed to have followed the market closely, put the proportion of foundry-iron from the district as low as 20 per cent. And from many quarters I heard the declaration that the reduction of the price of foundry-iron by the Thomas Iron Company, which was announced while I was at Birmingham, did not affect the makers of that district, because they had none to sell, whereas they did have stocks of mill-iron. Such, so far as I can now recollect, were the sources of the opinion I expressed in my letter. I say frankly that it is not a position I propose to fight for. A man must either know more or care more than I do to fight in this weather.

I started to write about the Anniston district; but before I come to that, I must mention the new development of coal in the Cahaba field at and near Blocton. The first results of coking the coal of these mines were exhibited to our party, and nothing better, in the way of physical appearance, than they showed could be asked. I was told that this adds a hundred square miles to the known area of coking coal in Alabama. It is intended to supply the coke furnaces at Anniston from this source, and no doubt the Cahaba coke will find its way to Birmingham also.

The prosperity of Anniston has grown up upon the manufacture of charcoal car-wheel iron, a business of which the Woodstock and Clifton companies here, the Shelby Company, also of Alabama, the furnaces in Connecticut, and a few in Michigan may be said to have the monopoly. There is not the money in car-wheel iron that there used to be, and an industry based on charcoal is necessarily not as permanently prosperous in a given locality as one which employs fuels more abundant in supply and able to stand transportation for longer distances. But the business has made the fortune of the founders of Anniston, and will carry them fairly for a while longer. So far as the supply of charcoal is concerned, they are said to be well provided in the ownership of large areas of woodland, which, by judicious cutting, may furnish a continuous crop of that fuel. Twenty years, I believe, is considered a sufficient interval between cuttings. What the charcoal iron makers have to face, however, is the gradual substitution of other metal in the uses for which they once furnished the only material. Mild steel has run them hard, they are not certain of the use of charcoal blooms in the open-hearth furnace, and their citadel, the American cast-iron car wheel, is insidiously attacked by the introduction of various mixtures of irons and steels. The result is summed up in the pregnant figures of the last market report:

"Cincinnati: Southern car-wheel iron, $20 to $25."

The Woodstock Iron Company, strong in a successful past, is preparing for the future by erecting two large coke furnaces at Anniston, in addition to the two charcoal furnaces now running there.

This concern, and the Clifton Iron Company, located at Ironton, a few miles south, depend for their ore-supply upon limonites, of which they have very large deposits. In fact the most extensive beds of good limonites that I know of in Alabama are the Clifton, Shelby, Tannahill (Mr. Samuel Thomas's) and Anniston banks. Perhaps they may rank for size in the order named; but Mr. Thomas's mine has not been developed enough to permit safe calculation of its dimensions. These are all ores of excellent quality, reasonably low in phosphorus, though not low enough for Bessemer iron.

Analyses from the Clifton beds have gone below the "Bessemer limit," *i. e.*, 0·05 phosphorus, which seems to be generally considered by ore-sellers as satisfactory for a 50 per cent ore. "Because, you see, two tons of ore make one ton of iron, and $2 \times 0{\cdot}05 = 0{\cdot}1$ phosphorus for the iron. Q. E. D." In reply to which demonstration I must observe, first, that it leaves no room for the phosphorus of the flux and fuel; secondly, that the big Bessemer concerns *make* iron as high as 0·12 phosphorus, but, to pay for that self-indulgence, are very apt to hold the furnaces from which they *buy* iron to 0·09 or even 0·08; thirdly, that no brown hematite of which I have knowledge in this country can be relied upon as a Bessemer ore, no matter what flattering tale Hope (that is to say the analysis of samples) may tell. The same bed varies as to its phosphorus contents—and it varies for the worse, too. Up to this time, I feel sure that there are no large supplies of Bessemer ores in the South except the long, lean Cranberry range in North Carolina. Rumors of them there are in abundance, like the big discovery of Mr. De Bardeleben, near Birmingham, whispered about last year. But they do not materialize.

Brown hematites are not abundant in the Birmingham district. But the parallel belt of Anniston presents them in large quantity; and northward along the East Tennessee, Virginia & Georgia Railroad, they extend towards the deposits which flank the great Tennessee limestone valley. Many of the beds are very high in phosphorus. Very many indeed are extremely delusive in their surface show as to quantity. No experience is more common in the South than to open with high expectations a "solid mountain" of brown ore, and find it to be a mountain of something else, covered with the *débris* of a brown ore bed no longer in place. Hence when really large deposits, such as those at Anniston, etc., have been developed, their value is enhanced by their comparative rarity. Such a deposit is a fortune in itself.

But I must break off this somewhat desultory letter right here. If, on looking it over in print, I find that there is any thread of continuity in it, I will pick up that thread next time, and go on. Otherwise, I will begin again. This is one comfort about writing belated letters. The work encompasses the writer with a delicious sense of leisure. Once late, what matters it how late? Till some other time, then, reader, adieu!

THE MOEBIUS ELECTRICAL PROCESS FOR REFINING SILVER.

Written for the Engineering and Mining Journal by Courtenay DeKalb.

For several years Mr. B. Moebius has been laboring assiduously to perfect his process for the electrical separation of gold and silver, which has now been put into practical operation, with excellent results. The first experiments were tried in Chihuahua, Mexico, several years ago, where a working plant was erected, and the efficiency of the method demonstrated, but want of sufficient capital to make rapid payments on the bullion treated necessitated the abandonment of the enterprise. Patents being obtained Mr. Moebius offered to sell the right to the government for use in the United States assay offices, especially at the one in New York, but some of the officials deemed the risk too great and the sale was not consummated. Since then a small plant has been erected in Kansas City, and another in the works of the Pennsylvania Lead Company, near Pittsburgh, which company has secured the right for the State of Pennsylvania. The results have been eminently satisfactory at the latter place, 20,000 ounces of silver bullion being refined daily, at a smaller cost than by the methods previously employed, and the product is said to be the best ever offered at the United States Mint in Philadelphia, the bars running from 999 to 999·5 fine. Encouraged by this, Mr. H. G. Torrey secured the patent right for New York and New Jersey, and has recently put up a small working plant at No. 153 Cedar street, New York City. The success of the method has received fresh demonstration here, one lot of 1000 ounces having turned out 1000 fine. This was attested, not only at the United States Assay Office, in New York, but at the Mint, in Philadelphia, as well. Refining by this method can be done in New York for three-fourths of a cent per ounce, while the minimum charge that will leave a profit to the refiner using other methods is one cent per ounce. As a result of Mr. Torrey's trial, a company is being formed which will enlarge the capacity of the plant to meet the requirements of custom work.

The principle upon which the process depends is, that when silver to be refined is made the anode in a weak nitric acid bath, the silver will pass into solution as nitrate through the action of an electric current from a dynamo, and will be redeposited in the metallic state upon a silver plate which constitutes the cathode. In practice the base bullion is cast in plates ¼ inch thick and about 14 inches square. These plates are inserted in muslin bags intended to retain the gold, platinum, lead (as per oxide), and other metals remaining after the silver is dissolved out, and are suspended in the tank of acid from copper rods. Alternating with these are the silver plates for the deposition of the refined silver. The current is 150 ampères, and one volt to each tank. The tanks can be arranged in "series" or in "multiple arc" at will. Mr. Torrey is using an Eddy dynamo of the Mather type. In each tank is a tray for catching the silver as it is scraped from the cathodes by automatic brushes, which move constantly back and forth across the plates, thus preventing the silver from accumulating and forming a connection with the anodes. For convenience in cleaning out the trays, they are arranged so as to admit of being hoisted out of the tanks, and the bottom of each is divided in the middle and hinged to the sides of the frame so that upon removing a silver pin these sections swing down and outwards, dropping the silver into tubs placed underneath. The bath contains no more than one per cent of nitric acid, and will not, for a very considerable period, produce any noticeable effect upon the muslin bags. Under the influence of the electric current the silver rapidly dissolves, and any copper in the bullion is dissolved also, but remains in solution. The process is peculiarly adapted to refining Doré silver, which contains about 800 silver and 100 of gold.

AN AMERICAN ENGINEER'S OPINION OF EUROPEAN COAL MINING.

Mr. Geo G. André recently published in the *Colliery Guardian*, and he prefaces it with an appreciative estimate of the independence and intelligence of American engineers:

"Chance threw me last week into the company of an American mining engineer who has been traveling all over Europe for the purpose of making himself acquainted with the various systems and diversities of system prevailing in the different coal mining localities. He was, like most of his countrymen, very communicative, and, like them also, very fond of expressing the opinion he had formed on various mining matters in the course of his travels. As the opinion of an American is usually unbiased, and always well founded, I will quote some of his remarks:

"'The French,' said he, 'are going ahead. The difference between the coal mining of to-day and that of twelve years ago would do credit to any American district. I speak only of the north; and they tell me that is the only go-ahead part; but in that locality there is improvement every where. The miners of the Nord and the Pas-de-Calais are up to the times. If you want to see the most scientific mining in the world go to the Anzin or the Lens collieries. It is not yet the most economical; it is, perhaps, too scientific. But economy will follow. This truth you English will probably learn in time from the diminishing exports of coal to France, which must assuredly result.

"'Belgian mining? Well, there is something to learn in Belgium, too. I am inclined to think that coal is got more cheaply there than any where else. Not at the lowest cost per ton, of course: but most cheaply, having regard to the work done. Belgian seams are thin, all of them. Many of them are very thin. In America we should not touch them. But the Belgian gets them out somehow, and dumps his coal at the top of a deep shaft at a cost that enables him to compete with his more highly favored neighbors, the Germans. Then, again, his ground is much disturbed. There is not much straightforward work. It is all up and down, in and out, twisting and turning. No man should consider himself a good, all round engineer who has not had some experience in the Belgian mines.

"'And Germany? Westphalian mining? Well, there you have another state of things. The Westphalian coal seams are thick and regular. No disturbance there to trouble you. All is straightforward, plain sailing, as far as the seams are concerned. But there is water—abundance of water. As I would send a young man to Belgium to learn how to deal with thin and broken seams, so I would send him to West Germany to study water-engineering. Your German miner is systematic. His work is laid out in the most orderly manner conceivable. He is all order and system. As the Frenchman is scientific, and the Belgian clever and full of resources, so the German is painstaking and systematic. He is, perhaps, too fond of order by arrangements and pleasing designs. His surface-works, for example, are a pleasant contrast to the rough, unsightly structures to be seen in England; but they cost him a lot of money, and are a tax upon his coal.

"'English more practical? Well, yes, in some respects, but generally more swayed by prejudice. The British miner is too conservative—too apt to think he has reached the highest point in every thing, and that consequently neither he nor any body else can devise any thing better. He is an efficient workman, and knows how to get coal cheap; but then he has no great difficulties to encounter. Nature has highly favored him. From his thick, flat and regular seams, in ground that is generally free from water, he can raise coal at a lower price than any body else in Europe, or perhaps in the world. With these advantages he can hold his own against all comers. He knows that, and so does not trouble himself either with science or system.

"'I tell you what it is,' said my traveling companion in concluding his critical remark on the several nationalities which had come under his notice. 'if you want to see good mining, scientific and systematic, clever and efficient, you should go to Russia. Yes, the statement is startling, no doubt, but in the Donetz coal-field you will see the best examples of mining, taken all round, in the world. A rich, regular and extensive coal-field, worked according to the most approved methods and supplied with the most recent designs of machinery, this district is rapidly coming to the front. Just take a trip through that locality and you will no longer wonder why the exports of British coal to the southern ports of Russia are falling off so heavily. Your Black Sea trade has not many more years to live.'"

THE ARTESIAN WELL, PLACE HEBERT, PARIS.

The artesian well which has been in process of boring for so many years in the Place Hébert, Paris, has been completed at a depth of 2,359 feet, where the greensand has been penetrated, furnishing the supply of heated water which was sought. The work of boring, which Mr. Lippmann has so ably conducted, is now at an end, and all that is further required is to make suitable arrangements for storing and distributing the water. For the present it is permitted to go to waste, being led through a subterranean gallery into the sewers of the city. The temperature of the water as it comes from the well is 30° C. (86° Fah.), and it is of a high degree of purity, the great extent of strata through which it has found its way into the greensands of the Paris basin having in some sort performed the office of a filter.

This artesian well ranks among the largest in the world, having a diameter of 3½ feet, which, however, has been equalled and exceeded in several instances, although the depth of these other wells has not been so great. The well at Passy, near Paris, begun under the direction of the Saxon engineer Kindt in 1855, was carried to a depth of 1923 feet, with an interior diameter at the bottom of 2 feet 4 inches, and discharged a continuous stream at the rate of 5,582,000 gallons per diem.

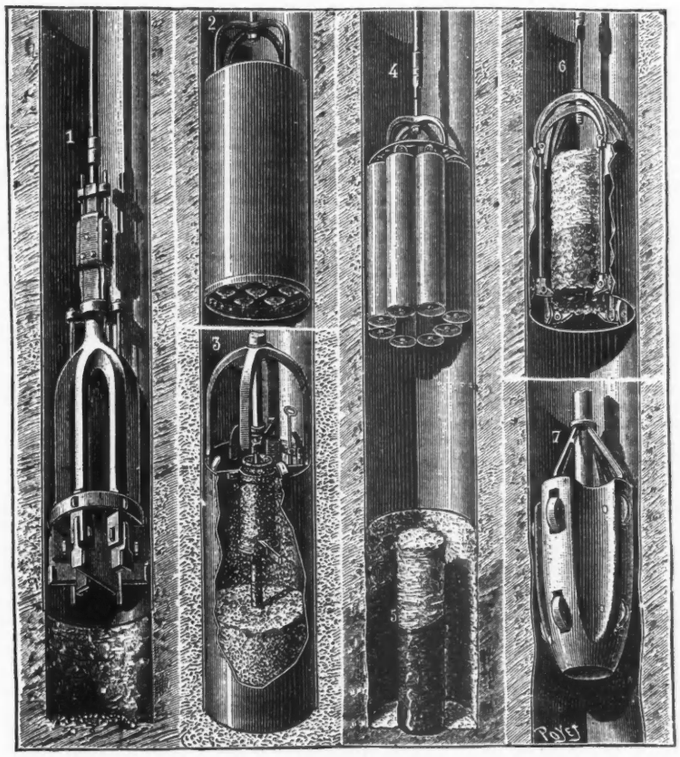
The accompanying cut, showing the various tools employed at the Place Hébert well, will give an idea of the method of boring. In Fig. 1 the casing is seen pushed down nearly to the bottom, and the drill is raised ready for another blow. The diameter of the drill is 4 feet 6 inches, and it has six arms, provided with channels to permit a free fall. The rods of the drill are balanced, and the blow is made by means of a catch allowing the drill to drop, the work being accomplished by concussion. The weight of the drill is 8000 pounds, and it falls 10 to 15 times a minute through a distance of from 1 foot to 1 foot 6 inches.

COST OF ELECTRIC TRANSMISSION OF POWER.

Mr. Geo. W. Mansfield, in a paper read before the American Institute of Mining Engineers, at the Boston meeting, gave some points upon the practical advantages of electricity as a motive power which will prove of interest. The ease with which electric power can be transmitted is one of its prominent features. The total available power of Niagara, estimated at about 7,000,000 horse-power, could be distributed throughout the Eastern cities with very little loss. Marcel Déprez has transmitted 40 horse-power through seventy miles of wire in France with a commercial efficiency of 56 per cent, and a Mr. Brown, in Switzerland, has put into practical operation a plant transmitting 50 horse-power five miles, with a commercial efficiency stated to be over 70 per cent. Of course the greater the distance from the dynamo the greater the loss of power in the circuit, but increase of the size of the conductor lessens the resistance to the current in a manner analogous to the hydraulic transmission of power. The following table gives Mr. Mansfield's estimate of the cost of a complete electric plant for the transmission of power to various distances, the potential at the central station being assumed to be 560 volts, with loss on line 10 per cent, copper conductors being used throughout the circuit:

Horse-power.	1 mile.	5 miles.	10 miles.	25 miles.	100 miles.
1	$450	$1,750	$4,250	$20,250	$230,250
10	2,150	7,850	24,000	136,750	2,041,750
25	5,050	17,950	56,850	326,850	5,044,350
50	10,000	35,050	111,750	646,250	10,058,750
100	19,750	68,800	221,000	1,281,250	20,072,500
500	72,800	314,100	1,066,500	6,327,500	40,122,500

The potential on which this table is calculated is very low for the transmission of large powers, but is generally used to-day for power



TOOLS USED IN SINKING THE ARTESIAN WELL, PLACE HEBERT, PARIS.

When it is desired to remove a sample, the large transverse blade is replaced by two small ones. The borings are removed by means of the drum shown in Fig. 2, which is provided with seven valves. Fig. 3 is another drum with an interior pump for drawing off the sand when such a stratum is encountered in boring, and another instrument consisting of 8 tubes provided with valves in the bottom (Fig. 4), serves to obtain a specimen of a stratum, and also to clean the annular space around the core made when the drill (Fig. 1) is used without the transverse blade. Fig. 5 represents the core and annular space thus formed. Drill No. 6, as will be seen, catches the core at the base and tears it loose, so that it may be removed.

Frequently the metal casings become bent in being driven down, and then the tool with rollers, shown in Fig. 7, is employed to straighten them, or when they are too badly crushed to be of further service, this same instrument is used to grind them up and remove them. The tubing is put down in lengths of 3, 9 and 12 feet, riveted together so as to form a rigid column with a smooth interior bore reaching from top to bottom of the well. The thickness of the tube varies from 0·118 to 0·787 inch, according to the diameter of the bore.

Dynamite was tried unsuccessfully in breaking the formation at great depths, charges of 30 pounds simply lifting the column of water without accomplishing the end desired.

circuits. The most expensive item in the plant is the copper, but this can be reduced by taking advantage of the fact that the cost of the copper conductor decreases as the square of the potential increases.

Take, for instance, an extreme case, viz., 500 horse-power transmitted 100 miles. If we double our potential, making it 1000 volts, the cost of our copper will decrease to one-quarter, or $10,000,000. If, now, we again double, we decrease to one-quarter again, or, at 2000 volts potential the cost of copper would be $2,500,000. The total cost of the electric plant at this potential is $2,622,500. Obviously, there is a limit to the increase of potential; and in the transmission of such enormous powers that limit may be placed at one more doubling, or 4000 volts. This is a possible voltage, for there are many electric light circuits in our large cities to-day of this potential, and even higher.

One thousand volts is a safe and easily handled potential; and if this potential were used, a large saving would evidently be effected. Professor Thomson has devised and patented a method whereby very high potentials can be used to overcome distance, and at the receiving station be reduced to lower safe-working potentials. This plainly means a tremendous saving in cost of copper.

For mining operations the use of this power will often enable work to be conducted where a steam plant for various reasons could not be operated. The dynamo can be located miles away from the mine if nec-

essary, on some stream furnishing sufficient power to run it. Electric motors at the mine would then do all the hoisting, pumping and drilling and supply the power for crushers and concentrators, and do all the hauling under and above ground. To show that this is not a mere assertion it will be well, Mr. Mansfield says, to mention what has been accomplished in this direction. There are in the aggregate, in this country, about 125 miles of railways so operated to-day; the motors propelling loads of 10 tons, at speeds of 1 to 15 miles per hour, to distances of 8 miles, and over grades of 10 per cent. Probably 2,000,000 passengers are now annually carried on these roads. As to size, three years ago experiments were made on the Elevated Railroad of New York City, the weight of the motor used being nine and a half tons, and capacity about 100 horse-power. With this motor the four regular coaches, nearly full of passengers, were drawn over a distance of two miles, and up grades of two per cent. at an average speed of eight miles per hour. A plant, complete, with 30 horse-power dynamo, 20 horse-power motor, wires, insulators, etc., would cost about $3,200, and would do 20 horse-power actual work at a distance of a mile from the station.

ON THE IGNEOUS FORMATION OF SILICATES AND ANALOGOUS SALTS.

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

Though some lithologists and mineralogists of the present day still cling to antiquated notions as to the occurrence of aqueous formations that are chemically and, in many instances, also physically impossible, it can be said that the geologists (using that term in a broader sense) are no longer divided on the question of igneous formations. The Neptunists of old have entirely succumbed, the whilom Plutonists admit the existence of igneous formations that derived the heat of fusion from the chemical reactions of unlike constituents in sedimentary deposits and in precipitates accumulated from aqueous solutions, most of the anhydrous silicates are now distinctly recognized as igneous products, and many of the hydrated silicates as their partly decomposed or metamorphic remnants.

If these conquests of abstract science are to be turned to practical account for all they can become worth in metallurgical smelting and other arts, greater efforts will have to be made to remove obscurity from the laws that must have governed the formation of igneous silicates, phosphates, borates, etc., as a better knowledge of those laws will enable us to predict results that have now to be reached by empirical, and, consequently, more expensive, laborious, and uncertain methods.

The student who has been taught to perceive an analogy in the formation and constitution of alum and of orthoclase feldspar, beyond the mere fact that both compounds are double salts, or that the "radical" $Si_2Al_2O_7$ may be assumed to constitute the *basis* of combination of numerous igneous silicates that happen to contain the respective or larger quantities of said constituents, or that 2 ($SiAl_2O_5$) may be considered as $Si_2Al_2O_7 + Al_2O_3$, or that the boric acid of turmalines (Bo_2O_3) may be classed as a sesquibase analogous to alumina, has much to unlearn before he will be able to predict results by formula.

The student who learns the composition of the double salt alum can readily understand the law that governs its formation (*i. e.*, that each base takes up as many acid molecules as it contains atoms of oxygen) because he can produce the double salt, as well as the two simple salt of which the former is composed, the latter only with somewhat less water of crystallization in the aggregate than the double salt will contain. The primary formation of the larger number of igneous silicates, phosphates, etc., can not be determined in that manner, but a logical course of reasoning leads irresistibly to the hypothesis, that their primary compounds are, without exception, monoxygen salts or salts that have an equal oxygen ratio of acid to base, and that greater acidity or basicity are the result of saturation, either direct, or when one salt saturates from another, indirect. The following example illustrates this law as applied to the formation of simple silicates. In order to produce calcium monosilicate ($SiCa_2O_4$), two molecules of lime must be in contact with one molecule of silica. If this theory is correct, two spherical bodies, the one composed of lime the other of silica, cannot enter into chemical combination, however intensely they may be heated, as long as they only touch each other at one point; but if pointed bodies of the respective materials are brought in such contact that one silica-point touches two lime-points, these three points, if suitably heated, will form a silicate-molecule as quickly as any precipitate will form in aqueous solutions.

If a lot of glass beads or balls of equal size and shape, but of two different colors, are repeatedly shaken in a jar so as to mix them thoroughly, a good many more of the same color will remain together when the numbers of the respective kinds are in the ratio of 2 : 1 than when they are equal, and in the latter case nearly every bead or ball of one kind will be in contact with two or more of the others. Hence, though the equation—

$$40SiO_2 + 80CaO = 40SiCa_2O_4.$$

furnishes the most direct result on paper, the bisilicate composition—

$$60SiO_2 + 60CaO = 30(SiCa_2O_4) + 30SiO_2 = 30(Si_2Ca_2O_6) = 60(SiCaO_3)$$

affords the quickest and most complete fusion.

But when silicates of different composition are to be melted together, with or without free oxides, then a charge that corresponds to a monosilicate composition will give the quickest and most complete fusion, because the chemical energy of subsilicates is incited by a feasible increase of acidity, and that of acid silicates by a feasible reduction, and because the bases of melted silicates can rearrange themselves, in the fluid state, according to their chemical energy, as the following formulæ will explain:

Progress of Saturation in Feldspar (Abbreviated).

	O		O
R_2O +	$2SiO_2$, 1 : 1 +	$2\frac{1}{2}SiO_2$, $4\frac{1}{2}$: 1 +	$3SiO_2$ 6 : 1
R_2O_3 +	$2SiO_2$, $1\frac{1}{2}$: 1 +	$2\frac{1}{2}SiO_2$, $1\frac{1}{2}$: 1 +	$3SiO_2$ 2 : 1
	$4SiO_2$	$4\frac{1}{2}SiO_2$	$6SiO_2$

Nepheline ($Na_2OAl_2O_32SiO_2$).

Primary.		O ratio.	Possible segregation.		O ratio.
Al_8O_{12}	Si_8O_{12}	1 : 1	Al_8O_{12}	Si_4O_8	2 : 3
Na_8O_4	Si_8O_4	1 : 1	Na_8O_4	Si_4O_8	2 : 1
16	16		16	8 16	1 : 1

Leucite ($K_2OAl_2O_34SiO_2$).

Bisilicate.					
Al_8O_{12}	$Si_{16}O_{24}$	2 : 1	Al_8O_{12}	Si_8O_{16}	4 : 3
K_8O_4	Si_4O_8	2 : 1	K_8O_4	Si_8O_{16}	4 : 1
16	16 16 32		16	16 16 32	2 : 1

Anorthite ($CaOAl_2O_32SiO_2$).

Primary.					
Al_8O_{12}	Si_8O_{12}	1 : 1	Al_8O_{12}	Si_4O_8	2 : 3
Ca_4O_4	Si_2O_4	1 : 1	Ca_4O_4	Si_4O_8	2 : 1
12	16 8 16		12 16	8 16	1 : 1

Calcium garnet (Grossular, $= 3CaOAl_2O_33SiO_2$)

Primary.					
Al_6O_6	Si_6O_6	1 : 1	Al_6O_6	Si_2O_4	2 : 3
Ca_6O_6	Si_6O_6	1 : 1	Ca_6O_6	Si_4O_8	4 : 3
10	12 6 12		10 12	6 12	1 : 1

That anorthite is completely soluble in HCl, and garnet insoluble, is easily explained by the different molecular aggregation which the formation of the respective primary compounds may involve.

That the so-called "radical" $Si_2Al_2O_7$ (anhydrous kaolinite) can not enter into combination with calcium monosilicate, and that the latter, though melting itself, cannot dissolve the former, is best explained by formulating the proposed reaction:

$Al_4\ O_6\ Si_4\ O_8$	4 : 3	$Al_4\ O_6\ Si_2\ O_4$		2 : 3
+ $Ca_4\ O_4\ Si_2\ O_4$	1 : 1	= $Ca_4\ O_4\ Si_4\ O_8$		2 : 1
8 10	6 12	8 10	6 12	1 : 1

In this case, as compared with those of anorthite and garnet, the lime silicate would have to do the additional work of reducing first the four third aluminium silicate to a monosilicate, which, though easily accomplished by an alkaline base, is beyond the energy of the lime base.

Another interesting question is, whether compound monosilicates can melt transparent, "unless the total oxygen of their bases is equal to the sum of the basic elements." Assuming this condition to be a law, the minimum additions to be made for the purpose of melting the following silicates into glass would be as follows:

Artificial silicate.	Si_6	O_{12}	Ca_{12}	O_{12}
12 (Si Ca Mg O_4)	Si_6	O_{12}	Mg_{12}	O_{12}
+ $Si_3\ Al_4\ O_{12}$	Si_3	O_6	Al_4	O_6
	Si_{15}	O_{30}	R_{28}	O_{30}
Addition:	Si_1	O_2	R_4	O_2
	Si_{16}	O_{32}	R_{32}	O_{32}
Anhydrous kaolinite,	$Si_4\ O_8$	$Al_4\ O_6$		
Addition:		$R_4\ O_2$		
	$Si_4\ O_8$	$R_8\ O_8$		

It will be readily seen that in both cases monad bases must be employed to equalize the atomicity of the sesquioxides. In order to apply the same rule to the most acid fire-clay, $Si_2Al_2O_7 + 2\frac{1}{2}SiO_2$, it will only be necessary to increase the above addition in the proportion in which the additional silica (he $2\frac{1}{2}$ molecules) can be made to melt, which is only another way of expressing one of the rules laid down in Berthier's remarks on the fusibility of clays.

It will also be apparent from the various formulæ of segregations hereinbefore adduced, that kaolinite, as a product of decomposition, can only be derived from compounds in which the aluminium silicate has become more acid than 1 : 1, as, for instance, $Si_3Al_2O_9$ (in orthoclase feldspar), which can yield $Si_2Al_2O_7 + 2H_2O$, whereas a four-third aluminium silicate (in leucite) can only yield $SiAl_2O_5 + 5H_2O$ or less, or may become entirely decomposed. As alumina is very refractory as a base, it is also probable that its introduction into silicates has mainly taken place in the form of fused aluminates of either aqueous ($H_4K_2Al_2O_8$) or igneous ($MgOAl_2O_3$, $3CaOAl_2O_3$, etc.) origin.

Finally, in order to apply the supposed laws of segregation or, as it is perhaps better termed, reciprocal action, to the melting of phosphates with silicates, the following example may be accepted as an untried prediction, of melting results, which gains significance from my previous assertion that the monosilicate of lime (which is to melt the phosphate) can not melt kaolinite ($Si_2Al_2O_7$). *Example:*

				O						O
P_4	O_{10}	Ca_6	O_6	$1\frac{1}{2}$: 1	P_4	O_{10}	Ca_6	O_6		$1\frac{1}{2}$: 1
Si_2	O_6	Ca_6	O_6	1 : 1	Si_2	O_6	Ca_4	O_4		$1\frac{1}{2}$: 1
7	16	12	12		7	16	12	12		

This combination involves a change of tribasic to tetrabasic phosphate.

Assuming the primary phosphate to be pentabasic ($P_2O_5 5CaO$), calcium monosilicate will react on it (in the absence of new accessions of phosphoric anhydride) as follows:

			O						O
P_4	O_{10}	Ca_{10}	O_{10}	1 : 1	P_4	O_{10}	Ca_8	O_8	5 : 4
Si_2	O_6	Ca_6	O_6	1 : 1	Si_2	O_6	Ca_8	O_8	3 : 4
7	16	16	16		7	16	16	16	1 : 1

Considering the large quantity of lime that the pentabasic or "mono" phosphate has to hold, this salt must, to a certain point, have much greater tendency toward acid saturation than the monosilicate, and thereby impel the latter to take a part of the lime away from it, whereas the tribasic or "five third" phosphate is already capable to take lime from the silicate.

Hence the tetrabasic phosphate, or five-fourth phosphate of lime is

apt to become frequently visible in metallurgical operations by crystallizing in the slag, whereas the primary or pentabasic compound will, in most cases, only have a transitory existence. Fortunately, for the vindication of the theories and deductions herein advanced, their pivotal point, the melting behavior of clays, can be easily demonstrated *ad oculos*, and the correctness of the predicted results can be determined by analysis.

HOBOKEN, N. J., June, 1888.

TREATMENT OF GOLD AND SILVER BEARING BOTTOMS, PRODUCED IN THE SWANSEA PROCESS.

For the Engineering and Mining Journal, by Alex Trippel, M.E.

In his excellent and exhaustive article entitled "Improved Process for the Lixiviation of Silver Ores" published in the ENGINEERING AND MINING JOURNAL and in the Trans. A. I. M. E., Vol. XIII., Mr. C. A. Stetefeldt speaks of the extraction of gold from silver ores which have been subjected to a chloridizing roasting, and subsequently alludes to the treatment of copper-matte containing silver and gold.

On this part of Mr. Stetefeldt's able treatise, I venture a few remarks, to complete a certain treatment, or suggest a new one, not mentioned in his paper.

In order to have a basis for my remarks, I take it for granted, that when Mr. Stetefeldt speaks of the Swansea process, he has in view that in which argentiferous matte which may contain some gold, and is intended for the Ziervogel process, is to be as rich as practicable in silver. The residues from this lixiviation are smelted in reverberatories with auriferous pyrites on other rich ores, and thereby a second high-grade matte is produced, which is rich in gold and poor in silver; and, finally, metallic bottoms are obtained, containing substantially all the gold in the charge, and the remaining silver, which, if the roasting for sulphates has been perfect, and the proper mixture of ore has been made, ought to be but a small quantity. Whether this is the exact routine I am not sure, but this is, I believe, substantially correct. With the production of these bottoms Mr. Stetefeldt stops; the further treatment is not given. It is only intimated that the separation of the precious metals by sulphuric acid can not be thought of.

Some years ago I had occasion to analyze several samples of argentiferous matte, roasted and raw, granulated bottoms, and the slags produced in separating the precious metals from these granulations in a refining furnace. (It should be remarked here, that these copper bottoms are smelted down, and granulated into fine, hollow shots.)

The following analysis is from raw copper-matte:

Dry assay:			
Silver	118·2 oz.	Cu	76·100 (by battery 75·88)
Gold	0·3 "	S	17·750
		Pb	1·580
		Fe	1·493
		SiO_2	1·057
		As	0·716
		Sb	0·490
		Agt	0·405
			99·605

Another example of such matte, roasted for sulphatization, had the following composition:

A. Soluble in water:		
Sulphate of silver	2·486 per cent.	
Sulphate of copper	0·980 "	
Sulphates of iron, zinc, etc.	0·582 "	
	4·048 per cent.	
B. Insoluble in water:		
CuO	44·94	
FeO + Fe_2O_3	32·87	
PbO	10·73	
ZnO	1·74	
MnO	1·02	
Agt	0·12	
Au	0 03	
Insoluble residue	2·98	
	94·430 "	
	98·478 per cent.	

Dry assay gave:

Silver, as sulphate	213·89 ounces.
" insoluble	32·13 "
Gold	$176.70

It will be seen that the sulphatization was incomplete, and I may add on this occasion that a small addition of bi-sulphate of soda (salt-cake) to the charge facilitates the perfect sulphatization very materially, as shown by numerous experiments make by Alf. Monnier and myself.

After mixing the residues of lixiviation with auriferous ores, a roast-smelting produces finally the copper bottoms, which are granulated. The following analysis gives their composition:

	Per cent.		Per cent.
Cu	92.56	As	0·12
Agt	1·01	FePbZ (by diff.)	1·67
Au	2·93		100·
Bi	1·14		
Sb	0 57		

Dry assay: Gold, $17,710.90; silver, $380.33.

It is evident that the amount of silver present is in excess and due to imperfect work, causing a decreased fineness of the resulting gold.

The next operation is a careful oxidizing-roasting of these granulations, by which all the base metals are converted into oxides—followed by smelting the roaste' mass with an abundant addition of litharge and a proportionate quantity of quartz, thereby forming a lead-slag, which contains all the base metals, and leaves gold and silver on the hearth.

The slag coming from this operation is not unlike copper refining slag, red and glassy. An analysis showed:

	Per cent.		Per cent.
SiO_2	14 48	CaO	trace
PbO	60·91	Sb_2O_3	trace
CuO	11·53	Agt	not determined
FeO	6·08		98·11
Al_2O_3	4·97		
MgO	0 14		

This method, at first, seems very wasteful, but the proportional weight of the copper bottoms is small compared with the whole charge, and the slags can be sold for their value in copper and lead for blast-furnace work.

In drawing this outline, I wish to call attention to this process, which, if already practically carried out, has, at least, not been published, nor is it generally known. My distinguished friend, Mr. Stetefeldt, may throw more light on it. I should state that Mr. A. L. Walker made some of the above analyses.

GLOBE, A. T.

Crookes' "radiometer" is being used in France for timing the exposure of photographic plates, an equal number of revolutions of the vanes of this little instrument corresponding to the proper time of exposure whatever the degree of brightness of the light.

Camels' Hair Belting.—According to experiments recently made at the Royal Polytechnic School at Munich the strength of camels' hair belting reaches 6315 pounds per square inch, whilst that of the ordinary belting ranges between 2230 pounds and 5260 pounds per square inch. The camels' hair belt is said to work smoothly and well, and it is unaffected by acids.

Pencils for Writing on Glass, etc.—The pencils introduced by Messrs. Faber for writing on glass, porcelain, and metals in red, white, and blue are said to be made by melting together four parts of spermaceti, three parts of tallow, and two parts of wax, the coloring being effected by adding white lead, red lead, or Prussian blue. The pencils are convenient for labeling bottles in laboratories and elsewhere.

New Chinese Reduction Works.—A large party from Hong Kong, China, upon the invitation of Mr. Ho Amei, assembled at the opening of the reduction and smelting works of the Tamchow and Tai-yu-shan Mining Company on April 15th. The occasion was celebrated by a banquet, at which Mr. Ho Amei and the superintending engineer, Mr. Candler, detailed the plan of operation of the mines and works, and expressed the greatest confidence in the success of the enterprise.

Fixing Indian Ink.—Indian ink, as most of our readers know, is composed of the finest ivory-black and a gelatine size, and is excellent for plans and drawings until any color "wash"—or even a little dampness—comes near the lines, when they then either "blur" or "run" all together. This may be prevented by dissolving in the water used for rubbing up the ink about eight grains of bichromate of potassium, or six and a half of the corresponding ammonium salt per fluid ounce.

Burma Ruby Mines.—Lovers of rubies may shortly expect to get their favorite stones very cheap. The annexation of Burma has put the great ruby mines into the control of the government, and the question is now raised as to whether the government should not retain them and prevent the market from being glutted by over-production. The same thing happened 18 years ago in Siam, when the sapphire mines were so overworked that the stones greatly depreciated in value.

Oil of Mustard as a Lubricating Oil.—Chief Engineer M. Thier, of Erfurt, Germany, says the *Eisen-Zeitung*, after battling for months to find a lubricator which would prevent the welding together of iron surfaces upon which much and rapid friction is exercised, such as turbine wheels, etc., has at last found that ordinary oil of mustard, mixed with small quantities of petroleum, fish oil or other similar fatty substances, answers the purpose in every respect and overcomes all the difficulties heretofore experienced with machinery where excessive friction disturbs the physical quality of the metal used.

Prize for Collecting Dust from Phosphoric Slag.—Gebrüder Stumm, Neunkirchen, Germany, offer a prize of 10,000 marks, equivalent to nearly $2500, for a paper, accompanied by models and drawings, which will suggest a means of overcoming the danger from fine dust in pulverizing basic or Thomas cinder. It appears that the dust formed in crushing phosphoric slag, previous to its use in agriculture, affects the lungs of the men at work in the mill. Gebrüder Stumm specify that the arrangements suggested shall be such as not to seriously interfere with the capacity of the mill nor materially affect the labor of the men.

Black Gold.—Mr. R. W. E. MacIvor has recently analyzed a specimen of black gold, obtained from the nugget rocks Maldon, Victoria, found in the granite veins which are met with in the quartz of this country. When first broken the ore is crystalline, malleable, and of a silvery appearance, but on being exposed to the air it becomes dull and blackens. Running through a sieve eliminates the bismuth, and leaves the pure gold. Mr. MacIvor's analysis gives its composition as follows: Gold, 64·211 per cent; bismuth, 34·398 per cent; silicate matter, 1·591 per cent. The black gold is, therefore, in reality a natural alloy of gold and bismuth.

Effect of Air Pressure on Electric Currents.—Mr. T. Bottomley showed that the temperature of a wire conveying electric currents varied with the air pressures surrounding it, and that a wire which remained dull at ordinary atmospheric pressure became incandescent in a moderate vacuum. *Nature* says M. Cailletet has been working in the opposite direction. He has shown that a current which would fuse a wire under ordinary pressure will scarcely raise it to redness when the pressure is not sufficiently great. These experiments show how essentially free convection as well as radiation is to the incandescence of filaments in glow lamps, as well as to the heating of conductors.

Sunshine Recorder.—An improved form of Jordan's new pattern photographic sunshine recorder has been made, the improvement consisting in using two semi-cylindrical or D-shaped boxes, one to contain the morning and the other the afternoon chart. An aperture for admitting the beam of sunlight is placed in the center of the rectangular side of each box, so that the length of the beam within the chamber is the radius of the cylindrical surface on which it is projected; its path, therefore, follows a straight line on the chart at all seasons of the year. The semi-cylinders are placed with their faces at an angle of 60 degrees to each other. They are fixed on a flat triangular plate, which is hinged to a suitable stand having leveling screws attached, and fitted with a graduated arc as a means of readily adjusting and fixing the cylinders to the proper vertical angle agreeing with the latitude of the station where used.

'Vulcanized Vegetable Fiber," a new and interesting product manufactured by the Vulcanized Fibre Company, of Wilmington, Del., is now offered as a substitute for rubber packing, and for both flexible and hard rubber in almost all of its mechanical applications. It appears to possess many meritorious qualities. As a material for valves it is

claimed that its flexibility increases by immersion in hot or cold water, and that by reason of its resistance of the action of accidulated waters it is particularly adapted for use in mining pumps in many districts. The hard preparation of this material is recommended for gibs, for engine cross-heads, journal bearings, and bushings, safety screw-nuts, and is also employed as an insulator in electrical machinery. It is sufficiently hard to be turned in a lathe, to be drilled, riveted, or sawed, and yet is elastic and will not break by a fall.

Ancient Materials for Paper Making.—Dr. Julius Wresner, from a microscopical examination of the paper from El-Faijûne, preserved in the Austrian museum at Vienna, in the collection known as "Papyrus Erzherzog Rainer," has conclusively proved that linen rags were used in the manufacture of paper as early as the eighth and ninth centuries. The fiber is chiefly linen, but there are also traces of cotton, hemp, and animal fibers present. The manufacture of paper out of rags is, therefore, an Eastern and not a German or an Italian invention, as has hitherto been supposed. Out of five hundred Oriental and Eastern specimens, not a single one was a raw cotton paper. All those that were examined had likewise been "clayed" like modern papers. The material used for this purpose was starch paste, manufactured from wheat, and in some cases from buckwheat. Animal substances do not appear to have been employed for "claying" before the fourtenth or fifteenth century.

Maxim's Pneumatic Gasoline Dynamite Gun.—Mr. Maxim has designed a new dynamite gun, in which he introduces a new and interesting method of expelling the projectiles from the weapon, hoped to be practicable in heavy guns. He retains the pneumatic principle which has been utilized by Lieutenant Zalinski, but instead of using compressed air alone, as Zalinski does, he mixes with it a quantity of volatile hydrocarbon, such as the vapor of gasoline. This compressed mixture is introduced behind the projectile, imparting the initial motion to it in the chamber of the gun. After it has moved a certain distance, the projectile automatically uncovers a detonating fuse, and an explosion then occurs, the air furnishing the oxygen for the explosion, and the pressure is thus increased about eight times. Mr. Maxim states that by this method the original pressure does not need to be more than half as great as that used by Lieutenant Zalinski, diminishing the amount of compressed air needed, and requiring less length of gun. The highest pressure is about 4,000 pounds to the inch, the first pressure being not more than one-tenth of that.

Aluminum in the Arts.—Improvements in the manufacture of aluminum have reduced its price so considerably that a much larger field of usefulness is now open to it. The readiness with which it may be cast and chased, its color and lightness, combined with its non-liability to tarnish, indicate a special application in jewelry and the manufacture of apparatus. In the market aluminum is to be obtained in the form of an ingot, sheet, foil, and wire, and alloyed in certain definite proportions with copper. The commoner alloys are those in which the proportions of of aluminum to copper are (1), 11 : 90—gold-yellow in color ; (2), 5 : 95—resembling 14 carat gold ; and (3), 2·5 : 97·5—the copper in this case containing also silicon. All these bronzes are readily fusible, may be rolled with facility, take a high polish and resist tarnishing ; the No. 3 alloy would be a suitable substitute for telegraphic silicon bronze. It is possible that many have already experimented in applying aluminum to the arts, and have failed, partly from want of experience in manipulating a new material, partly from difficulties in casting ; for if melted in a clay crucible, this metal reduces silicon from the substance of the pot, becoming itself gray and brittle in consequence. Lime crucibles, or clay pots either brasqued or lined with well-ignited cryolite alumina, must therefore be used for casting aluminum. In soldering the pure metal, the *Journal* of the Society of Chemical Industry says it is found that the clean surfaces rapidly become coated with an almost imperceptible film of oxide, which, although protecting them from further oxidation, is nevertheless sufficient to prevent their union in the usual way. The surfaces to be joined must, therefore, be scraped or scratched perfectly bright and be covered with a film of paraffine, then a thin rolled piece of soldering alloy—Zn : Sn : Pb = 5 : 2 : 1—is placed on each, and each surface is heated separately. The paraffine first melts and protects the bright portions from oxidation, then the alloy fuses and unites with the aluminum. The overlaid aluminum surfaces may afterwards be soldered as usual.

Danger from Electric Lighting Wires.—M. Mascart recently illustrated by experiments before the French Philosophical Society the possible dangers of fire from electric lights. He pointed out the necessity for precaution in electric light installations against excessive heating of the conductors, and the risk of materials being ignited by heat generated in the lamps. In the case of insulated wires laid beneath moldings the heat generated was usually dissipated by conduction, which keeps down the temperature of the wire and its covering. An excessive current might destroy the insulation and inflame the wood. An experiment was made with a wire 1·2 mm. diameter, laid between two blocks of wood. This wire would in ordinary practice carry a current of 4 ampères, but in this experiment the current was increased to 40 ampères, at which point carbonization of the wood began. With a greater current the wood was ignited. To test the danger from lamps the following eight experiments were made: 1. The globe of an arc lamp was covered with several thicknesses of a light fabric, such as green tarlatan. 2. A glow-lamp of 32 candle-power was covered in a similar manner, the folds of the cloth being held against the lamp by an India rubber band. 3. An incandescent lamp was covered with a cotton hood. 4. A glow-lamp was covered with a similar hood of black silk, which was surrounded by another of velvet. 5. A lamp was covered with a layer of white wadding, the gummed surface of which had been removed. 6. Two glow-lamps were covered with layers of wadding, one layer white, the other black. 7. A lamp of 32 candle-power was placed in a vertical fold of an old theatrical scene. 8. A lamp of 300 candle-power was laid in a similar scene. In cases 1, 2, 5 and 7 no carbonization nor excessive heating was caused for 20 minutes. In case 8 the scene commenced to carbonize without flame after 1½ minutes. At the end of 2 minutes the envelope of the lamps in 5 burst into flame, and in 6 minutes the velvet calotte in experiment 4 commenced to burn slowly. The cotton hood in 3 was partially carbonized at the end of 10 minutes, but was not set on fire.

A Cingalese Rock Fortress.—For the first time for a number of years, the Sigiri Rock, in Ceylon, has been scaled by a European, the feat on this occasion being performed by General Lennox, who commands the troops in the island. It is said, indeed, that only one European, Mr. Creasy, ever succeeded in reaching the summit. The rock is cylindrical in shape, and the bulging sides render the ascent very difficult and dangerous. There are galleries all round, a groove about four inches deep being cut in the solid rock. This rises spirally, and in it are fixed the foundation bricks, which support a platform about six feet broad, with a chunam-coated wall about nine feet high. The whole structure follows the curves and contours of the solid rock, and is cunningly constructed so as to make the most of any natural support the formation can afford. In some places the gallery has fallen completely away, but it still exhibits flights of fine marble steps. High up on the rock are several figures of Buddha, but it is a mystery how the artist got there, or how, being there, he was able to carry on his work. The fortifications consist of platforms, one above the other, supported by massive retaining walls, each commanding the other. Owing to the falling away of the gallery, the ascent in parts had to be made up a perpendicular face of the cliff, and General Lennox and four natives were left to do the latter part of the ascent alone. The top they found to be a plateau about an acre in extent, in which were two square tanks with sides 30 yards and 15 feet respectively in length, cut out of the solid rock. A palace is believed to have existed on the summit at one time, although time, weather, and the jungle have obliterated all traces of it. During the descent the first comer had to guide the foot of the next into a safe fissure, but all reached the bottom safely after two and a half hours. It is said that the amount of work expended on the galleries is incredible, and the writer of the account of the feat doubts if all the machinery of modern times could accomplish the stupendous work that was achieved here in old days by manual labor alone.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED JUNE 19TH, 1888.

384,612. Motor. Jas. B. Erwin, Milwaukee, Wis.
384,615. Sand and Water Distributor for Stone-Sawing Machines. John H. Frenier, Rutland Vt., Assignor of one half to Leon Leblanc, same place.
384,628. Converter for Refining Molten Iron. Isaac G. Johnson, Spuyten Duyvil, New York, N. Y.
384,630. Apparatus for Moistening the Atmosphere in Mills, Factories, etc. Albert Koechlin, Mülhausen, Alsace, Germany.
384,637. Valve for Steam-Engines. John E. McIntosh, Auburn, N. Y.
384,638. Dynamo-Electric Machnie. Robt. Oliver, Alpena, Mich.
384,645. Magnetic Separator. M. Holroyd Smith, Halifax, Eng.
384,646. Shell for High Explosives. William T. Smith, Birmingham, Ala.
384,660. Shell. Edmund L. Zalinski, U. S. Army.
384,661. Shell for High Explosives. Edmund L. Zalinski, U. S. Army.
384,662. Magneto-Electric Fuse. Edmund L. Zalinski, U. S. Army.
384,663. Projectile. Edmund L. Zalinski, U. S. Army.
384,664. Shell-Fuse. Edmund L. Zalinski, U. S. Army.
384,666. Injector. Edwin J. Young and Albert Lambert, Wadsworth, and Hiram R. Ferris, Cleveland, Assignors to the Garfield Injector Co., Wadsworth, Ohio.
384,673. Gas-Motor. Reinhold Boeklen, Brooklyn, N. Y.
384,682. Process of Obtaining the Precious Metals from Speiss. Lewis W. Davies, Eureka, Nev.
384,785. Electric Railway. Stephen D. Field, Yonkers, N. Y.
334,686. Valve for Air-Brakes. Herman Guels, St. Louis, Mo., Assignor to the American Brake Co., same place.
384,687. Air-Brake System. Herman Guels, St. Louis, Mo., Assignor to the American Brake Co., same place.
384,708. Dump-Car. Joseph Odorizzi, "Trinidad," Colo., Assignor of threefourths to Simeon S. Wallace, Pascal Gerardi and Matthew Harasin, same place.
384,709. Alloy. Charles A. Paillard, Geneva, Switzerland.
384,716. Steam Boiler. Mortimer S. Rexford, Norman, Dak.
384,718. Centrifugal Machine. Frank H. Richards, Troy, N. Y.
384,727. Steam Regulator. John W. Taylor, Pittsborough, N. C.
384,731. Alloy. Charles W. Ward, New York, N. Y.
384,735. Nail-Assorting Machine. Edward B. Allen, Portland, Me., Assignor to James W. Brooks, trustee, Cambridge, Mass.
384,751. Die for Forging. Henry H. Forsyth, Pittsburg, Pa.
384,762. Oiler. Peter H. Hay, Detroit, Mich., Assignor to the Michigan Lubricator Co.
384,735. Metallic Railway Tie. Jacob Reese, Pittsburg, Pa.
384,791. Pipe, Tube, or Shell Extractor. Walter S. Scott, Fort Meade, Dak.
384,812. Coupling for Shafts, Pulleys, etc. Benjamin L. Williamson, Little Rock, Ark.
284,813. Process of Refining Iron with Air. Riley P. Wilson, Cleveland, Ohio, Assignor of one half to Franklin J. Wall, New York, N. Y.
384,818. Smoke-Consuming Furnace. Rudolph Affeltranger, Zurich, Switzerland.
384,841. Process of Producing Sulphuric Anhydride. Emil Hanisch and Max Schroeder, Hamborn, Prussia, Germany.
384,846. Apparatus for Breaking Steel-Ingot Bars. William R. Hinsdale, Hoboken, N. J.
384,847. Apparatus for Severing Ingot-Bars. William R. Hinsdale, Hoboken, N. J.
384,849. Straight-Way Valve. Harrison P. Hood, Indianapolis, Ind.
384,869. Hammering Machinery Actuated by Explosive Gaseous Mixtures. Charles W. Pinkney, Smethwick, Eng.
384,872. Brick Machine. Peter L. Simpson, Minneapolis, Minn.
384,873. Apparatus for Burning Crude Petroleum Oil. Robert W. Smith, Toledo, Ohio.
384,878. Machine for Rolling Metal Articles to Form. Charles F. Tebbetts, Fitchburg, Mass., Assignor to the Tebbetts Rolled Forging and Machine Company, Kittery, Me.
384,823. Valve. Edwin F. Williams, Chicago, Ill.
384,884. Manufacture of Bicarbonate of Soda. Milton R. Wood, Brooklyn, N. Y.
384,895. Limekiln. James W. Devling, Flemington, Pa., Assignor of seven eighths to Amelia E. Devling, same place.
384,905. Kiln for Burning Hydraulic Cement. Charles R. Gostling, Whitehall, Assignor of one half to Sam'l B. Wellington, Catasauqua, Pa.
384,906. Straight-Way Stop-Valve. Henry Hall, Lansingburg, N. Y., Assignor to the Rensselaer Manufacturing Company, same place.
384,908. Electric Railway. Rudolph M. Hunter, Philadelphia, Pa.
384,909. Electric Railway. Rudolph M. Hunter, Philadelphia, Pa., Assignor to the Electric Car Company of America, same place.
384,910. 384,911. 384,912. Electric Railway. Rudolph M. Hunter, Philadelphia, Pa.
384,920. Anti-Friction Compound. Thomas J. Mayall, Reading, Mass.; Lucy A. Mayall, same place, executrix of said Thomas J. Mayall, deceased.
384,922. Portable Engine. Jacob Miller and Martin J. Hogan, Canton, Ohio, said Hogan Assignor to said Miller.
384,929. Wire-Stretching Machine. Cortez V. Pugh, Bowling Green, Mo., Assignor to William A. Hutchinson, same place.
384,930. Horizontal Thrust-Bearing. Alva C. Rice, Dayton, Ohio. Assignor to the Stillwell & Bierce Manufacturing Co., same place.
384,935. Tempering Steel or Steely Iron. Henri Schneider, Le Creuzot, France.
384,941. Steam Generator. Elias H. Thompson, Newark, Assignor of one half to E. J. Clark and J. B. Welch, Tulare, and Cornelius A. Sherman, Los Gatos, Cal.
384,943. Steam Boiler. Charles H. Twist, New York, N. Y.
384,949. Conduit for Underground Pipes. Thomas J. Young, Boston, Mass., Assignor, by mesne assignments to himself, C. L. Perrin, and Mark Wilmarth, all of same place.
384,950. Separating Machine. Noah W. Holt, Manchester, Mich.

THE METALLURGY OF STEEL.*

By Henry M. Howe.

(*Continued from page* 439.)

The isotherms and through them the pipe are liable to be lowered by strongly tapering moulds and by bottom casting. In the latter the first entering portion of metal, which forms the top of the ingot, is cooled much by the initially cool gate and runners: as these become heated by the passing iron they cool the last entering portion less.[a] In strongly tapering moulds as in Fig. 37 the isotherms are crowded together at the top of the ingot, where the metal freezes across early, and hence cannot flow down to fill the cavity which grows beneath: this tends to cause a deep-seated pipe.

Let us now briefly consider the effect of the rate of cooling not on the volume but on the position of the pipe. Quick cooling crowds the isotherms together, and causes them to follow each other inwards rapidly. Up to a certain time, t'' the upper part of the axial metal, or sinking-head metal, will be hot enough to flow down and fill the cavity which forms beneath, and to raise it to a relatively harmless position. Now the closer together the isotherms are, the farther will the cooling and contraction of any given layer have proceeded when the time t'' is reached, and hence the less will that layer cool and contract after t''. Hence, the more rapid the cooling the more of the cavity will be raised by the sinking-head metal to a harmless position, and the less of this cavity will be formed after the sinking-head metal has frozen.

On the other hand, however, quick cooling drives the isotherms inwards rapidly. In a long ingot an appreciable length of time is needed to enable the sinking-head metal to flow down, and it is quite possible that very rapid solidification may force the isotherms inwards so rapidly that freezing overtakes the sinking-head metal before it has time to flow far down the walls of the cavity, and so may deepen the pipe. Indeed, as the pipe is due to difference in the rate of contraction of shell and interior, and as this difference should be the less the more slowly the ingot cools, slow cooling should lead to a smaller pipe than rapid cooling. When ingots are placed in pits or furnaces while their interior is still molten, and are then rolled without great fall of temperature, it is not clear that any important pipe forms at all. Certainly the pipe which then forms should be very much smaller than when the ingot is allowed to solidify and cool rapidly. As experiments on the size and position of pipes have usually been made on ingots which have cooled comparatively rapidly, they are liable to give a greatly exaggerated idea of the size of pipe which actually arises in practice, in which the ingot cools and contracts not only little but comparatively uniformly.

Taking these two considerations together, we should expect that rapid cooling would raise the greater part of the pipe to a harmless position, while at the same time it may actually cause a thin tail or pipelet to extend deeper than it would were the cooling slower.

The results of such speculation must be received with extreme caution: they are offered simply as speculations, and to stimulate thought and observation.

Rapid solidification is to be looked for *A* in ingots cast too near their freezing point, *B* in those cast in iron instead of sand moulds and *C* in narrow ingots.

§ 225. THE VOLUME OF THE PIPE, assuming for the moment that it is not diminished by the formation of blowholes, will equal the excess of the net contraction of the interior over that of the shell during the cooling subsequent to t'. If we knew accurately the laws which the thermal conductivity and dilatation of cooling and solidifying steel follow, we could discuss with confidence the effect of variations in the conditions of casting and cooling on this excess: in our comparative ignorance we may conjecture that it will be roughly proportional to the difference between the temperature of the outside and the average temperature of the inside at the time t' when the shell becomes rigid, and that this difference will be the greater the more rapidly heat is conducted away from the metal by the mould: hence the pipe should be greater in ingots cast in iron than in those cast in sand moulds, and greater when cold than when hot iron moulds are employed. Even the iron rail-ingot moulds are now intentionally heated at some American Bessemer works before teeming, to lessen the pipe.

In regard to ingots of large as compared with those of small cross-section the case is less simple. If the power of the mould to abstract heat increased proportionately to the mass of the ingot, then the center of the large ingot should be hotter than that of the small ingot, when the outer shell becomes rigid: being hotter, the subsequent contraction of the center of the larger ingot would be greater, and hence its pipe should be greater than that of the small ingot. But the thermal capacity of the mould of a large ingot relatively to that of the ingot itself, and hence its power of abstracting heat from the ingot, is usually much smaller than in the case of small ingots. Before the shell of the large ingot begins to become rigid its mould has become highly heated; that of the small ingot remains cold up to and past the time t'. The cold mould of the small ingot may well lead to a difference between the average temperature of outside and that of inside at the critical time t' greater than the corresponding difference in case of the large ingot, whose hot mould abstracts heat but slowly from the ingot's shell, which long remains hot and plastic. This would give the small ingot a pipe larger in proportion to its size than that of the large ingot.

Similar reasoning applies to the case of very hot and rather cool-cast ingots.

We have no very satisfactory data as to the total contraction of volume which the particles of steel undergo during solidification and cooling. The shortening effected by Whitworth's fluid compression suggests that the total contraction is not far from 13 or 14% by volume. The enormous pressure which he employs is said to shorten ingots of uniform cross-section by 12·5% (1·5 inches per foot) in addition to the longitudinal contraction of similar uncompressed ingots, which varies from 1 to 2·6%[b] (1–8th to 5–16ths inch per foot); so that we here have a total longitudinal contraction of at least 13.5%. If we knew the transverse contraction and if we knew that Whitworth's compression left no cavities, we could calculate the total contraction. But we do not. During the early part of the compression the ingot probably expands transversely, the enormous pressure as well as the rising temperature dilating the mould, and the ingot spreading laterally and following up this dilatation. Later, after the walls of the ingot have grown so cold that they defy even the action

[a] Walrand, Van Nostrand's Eng. Mag., XXXIII., p. 356, 1885.

[b] In a case within the writer's knowledge the shrinkage on steel cylinders 2 feet in diameter has been 5–16ths inch per foot, or 2·6 per cent. linearly.

of Whitworth's press, say from dull redness down, a very considerable transverse contraction probably occurs. If we assume that this roughly equals the transverse dilatation which occurs earlier, we have a total contraction of 13·5% by volume.

The volume of the pipe in the six-inch steel gun lately cast by the Pittsburgh Steel Casting Company must have been about 6·4% of that of the original molten metal.[a]

If we assume that the external shrinkage here was 0·25 inch per linear foot, or 6·12·% by volume, and further assume that the metal was free from blowholes, we have a total contraction, external and internal, of 12·49% by volume, which is not far from that deduced from Whitworth's compression. And the contraction should be substantially the same in both cases, since Whitworth's compression probably does not affect the density of the solid portion of the cold metal.

This total contraction should be composed of the external shrinkage, the volume of the blowholes, and that of the pipe. Changes in the shape, size, etc., of castings, or in other conditions, which increase the external shrinkage diminish the pipe, provided the volume of the blowholes and the density of the cold metal remains unaltered. To put it algebraically,

Let VM, VC, VP, VSand VB = the volumes of the molten metal, the cold metal, the pipe, the external shrinkage and the blowholes respectively, VC of course being the volume occupied by the ultimate particles of the cold metal, excluding all cavities, large and small,

Then VM = VC + VP + VS + VB.

If VM, VC and VB be constant, then the larger VS is the smaller will VP be.

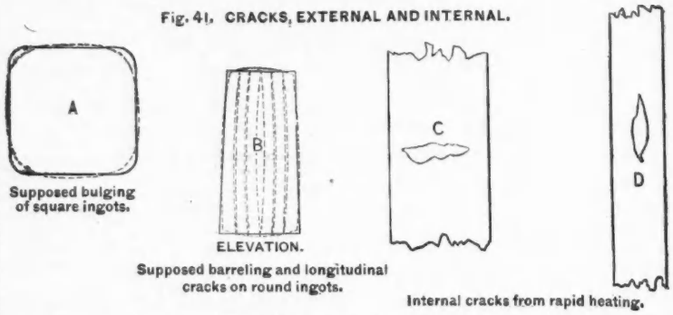
The maximum volume of pipe. The smallest linear contraction in case of steel castings is probably about 1%, which implies a contraction of 3% by volume. If, as we have estimated, the total contraction be about 14%, then the maximum volume of pipe, which would of course occur when there were no blowholes, so that VB = 0, would be 14 — 3 = 11% of the volume of the metal when molten, or 11·3% of that of the cold ingot.

The volume of the pipe is usually much less than this. Of 78 rail ingots, each weighing about 3,300 pounds, which were broken at an American Bessemer works, all but two showed decided pipes or masses of honeycombed cavities. In thirty instances their volumes ranged from 6 to 136 cubic inches, the average being 30 inches.[b] The largest of these pipes represents only about 1% of the volume of the molten metal.

§ 226. Surface cracks in steel ingots are chiefly vertical (longitudinal) and horizontal (transverse).

Longitudinal cracks appear to be due chiefly (1) to the ferrostatic pressure of the molten steel against the thin shell, when the mould, expanding, draws away and leaves it unsupported: and (2) to the excess of the early contraction of the shell over that of the interior. In the case of square ingots this excess tends to relieve itself by drawing in the corners of the square and bulging out its sides, so that its section becomes more nearly circular, as in A, Figure 41. Later, when the contraction of the interior overtakes and out-runs that of the outside, the tables are turned, and now the sides of the square tend to bend in and follow up the contraction of the interior. This bulging and approach to a circular section can take place more or less with all sections except one initially circular; hence in cylindrical and conical ingots the excess of contraction of shell over interior can relieve itself only by

Fig. 41. CRACKS, EXTERNAL AND INTERNAL.



making the ingot slightly barrel shaped, which must tend to cause longitudinal cracks, such as would arise were the staves of a barrel rectangular instead of curved, and such as are shown in exaggeration by the dotted lines in Figure 41 B: and hence the very strong tendency of round ingots to acquire longitudinal cracks.

As these cracks are in large part due to difference between the rates of cooling of outside and inside, they are to be especially looked for when this difference is greatest, *e. g.* in ingots cast in cold metallic moulds. The effects of ferrostatic pressure are most severe in tall, in bottom-cast, and in hot-cast ingots, for here the shell of the lower part of the ingot is comparatively thin after the ferrostatic pressure has become severe.

Transverse cracks as well may be due to the more rapid contraction of shell than of interior. They may also arise if the ingot attaches itself to the mould at different levels, for then its contraction is resisted by the mould, which is indeed expanding. They are most likely to occur if the mould be rough, if the casting temperature be excessively high, and if the steel in teeming strike against the sides of the mould. Hence transverse cracks arise less frequently with bottom than with top casting. Tapering moulds also lessen the tendency towards transverse cracking, for in them the longitudinal as well as the transverse contraction of the ingot and expansion of the mould tend to separate mould from ingot. Should a fin of metal connected with the ingot become attached to the top of the mould, (and this often occurs from leakage while the ladle is passing from one mould to the next), as with their changing temperatures the mould elongates and the ingot shortens, this fin tends to suspend the ingot, whose weight may tear its thin skin. These fins should be carefully removed.[c]

ADDENDUM TO SECTION 222.—The fracture of a rail ingot containing many blowholes is shown in plate I.

Pits.—The fine blowholes which in case of extremely hot-cast steel extend nearly or quite to the ingot's skin (A, figure 20) are thought to be the cause of the pittings with which boiler-plate steel is liable to be covered: at least it is the observation of some open-hearth steel-melters that these pits may be induced by an extremely high casting temperature, and blowholes so close to the ingot's skin seem well-calculated to become filled with iron oxide during heating, the thin skin of metal outside them being comparatively permeable if indeed it is not removed by oxidation, leaving the ends of the blowholes open. The contents of these pits has been found to consist chiefly of iron oxide.

(TO BE CONTINUED.)

[a] This number is reached from data furnished me by Mr. Wm. Hainsworth of the Pittsburgh Steel Casting Company.

[b] Private communication, F. A. Emmerton, Feb. 4th, 1888.

[c] Concerning surface cracks, cf. Walrand, loc. cit.

PERSONAL.

Mr. Austin Corbin has returned from Europe.

Mr. F. F. Chisholm, Mining Engineer of Denver, Colo., is now in Dakota examining tin properties.

Mr. F. M. Taylor, of Taylor & Brunton, Mining Engineers, has returned from Europe and is at present in this city. He met with great success in his business negotiations.

Messrs. Jas. E. Stout and Thos. Binks were re-appointed mine inspectors of Iowa, and Jas. Gildroy, of What Cheer, was appointed in place of J. A. Smith.

Mr. John D. Frossard, Mining Engineer of Montreal, Canada, has gone to the south of France and to Spain on professional business. He will be absent three months.

Mr. T. Guilford Smith, the well-known coal producer and dealer, was elected President of the Alumni of the Rensselaer Polytechnic Institute, at Troy, N. Y., last week.

Mr. G. C Hewitt, Manager Grand River Coal and Coke Co., Glenwood, Colo., has resigned, and Mr. W. J. Morgan, of Pennsylvania, has been appointed to succeed him as manager.

Mr. Carl L. Wendell, founder of the village of Norway, Mich., and for many years prominently identified with mining enterprises in northern Michigan, died on the 19th inst.

The trustees of Rochester University, N. Y., have accepted the resignation of President Martin B. Anderson. Dr. Anderson has been Acting President of the university for thirty-five years.

Capt. R. L. Phythian has been relieved from duty as president of the Steel Inspection Board of the navy at his own request, and Capt. H. L. Howison, now on waiting orders, has been ordered to that duty.

Mr. George H. Myers has been elected a director of the Bethlehem Iron Company of Bethlehem, Pa., to fill the vacancy caused by the death of Alfred Hunt. William W. Thurston has been elected president, and Robert P. Linderman vice-president.

Mr. Albert Broden, of Reading, Pa., has been appointed superintendent of the furnaces of the Philadelphia and Reading Coal and Iron Company. He will have charge of some ten furnaces along the main line of the Reading Railroad and branches.

Mr. Charles E. Maxwell died suddenly on the 19th inst., at Orange, N. J., aged forty-two years. He was a member of the firm of Manning & Squier, of New York, was treasurer of the Passaic Zinc Company, and was connected with several other corporations.

Mr. James Henderson, whose recent success in making high-class steel from phosphoretic pig-iron, at Birmingham, Ala., announces that he has severed his connection with the Birmingham company, and is endeavoring to organize works in the North. The waters of New York harbor offer advantages in location which are certainly not excelled in any other portion of the country, and we trust he will meet with success in securing the necessary co-operation.

Mr. Noble, of Petrolia, Canada, formerly a great "oil" man, has obtained a concession from the government of India to prospect for three years in the Punjab for mineral oil, and at the end of that period the right to take up 50,000 acres in case of success, with the privilege of supplying the whole of the N. W. R. system with lubricating oil. His men and machinery are coming out to commence boring operations in September next. Mr. Noble is a brother of Colonel Noble, R.A., Superintendent Government Powder Works, Waltham Abbey.

The degree of Doctor of Engineering was conferred on Mr. Coleman Sellers, of Philadelphia, at the commencement exercises of Stevens Institute, Hoboken, N. J., on the 14th inst. The trustees received anonymously the sum of $10,000 toward the endowment of the chair of engineering practice, just created, the liberal donor saying that he has had this step in view for a number of years, but makes it now, being satisfied with the course of the college in securing the services of an engineer of long practical experience as the first Professor of Engineering Practice. It has been President Morton's aim to render this institution eminently practical, holding that its methods must be what will at once fit the student to enter the workshops with knowledge applicable to the custom of the shops. A few years ago he furnished the means from his own purse to establish a complete workshop fitted with modern tools, and now it is certain that his earnest desire to contribute to the success of the institution has influenced this donation.

The *American Meteorological Journal*, Ann Arbor, Mich., desiring to direct the attention of students to tornadoes, in hopes that valuable results may be obtained, offers the following prizes: For the best original essay on tornadoes or description of a tornado, $200 will be given; for the second best $50, and among those worthy of special mention $50 will be divided. The essays must be sent to either of the editors, Professor Harrington, Astronomical Observatory, Ann Arbor, Michigan, or A. Lawrence Rotch, Blue Hill Meteorological Observatory, Readville, Mass., U. S. A., before the first day of July, 1889. They must be signed by a *nom de plume*, and be accompanied by a sealed envelope addressed with same *nom de plume* and inclosing the real name and address of the author. Three independent and capable judges will be selected to award the prizes, and the papers receiving them will be the property of the journal offering the prizes. A circular giving fuller details can be obtained by application to Professor Harrington.

FURNACE MILL, AND FACTORY.

The Forcite Powder-Works at Lake Hopatcong, N. Y., have suspended operations. The management say they will commence again in the fall.

Furnace No. 1 of the DeBardeleben Coal and Iron Company, at Bessemer, Ala., has been blown. Furnace No. 2 is also ready to be blown in.

The Pennsylvania Steel-Works, at Harrisburg, Pa., will be closed for two weeks on June 30th for repairs, and when operations are resumed there will be a reduction of wages.

The Salem Lead Company's works, at Salem, Mass., were destroyed by fire on the 14th inst., together with a large quantity of pipe and machinery. Loss estimated at $100,000.

Owing to the dullness in the steel rail trade the North Chicago Rolling Mill Company has blown out two more of its South Chicago furnaces, leaving but one stack in blast.

The Sherman Iron and Machine-Works, of Sherman, Tex., has purchased the plant of the Sherman Iron-Works, at that place, and intend enlarging the works. The company has a capital stock of $50,000 and no liabilities.

Mr. Philip E. Chapin, late general manager of the Cambria Iron Company, Johnstown, Pa., took a nonsuit on the 15th inst., in his action against that company for arrears of salary and expenses, to the amount of $15,000.

The Jeffrey Manufacturing Company, of Columbus Ohio, advise us that they will manufacture in addition to their present specialties the Willson Spring Whiffletree, which is designed to make the work of the laboring horse easier.

The Baltimore & Ohio Railroad Company has purchased the iron mills of Messrs. H. J. Hammond & Co. at Pittsburg and will wreck them, using the site for yard purposes. The mills have been idle since the failure of the firm about one year ago.

The furnace of the Charlotte Iron-Works, Charlotte, N. Y., went out of blast on the 17th inst. The furnace has had a very successful run of two years and four months. It will probably take from six weeks to two months to reline the stack.

Messrs. Savage, Son & Co., proprietors of the Empire Foundry, at San Francisco, Cal., one of the oldest firms on the Pacific Coast, have assigned. The liabilities are estimated at $100,000 and the assets at $150,000. The failure is due to low bids on work.

The Sprague Electric Railway and Motor Company, New York, has received an order from the United States government for motors for use in the service, and an installation is to be made at once on board the United States steel cruser "Chicago" of motors to be used in the training and elevation of the guns.

The office and laboratory of the Cowles Electric Smelting and Alluminum Company, at Lockport, N. Y., were burned on the 13th inst. These were in the building detached from the smelting works. The building burned with such rapidity that nothing was saved.

One of the charcoal furnaces of the Woodstock Iron Company, located at Ironton, Ala., recently made the largest output of pig ever made in the South in one day with a furnance of similar capacity. This furnace has a capacity of 40 tons per day, and the output alluded to consisted of 65 tons of car-wheel iron, ranging from three to five grade. Only 95½ bushels of charcoal to the ton were used.

The Cleveland Foundry Company has been organized at Cleveland, O., with F. E. Drury President, and H. P. Crowell Vice-President. The specialty will be the manufacture of light gray iron castings. The company is prepared to manufacture on contract oil stoves, gas and gasoline stoves, novelties or staple goods, composed mainly of cast-iron, metal patterns, hardware specialties, etc.

Work on the new plant of the Westinghouse Air-Brake Company, to be located at Turtle Creek, eleven miles from Pittsburg, Pa., will soon be commenced. When the plant is completed it will have a capacity of 500 complete equipments per day. The works of the company in Allegheny City have a capacity of 150 equipments per day. They will be operated in connection with the Turtle Creek plant, which will furnish a total capacity of 650 equipments per day. Both passenger and freight brakes will be manufactured.

The Rae electric system of metallurgy, patented by Dr. J. H. Rae, and owned by the Electric Bullion Saving Company for the States of Colorado and the Territories of Dakota, Wyoming and New Mexico, is now being successfully worked in various parts of this country. Recent reports from the Douglass mine, of Dayton, Nevada, where this process is being worked, state the average monthly saving has been $4000 for sixteen months. The system was fully described and illustrated in the ENGINEERING AND MINING JOURNAL of August 12th, 1887, and furtner particulars can be had at the company's office in this city.

One of the suits brought some months ago against the Chicago Forge and Bolt Company, Chicago, Ill., by ten householders residing in the vicinity of the works, who claimed damages for injury to property resulting from the jarring of the heavy hammers and the destructive effects of the smoke, soot and gas, and, in which $10,000 damages were claimed came up for trial last week in a Chicago court, and a verdict was rendered by the jury in favor of the claimant and against the company. The case was immediately appealed to a higher court by the representatives of the company. The plaintiffs are members of a French colony which located in the vicinity before the works were established.

CONTRACTING NOTES.

Machinery and supplies wanted. See page xiv.

Contracts open will be found on page xix. New contracts this week: No. 932, Boring Artesian Well; No. 933, Water-Works; No. 934, Water-Works; No. 935, Bridges; No. 936, Bridge; No. 937, Iron Bridge; No. 938, Deepening and Finishing Shaft No. 24 on Section A, New York Croton Aqueduct. No. 939, Bridge; No. 940, Bridge; No. 941, Water-Works; No. 942, Water-Works; No. 943, Sewerage System; No. 944, Building Reservoir.

The Navy Department has awarded contracts for steel to be used in the construction of the armored cruiser Maine at New York as follows: Carnegie, Phipps & Co., of Pittsburg, steel plates, at $89,779; steel shapes at $35,986 and steel rivets at $9737; the Pittsburg Steel Casting Company, steel castings, at $50,176.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including June 13th, as reported by the Marquette *Mining Journal*, were as follows:

		Tons. 1888.	Tons. 1887.
Marquette,	Marquette District	68,420	151,938
St. Ignace,	" "	29,957	22,278
Escanaba,	" "	154,041	202,093
"	Menominee District	202,543	248,209
"	Gogebic District	53,312	... ...
Ashland,	" "	122,884	179,998
Two Harbors,	Vermillion District	31,333	48,191
		662,090	852,707

OHIO COAL COMPANY.—This company has bought out the firm of Sunderland, Rucker & Co., at Ashland, leased the new Wisconsin Central dock, and established a branch at Ashland, Wis., of its Northwestern coal business, making it one of its most important distributing points. The Northwestern headquarters of the company is at St. Paul, with branch offices at Duluth, Cleveland and Chicago. The branch now located in Ashland will supply the Wisconsin Central Railroad system and local business in the city. Mr. P. J. McDonald has been appointed the agent at Ashland.

OREGON RAILWAY AND NAVIGATION COMPANY.—The election of directors of this company, at a meeting held at Portland, Oregon, on the 18th inst., shows, it is said, that there will be no change in the policy of this company, and that it will extend the Farmington Branch to the Cœur d'Alene mines.

TENNESSEE COAL, IRON AND RAILROAD COMPANY.—It is reported, says the Birmingham *Age*, on good authority, that the company has leased all its Alabama mines to a Tennessee corporation and that the new firm will take hold of the mines in the vicinity of Birmingham and operate them to their best possible advantage.

UTAH MINING AND MANUFACTURING COMPANY.—This company has been organized with a capital stock of $350,000, shares $100 each, to carry on a general mining business in Millard and Beaver counties, and a manufacturing business at Cleveland, Ohio. The incorporators are: D. M. Marsh, Truman Dunham, Eugene Grasselli, H. A. Sherwin, Ferdinand Dickert, E. P. Williams, Daniel Meyers, and Alanson T. Osborne.

ALASKA.

Our special correspondent sends us the following:

DOUGLAS ISLAND.

Work at the Treadwell group continues steadily. The foundation for the additional 120 stamps is about finished. Work on it continues day and night. The Mexico claim, it is said, is being developed in a thorough manner. Some work is also being done on the Great Eastern group. Work is going on at a number of other claims. Prospecting many of the claims on this island is not only tedious, but very expensive. The ore-bodies are large and the surface is covered with heavy timber, moss and débris, and as most owners have but limited means, they must content themselves with doing it gradually. It will take years to prospect Douglas Island.

GLACIER BAY DISTRICT.

This district comes to the front with very fine silver-lead ores, samples brought in assaying as high as 40 per cent in lead and several hundred ounces (1300) in silver and some gold. This discovery was made late last fall. The owners will develop the claim as soon as practicable. In this district is also found a very fine silver bearing copper ore. One of these claims passed lately into the hands of men with means, who are now opening it up in a systematic manner and express themselves as very much pleased with the results so far attained.

SILVER BOW BASIN.

A good many properties in this district have lately been in the hands of "bubble blowers," but are now

back again in the hands of the sturdy miners, who are preparing to work on them again as soon as the snow is off the ground; in fact, a good many are at it already. The properties here do not contain 500 or 600 feet ore-bodies, but the ore is high grade. A gentleman who owns one of the best claims there stated recently that he will commence to take out ore next week, and work it in one of the mills already built there.

The placer miners in this district have done a large amount of work this winter preparing for systematic work during the summer. Every one of them has done well during previous seasons, and as they will be better prepared this year, it is to be expected that they will have a good harvest by next fall.

ARIZONA.

COPPER BASIN COPPER COMPANY.—The company has posted up the following notice in the camp:

Desiring to have at the Basin a moral and respectable camp, the Copper Basin Copper Company establish the following rules for the benefit of their employés: Profane or other improper language will not be allowed; intoxication prohibited, although no restraint is imposed on the temperate use of liquor; gambling in any form prohibited, although no objection to the use of cards, chess, checkers or dominos. The patronizing of any liquor saloon, gambling house or any other place of bad repute by any of the employés of the company is prohibited. The violation of any of the above rules will subject the offender to immediate discharge. Any employé of the company unable or unwilling to comply with the above regulations will please call at once at the office for settlement of their account. COPPER BASIN COPPER COMPANY,
By J. J. WILLIAMS, Superintendent.

The *Journal Miner* says: "As a clincher to the above, all employés of the company are required to subscribe to the following pledge: We, the undersigned, employés of, or doing business for the Copper Basin Copper Company, do hereby subscribe to the rules and regulations of the camp, and pledge ourselves to refrain from the use of profane or improper language, from gambling, from immoderate use of liquors, and agree not to patronize any liquor saloon, gambling house or any place of ill repute while in the employ of the company."

GRAHAM COUNTY.

ARIZONA COPPER COMPANY.—The hot-blast water-jacket copper furnace sent out from Scotland for the Arizona Copper Company has been completed, and, after frequent trials, accompanied by some alterations and adaptations, has so far proven a failure. It was blown in again for one day. Among its qualifications it was to use coal instead of coke, but those familiar with freights hither do not think that to be an advantage. Another claim was that it will "do away with" the flue-dust nuisance, but it looks as if the flue-dust had the best of it. The furnace was expected to work a revolution in the method of smelting the company's glance ores, but as yet it has not "worked" at all. At a meeting, held in Edinburgh recently, a form of agreement, with the Arizona Trust and Mortgage Company, was approved, subject to certain modifications on the original proposals of the directors. The chief of these modifications are that the interest on the new debenture stock is fixed at 10 per cent instead of 8 per cent, and that the capital is reduced to the extent only of 1 pound instead of 2 pounds per share. The Trust and Mortgage Company has approved of the agreement on these lines.

MOHAVE COUNTY.

AMERICAN FLAG.—This mine has been examined by an eastern company, who intend to buy and equip it with improved machinery. This property, for the past thirteen years, has been worked by four miners, who have realized $300,000 profit from it. One ton of ore recently shipped is said to have been worth $600.

PIMA COUNTY.

Mr. W. S. Lyle, President of the Peer, Peerless, Crocker and other companies at Quijotoa, has taken charge of the mines for a short time to enable Superintendent Pickett to take a much needed vacation. According to reports the mines never looked better. It is said that the cost of milling and extracting ore from these mines is only about $5.50 per ton.

CALIFORNIA.

ALAMEDA COUNTY.

LIVERMORE COAL MINING COMPANY.—This company, which purchased the coal lands of the Derby estate near Livermore, and purchased the coal bunkers, railroad tracks and cars, is about to begin operations on an extensive scale. The company proposes, in three months, to be able to ship 100 tons of coal a day.

AMADOR COUNTY.

Our special correspondent sends us the following:

The Plymouth Extension Mining Company has nothing but a location with a prospect hole down about 25 feet. So far as I could learn it is a full claim, and lies west of and parallel with the Chicago Mine and Milling Company's property.

The latter company has a shaft on its property 280 feet deep, but is not working the mine at present. They claim to have ore that prospects fairly well. I do not know why this latter company is not working its property. Unless they push work harder than they have for the past year, it will be a long time before they have a *mine*.

The name "Plymouth Extension" was given to the company which is now floating the stock in the East for the purpose of drawing attention to it and assist in selling the stock. The claim is situated southeast about one quarter of a mile from the noted "Plymouth Consolidated" mine; it is no way connected with it.

All I can say is there is no *mine* there at present, as we understand a mine. There may be good ledges under ground on that property, as well as on other properties in the immediate neighborhood, *but* it will be well for the public to know they are buying stock in a mine *location* rather than an actual mine in operation. I tried to get some reliable information as to the time when the Plymouth Consolidated was likely to resume work.

The Plymouth people say that outsiders know as much as any one in regard to that matter. The fact is, no one knows anything about it.

The general opinion in Plymouth is that there is no fire in the mine, nor has there been for some time. Why the company does not work it they do not know.

They say the contractors are to furnish round timbers and lagging the same as usual this summer, although the yards are nearly full of those supplies. It would seem as though work would be resumed in those mines very soon now.

The New London Company is sinking its shaft another 200 feet, making in all 1200 feet. They have quite a large body of ore on the dump, some of which looks well.

Without doubt a mill will be built on this property the latter part of this season, and I look for it to pay from the word go.

This property might well be termed the Plymouth Extension if one wishes to convey the idea of an extension of the Plymouth Consolidated.

There is some prospecting going on south of the Plymouth mines, but nothing of any note until you get to Dry Creek, where the Cosmopolitan mine is being worked by an Eastern company, under the management of Wm. Waymouth, brother of one of the principal Eastern owners.

They have a small hoisting rig, and a shaft down 250 feet, and are now sinking deeper. Their prospects are fairly good.

Mining through Amador City, Sutter Creek and Jackson is prospering as usual.

GILLICK.—Work on this mine, in Volcano basin, has come to a standstill. This property was recently bought by San Francisco parties, who started in to open it up in good shape. When sold, the mine showed every promise of paying, but it seems the prospects did not hold out, and the company concluded to quit.

SUTTER CREEK MINING COMPANY.—This company has been organized with a capital stock of $500,000; shares, $5 each. The property owned is situated in Sutter Creek, heretofore known as the Iowa mine, between the Lincoln and Mahoney. The directors are J. S. Emery, T. B. Valentine, George McWilliams, Martin Jones and F. E. Jewell, all of San Francisco.

CALVERAS COUNTY.

All the mines and mills at Angel's Camp are running up to their full capacity.

MCCREIGHT.—A correspondent informs us that this mine, located on Chaparral Hill, 3 miles south of Angel's Camp, promises to be a very valuable property. Four months ago the owner put a ten-stamp mill near the mine, with a 40-foot overshoot water-wheel. The mill has been kept running steadily ever since it started four months ago, turning out every month from $4000 to $5000 of gold. Last week they struck it very rich. On the 10th inst. they cleaned up about $10,000 in gold for six days'. There are a number of mines on Chaparral Hill and Carson Hill now lying idle for want of capital to develop them, which will prove fully as good as the McCreight mine, when once in operation.

NEVADA COUNTY.

BRUNSWICK GOLD MINING COMPANY.—The Grass Valley *Tidings* of the 14th inst. says: Speaking of this mine, Superintendent Tilley said to-day: "The mine never looked so well before. In the bottom drift is a 14-inch ledge of very good looking ore indeed, and the country ground is not hard. We have also got a ledge in the east drift of the same level which promises first-rate. It's from 2 to 2½ feet in thickness."

GOLCONDA GOLD AND SILVER MINING COMPANY.—This company has been organized, with a capital stock of $10,000,000, shares $100 each, to develop the Egyptian quartz ledge on Grizzly Hill, Bloomfield township. The directors are Geo. Baker and J. A. Jones, of Columbia Hill; A. E. Helm, of Calaveras County; G. E. Riley, of Moore's Flat; Geo. J. Hothersall, of Nevada City.

ORO FLAT MINING COMPANY.—Mr. Whitaker Wright, the president of this company, is in Grass Valley to give personal attention to matters pertaining to the development of the company's property. The present shaft on the Oro Flat (formerly Ford and Reilly ground) is 200 feet deep. He has ordered the shaft to be enlarged to 16 by 5½ feet in the clear. Two compartments—one for hoisting and one for pumps and ladder way.

ODIN GOLD AND SILVER MINING COMPANY.—This company has been organized, with capital stock of $1,500,000, shares $10 each, to resume work on the old Nebraska and Wait-for-the-Wagon drift mines a short distance in a northerly direction from Nevada City. The directors are Chas. H. Seymour, Charles Klingenspor, George G. Allan, O. Maltman and K. Casper.

PLUMAS COUNTY.

GREEN MOUNTAIN MINING COMPANY.—We are advised that the company's mines are not being worked at present. A special meeting of the company was held in this city on the 20th inst. for the purpose of considering what steps can be taken for the redemption of the company's property from sale under execution. It is stated that the company has a debt of $140,000; but, as an insufficient number of stockholders were present, the meeting was adjourned. Little or no interest seems to be taken in the company, as even at the place of the meeting no one knew the date of the adjourned meeting.

TAYLOR PLUMAS MINING AND MILLING COMPANY.—Operations at the mines were suspended six weeks ago, owing to a lack of funds, but it is said that work will be resumed shortly.

SANTA CLARA COUNTY.

QUICKSILVER MINING COMPANY.—A meeting of the stockholders of this company was held in New York on the 20th inst. The old board of directors were re-elected.

CANADA.

PROVINCE OF NEWFOUNDLAND.

TILT COVE.—The sale of this copper mine to an English syndicate for $384,000 is reported. In our issue of May 5th we reported the organization of the Tilt Cove Copper Company, Limited, organized for the purpose of buying the copper mines above referred to.

PROVINCE OF NOVA SCOTIA.

Forest fires destroyed the mining village of East Rawdon, Hant's County, on the 13th inst. Twenty dwellings and stores, together with the mill crusher and hoisting gear of the gold mining company, were destroyed.

PROVINCE OF ONTARIO.

A correspondent sends us the following:

Unusual activity at east and west ends Silver Mountain. M. Taico, M.E., of the l'Ecole Nationale Superieure des Mines de Paris, France, is opening up the west end, and Captain Intheway continues on the east end with good results.

The Silver Glance western extension of Silver Mountain shows good. Assays by Professor Kreissmann give results from 50 to 1650 ounces to the ton between surface and 15 feet in depth.

The Badger mill is under construction The Beaver, under Mr. Hooper and Mining Superintendent Williams, is looking well. A large consignment of hoisting and other plants is going in there. A number of American capitalists are here. Professor Eschweeler, M.E., leaves the Badger and Mr. H. Shear assumes the management. The Badger is solid, and Mr. Eschweeler leaves a good record behind.

CENTRAL AMERICA.

SALVADOR.

SAN SEBASTIAN GOLD MINING COMPANY.—The company has sent us the following extract from letter of W. D. Rennie, acting general manager of the company, dated May 3d: "The mine is now in splendid condition for inside work, and I see no difficulty in getting out all the ore the mills can grind. In the future the ore taken out will be of a much richer character than any previous workings, the vein showing signs of greater strength as we get down on it, some of the ore running as high as $200 per ton."

COLORADO.

BOULDER COUNTY.

GUNNISON.—This mine, situated at Sugar Loaf, has been sold by the sheriff to Charles Boettcher, for $4743.

KEYSTONE GOLD AND SILVER MINING COMPANY.—This company has nominated Elisha Seymour, of Sugar Loaf, its authorized agent for Colorado.

CLEAR CREEK COUNTY.

Mr. Oliver, of New York, is about to commence the erection of a 25-stamp mill, for custom work, at Idaho Springs. Such a mill will be of immense value to miners, whose output has been seriously retarded by the small capacity for custom work of the stamp mills at this place.

SEATON MOUNTAIN MINING COMPANY.—This company has served a suit in ejectment upon the Mascotte Company to compel the latter to vacate the ground of the Martha, alleged to have been improperly occupied.

CONEJOS COUNTY.

MAMMOTH.—This mine, situated in the Conejos mining camp, forty miles west of Antonito, is reported to have been sold to Denver parties for $55,000. The camp is reached by a good wagon road up the Conejos cañon, which is the only practical route.

CUSTER COUNTY.

RED SPRINGS MINING AND MILLING COMPANY.—This company at Silver Cliff has completed its large roasting furnace and is now building its leaching tanks.

GARFIELD COUNTY.

GRAND RIVER COAL AND COKE COMPANY.—It is unofficially reported that important changes are about to take place in the management of this company, the principal owners of which have been largely interested in the Colorado Midland Railway, and it is said that the affairs of the coal company will be wholly segregated from those of the railway. Col. J. B. Wheeler, who was the first vice-president of the Midland, will assume active management of the coal company's interests. It is given out semi-officially that the coal company, now relieved of all embarrassing entanglements, will at once enter into lively competition for the trade of the State; that they will enter the markets at Leadville, Denver and Pueblo and compete for the business of the smelters as well as of the mines.

HINSDALE COUNTY.

LAKE CITY MINING COMPANY.—A new air compressor, said to be the largest ever built in Colorado, is well under way at the works of Jas. W. Jackson, in Denver for the Ulay mine. The recent strike in the sixth level holds out well, and yields daily large quantities of the same excellent mixture of gray copper and galena. Sinking in the main shaft will soon be resumed, preparatory to opening the tenth level. The shipments from this mine were regularly maintained throughout the winter, at heavy expense, in order to make such a showing as would induce the construction of a railroad.

LAKE COUNTY.

AGASSIZ MINING COMPANY.—It is rumored that a

sale is pending in New York of this company's property. It includes the Wolfe Tone mine. The price is said to be $1,000,000.

CASTLE VIEW.—Operations will soon be resumed. The owners contemplate sinking the shaft 40 feet deeper, which will make it about 645 feet deep, and give vantage ground for future drifting beneath the known ore chute of the mine. It is well located, south of the Adams, but comparatively undeveloped.

MARION.—The mines, idle for years and conceded to be some of the best property in the district, will be again among the working mines of the camp about July 1st, and under the management of Mr. Will Havens.

MAID OF ERIN AND HENRIETT.—These mines will be shut down for the present, until there is a revival of the price of lead.

THE LEADVILLE MINES (LIMITED).—This company has been organized in London with a capital stock of £210,000, shares £1 each. The object is to purchase or acquire mines and land in Colorado, and in particular to acquire the mines known as the New Year, Grand View, Golconda, part of the Kokoms, The Jew, Sedalia, What is Left, Resurrection, and Mary lode mining claims in Lake County; to carry on the business of miners and smelters in all their branches.

WYOMING MINING AND PROSPECTING COMPANY.—The company is sinking the Pocahontas shaft, situated on the northwest slope of Carbonate Hill, and just below the Glan-Pendery fault. The shaft is now down over 400 feet and 4 feet of high grade carbonate ore has been struck. The shaft is quite wet, making perhaps 500 gallons of water per minute, but there are now three pumps employed, connected with a 10-inch discharge pipe, and no difficulty is anticipated in handling the water. An additional 80 horse-power boiler has just been ordered to reinforce the plant. This discovery is one of the most important made in the Leadville district for a long period. The shaft is situated below the Carbonate and Pendery faults, the line beyond which nothing had so far been discovered. It opens up a comparatively new area, of vast extent, and is almost certain to lead to other work that will follow at no distant day.

OURAY COUNTY.

GUSTON.—This mine is to be started up at once under the management of T. E. Schwartz, of the Yankee Girl.

PARK COUNTY.

PHILLIPS GOLD MINING COMPANY.—The Colorado Iron Works is building the 50-stamp mill for this company. The mill will be supplied with 16 Bertenshaw Gilpin County gilt edge concentrating bumping tables, which were illustrated in our issue of April 28th. The mine will be equipped with compressed air drills and other appliances for large operations at minimum expense. A T-rail tramway is also to be built, and it is said that with these improvements completed the ore can be mined, delivered, and milled at less than $3 per ton.

PITKIN COUNTY.

Our correspondent sends us the following from Aspen:

The management of the Aspen Mining & Smelting Company is replacing the present light iron rails of the gravity tramway with substantial 30-pound steel rails bought of D., R. G. R. R. Electric motor furnishing power for hoisting and ventilation will be introduced. Mr. George W. Nyce, Aspen's trustworthy mining engineer, is prosecuting the field work connected with the Jay Gould vs. Snowstorm adverse suit. Mr. J. W. Remfry, Superintendent of the Bonnybel mine, has uncovered a body of mineral assaying 585 to 816 ounces of silver. The discovery was made in the winze below the track running in the lime drift.

Initial strike in the Charles L. mine assays 458 to 470 ounces silver. The pitch of the mineral is north 45 degrees west; formation north 20 degrees west. T. P. Kennedy has a lease on the property.

Buckhorn No. 2 is shipping a ton and a half of ore per day, averaging 100 ounces of silver. A new road is completed to the mine.

The ore output for the week ending June 15th is 1604 tons. Of this 992 went to Denver, 196 to Leadville, 356 to Pueblo, and 160 to Kansas.

SAGUACHE COUNTY.

The correspondent of the Denver *Republican* reports the following from Bonanza:

EUREKA.—This mine, on Spring Creek, is in full blast and is running ten men and has a large body of concentrates ready to ship.

LEGAL TENDER.—The mine is running a full force, principally on development work. There is a fine body of copper here.

MICHIGAN.—The mine is producing more ore than any other mine—two car-loads per week. It was opened up three months ago and has paid well.

SASTHENSIS.—The mine has been worked all winter and has six or seven car-loads on the dump. This mine has been worked steadily for two and a half years. Dead work is being done now and some good ore is being taken out.

SAN MIGUEL COUNTY.

GOLDEN CHICKEN MINING COMPANY.—The company has filed certificates declaring all its stock fully paid up.

TOURTELOTTE PARK.

The Richmond mine, owned by Stevens & Leiter, shipped 3000 pounds of ore, averaging 139 ounces silver, 42 per cent lead, per jack train. The screenings, averaging 13 ounces silver, are reserved for concentration. Mr. Bates is the manager.

The Little Annie, under lease to Holbrook & Atkinson, has found galena 9 feet below the surface, assaying 30 ounces silver.

The Climax Group is preparing to ship mineral found east of the porphyry.

CONNECTICUT.

MIDDLESEX COUNTY.

The managers of the Brainard, the Middlesex and the Schaler & Hall brown stone quarries in Portland, have reduced the time to five hours for each working day. These quarries have been run ten hours, and this is the first time for many years that the working hours have been reduced at this season. This has been done, it is stated, owing to the uncertainty of the Mills bill in Congress.

DAKOTA.

CUSTER COUNTY.

TIN MOUNTAIN MINING COMPANY.—The first pig of tin produced by this company, whose mines are located near Custer City, is now on exhibition at Chicago. The pig weighs about 40 pounds. The tin concentrates from which it was obtained were received in Chicago some time since, but the special furnace for smelting them has but recently been completed. Further shipments of concentrates are now on the way from the mines, and the production of American tin may be said to have at last actually begun.

PENNINGTON COUNTY.

HARNEY PEAK TIN MINING COMPANY.—Fifteen hundred dollars has been paid by this company for an undeveloped tin location, situate one and a half miles north of Custer, and known as the Grant lode. The property has been held under bond by the company for several months. Five tin mines, located near Niggerville, have been bonded to this company. The appearance of several persons in Rapid City, who are said to be from London, England, and interested in the Harney Peak tin deal, is reported by the *Republican* of that place. The general impression is that the movement indicates that arrangements are being made for the commencement of work under the auspices of the English syndicate, and that the final papers of transfer from the American company have been or are about to be made. It is further stated that the company continues to pay its bond obligations at points near Custer City. The bond on the Grand and Telephone mines for $3,000 has just been paid.

HARNEY PEAK TIN MINING, MILLING AND MANUFACTURING COMPANY.—This company is doing a little farming on the side, says the Custer *Chronicle*. Several teams are employed plowing on the Reder Ranch, owned by that company at Hill City. The term agricultural should now be added to their already voluminous charter title. From the company's mining developments, it is not improbable that the growing of cabbage, etc., might produce a large proportion of its income.

OCCIDENTAL TIN MINING COMPANY.—Mr. S. A. Mills, secretary of this company, has been examining the properties of the company located in the Toe-calk mining district, with a view of planning the development work to be done and the location of a mill. This company was organized recently with a capital of $1,000,000.

GEORGIA.

CARNEGIE IRON MINING AND MANUFACTURING COMPANY.—This company has been organized at Chicago, with a capital stock of $300,000; to develop certain iron and coal mines in Georgia and to manufacture and deal in iron and lumber for building purposes. The incorporators are C. J. Becker, W. Yager, D. T. Bagley and I. Ackerman.

IDAHO.

ALTURAS COUNTY.

CAMAS No. 2.—The mill has been shut down and will not, it is stated, be started up again under the present management. A one-fifteenth interest in this property has been purchased by Thos. E. Tootle, of St. Joe, Mo., for $5000.

CUSTER COUNTY.

CINNABAR.—This mine has been bonded by Messrs. Geo. and Cal. Kirk, the locators and owners, to St. Louis and Illinois capitalists. A bonus of $20,000 has been put up, and is on deposit in St. Louis. The bond is for ninety days, beginning on the 1st inst., and a deed in escrow has been forwarded. Mr. Cal. Kirk has been selected as general manager by the company, and is to take charge of the property as well as to see to the putting in of a large amount of machinery, with which the mine is to be furnished at an early date. It is the intention of the company to put in concentrating works of from 30 to 50 tons capacity. These works are to be built on Squaw Creek, near the mine, and are to be completed this season.

The mine is situated on Bruno Creek, a tributary of Squaw Creek, and is about ten miles in a northwesterly direction from Clayton. It is developed by a shaft 304 feet deep. No stoping has been done to speak of, and all the ore extracted has been taken out in sinking the 304-foot shaft. Five thousand tons of second-class ore are now on the dump, and owners have realized from the first-class ore, which they shipped to Clayton and Bayhorse for reduction, the sum of $58,000. The ores are silver-lead and carry no sulphurets or chlorides. The gangue is iron, and, where it does not carry a large vein of good ore, is sufficiently filled with mineral to make it profitable for concentrating.

OWYHEE COUNTY.

WILSON MINING COMPANY, LIMITED.—This company has been organized in London with a capital of £350,000, shares £1 each. The object is to work mining rights under or upon the lands, estates or properties of any person or persons or companies in the Wilson gold mines and claims situate near Waggon Town, in the county of Owyhee.

ILLINOIS.

SHELBY COUNTY.

SHELBYVILLE COAL, OIL AND NATURAL GAS COMPANY.—This company has contracted with an Eastern firm to sink a well at Shelbyville to the depth of 3000 feet for the purpose of prospecting for coal and gas. A well was sunk 1200 feet last year without good results.

KANSAS.

COFFEY COUNTY.

The coal find at Le Roy has been found to be a fraud by the discovery and removal from the bottom of the well of a sheet iron cylinder filled with a good quality of coal. Reports state that before this discovery, however, the contractor, J. W. Snyder, and a man by the name of Marshall, who had charge of the drilling, convinced the company that coal had been found; the stipulated sum was paid and the contractors disappeared. They have since been arrested and held for trial.

KENTUCKY.

MEADE COUNTY.

Representatives of all the natural gas companies of Meade County, and others, held a meeting at Louisville recently to consider plans for the utilization of the natural gas resources of that county.

MICHIGAN.

LAKE SUPERIOR IRON COMPANY.—When the first strike of gold was made on this company's property some months ago, as mentioned at the time in the ENGINEERING AND MINING JOURNAL, the shaft was filled up and the work stopped until the company, which was authorized to explore for only iron ore, could be reorganized. The shaft was opened again on the 17th inst., and it is reported that the first blast in the bottom threw up free gold-bearing rock.

ROPES GOLD AND SILVER MINING COMPANY.—The following circular has been issued to the stockholders by Mr. Julius Ropes, the president of the company: "Being assured that a syndicate of Detroit capitalists can be induced to buy 40,000 shares of Ropes Gold and Silver mine at a reasonable figure, and being desirous that each stockholder be allowed the privilege of selling as much as they feel disposed to part with, I would ask you to send promptly to the Ishpeming National Bank or Peninsula Bank, of Ishpeming, Mich., signed in blank, all of the stock you wish to furnish at $3 per share, less brokerage and exchange of 25 cents per share, payable on or before July 25th, 1888, or stock refunded. A receipt for same will be sent you by the bank. I am allowed to say that Messrs. Cummings, Carpenter, Curry, Sellwood, Ely and other large stockholders will furnish at least three-fifths of their stock."

COPPER MINES.

CALUMET & HECLA MINING COMPANY.—The work of unwatering the main shafts, says the Boston *Traascript*, gives promise of enabling the resumption of operations in some of the said shafts rather earlier than was thought possible at first. The *Transcript* has it from the highest official sources that the mine from now on will produce every ton of mineral possible. In a Providence, R. I., foundry is being manufactured for this company the largest mining pump in the world. A single section of this gigantic pump has been cast, and its weight is fullytwenty tons. The material used was charcoal iron from the Katahdin Iron-Works, Maine. It is stated that considerable silver is found in the copper-bearing rock at the South Hecla mine of this company.

MASS.—The owners of this property are seeking a market for it.

PENINSULA.—The mine is being unwatered, which is being done by means of large skips, the pumps not being in working order. It is understood that the property is about to be sold.

PILGRIM MINING COMPANY.—The claims against this company have been paid and all the suits discontinued. Work will probably be resumed.

IRON MINES.

The Jackson Iron Company and the Negaunee Mining Company announce the intention of platting and selling their properties in Marquette, reserving the mineral rights of course. The land to be thus placed on the market includes all that suitable for building purposes owned by these companies.

ARAGON MINING COMPANY.—Work on this company's property (Norway townsite) has been suspended, and the company has in contemplation the advisability of sinking another shaft to reach the ore. Water has troubled the miners greatly in the shaft which they have been putting down, and further work with the drill established that the deposit lies deeper than was supposed when the shaft was started. It is proposed to overcome the trouble caused by water in the new shaft by pumping out the water as rapidly as it makes in the present shaft. From 1000 to 1200 gallons of water are being lifted every minute out of the present shaft.

BESSEMER CONSOLIDATED IRON COMPANY.—The Bonnie, Blue Jacket, First National and Valley mines of this company, says the Gogebic *Mining Record*, are all lying idle, and are filled up with water. There seems to be no prospect of their resuming work this season. The Iron King, however, is doing something, and is even adding some men to its force.

CLEVELAND IRON COMPANY.—The company is making a test of crude petroleum as a fuel under two of its boilers in the main engine-house, a representative of the Standard Oil Company having charge of the experiment.

NANAIMO.—The pumps are being hoisted out of this mine and it will be allowed to fill up. There has been some trouble at this mine for some time past. The

miners' wages have not been paid for three months, and they have attached ore and chattels.

MINNESOTA.

LOUISE COUNTY.

MINNESOTA IRON COMPANY.—Recent explorations with the diamond drill on this company's property, says the Vermillion *Iron Journal*, have proved the ore deposit there to be of great depth. In No. 7 shaft a drill hole, bored at the same angle as the ore dipped, cut a clean deposit for 193 feet. Another hole bored at the base of the bluff cut 38 feet of a clean deposit at a depth of 330 feet in a vertical line from the outcrop. A third hole was then bored, which crossed the ore at 440 feet below the top of the ridge, which proved at that depth a deposit of 47 feet 10 inches of ore. Other holes will be bored to give the deposits a greater test as to depth.

MISSOURI.

JASPER COUNTY.

LEHIGH MINING AND DRAINAGE COMPANY.—The company will put in operation four shafts at Lehigh that have been idle for a long time. This company's yield will now run about 200 tons a week. The company is getting $23 a ton for its ore.

LONE ELM SMELTING WORKS.—The new stack furnace which has been placed in position at these works at Joplin, has started up.

MAHASKA MINING COMPANY.—"Mahaska Mining Company" is the name by which Messrs. Rice & James will hereafter be known. The company's land at the Cox Diggings is developing some of the best paying mines in the district.

MONTANA.

MONTANA COAL COMPANY.—The company's property is situated on Rock Creek, opposite the mines of the Rocky Fork Coal Company, and about 280 miles from Helena, on the uncompleted line of the Rocky Fork Railroad, which connects with the Northern Pacific road at Laurens. The company owns 640 acres land. They embrace five veins, three of them being tunneled, and there are others that can be opened at any time. The quality of coal is said to be good. The Rocky Fork road, which posses through a part of the Crow reservation near the fields, will be completed to the mines in about thirty days, after which shipments will commence to Helena, where the company will start a large coal yard, with Moses Morris as the superintendent. The company is composed entirely of Helena people.

DEER LODGE COUNTY.

The question of the building of the mills by the Granite and Bi-Metallic mining companies has at last been definitely settled. The site chosen is in Douglas Gulch, about two miles from Phillipsburg, and one mile from the Bi-Metallic grounds. The Granite Company will build an eighty-stamp and the Bi-Metallic a forty-stamp mill, as previously decided upon.

LEWIS & CLARKE COUNTY.

MONTANA COMPANY, LIMITED.—Official advises to us show that the production for May amounted to $90,700, and the working expenses to $48,300. The company has issued the following circular, dated the 5th inst., from which we take the following: Many shareholders are under the impression that the Jubilee Shoot ought to have been cut ere this in the 600 foot level south, and imply that, as it has not yet been reached, it does not exist at this depth. Now, the 600 foot level south may not yet be sufficiently advanced to intersect the dip line of the shoot, or the shoot may be lying to the right or left of the forebreast of the level, requiring a cross-cut for its discovery; further time is necessary to determine this question, as from a cablegram received this morning Mr. R. T. Bayliss states that he can not tell when the Jubilee Shoot will be reached. In Mr. R. T. Bayliss's last report, dated 17th May, and received on the 1st inst., he states that work in the 600-foot level south is being prosecuted with all possible vigor, and that he had employed in this drift for the past nine months two machine drills, working night and day. During the time the new hoisting plant is being erected it will be impossible to continue work in the lower levels; but as soon as connection is made in the No. 2 shaft some machine drills will be placed in the 600-foot level, and continue thenceforth with all practicable speed the erection of the new hoisting plant and alterations to the old hoisting plant. This will probably stop all work below the 400-foot level for about two months, and all the men now in the lower part of the mine will be employed above the 400-foot level. The 50-stamp mill is now working entirely as a low-grade mill. There is no appearance of any improvement in the 800-foot level north at present, but the improved condition of the Pixley No. 4 shoot in the 600-foot level, indicates that a similar improvement may be met with in this ore-body when it is reached in the 800-foot level. The 600-foot level north still continues in the Pixley No 4 shoot, but we are approaching the northern limit of the ore-body in this level. The 600-foot level south is still in ore, but of very low grade. The drift, which is being driven on the Armitage lode to connect with the 400-foot level, has entered a body of quartz which will average 10 dollars to 15 dollars a ton. The last circular issued by the company was published in our issue of May 26th.

WINSCOTT MINING COMPANY.—The new mill of this Company has started up. It is amply able to handle the ore for the Winscott and McClellan mines, and, with an increase in the number of stamps, can do custom work. The equipment is first class in every particular. The mill has a capacity of thirty-five tons—ten stamps—and cost about $20,000, including machinery. It will be kept running night and day for thirty days, when a clean-up will be made.

SILVER BOW COUNTY.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—The company's plant at Meaderville is now running in full blast for the first time, the last furnace having been started up on the 12th inst.

SILVER BOW MINING COMPANY.—This company was recently organized under the laws of Illinois, with a capital of $2,000,000. The officers are George Shields, President; L. P. Kennedy, Vice-President; John P. Farrington, Secretary and Treasurer. Mr. T. J. Drum is the manager and resident agent of the company in Montana, and Timothy Lynch is superintendent. The property consists of the Tarra, the Santa Maria, and the Laurie, mainly carrying free-milling ore, situated about three miles north of Butte, in the Summit Valley district, upon which property considerable developments have been made. It is the intention of the company to at once commence active operations. A hoisting engine will be shipped from the East and sufficient capital has been paid in to vigorously push operations on the property. St. Louis parties are interested in the enterprise.

NEVADA.

ELKO COUNTY.

GRAND PRIZE MINING COMPANY.—The Grand Prize mill at Tuscarora will start up on ore from this mine on July 1st.

NYE COUNTY.

BARCELONA MINING COMPANY.—A well-known engineer has been sent by Eastern capitalists to examine this mine, and it is stated that he will telegraph a brief report next week. At the office of the company a gentleman said to a representative of the ENGINEERING AND MINING JOURNAL: "It is true that we have made a rich strike in the mine recently. Here is an assay made by Riotte, which shows that the ore contained 2422½ ounces of silver and $31.00 worth of gold to the ton. Are we not justified in calling this a rich strike? Last October, Governor Bodwell, of New Hampshire, without the company's knowledge, sent an expert to the mines, and upon the strength of his report bought a large block of the stock."

DELARBAR.—Operations have been resumed in this mine on Arizona Hill.

STOREY COUNTY—COMSTOCK LODE.

We condense the following from the Virginia City *Chronicle*:

BENTON MINING COMPANY.—The mine was started up on the 1st inst., after a suspension of operations during the entire month of May, pending the overhauling of the affairs of the company by the President and Secretary, who are now on the lode. A Loughran, foreman of the mine, has been appointed acting superintendent and will be elected at the next meeting of the company. Major W. J. Collins, the late superintendent, arrested for alleged forgery and embezzlement, is out on cash bail of $1500, furnished by himself, in place of $4000, as heretofore stated, and it is rumored that there is a favorable prospect of matters being compromised between him and the company.

CHOLLAR MINING COMPANY.—The 20 additional stamps being placed in this mill, will be ready for operations by July 1st. The management is pushing the work of setting up the electric plant on the Sutro Tunnel level of the Chollar main incline to have it ready for testing its power as a motor on the same date. With the 20 additional stamps the mill will have a crushing capacity of above 200 tons in 24 hours.

CONFIDENCE MINING COMPANY.—One hundred and ninety tons of ore are being shipped daily to the Brunswick mill, showing a value of $33 per ton by pulp assays. On the 11th inst. the mine shipped five bars of bullion, valued at $15,844 95, making a total for the month to that date of $31,912.18.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—The official statement of the ore worked and bullion produced during May shows that there was worked at the Morgan and Eureka mills a total of 13,540 tons of ore, yielding bullion valued at $411,173.13, of which $191,701.83 was gold and $219,471.30 was silver. The yield in bullion per ton of ore was $30.36, and the average assay value of the ore per ton was $36.04. Attention is directed to the unusually large amount of gold contained in the bullion produced last month, which effects a great saving to the company on account of the heavy discount on silver. During the week ended the 9th inst., 1213 tons of ore were shipped to the Morgan mill and 1780 tons to the Eureka mill. The average assay value of all the ore worked at the above mills during the week, according to battery samples, was $38.25.

CROWN POINT MINING COMPANY.—At the annual meeting held at San Francisco recently the following officers were elected: C. L. McCoy, President; A. K. P. Harmon, Vice President; James Newlands was re-elected Secretary, and S. L. Jones Superintendent. The superintendent's report shows that during the year 9026 tons of ore yielding $10.70 per ton were extracted, and 810 tons yielding $13.53 per ton, coin value, were worked. The latter was profit to the company (less milling), as the ore was extracted in running various prospecting drifts and cross-cuts. A considerable amount of ore has been developed on the 400, 500 and 600 levels, extraction of which will be commenced as soon as milling facilities can be obtained.

GOULD & CURRY MINING COMPANY.—During the week ended the 2d inst., there were extracted from the 250 and 300 levels 180 tons of ore. To date the Douglas mill has crushed 1000 tons and 1600 pounds of ore from the mine, yielding $16,608.18 in bullion, which has been shipped to San Francisco. The ore reserves now stripped in the mine are of an area to warrant the statement that it will soon be upon a self-sustaining basis. The company pays the Sutro Tunnel Company 50 cents per ton royalty only on the ores extracted from its mine, whereas the other Comstock companies pay a royalty of $1 per ton on the grade of ore now coming out. This is because the Sutro Tunnel Company owes the Gould & Curry Company about $40,000 for money advanced to run the north lateral branch of the tunnel, which lien enables the Gould & Curry to make favorable terms with the tunnel company.

HALE & NORCROSS MINING COMPANY.—The ore shipments for the week ended June 12th aggregate above 1650 tons, showing an average value by pulp assays of $34.10 per ton. The company has declared a monthly dividend of 50 cents per share. The May report shows 5,925 tons of ore crushed, yielding $168,686.97. Out of this a dividend of $56,000 was paid. On June account, $32,000 in bullion has been produced.

IOWA MINING COMPANY.—The motion made by the counsel for this company to declare invalid the sale of the mine by the sheriff, last December, to satisfy claims of lienholders, was denied by Judge Rising. The six months' time allowed for the redemption of mining property sold at sheriff's sale expire June 15th. The entire indebtedness against the mine, aggregating $5,800, has been settled, the creditors receiving 18 per cent interest on their claims. Explorations in the mine have been pushed vigorously pending the settlement, and an important ore vein has been developed in extending the McBee tunnel. The vein is being stripped by north and south drifts. The mine will remain under the old management, with William Welch as Superintendent.

KEYES MINING COMPANY.—Sinking the shaft below the 280 level is suspended on account of the flow of water being too strong. The bailing tank keeps it drained to the bottom of the sump, and a north drift has been started from the 280 level shaft station to cut the downward continuation of the five feet of ore developed in the winze below the 240 level. Sinking the shaft will be resumed as soon as a pump plant, to be contracted for, is in position.

OCCIDENTAL MINING COMPANY.—The company has begun shipping ore to the Atlanta mill, near Dayton. Sixty tons of ore have been shipped

SAVAGE MINING COMPANY.—The ore shipments average 80 tons daily, pulp assays showing a value of $24 per ton. Begun stoping ore stripped by the 400 level south drift, which has reached the south line

SEGREGATED BELCHER & MIDAS CONSOLIDATED MINING COMPANY.—The report presented at the annual meeting recently held at San Francisco shows that there is a net cash indebtedness in the bank of $26,381.92. The raise above the 1300 level south drift disclosed a considerable amount of good ore, some of which was of very high grade. But comparatively little prospecting has ever been done in the mine, and this, together with the promising development already made, makes the ground a favorable field for future active exploration.

WHITE PINE COUNTY.

Rumor has it that Capt. Frank Drake is to be back shortly and resume work on a gigantic scale on the Aurora series of mines and in driving the Eberhardt tunnel.

KEYSTONE MINING COMPANY.—This company of Robinson has found an abundance of water and will soon commence work on its leaching works. It is stated that several important strikes have recently been made in the mine.

NEW MEXICO

GRANT COUNTY.

MOGOLLON MINING COMPANY.—The parties interested in this company, organized in St. Louis, it is said have gradually gathered in the bonds of the Sheridan mill, caused a sale by the sheriff, and recently purchased the mill at Socorro. It is understood that Peacock men are in the move and will run the Sheridan on ore of that mine and for custom work.

PEERLESS MINING COMPANY.—Mr. J. W. Ripley has secured a judgment against this company, and on the 21st inst. was to sell some of the company's personal property at the mine. The other sale, which was to satisfy the $6000 mortgage, did not include the personal property.

RIO ARRIBA COUNTY.

It is reported that placer mining will be revived on the Chama, northwest of Espanola, this season. Kentucky capitalists who recently visited the placers have secured 1000 acres of ground. They expect to put in extensive machinery and push work vigorously.

SIERRA COUNTY.

In the suit about the title of the Gray Eagle mine at Kingston, which was in dispute when Whitlach bought it for St. Louis parties, he deposited $50,000 in the Percha bank, which gave bond to the court. All parties signed the deed and agreed to litigate for the money. The amount involved was $50,000. G. G. Posey, special master, finds that there was no contract for settlement between the Meads and the Avey, Routh and Stacey parties; that assessment work on the Bismarck, the old name of the claim, was done in 1883 by the Meads, and in the subsequent years until the sale to Whitlach. This gives the property to the Meads, subject to claims of others. All the amounts are to be reduced by whatever proportion of costs is assessed against them by the court.

SILVER MINING COMPANY OF LAKE VALLEY.—A correspondent who visited this company's property a few weeks ago writes as follows: Through wasteful

management, as also through investing too largely in experimental processes and machinery, the "once famous Sierra" ran behindand got in debt about $25,000 or more. Money was raised in judgment notes to amount of $10,000; this was used to partially cancel debts, then the property was foreclosed to satisfy the judgment notes. A syndicate was formed by stockowners, who would remit 10 cents per share on the stock they held. After all had come into the syndicate who wished to, the trust turned over the property to the syndicate and the syndicate organized the S. M. Co. ("the remnant of the once famous, etc."). While all this was going on new men took hold of the management—men who appreciated that everything had to be brought down to hard pan. The result was that very soon the bank showed a credit. The credit was enlarged some by the sale of a few articles not needed, with the exception of one or two months each month has added to the credit balance, until now there is *about* $80,000 in the treasury in money and *about* $5000 per month is being added. The old capitalization was $20,000,000. It is now 500,000 shares at $1, and about 98,000 shares are in the treasury. Of the about $80,000 cash nearly $40,000 is out at interest to pay home office expenses. That office is so managed that the interest more than pays the expenses. About 300 tons of ore per month is shipped. The company works only eight or ten mines. Balance is done by lessees, who buy their supplies, etc., from the company. After deducting profit on supplies, collections, for assaying, sampling, reaming, tool sharpening, rents, etc., the expense at mines is only about $10,000 per year.

As for the mines, I am told by disinterested experts that they are of vast possibilities, and in more promising condition than ever before.

The mine is making money every day, and every day makes the mine look better. Some weeks ago I was given a partial list of stockholders. I recognized them as business men, merchants, etc. In not one of them did I recognize a stock operator, and I believe that three quarters of the stock is being held as I hold mine, *i. e.*, for the dividends that it should pay, and prognosticate will pay. I would be grateful for any reliable information that you may have derogatory to the property or its management.

PENNSYLVANIA.

At the new shaft at the iron mines of Gabel, Jones & Gabel, at Boyertown, the black vein, or upper vein of ore, has been reached at a depth of 638 feet. Ground was broken in August, 1886, at this shaft, and the work has since been prosecuted night and day, with a few stoppages only, sometimes through very hard rock, which rendered operations quite difficult and slow. The black vein is richer but not so thick as the one underneath it, the former 15 to 25 feet and the latter over 50 feet through. Messrs. Gabel, Jones & Gabel expect to take out ore in a short time. This new mine was put down not only for mining on their own tract, but on leased lands adjoining.

COAL.

It is stated that all attempts in the Clearfield mining region to establish monthly payments and company stores have failed.

L. M. Righter and Wm. Schwenk, of Mt. Carmel, and E. B. Leisenring and S. Kemerer, of Mauch Chunk, have signed a lease for the Dundas tract of coal lands situated near Minersville. The J. A. Stauver and George Spencer slopes, which are full of water, will be at once pumped out and the Spencer slope will be run down 200 yards further and a tunnel driven northward from that point to cut the Primrose White Ash vein. The mine is but a mile and a half from Minersville, and a large amount of money will be expended in improvements this summer.

BUCK MOUNTAIN.—This colliery, whose breaker was burned November 19th, resumed mining on the 11th inst. The new breaker, which is larger than the one destroyed, will have a capacity of producing 150,000 tons per annum. It is fitted with every modern appliance for the quick and thorough preparation of anthracite.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to June 16th.

	1888. Gallons.	1887. Gallons.
From Boston	1,001,922	2,038,280
Philadelphia	50,162,104	69,467,017
Baltimore	7,009,401	3,917,389
Perth Amboy	9,961,098	7,735,561
New York	15,996,980	167,810,874
Total exports	217,131,505	250,969,121

SOMERSET OIL AND GAS COMPANY.—This company, incorporated by George Johnston, Peter J. Urling, William McCallin, John D. Bigkert, and George R. Scull, has applied for a charter. The intention is to develop an oil field in the almost untested district of Somerset County. Some months ago an extensive well was drilled. Samples of the oil have been tested, and have shown it, it is said, to be very fine grade of petroleum. As a result the company now has in its hands leases for nearly 20,000 acres of land. Sufficient wells will be drilled thoroughly to test the field.

SOUTH AMERICA.

UNITED STATES OF COLOMBIA.

EL CRISTO GOLD AND SILVER MINING COMPANY.—We have received the following letter from Mr. D. B. Huntly, the General Superintendent of the El Cristo Gold and Silver Mining Company, dated May 31st: In your issue of March 24th, 1888, under the head of General Mining News, you publish some paragraphs about Colombia mines from "our special correspondent."

While not wishing to disparage the many statements of your correspondent, of which I have no knowledge whether right or wrong, I decidedly take exception to the paragraph relating to El Cristo, of which mine I know.

Please treat us fairly and publish also the other side of the question, from another "special correspondent."

We have not "crawled into our shell," but in the months of January and February (to which your correspondent must refer) were steadily increasing the force of miners, owing to the opportunities for using more men. True, we discharged an outside force, having completed ditches, trails, clearings, etc.; but in all the time the present company have owned El Cristo, no months up to those mentioned have shown a greater progress in underground work than January and February, 1888. It is your correspondent who has crawled into his shell—too far to get knowledge before writing

Regarding statements about water rights, they are totally incorrect.

1st. The Frias mine is not the least in the water question, being situated on a different water course.

2d. The "lack of business prudence" was entirely an affair of the Calamonte mines, as a former owner of El Cristo, four years ago, in a public document, made an agreement with the superintendent of Calamonte, whereby the El Cristo Company has the right to one third of the water Calamonte had formerly taken. This, with the other streams entirely controlled by El Cristo, gives it an abundance.

3d. When on completion of its ditch El Cristo took what belonged to it, it was not "sat upon" either promptly or tardily.

The El Cristo mine is being prospected vigorously by a tunnel to cut several veins far below the old workings, and thus save all trouble and expense from water for years, and also by a vertical shaft on the hanging wall of another vein. This shaft is now sinking for the 300-foot level. Cross-cuts and levels have been run and are running from upper stations in the shaft.

SOUTH CAROLINA.

The following shipments of land phosphate rock from Charleston during May are reported by Mr. Paul C. Trenholm:

	1887		1888.	
	Crude. Tons.	Ground. Tons.	Crude. Tons.	Ground. Tons.
To domestic ports	16,535	655	23,259	....
To foreign ports	1,930	...	.....	....
Total	18 465	655	23,259	....

TENNESSEE.

SCOTT COUNTY.

ROBBINS COAL AND MINING COMPANY.—This company has opened a mine at Robbins, and is shipping 10 cars per day, and expects to ship 20 cars daily by September 1st.

UTAH.

EMERY COUNTY.

The agate and jet mines at Cisco, near the dividing line of Colorado and Utah, are attracting considerable attention. The Salt Lake *Herald* says that the jet was but recently discovered. It has been tested by experts, however, and pronounced to be of the purest quality. Efforts are being made to organize a company, with a view of working the deposits, both of agate and jet. The existence of agate in that vicinity has been known for some time.

SUMMIT COUNTY.

DALY MINING COMPANY.—The production for May was 72,659·37 fine ounces silver: $14,318.85 from ore sales, an approximate total of $86,977.72.

ONTARIO SILVER MINING COMPANY.—The production for May was of bullion 98.366·71 fine ounces of silver; ore sales, $68,337.36; total, $166,704.07.

TOOELE COUNTY.

At the Wade Hampton and Argent mines at Stockton, which have been in litigation the past seven years, some development work is being done, Gustave Johnson and J. F. Connor having effected a compromise. The main incline is down 400 feet, and a winze has been sunk 75 feet lower. The property lies east of the Silver King, and has ore of similar character. It has yielded much in the past, and there is a sale rumored.

HONORINE MINING COMPANY.—The mill is kept busy during day time, running through about 60 tons of ore, and turning out about 15 tons concentrates going 50 per cent. lead and 25 to 30 ounces silver. First-class ore, of which about 50 tons is produced per month, runs about 60 per cent lead and 25 ounces silver

WEST VIRGINIA.

M'DOWELL COUTNY.

NORFOLK COAL AND COKE COMPANY.—This company has been organized, with a capital stock of $500,000, by Stewart M. Beck, of Hampton; H. M. Sill, H. A. Dubring, J. S. Clark and A. C. Denniston, of Philadelphia, Pa., to mine coal, iron ore, etc., manufacture coke, iron, etc., develop quarries, etc., at Maybery.

WISCONSIN.

EAU CLAIRE COUNTY.

A syndicate has been formed at Eau Claire for the purpose of developing the newly discovered gold and silver mine on Weigne Creek, seventy miles north of Eau Claire.

GOGEBIC DISTRICT.

BESSEMER.—Work at this mine has been suspended and the pumps taken out. The company lacks funds wherewith to pay operating expenses. This mine is one of the mines owned by Moore, Benjamin & Co.

IRON BELT.—Shipments of ore have begun, and will continue during the season in all probability. It is now expected that the output from the mine will be about 25,000 tons for the season.

SAUK COUNTY.

DOUGHLAS IRON MINING COMPANY.—This company, which was organized in Baraboo over a year ago with the intention of prospecting for iron ore, has at last been successful. Operations at the mine, which have been going on for several months in a quiet way, have developed the finest quality of soft hematite ore. Three working shafts have already been sunk. The company after expending $30,000 on this mine has bought the property for $11,000. Operations for the present have been suspended until proper machinery is purchased to go on with the work preparatory to shipping. The Chicago & Northwestern Railway Company, it is said, will construct a spur track to the mine, as soon as operations begin.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 22.

Statistics.

Production Anthracite Coal for week ended June 16th and year from January 1st:

Tons of 2240 lbs.	1888. Week.	1888. Year.	1887. Year.
P. & Read. RR. Co.	134,266	2,434,510	3,530,080
Cent. R. R. of N. J.	128,827	2,2 6,418	2,226,889
L. V. RR. Co.	192 722	2,691,161	3,278,082
D., L. & W. RR. Co.	115,624	2,853,959	2,373,948
D. & H. Canal Co.	50,237	1,910,469	1,712,394
Penna. RR.	84,612	1,821,853	1,402,158
Penna. Coal Co.	35,337	671,779	629,880
Penna. Canal Co.	16,633	137,709	106,489
Total	766,258	14,807,758	15,260,020
Decrease	...	452,262	...
Increase	75,143	...	...

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production

Production for corresponding period:

1883	13,649,241	1885	12,197,100
1884	12,675,530	1886	13,642,764

Production Bituminous Coal for week ended June 16th, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1888. Week.	1888. Year.	1887. Year.
Phila. & Erie RR.	.....	27,465	3,432
Cumberland, Md.	77 625	1,586,366	1,285,630
Barclay Pa.	3,054	83,782	99,540
Broad Top, Pa.			
B. & Broad Top RR	6,535	172,494	168,703
Clearfield Region, Pa.			
Snow Shoe	955	60 989	79,774
Karthaus (Keating)	2,503	68,183	88,136
Tyrone & Clearfield	71,180	1,593,133	1,511,673
Tipton	981	27,920	3,519
Alleghany Region, Pa.			
Gallitzin & Mountain	13,451	421,473	508,854
Pocahontas Flat Top Coal.			
Norf'k & West. RR.	30,380	733,877	548,607
Kanawha Region, W Va.			
Ches. & Ohio RR.	38,503	858,113	725,008
Total	245,167	5,633,795	5,017,866

* Tons of 2240 lbs.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.			
West Penn RR.	7 957	183.028	147.463
Southwest Penn. RR.	1.878	47 274	64 914
Pennsylvania RR.	7,201	141.479	102,087
Westmoreland Region, Pa.			
Pennsylvania RR.	31.737	809,171	691,097
Monongahela Region, Pa.			
Pennsylvania RR.	15,037	178.797	162,973
Total	63,810	1,359 749	1,189,034
Grand total	308 977	6 993.644	6,207,900

Production of Coke on line of Pennsylvania RR. for week ending June 16th, and year from January 1st, in tons of 2000 pounds: Week, 66,965 tons; year, 1,795,750 tons; to corresponding date in 1887, 1,587,815 tons.

Anthracite.

Business in this market is still rather dull, though perhaps a little better than it was a week ago. Prices are well maintained even by the outside operators, but production was not kept down to that of the corresponding month last year, as is shown in the annexed official statistics.

The Lehigh Valley, Central Railroad of New Jersey, Lackawanna and the Pennsylvania Railroad have very largely overproduced during the month past. It is needless to say that if the production is to be one quarter million of tons a month more than it should be; the market will feel the effect, and the companies will be unable to advance the prices in the face of such heavy stocks as are working up. As we announced two weeks ago, the stock June 1st was more than 812,000 tons. No decision has yet been arrived at regarding future prices, but it is pretty generally conceded that no advance will now be made before the 1st of August.

The production of anthracite for the year up to the 1st of June was almost the same as during the corresponding period in 1887, but the stocks at present are considerably higher than they were a year ago.

We continue to quote circular prices as follows, which, of course, are subject to the usual 15 cents commission:

Broken, $3.75; Egg, $4; Stove and Chestnut, $4.25; Pea, $3 to $3.20 for free burning coals f.o.b. Of these sizes stove and egg appear on best demand, and pea coal continues to be sold regardless of the prices of other sizes.

Mr. John H. Jones, Chief of Bureau of Anthracite Coal Statistics, has issued the following statement of anthracite coal tonnage for the month of May, 1888, compared with same period last year. This statement includes the entire production of anthracite coal, excepting that consumed by employés and for steam and heating purposes about the mines, but does not represent the entire anthracite coal tonnage actually transported by the respective railroad companies, ad-

justment being necessary in the compilation to avoid duplications, etc.

COMPANIES.	May, 1888.	May, 1887.	Difference.
Phila. & Reading RR...	568,117	547,507	Inc. 20,610
Lehigh Valley RR.....	583,580	541,062	Inc. 42,518
Central RR. of N. J....	444,220	396,156	Inc. 48,064
Del., Lack. & West. RR.	393,123	441,687	Dec. 48,564
Del. & Hud. Canal Co..	264,953	266,402	Dec. 1,449
Pennsylvania RR.....	391,873	313,512	Inc. 78,361
Pennsylvania Coal Co.	122,888	127,159	Dec. 4,271
N. Y., L. E. & W. RR...	82,716	66,869	Inc. 15,847
Total	2,851,470	2,700,353	Inc. 151,117

COMPANIES.	For year 1888.	For year 1887.	Difference.
Phila. & Reading RR...	2,064,162	2,758,285	Dec.694,123
Lehigh Valley RR.....	2,160,972	2,657,397	Dec.496,425
Central RR. of N. J....	1,951,451	1,925,077	Inc. 26,373
Del., Lack. & West. RR.	2,588,170	2,098,594	Inc. 489,576
Del. & Hud. Canal Co.	1,743,494	1,498,719	Inc. 244,775
Pennsylvania RR	1,712,454	1,370,969	Inc. 341,485
Pennsylvania Coal Co..	587,272	557,621	Inc. 29,651
N. Y., L. E. & W. RR..	369,831	326,075	Inc. 43,755
Total.....	13,177,806	13,192,737	Dec. 14 931

	May, 1888.	May, 1887.	Difference.
From Wyoming Region	1,447,602	1,417,313	Inc. 30,288
From Lehigh Region..	548,367	507,934	Inc. 40,433
From Schuylkill Region	855,501	775,106	Inc. 80,395

	For year 1888.	For year 1887.	Difference.
From Wyoming Region	8,541,892	6,874,887	I. 1,677,005
From Lehigh Region..	1,330,530	2,385,265	D. 1,054,735
From Schuylkill Region	3,305,384	3,932,586	D. 627,201

The stock of coal on hand at tide-water shipping points May 31st, 1888, was 812,425 tons; on April 30th, 1888, 733,314 tons; increase, 79,111 tons.

Statement showing general distribution of entire production of anthracite coal, year ending December 31st, 1887:

	Tons.
To Pennsylvania, New York, and New Jersey..	22,508,082
New England States	5,590,972
Western United States.....	3,707,117
Southern States, including Delaware, Maryland and the District of Columbia.....	1,739,052
Pacific Coast.....	6,810
Dominion of Canada.....	1,057,737
Foreign ports	31,237
Total.....	34,641,018

Bituminous.

There is nothing doing in bituminous coal, nearly all the contracts of importance having been taken, and the prices are now quoted fairly well up to the official standard.

Coal is abundant, and there is no indication of any change in prices by the principal companies, but outside dealers are still quoting considerably below the official rate, which remains, as we stated last week, from $2.20 to $2.60 f.o.b. at tidewater shipping ports.

Buffalo. June 21.

[From our Special Correspondent.]

There is a probability that there will be a change in anthracite coal quotations, wholesale and retail, on or about the 1st of July—but yet it may be only a rumor. It is noticeable, however, that private families are stocking up their bins and cellars for the coming winter, which is indicative of two things: (1) that coal will not be lower, and (2) that it may be higher. It sets a fellow shivering to think of "winter," as we have had only four or five summer days thus far this season in this locality, and a natural gas fire was quite comfortable in the evenings of last week to your correspondent.

Bituminous coal trade still demoralized and without new features worth telling. The stocks on track and in yards large and greatly in excess of demand.

Coke unchanged, with average business.

The Grand Trunk Railroad of Canada have asked for tenders for about 1650 tons of anthracite coal to be delivered at Brockville or Belleville, on the St. Lawrence River, and 8200 tons at International or Suspension Bridges, said tenders to be sent in on or before June 27th to the offices at Montreal. The imports of anthracite coal into the Dominion of Canada during the year 1887 aggregated 1,057,737 tons; in 1886, 970,306 tons, and in 1885, 878,177 tons, showing a steady increase.

Lake freights, for coal, active for Chicago and Milwaukee. Rates have advanced 10c. to Lake Superior and 5c. to Chicago ports. Probably some difficulty may be experienced at Milwaukee in unloading vessels, in consequence of the many arrivals and limited handling facilities at that place. Closing feeling here, firm and with upward tendency to upper lake ports.

The shipments by lake westward from June 14th to 20th, both days inclusive, 86,640 net tons, namely: 33,860 to Chicago, 32,120 to Milwaukee, 5800 to Duluth, 250 to Bay City, 630 to Houghton, 450 to Ludington, 800 to Lake Linden, 3350 to Superior, 1250 to Manitowoc, 980 to Racine, 5400 to Green Bay, 1150 to Saginaw, and 606 to Kincardine. Total shipments thus far this season (including vessels from Tonawanda not reported at Custom House), 671,240 net tons. The rates of freight were 85@90c. to Chicago, 85c. to Milwaukee, Manitowoc, Green Bay, and Sheboygan, 50c. to Saginaw, 75c. to Houghton, 95c. to Ludington, 85@90c. to Racine, 60@70c. to Duluth and Lake Superior ports.

Canal shipments this season very light: no charters. The nominal rate to New York $1, and to Albany or Troy 80c. per net ton, free on and off.

The new ore docks of the Minnesota Iron Co. are now ready at this port, and the first installment] of a 200,000 tons consignment will be handled to-day. The capacity of the dock is about 1800 tons daily. This is expected to be the forerunner of a large receiving and shipping trade of ore in Buffalo.

Boston. June 14.

[From our Special Correspondent.]

The demand for anthracite coal is very moderate. The market, while containing some very essential elements of strength, is not so strong as to induce retailers to order ahead when they have not received coal already ordered. Of course, the coal alluded to as already ordered could be brought along if the buyers were willing to bid up freights. The fact that they are not doing this, but are content to wait for vessels, is plain evidence that they are not looking for any advance in coal at wholsale right away, to say the least. There is understood to be a large and constantly increasing amount of coal at tidewater, and while it is not generally considered probable, some think a decline may follow. At all events a fortnight or so more must elapse before the companies are shown to be able to fully control the market beyond a reasonable doubt. F.o.b. quotations remain nominally unchanged.

There is a small movement among bituminous jobbers, or else the trade is being conducted with exceptional secrecy. It is agreed, however, that but two or three contracts of any size remain unsecured, and those are probably as good as taken. Nothing has occurred to disturb the quotations, and every week which passes now without an open break, adds to the chances, now very good, that prices will be maintained. Things can go on so another season; but then, that is too far off to bother about now. We quote $2.50@$2.60 f.o.b., and delivered rates on that basis.

The same light supply of vessels continues to be a marked feature of the coal trade. Quotations are kept where they are only from the fact that shippers are very careful not to bid up rates, and this course can be pursued as long as buyers can wait for their coal. Any pressure to ship now would advance rates, unless vessels become unexpectedly plenty right away.

We quote vessel rates, exclusive of discharging: New York, 80@85c.; Philadelphia, $1.05@$1.10; Baltimore, $1.10@$1.15; Newport News and Norfolk, $1.05@$1.10; Richmond, $1.15@$1.25.

Lately there has been some improvement in retail trade, but the movement is still small and will remain so until after the Glorious Fourth. Prices are unchanged, but are not very strong.

Retail quotations, 2000 pounds to the ton, delivered, are as follows: Stove, $6; Egg, $5.75; Broken, $5.50; Nut, $6; Franklin, $7.25; Lehigh Egg, $6; Broken, $5.75; Bituminous (on the wharf), $4.25.

The contracts for furnishing the city of Salem with coal and fuel were awarded to William Pickering, C. S. Clark and D. P. Pitts. The prices are: For furnace, $6.08; for stove, $5.85; for egg, $5.70; for white ash stove coal, $6.25.

Messrs. John R. White & Son, coal dealers, ar building on their dock on India street, Providence, R I., what will probably be the largest single coal pocket in New England. The building proper will be 180 feet long, 70 feet wide, will have twenty-nine divisions, a storage capacity of about 9000 tons, and will cost $50,000. The Wilkes-Barre pocket, on the opposite side of the river in East Providence, holds, it is understood, about 6000 tons. Four tracks will converge from the main track on India street, and cars can be switched to any part of the pocket. Three Fuller hoisting engines will raise the automatic buckets, and the coal will be distributed throughout the pocket by Hunt's automatic railway, each carload being weighed before dumped into the Kelsey shute, a patent arrangement for breaking the fall of the coal, and thus preventing waste.

Pittsburg. June 21.

[From our Special Correspondent.]

Coal.—The coal trade has undergone no particular change. Continued low water prevented shipments by the Ohio River. So far there has been no June rise. The pools on the stockwater are well provided with coal. The wickets at Davis Island dam were raised on Wednesday. This will make a six-foot stage of water to the first Monongahela dam. The loaded coal in the pools will be towed to the lower landing at once.

PRICE OF COAL PER 100 BUSHELS = 7600 LBS.

First pool.....	$4.75	Fourth pool.....	$3.25
Second pool	4.25	Railroad coal.....	5.00
Third pool.....	3.75		

Connellsville Coke.—We have no improvement to note. All the conditions are the same as last and preceding weeks, with coke selling below cost of production. Blast-furnace, $1 f.o.b. at works; foundries, $1.15 per ton.

New coke rates went into effect on Monday June 18—a further reduction from the Connellsville regions: To Chicago, $2.75; Cleveland $1.80; Wheeling, $1.35; East St. Louis, $2.30; St. Louis and Carondelet, $3.35; Indianapolis, $2.75; Cincinnati, $2.65; Pittsburg, 70c.; Mahoning and Shenango Valley points, $1.35, Joliet, $2.75; Toledo, $2.50; Springfield, O., $2.50; Beaver Falls, $1.25 per ton.

The strike at McClure's coke works still continues. There are now 1350 ovens out of blast and no sign of a settlement.

The Forks coal-field near Leechburg, will be opened shortly by J. M. Guthrie and other capitalists. To develop the fields a branch road will be run from Leechburg to the A. V. R.R.

The J. M. Schoonmaker Coke Company has erected a coke crusher at their Red Stone works. The machine is of a new design, and is intended to break coke into any size desired. It will be put into operation about August 1st.

A Pittsburger has invented a process for making fuel gas from a mixture of heated air, steam and oil. A furnace has been built at Oliver & Roberts's wire mill and the new process will be tested. A trial proved a success.

FREIGHTS.

Southern Pig-Iron Freights.—The Southern Railway and Steamship Association issued a circular June 14th, which gives the rates of freight on pig-iron from Birmingham, Chattanooga and Sheffield and Florence, to points on and beyond the Ohio River. The rates from Birmingham are: To Cincinnati, $2.75; Louisville, $2.50; St. Louis, $3.25; Chicago, $4; Detroit, $4; Cleveland, $4; Pittsburg and the Wheeling district, $4.65; Kansas City, Atchison, Leavenworth, and St. Joseph, $5.83. From Chattanooga the figures are: Cincinnati and Louisville, $2.25; St. Louis, $3; Chicago and Detroit, $3.75; Cleveland, $3.50; Pittsburg and the Wheeling district, $4.15, and Kansas City and the other points named, $5.83. The rate-sheet for the first time gives the figures relating to Sheffield and Florence, Ala., the principal points being as follows: Cincinnati, $2.50; Louisville, $2.25; Memphis, $1.55; St. Louis, $2.80; Chicago and Detroit, $3.75; Pittsburg and the Wheeling district, $4.40, and Kansas City, Atchison, Leavenworth and St. Joseph, $5.38.

The latest actual charters to June 21st, per ton of 2240 pounds:

From New York to:—Bath, Me., 80@.90*; Beverly, .90*; Boston, .80*; Bridgeport, Conn., .55; Bristol, 75@.80; Cambridge, Mass., .80*3c; Cambridgeport, .80*3c.; Chelsea, .80*; Com. Pt., Mass., .80*; E. Boston, .80*; E. Cambridge, .80*3c.; E. Greenwich, R. I., .75@.80; Fall River, .75@.80; New Bedford, .80@.85; Newburyport, .95*; New Haven, .55; Newport, .75; New London, .70@.75; Portsmouth N. H., .90*; Providence, .75@.80; Salem, .80*.

From Philadelphia to:—Alexandria, .85; Annapolis, .65; Bangor, .95*; Bath, Me., .95@1.05*; Boston, .90@1.00*; Cambridge, Mass., 1.10@1.15*; Charleston, .75; Com. Point, Mass., 1.00@1.05*; Fall River, 85@.90; Gardner, Me., 1.05*‡; Gloucester, 1.00@1.05*; Lynn, 1.10@1.30*; Milton, 1.20*; New Bedford, .90*; Newburyport, 1.15; Norfolk, .60@.65; Portland, .95@1.05*; Portsmouth, N. H., 1.05@1.15*; Providence, .85@.90*; Richmond, Va., .75; Salem, Mass., .95@1.05*; Savannah, .85@.90; Wilmington, N. C., .80.

From Baltimore to:—Bangor, Me., 1.10; Bath, 1.10; Boston, 1.10; Bridgeport, Conn., .90; Charleston, .70; Fall River, .90; Galveston, 2.90@3.00; New Bedford, .90; Newburyport, 1.30; New Haven, .90; New London, .90; New York, .85; Portland, 1.05; Portsmouth, N. H., 1.10; Providence, .90; Richmond, Va., .60; Salem, Mass., 1.05; Savannah, .90@1.00; Williamsburgh, N. Y., .85@.95.

* And discharging. 3c. per bridge extra. † Alongside. ‡ And towing.

MARKETS.

NEW YORK, Friday Evening, June 22.

Prices of Silver per ounce troy.

J'ne	Sterling exchange	Lond'n Pence.	N. Y. Cents	J'ne	Sterling exchange	Lond'n Pence.	N. Y. Cts.
16	4.88⅛	42 1-16	92	20	4.88⅛	42 1-16	92
18	4.88½	42 1-16	92	21	4.88⅛	42	91⅞
19	4.88⅛	42 1-16	92	23	4.88⅛	42	91⅞

Foreign Bank Statements.—The governors of the Bank of England, at their weekly meeting, made no change in its rate for discount, and it remains at 2½ per cent. During the week the bank gained £360,000, and the proportion of its reserve to its liabilities was raised from 42·50 to 42·75 per cent, against a reduction from 48·01 to 47·52 per cent in the same week of last year, when its rate for discount was 2 per cent. Thursday the bank gained £214,000 bullion on balance. The weekly statement of the Bank of France shows a gain of 2,250,000 francs gold and a loss of 700,000 francs silver.

Copper—A more buoyant tone has been observable in this market throughout the past week. The spot value of 16½ for Lake descriptions has been well maintained, and a fair amount of business has been transacted at this figure. Future deliveries have also attracted rather more attention, and quotations are consequently somewhat firmer. The principal buyers have been the syndicate, but several large parcels have also been taken up by other parties. We quote Lake copper, spot, 16·55; June, 16·55; July, 16·55; Aug., 16·40; Sept., 16·35; Oct., 16·25; Nov., 16·15; Dec., 16.

The exports of copper from this country continue at a satisfactory rate.

In London the market for Chili bars has been comparatively steady all the week, the closing quotations showing a slight falling off as compared with last weeks, and being now £82 to £82 5s. for spot, and £78 10s. to £78 15s. for 3 months futures. These prices are, however, comparatively high in relation to other descriptions of copper, and the Chili bar quotations have not therefore at present their usual significance.

The report from the Moonta copper mines, Cape of Good Hope, for the last half year shows that the ore raised produced an average of 20¼ per cent of fine copper. The gross weight raised during the six months amounted to 9170 tons, o f21 cwt., cf fine copper, added to which were 2635 tons on hand at the beginning of the half year, making a total of 11,805 tons, the greater part of which was smelted by the Wallaroo Co. Arrangements had been made with the French syndicate for the monthly disposal of the company's production of copper from March 1st, 1888, to December 31st, 1889, at an advance of £5 on the monthly average cash value of Chili bars, and a second proposal being made from the same quarter to extend the time t

1890, with an option on the part of the buyers to continue the same to 1893, on a guaranteed basis of £65 for the total output, it was unhesitatingly accepted. A further provision of the contract is, that any excess over £65 is to be divided by the company with the syndicate in certain proportions.

The exports of copper from New York during the week were as follows :

	Copper matte.		Lbs.	
To Liverpool—				
By S. S. Ohio..... .....Bbls.	110	107,525	$5,000
" " ....Bags	1,540	154,000	10,780
By S. S. Republic..... "	2,774	323,918	17,000
By S. S. City of Berlin....Casks	86	116,000	6,000
By S. S. City of Rome....Sacks	4,205	493,638	26,000
By S. S. The Queen..... "	4,681	539,829	27,000
To Rotterdam—	Copper.			
By S. S. Amsterdam.. ....Casks	180	300,160	37,500
and Bags	554		
To Havre—				
By S. S. La Normandie...Sacks	90	112,500	14,060
To Hamburg—	Old Copper.			
By S. S. California.....Pks.	30	39,664	4,159
To Hamburg—	Old brass			
By S. S. California.....Pks.	6	6,003	342

Tin.—Although the consumptive demand may be fairly described as good, owing to the continuance of large offerings, quotations are again a little lower than at the end of last week. The delivery for the month of June are again expected to be very satisfactory. The steamer Gallaleo with 755 tons has arrived in this port to-day, but it is understood that the whole of this quantity has been previously sold. We quote to-day : Spot, 17·75; June, 17·75; July, 17·60. The closing quotations in London to-day are : Spot, £78 5s.; Futures (three months prompt), £78 12s. 6d., being a decline of about £1 15s. for the week.

Lead.—We are glad to be able to report that the low prices lately prevailing for this article (which we referred to in a spe ial editorial last week) have very quickly given place to a considerable improvement during the past week, although the reaction can not be said to have proceeded from the most desirable quarters. Consumers have lately bought pretty freely and are understood to be now fairly supplied, but it having become apparent that a considerable short interest existed, the speculators who had been persistently hammering the market down suddenly hurried round, and in a single day forced prices up more than ⅛c. This action alarmed the "bears," who endeavored to cover, and the result is a rise of ⅜c. in one week. This rise may be considered rather too rapid, but prices may still be regarded as comparatively low, and it now remains to be seen whether consumers' orders will still come in. Production is likely to show appreciable increase this year, and we shall not be surprised to see lower figures than any we have yet reached before the close of the year. Our closing quotations to-day are: Spot, 4⅛; July, 4·15; August, 4·17½; September, 4·22½; October, 4·25. The London market has been dull, and at the beginning of the week quotations declined to £12 for Spanish and £12 5s. for English: but in sympathy with this market a firmer tone has since supervened, and the last closing prices are: Spanish, £12 10s.: English, £12 15s.

Messrs. Everett & Post, of Chicago, telegraph to-day as follows: The market is rising, excited and unsteady, and it is difficult to get exact quotations from consumers and speculators; 4 asked for desilver ized at the close. Sales during the week amount to 500 tons, at from 3·60 to 3 85.

Spelter is in a very depressed condition, and comparing the amount of business in spelter with that in copper, it appears very evident that for brass making purposes, and in fact for all purposes requiring a composition of these two metals, business must be at a very low ebb. In spite of the action of the syndicate formed in Europe for the purpose of limiting production over the next two years, prices have not been sustained, and have experienced rather a sharp decline in London lately, ordinaries in that market being now quoted from £16 to £16 5s., and specials, £16 5s. to £16 10s. 5d. In this market domestic spelter is just as dull, and we quote some 4⅛ to 4·50, while foreign descriptions are obtainable at 5·17½ to 5·25.

Antimony is dull at 13¼ for Cookson's and 10@10¼ for Hallett's. We have recently seen samples of a very beautiful "star antimony" of great purity, made by the Brunswick Antimony Company, and which is expected to come on the market in quantity at an early day.

Chemicals.—There are few changes to record in the condition of the chemical market. Trade in a jobbing way is fair, but we hear of little doing in the way of contracts or large orders for future delivery.

Carbonated soda ash, 48 per cent, is quiet and the market is somewhat weaker. The very light spot stock still keeps the price of goods for immediate delivery up to 1·30@1·35, but futures are now freely offering at 1 22½, and probably for a large order 1·20 might be acceptable. High test is inactive, and the quotations of 1·15@1·17½ are nominal.

Caustic soda ash, 48 per cent, continues dull, the small amount of business doing being merely of a jobbing character to supply consumers' immediate wants. Small spot lots continue to be held at 1·30c., and larger quantities at ⅛c. less. In futures 1·25c. is the quoted price, but little business is done at this figure.

Caustic soda continues very dull for the 60 per cent article; future delivery is quoted at 2·35c., while goods on the spot are held at 2·40 to 2·60c., according to quantity, etc.

High test (70 to 74 per cent) is a little more animated, though business is all of a jobbing character. The quotations range from 2·20@2·25c., according to quantity and position.

English sal soda is in very moderate demand and the price weaker. Spot lots are offering at 1c., and lots to arrive at .95@.97½. The stock on the spot is very light.

Bleaching powder is in a little better demand than it has been for some time past. Owing to reduction of the spot stock, the market is a little firmer, though we note no advance in price, the quotations continuing at 1·87½@1·95, according to brand, quantity, etc.

We note no changes in the condition of the acid market.

Sulphuric acid, 66 degrees, is without change; the price is well maintained at our former figures. Most of the business continues of a jobbing character, no large orders being noted.

Acetic acid is moving fairly in a jobbing way, with nothing of importance to attract attention of buyers. We continue to quote 2½@2¼.

Nitric and muriatic acids are moving fairly in a jobbing way at our list prices. We hearing of nothing doing in a large way.

Oxalic acid is wanted only in small quantities to supply passing wants of consumers, who apparently are anticipating a reduction in prices. The quotations are unchanged, at 6½c. for large lots and 7c. for smaller quantities.

The last few warm days have had some effect on the fertilizer trade, though a fair amount of jobbing business has been done. It is a little early yet for contracts for fall delivery and the market presents a rather dull appearance. We continue to quote high grade dried blood 2·30c. per unit of ammonia; low grade, 2·15@2·20. Tankage, high grade, $22@$23 per ton ; low grade, $20@$21. Azotin, 2·15@2·20 per unit. Refuse bone black, $16.50@$17 per ton. Ground steamed, $25@$27 per ton.

High-grade sulphate of potash continues to sell well, with no change in price, which is firmly maintained at 2·10c. on basis of 90 per cent.

Kainit is in unabated demand, with very little available stock on the spot. Small lots ex store bring $10@$11, according to quantity, while futures are firm at $9.

Muriate of potash continues to do well, and we note no change in quotations, which are firm at 1·80 spot; 1·77½@1·80 for delivery, according to position, and 1·75 for sail shipments.

Double manure salt is a little firmer, but we hear of little business being done in the article. Our quotations remain unchanged at 1·10c.

Nitrate of soda is very quiet, and we hear of little business ; 2·07½ is the quoted price for jobbing quantities, and 2·05 for round lots; 2c. the quoted price on futures, but they are attracting little attention.

Brimstone is weaker than at our last writing, and the market dull. The quantity on the spot is very limited, and holders demand $26.00 per ton for small lots ex store. To arrive nearby, $22.50 per ton is the asking price, and future shipments are offered at $20, without attracting much attention.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 22.

The iron market is much more subject to political influence than is the coal trade, hence we find the reports colored by the politics of the different merchants to such an extent that it becomes somewhat difficult to ascertain the condition of the article. It is certain that stocks in consumers' hands are very light, as is always the case on a declining market. Producers in this market report a fairly good demand, and deliveries called for as promptly as could be expected at this season of the year. Standard brands are quoted as heretofore, $18 to $19 for No. 1, $17 to $18 for No. 2, and $15 to $16 for forge. It is scarcely possible to obtain good brands at the lower of these quotations. Southern irons still sell at perhaps 50 cents below the standard Lehigh brands, but they are not making much stir in this market.

The cost of producing iron is gradually being reduced by the using up of high-priced stock, by reductions in wages, and by economies in various ways. One of the most promising of these is perhaps by the enrichment of the ores which are sent to the furnace. Some of the Lehigh furnaces, the Thomas Company's in particular, having adopted the principle of buying even domestic ores only by the unit of iron. The use of concentrating machinery to secure a higher grade of ore will also bring about very considerable economies in production by increasing the capacity of the plant, lessening the consumption of fuel and wages per ton, and also several other items.

Foreign Bessemer ores are being offered in this market at 9½ to 10 cents per unit.

The Scotch pig iron market is still without change. Some 800 tons have come in during the week, but it is mostly as ballast, and there appears to be no profit on either side at the prices at which it is sold. As the consumers of this article became better acquainted with the qualities of our domestic ores it is certain that the demand for Scotch will diminish, and the price at which it comes in is so much above that of American irons which can take its place, that it should before long disappear from our imports.

Structural Iron and Steel.—The demand for building purposes is dull except for elevated roads, of which a number are building in Brooklyn and in some of the large interior cities. The great decline in railroad building severely affects the structural steel and iron market. At present we can quote bridge plates at about 2 cents and tees 2½ to 2¾; channels and beams, 3¼ to 3½.

Steel Rails.—We hear of sales of about 5000 tons, mostly in small lots. Several of the mills have either closed or are going to close next month. Having run through the month of January when they generally stop for repairs, they take the slack time of July to do this necessary work. Moreover, the effect upon the labor vote may be more important in July, August and September than it would have been had the mills stopped in January and run through July.

A reduction in wages will be proposed in most of the steel mills, and, no doubt, will be effected, but this point will also be worked for political effect.

Some of the steel-makers claim that at the present prices, and those which they are likely to obtain during the balance of the year, it will be impossible to make ends meet. Other mills claim that they will make at least 5 per cent on their capital during the year. It is certain that the demand for rails will be much lighter than it was a year ago, and probably the prices, which are now $30 to $32, according to the mill, will be no higher and may be somewhat lower as wages and cost of manufacturing decline.

There is nothing of importance to report in other departments of the iron trade. Prices remain as heretofore, and the demand in every department is dull, with some uncertainty as to the future of these articles which are affected by the labor conditions in Pittsburgt

We refer to our own weekly register of curren. quotations for prices.

Louisville. June 19.

[Reported by HALL BROTHERS & Co.]

Inquiries and orders have been more numerours and for larger quantities during the last week, and orders for several thousand tons have been placed, while other large inquiries and negotiations are now pending. Some buyers display a disposition to place orders now for future delivery to save the advance in freight rates that will take place on the 24th inst., and in view of this advance some of the furnaces are inclined to go a little slow until the freight matter is fully settled, not caring to commit themselves on future delivery sales until the freight rates are adjusted.

Quotations for cash f.o.b. cars Louisville will be found in our weekly register of prices.

Philadelphia. June 21.

[From our Special Correspondent.]

Pig-Iron.—The best foundry brands were sold for July, August, and September delivery this week at $18.50, and tire or wheel pig at $19 for No. 1. Nosales of No. 2 are heard of. There are good prospects for large sales of forge iron. Most mills have been running in a hand-to-mouth way and have not more than enough to see them out with present expiring contracts. All eyes are turned to the Pittsburg wrangle, which on Tuesday had an ugly look. Should there be any trouble there, there will be joy here. Consumers have been between two fires, and even now are undecided.

Southern iron is not threatening as much as a month ago, and our furnace people are not selling iron at $16, $17, and $18, as they were ordered to do by the would-be iron autocrat. Good forge iron was sold today at $16.50.

Foreign Material.—Prices are nominal. Bessemer, $19.25@$20.

Muck Bars.—A sale was made to-day at $27.25.

Blooms.—Charcoal blooms, $52.50; anthracite, $42½; scrap, $35, at which offers have been made.

Merchant Iron.—Every thing is mixed up. Some mills have reduced wages. The Philadelphia list is under revision. The western schedule is awaited. No manufacturer is seeking business but only taking care of his customers, and they want the least possible. The stores are doing most of the business. The light condition of stocks, in view of the possibility of a western suspension, is causing some little uneasiness. Selling prices, 1·70@1·85.

Nails.—The nail salesmen have made a very thorough canvass of our territory since the new classification went into effect, without greatly increasing orders. Building is not very active. Quotations: $1.90@$2.

Skelp iron mills are better off than 30 days ago, and at the low prices, 1·80 shaded. It is said to-day that more business will be placed soon.

Wrought-Iron Pipe.—The engine and boiler builders and the users of pipes and tubes have added to their work this month sufficiently to send them into the market with more work, and the mills are adding to their engagements enough to assure continuous work through the season. Discounts are respected.

Plate and tank manufacturers have received promises of more business and from what can be gathered it will be of considerable magnitude. The buyers consider that no mistake will be made to order at 1·90 for ordinary plate with corresponding prices for tank, shell flange and fire-box iron and steel.

Structural Iron.—From a pretty careful canvass recently made by the representative of one of our leading concerns, the assurances are not quite so promising for an active winter's work in bridge building, but nothing definite can be had until after semi-annual meetings of railroad stockholders and managers. Yet there is a great deal of work in sight. Bridge plate is 2c.; angles, 2·10c.; tees, 2·60c.; beams and channels, 3·30c.

Steel Rails.—Quotations were made at $30 this week on an inquiry for a large lot. Small lots, $31. Managers, it is said, are on the point of breaking from $30 to take in a few large orders.

Old Rails.—Some parties are asking as much as $22. Buyers are not just at present offering over $21.

Scrap.—Choice scrap is held at $21.50 without finding buyers. Cargo scrap would sell at $18.50@$19. The scrap demand is light and yards are filling up.

Pittsburg. June 21.

[From our Special Correspondent.]

The iron trade during the week has undergone but few changes. The difficulty in regard to iron scale has not yet been satisfactorily arranged. The Amalgamated Association has made out a scale embodying the views of its members and their expectations for the next year. The manufacturers refuse to sign it. The mill owners have their scale made out, which the Amalgamated Association decline to accept; that is the situation at this time. The difference is so wide that there is no probability of either being signed as they now read. It was considered a good stroke of policy when the Amalgamated Association agreed for the mills to shut down for three months to use up the surplus production. The answer of the mill owners took the starch out of the proposition by accepting the same, provided the Amalgamated men shut down the mills they controlled for the same length of time, so that the shut-down would be general; so both propositions fell through. As all the meetings are held with closed doors, correct information is difficult to obtain. The general impression now is that a compromise is likely to be made between now and the 1st of July that will hold good for one year, at least. There is very little prospect of either scale being signed in its present shape. It appears to an outsider that the bottom has been reached, particularly in No. 1 iron and choice brands.

Bessemer Pig.—The sales were large, at prices higher than has ruled for some weeks. The impression is pretty well maintained that now is the time to lay in a stock of Bessemer. The following sales tell the whole story:

Coal and Coke Smelted Lake Ore.

2000 Tons Bessemer, at Valley Furnace, Saturday, equal to Pittsburg delivery	16 85 cash.
500 Tons Bessemer	16 75 cash.
500 Tons Gray Forge	14.35 cash.
1000 Tons Low Phos. Bessemer	22.50 4 mo.
500 Tons Low Phos Bessemer	22.50 4 mo.
2500 Tons Bessemer, July	17 00 cash.
1000 Tons Bessemer	17.00 cash.
1000 Tons Bessemer	17.00 cash.
500 Tons Bessemer	17.00 cash.
2500 Tons Bessemer, at Valley Furnace, to go West	16.50 cash
100 Tons Gray Forge Extra	14 50 cash.
100 Tons No. 2 Foundry	16 00 cash.
100 Tons No. 1 Foundry	17 00 cash
50 Tons White Iron	13.25 cash.

Coke, Native Ore.

100 Tons Gray Forge	14 50 4 mo.
50 Tons No 1 Foundry, all ore	17.00 cash.
50 Tons No. 2 Foundry all ore	16.00 cash.

Steel Slabs, Billets and Blooms.

500 Tons Blooms	28 25 cash.
500 Tons Billets	28.25 cash.
500 Tons Billets	28.50 cash.
500 Tons Nail Slabs	27.75 cash.
700 Tons Billets	28 00 cash.
350 Tons Billets	28.25 cash.

Muck Bar.

500 Tons Good Neutral	26 50 cash
750 Tons Good Neutral	26.00 cash.
300 Tons Good Neutral, July	26.75 cash
100 Tons Good Neutral	26.50 cash.

Old Iron Rails.

1000 Tons American T's	21.50 cash.
300 Tons American T's	21.75 cash.
200 Tons American T's	21.75 cash.
200 Tons American T's	21.50 cash.

Steel Crop Ends.

1000 Tons Crop Ends	18.25 cash.
250 Tons Crop Ends, July	17.80 cash.

FINANCIAL.

NEW YORK, Friday Evening, June 22.

The week opened with quite an active market, but the heat and the interest taken in the Republican Convention at Chicago took the bottom out of the mining market toward the close of the week. With the thermometer in the "nineties," the bulls and bears do not wish to exert themselves!

The letter in reference to the El Cristo Gold and Silver Mining Company, which we announced last week would appear in our mining news, was held over by the printer's devil, who no doubt wanted to "bear" the stock. He was quite successful in his endeavors, and brought the price down from $1.30 to 97c. The publication this week of the letter, which contains some favorable news, will no doubt have a good effect on the price of the shares.

The reorganization of the Sutro Tunnel Company is assured, as already mentioned in our last issue, by a syndicate composed, in fact, of J. & W. Seligman & Co., Maitland, Phelps & Co. and Ladenburg, Thalmann & Co. A little more than half of the stockholders assented to the assessment necessary to discharge the mortgage, but at this point the plan halted. The syndicate, which includes influential friends of the company, has undertaken to pay the mortgage and to intervene practically between the delinquent stockholders and the mortgagees. The terms have not been made public, but it is understood that the belated stockholders will have an opportunity to subscribe to the bonds at a small penalty. The syndicate will take the balance, and, if necessary, foreclosure proceeding will be resorted to. The earnings of the company in May were $26,000 and in April 22,000, which is considerably in excess of the interest on the bonds. The stock was again active this week, selling at from 17@20c. The Comstocks were quiet with small sales. Consolidated California & Virginia was steady at from $10 63@$11. Yellow Jacket held its own at $5.13. Sierra Nevada declined from $4.50@$4.10. Savage sold at $4.35. Hale & Norcross at $7.08. Union Consolidated at $4.50.

Navajo was quoted at $1.85 and Tornado at 46c.

Barcelona continues to be a favorite stock, and some 12,000 shares changed hands at prices ranging from $1 05 to $1.25.

Deadwood-Terra, which is at present attracting but little attention, shows one sale at $1.50 per share, Caledonia at $2.25, and Homestead a few at from $10.50 to $11.25.

Among the Colorado stocks Little Chief was the most active, at from 30 to 33c. Little Pittsburg shows one sale of 100 shares at 18c. per share. Colorado Central a few sales at $1.80@$1.85. Chrysolite at 40@41c. Bassick at 17@16c. Security is neglected, and is selling at 7@6c. Lacross at 8@9c.

The stocks of the Astoria Mining Company, of Amador County, California, appeared on the list for the first time on Monday at 25c. The stock has since been selling up to 27c., the sales amounting to 13,200 shares. Amador, which advanced in the beginning of the week from $2.50 to $2.65, declined to $2 on Thursday, and has since been selling at from $2 to $2.25. Middle Bar was firm at from 40c. to 43c. Some interest was also shown in Hollywood, and the price advanced from 33c. to 44c.

Plymouth Consolidated has gone to $8.

Brunswick is quoted at $15.

Bodie Consolidated was only dealt in on Wednesday, when it sold at $2 20, and Mono at $1.40.

The Quicksilver stocks were quiet. Preferred shows a few sales at from $37 to $37.50, and Common at $10.75.

Green Mountain was dealt in at 4c. and Taylor Plumas at 1c.

Silver King, which has been selling at $4 and $5

IMPORTATIONS AT NEW YORK FROM JUNE 12 TO JUNE 20, AND FROM JAN. 1 TO SAME DATE.

	Week. Tons.	Year. Tons.
Spelter.		
American Metal Co., Lt.		236
Friedensville Zinc Co.		24
Hendricks & Bros	28	28
Lewisohn Bros.		33
Naylor & Co.		75
Osgood, F.		42
Perkins, C. L		725
Total	28	1,162
Corres. date 1887		1,798
Zinc Sheets.	Tons.	Tons.
H. Lemaanche's Sons		594
Milne	1	1
Naylor & Co.		25
Total	1	620
Nickel.	Lbs.	Lbs.
Mccoy & Sanders		138,166
Total		138,866
Antimony.	Casks.	Casks.
Total	100	1,561
Corres. date 1887		1,894
Pig Lead.	Tons.	Tons.
Hendricks Bros.		100
Total		100
Corres. date 1887		60
Pig-Iron.	Tons.	Tons
Abbott & Co, Jere		600
Baldwin Bros. & Co.		103
Bartlett & Co., N. S.	100	2,700
Crocker Bros.	580	5,240
Crooks & Co., R.		700
Dana & Co.		400
Downing & Co		51
Drum'nd, McCall & Co.		20
Erie Despatch		250
Henderson Bros	200	1,275
Holt, H. N		50
Lee & Co., James		309
Milne & Co., A.		796
Naylor	460	1,420
Pierson & Co.		15
Sanderson & Sons		2
Stetson & Co., G. W.	200	10,147
Walbaum, W. H		200
Williamson & Co., Jas.		2,003
Total	1,540	26,286
Corres. date 1887	4,882	66,902
Tin.	Tons.	Tons.
Abbott & Co., Jere.		3,448
American Metal Co.		35
Birdwell & French	45	89
Crooke S. & R. Co.	12	121
Davol & Sons	8	8
Dickerson, Van Dusen		10
Hendricks Bros	14	109
Knauth, W. & K.	11	11
Lewisohn Bros.	15	15
Muller, Schall & Co.	56	1,584
Naylor & Co	27	723
Phelps, Dodge & Co.		381
Pope's Sons & Co		57
Schwarer Bros.		7
Thomson & Co., D.	11	163
Total	199	6,757
Corres. date 1887	45	5,020
Tin Plates.	Boxes.	Boxes.
American Metal Co.		301
Bruce & Cook	4,839	49,222
Byrne, James		15,750
Central Stamping Co.	3,007	15,363
Coddington & Co., T. B.	2,175	75,069
Corbierre Fellows & S.		1,332
Cort & Co., N. L.	4,280	56,318
Cons. Fruit Jar Co.		849
Crooks & Co., Robert	3,260	33,087
De Mill & Co., H. R.	553	7 639
Dickerson, Van Dusen	6,511	128,560
Dolly, T. G. F		112
Iron Clad Mfg. Co	38	119
Lalance & Grosjean		893
Lombard, Ayres & Co.	716	6,694
Merchant & Co.	722	7.162
Merack & Co., C. S.	88	3,941
Morewood & Co., G.		15,239
Naylor & Co.		8 869
Newall Bros		158
Phelps, Dodge & Co.	11,924	226,366
Potts, W. A., Son & Co.		573
Pratt Mfg Co.	425	74,778
Shepard & Co., Sidney	468	67,771
Stroud & Co		342
Taylor, N. & G.		295
Thomsen & Co., A. A.	3,022	68,297
Warren & Co		1,065
Wheeler & Co.		908
Whittemore & Co., H.	4,000	37,127
Wolff & Reesing		14,507
Wright & Sons, Peter		165
Total	46.028	918,626
Corres. date 1887	36,984	912,65

	Week. Tons.	Year. Tons.
Steel & Iron Rods.		
Abbott & Co. Jere	6	5,407
American Screw Co		748
Bacon & Co.		109
Carey & Moen	45	405
Cohn, M.		60
Dana & Co.		1,071
Downing & Co., R. F.	55	192
Galpin, S. A.		2,110
Heyn, A.		1,689
Hugill, Chas		33
Jacobus, E. Y.		12
Lazard Freres	100	427
Leng, J. S		17
Lundberg, Gustaf		120
Milne & Co., A		1,408
Montgomery & Co.		48
Muller, Schall & Co		150
Naylor & Co.	1,254	11,285
Newton, & Shipman		2
N. Y. Barb Wire Co.		20
Page, Newell & Co.		152
Pierson & Co.		10
Pilditch, F. S.		11
Prosser Thos		20
Roebling's Sons, J. A.	156	1,414
Sanderson & Son		67
Snelson & Co., G. W.		11
Walschid C. A.		15
Washburn Mfg. Co.		35
Whittemore & Co.		1,700
Wolff & Co., R. H.	405	1,106
Total	2,621	31,100
Corres. date 1887	1,969	63,478
Steel Sheets, Billets, Forgings, etc.	Tons.	Tons.
Abbott & Co, Jere	171	1,482
Arkell, Jas		17
Bowker, C. F.		191
Bruce & Cook		7
Carey & Moen		24
Carter, G. T.		273
Cohn, M.	13	96
Co ney, D. J		20
Crooks, R. & Co.	51	612
Crousbey, H.		236
Dana & Co.		51
Downing & Co., R. F.	14	221
Henderson Bros.	1	31
Holt, H. N		6
Hondolette & D.		86
Hugill, Chas	5	90
Lalance & G. Mfg. Co.		192
Lazard Freres		50
Leng, J. S		22
Lebenberg, N.	36	36
Littlejohn, Jas		40
Mersick & Co.		124
Milne & Co., A.		984
Montgomery & Co.		33
Moore's Son & Co.		25
Muller, Schall & Co.		5
Manas, J. & Son		10
Naylor & Co.	1,442	5,142
Newton & Shipman	4	37
Ogden & Wallace		181
Phelps, Dodge & Co.		3
Phœnix Steel Co.		20
Pierson & Co	20	540
Pilditch, F. S.	18	155
Power, C. W	3	38
Prosser, Thomas	68	1,509
Roebling's Sons, J. A.		224
Sanderson & Son		40
Shotts Iron Co.		15
Strouse & Co.		25
Temple & S.		6
Union Bridge Co		287
Wagner, W. F.	32	492
Walbaum, W. H.		2,479
Walschid C. A		
Wallace, W. H. & Co.		15
Whiting, E. W.	11	11
Whitney & Co.		27
Wilson, J. G	4	7
Whittemore & Co	6	6
Wetherill & Co		2
Wolff, R. H		119
Wright's Sons & Co.		10
Total	1,899	16,424
Corres. date 1887	800	38,216
Bar-Iron.	Tons.	Tons
Abbott & Co., Jere	197	1,668
Abeel Bros.		3
Bacon & Co.		13
Downing & Co.		50
Jacobus, E. Y		11
Lilienberg, N.		5
Lundberg, Gustaf		112
Milne & Co., A.		95
Naylor & Co		25
Page, Newell & Co.		122
Philip, C. M		20
Wallace & Co., W. H.		12
Wilson, J. G		7
Totals	197	2,143
Corres. date 1887	195	4,833

	Week. Tons.	Year. Tons.
Old Rails.		
Baldwin Bros.		100
Bowening & Archibald		100
Brown Bros. & Co.		668
Crossman & Bro., W. H.		1,005
D., L. & W. R. R.	409	409
Frankfort, M.		100
Geisenheimer & Co.		100
Henderson Bros	100	537
Neumark & Gross		1,012
Stetson & Co., Geo. W.		230
Waltam & Co		300
Winter & Smillie		80
Total	509	5,541
Corres. date 1887	5,556	101,369
Sheet Iron.	Tons.	Tons.
Coddington & Co.	31	1,096
Newton & S.		4
Wagner, W. F		40
Whitney & Co.		5
Total	31	1,145
Corres date 1887	25	1,025
Scrap-Iron.	Tons.	Tons.
Brown Bros. & Co.		20
Burgess & Co		172
Crossman, W. H. & Co.		47
Geisenheimer & Co.		565
Gerhardt, P. T.		8
Muller, Schall & Co.		15
Neumark & Gross		321
Purdon & W		75
Trowbridge & Co., D.		75
Ward & Co., J. E.		100
Total		1 398
Corres date 1887	1,325	12,849
Chracoal Iron.	Tons.	Tons.
Abbott & Co., Jere		3
Downing & Co.	25	25
Lundberg, G.		16
Mersick & Co.		10
Milne & Co		15
Muller, Schall & Co.		2
Naylor & Co		25
Page, Newell & Co.		307
Sanderson & Son		1
Total	25	404
Spiegeleisen.	Tons.	Tons.
Abbott & Co., Jere		205
Arkell, Jas		28
Crocker Bros.		1,248
Dana & Co.		251
Geisenheimer & Co.		203
Jansen, J. A.		9 983
Naylor & Co.	250	5,768
Perkins, C. L.		2,443
Pierson & Co.		1,045
Total	250	19,499
Corres. date 1887	4,024	49,118
Iron Ore.	Tons.	Tons.
De Flores, R.	1,357	5,770
Earnshaw, A.		4.670
Ennis & Co		1,721
Johnston & Co		300
Naylor & Co.		3,706
Wright, Chas. L. & Co.		1,640
Total	1,357	17,797
Corres. date 1887	1,933	24,747

EXPORTS.

Copper.	Week. Pounds.	Year. Pounds.
Abbott & Co	505,536	5,286,148
Amer. Metal Co	116,000	4,237,300
Becker, & Co., H.		1,250
Bridgpt. Copper Co		112,000
Copper Queen		224,034
Herold, Emil		250,000
Ismay, J. Bruce		115,000
Jones, R. W.		189,984
Ledoux & Co		110, 76
Lewisohn Bros.		4,860,254
Lomal, F. A.		2,691,393
Mendel, S		560,000
Muller, Schall		1,105,000
Neumark & Gross		120,143
Orford Co		349,881
Parsons & Co.		67,500
Phelps, Dodge		230,664
Pope's Sons		1,282,530
Todd & Co.		112,026
Total	474,536	21,425,333
Corres date 1887		6,422,427
Copper Matte.		
Abbott & Co		601,145
Amer. Metal Co.,	112,000	2,238,822
Ledoux & Co.		469,750
Lewisohn Bros.		1,126,822
Nichols & Co		516,783
Wilm's, Terhune	1,511,090	20,116,738
Total	1,623,090	33,015,928
Corres. date 1887		14,254,971

WEEKLY REGISTER OF
CURRENT QUOTATIONS.

CHEMICALS.

Acid—Acetic....2⅜@2½
Muriatic, 18°, per 100 lbs....1 20
Muriatic, 20°, per 100 lbs....1.35@1 50
Nitric, 36°, per 100 lbs....4.50@5.00
Nitric, 42°, per 100 lbs....6 00
Oxalic....6½@7
Sulphuric, 60°, per 100 lbs....90
Sulphuric, 66°, per 100 lbs....1.10
Alkali—36 p. c....1.10@1.15
48 p c....1.22½@1 25
Refined, 58°....1.15
Alum—Lump, per lb....1¾
Ground, per lb....2½
Lump per ton, Liverpool....£5
Sulphate of Alumina, ℔ ton....£3 15
Aqua Ammonia—18°, ℔ lb....4
20°, ℔ lb....5
22°, ℔ lb....6¾
26°, ℔ lb....9¾
Ammonia—Sul., per 100 lbs. 3.00@3·50
Carb, per lb....7¾
Muriate, per lb....7
Arsenic—White, powdered, ℔ lb.3¼@3½
White, glass....
Red. per lb....6⅛
White, at Plymouth, per ton....£11 10
Asbestos—Am., p. ton....$20@$100
Italian, p. ton. c. i. f. L'pool....£18 0 0
Asphaltum—P. ton....13.00
Prime Cuban, ℔ lb....5@6c.
Hard, ℔ ton....$28.00
Trinidad, refined, ℔ ton....$30.00
Barytes—Sulph., Am. prime white16.00
Sulph., foreign, floated, p. ton....19.00
Sulph., off color, p. ton....12.50
Carb., lump, f.o.b. L'pool, ton....£6 0 0
No. 1, casks, Runcor " "£4 10 10
No 2. bags Runcorn " " 3 15 0
Bleach—Over 35 p.c., ℔ lb.1.82½@1.95
Borax—Per lb....7¾
Refined at Liverpool, per ton....£31
Brimstone—*See Sulphur.*
Bromine—Per lb....36
Cement—Rosendale, per bbl....1.00
Portland, American, per bbl....2 00
Portland, foreign, per bbl....2 25
Chalk—Per ton....3.00
Precipitated, per lb....4
China Clay—English, per ton....18.50
Southern, per ton....13.50
Chrome Yellow—Per lb....8
Cobalt—Oxide, per lb....270
Copper—Sulph. English Wks.,ton£23
Precip., Eng Wks, unit....fluctuating
Copperas—Common, per 100 lbs.$ 65
Best, per 100 lbs....1.00
Liverpool, per ton, in casks, £1 16 1.20
Cream of Tartar—Am. 99%....32@32¾
Powdered, 99 p c....33½
Emery—Grain, per lb....4
Flour, per lb....2½
Feldspar—Ground, per ton....14.00
Fuller's Earth—Lump, per bbl. 95
Powdered, per lb....2
Gypsum—Calcined, per bbl....1.25
Iodine—Resublimed....3.60
Kainit—Per ton....11.50
Kaolin—*See China Clay.*
Lead—Red, per lb....6
White, American, in oil, per lb....6⅛
White, English, per lb....7½
Acetate, or sugar of....13@13½
Lime Acetate—Amer. Brown.1.50@1.55
" Gray.2.37½@2.40
Litharge—Powdered, per lb....6@6¼
English flake, per lb....9
Magnesite—Greek, per ton....10.00
Manganese—lump, c.i.f. L'pool.£ 15
Per unit, up or down....1s. 6d.
Ground....£5 10
Mercuric-Chloride—(*Corrosive Sublimate*) per lb....55
Mineral Wool—Per lb....2
Mica—
In sheets according to size, 1st quality, ℔ lb....25@$6 00
Phosphate Rock—S. Carolina, per ton f. o. b. Charleston....5.80
Ground, f. o. b. New York..9.00@ 9.50
Canadian Apatite, lump, f. o. b. at shipping port, per unit....24
Phosphorus—Per lb....65
Plumbago—Ceylon, per lb....4@5
American, per lb....5@7
London, per cwt....£0 15 0
Potassium—Cyanide, per lb....39@41
Bromide, per lb....37
Chlorate, per lb....15¼@15½
Carb. per lb....5
Caustic, per lb....7½
Iodide....2.70@2.75
Muriate, per 100 lbs....1.77½@1.80
Nitrate, refined, per lb....6
Bichromate, per lb....10½
Sulphate, per 100 lbs....1.10
Yellow Prussiate, per lb....19
Red Prussiate, per lb....42
Pumice Stone—Select lumps, lb. 3@5
Original cks. per lb....1¾
Powdered, pure, per lb....2
Pyrites—Non-cupreous, p. unit, s. 14
Quartz—Ground, per ton....18.00
Rotten Stone—Powdered, per lb. 8½
Lump, per lb....5
Eng., powdered, per ton....£4
Lump, per ton....£5
Salt—Liverpool, ground per bbl. 70
Turk's Island, per bbl....25
Salt Cake—Per 100 lbs....50
Saltpeter—Crude, per lb....4½
Refined, per lb....6
Soda Ash—Carb.,48% 100 lb...1.30 @1.35
Caustic, 48%....1.30 @1.35
High test....1.12½@1.15
Soda Caustic, 60%....2 40@2.50
" " 70%....2.25
" " 74-5%....2.20
Sal, English, per 100 lbs....1.15
Sal, American, per 100 lbs....1 15
Nitrate per 100 lbs....2.05
Strontium—Nitrate per lb....10½

Sulphur—Roll, per lb....1¾
Flour, per lb....2
Crude Brimstone, 2s., ℔ ton....27@28
Crude Brimstone, thirds, per ton 24@25
Talc—Ground French, per lb....1¼
Domestic, per lb....6
Domestic, per ton....15 00
c. i. f. Liverpool, per ton....£4 5 0
Tannin—Pure, per lb....
Vermillion—American, per lb....50
English, per lb....65
Vitriol—(Blue), Ordinary, per lb....5½
Extra per lb....6
Zinc Oxide—Am., Dry, per lb....4½
Antwerp, Red Seal, per lb....6@6½
Paris, Red Seal, per lb....6½@7
* Spot

BUILDING MATERIAL.

Bricks—Pale, per 1,000....5.00
Jerseys, per 1,000....7.50
Haverstraw per 1,000....8.50
Front bricks, per 1,000 from....10.00
Building Stone—Amherst freestone, per cu. ft., from....75
Brownstone, per cu. ft., from....1 00
Granite, rough, per cu. ft., from....45
Slate—Purple and green roofing, per 100 ft....6 00
Red roofing, per 100 sq ft....15.00
Black, roofing, per 100 sq. ft....5.00

THE RARER METALS.

Aluminum—(Metallic), per lb....11.00
Arsenic—Metallic, per lb....32
Barium—(Metallic), per lb....975.00
Bismuth—(Metallic), per lb....2.40
Cadmium—(Metallic), per lb....1.45
Calcium—(Metallic), per oz....150.00
Cœsium—(Metallic)....
Cerium—(Metallic) per oz....160.00
Chromium—(Metallic), per lb....200 00
Cobalt—(Metallic), per lb....6.00
Didymium—(Metallic), per oz....160 00
Erbium—(Metallic), per oz....140.00
Gallium—(Metallic), per oz....3250.00
Glucinum—(Metallic)....4.50
Indium—(Metallic), per oz....158.00
Iridium—(Metallic), per lb....700.00
Lanthanum—(Metallic), per oz.175.00
Lithium—(Metallic), per oz....160.00
Magnesium—Per lb....4.50
Manganese—Metallic, per lb....1.10
Molybdenum—(Metallic), per oz. 6.00
Nickel—(Metallic), per lb....65
Niobium—(Metallic), per oz....128.00
Osmium—(Metallic), per lb....640.00
Palladium—(Metallic), per lb....512.00
Platinum—(Metallic), per lb....128.00
Potassium—Metallic, per oz....2.00
Rhodium—(Metallic), per lb....512.00
Ruthenium—(metallic), per oz. 112.00
Rubidium—(Metallic), per oz....200.00
Selenium—(Metallic), per oz....3.00
Sodium—(Metallic) per lb....4.50
Strontium—(Metallic), per oz..128 00
Tantalum—(Metallic) per oz....144.00
Telurium—(Metallic) per oz....9 00
Thallium—(Metallic) per oz....3.00
Titanium—(Metallic) per oz....32.00
Thorium—(Metallic) per oz....272.00
Tungsten—(Metallic) per oz....1.25
Vanadium—(Metallic), per oz..320.00
Yttrium—(Metallic), per oz....144.00
Zirconium—(Metallic), per oz..240.00

METALS.

Aluminum—
Bronze (10%), ℔ lb....46c.
Copper—
Lake Ingot, Spot, ℔ lb....16·60@16·70c.
Electrolytic, ℔ lb....16·25c.
Casting Brands, ℔ lb....15·25@15·50c.
Chili Bars, London, ℔ ton....£82
Sheet Copper (according to size), ℔ lb....25 @38c.
Lead—
Domestic, Common, Spot....4⅛@4·15c.
Foreign....4 60@4 70c.
Sheet ℔ lb....6.75@6·80c. net
Pipe, ℔ lb....6¼c. "
Tin lined Pipe, ℔ lb....12c. "
Shot, ℔ lb....6½@ 7¼c.
Tin—
Tin Plates....14s. 6d.
Tin Spot in London....£78@£78 5s.
Pig tin, spot in N. Y., ℔ lb..17⅞@18·c.
Zinc—
Domestic spelter, ℔ lb....4·50@4·60c.
Foreign spelter, ℔ lb....5·25@5·35c.
Silesian, ton....£16 5s.
Sheet, American, ℔ lb....6¼@6⅛c
Antimony—Hallet's, per lb...10@10⅛c.
Cookson's, per lb....12⅛
Star Antimony....£41
Quicksilver—Per lb....61@63c.
London, ℔ flask....£7@£7¼

IRON AND STEEL.

New York Prices.

American Pig-Iron.
No. 1 X....$18 00@$18.50 at tidewater
No. 2 X....$17.00@ 17 50 " "
Forge....$16.00@.... " "
Scotch Pig—Coltness....$20.00@$20.25
Clyde....
Dalmellington....18 50@ 18.75
Summerlee....19.50@ 19.75
Shotts....@....
By Cable to-day to the Metal Exchange:
Scotch Warrants....38s.
Coltness, at Glasgow....47s. 3d.
Langloan, at Glasgow....44s. 3d.
Summerlee, at Glasgow....46s.
Gartsherrie, at Glasgow....44s. 3d.
Glengarnock, at Ardrossan....43s. 6d.
Dalmellington, at Ardrossan....39s. 6d.
Eglinton, at Ardrossan....38s.
Bessemer Pig—
Foreign, nominally....$19.00
Domestic....18@18.50 at furnace
Spiegeleisen—
German, 20 per cent....$26
English, 20 " "....$26.50@ 27.00
" 30 " "....31.00@ 31.50

Ferro Manganese....49.00@ 50.00
Steel Blooms, nominally $28.00@$28.50
Steel Billets. "....29.00@....
Steel Nail Slabs. "....30 00@....
Steel Wire Rods, "....40.50@ 41.00
Steel Rails—
Heavy sections, at mill....$30.00@ 31.00
Light " "....31.00@ 35.00
Structural Iron and Steel—
Bridge Plate, at mill....1·9 @2c.
Angles, at mill....2·00@2·05c.
Tees, at mill....2 40@2 50c.
Steel Angles, at mill....2·1 @2·2c.
Beams and Channels, on wharf, 3·3c.base.
Steel Plates—
Tank and Ship, on wharf....2·25@2·4
Boiler Shell, on wharf....2·15@2·25
" Flange, "....2·60 @2·75
" Fire-Box, on wharf....3 @3·50
Iron Plates—
Common tank, on wharf....1·9@2·0c.
Refined tank, on wharf....2·1@2 3c.
Boiler shell, "....2·1@2·3c.
Boiler flange, "....3·50@3·75
Extra flange, "....3¼@3½
Bar Iron—
Refined....1·7@1·9c. "
Common....1·5@1 6c. "
Merchant Steel—
American tool....8½@10c.
Special grades....13 @20c.
Crucible machinery....5 @6c
" spring....4½c
Bessemer machinery....2·2@ ·5c.
" spring....2·7@2·9c
Cast-Iron Pipe—
According to size....$20 00@$30.00
Wrought Iron Pipe—nominally—
Butt-Welded, Plain and Tarred, 55% disc.; Galv., 45% disc.
Lap-Welded, Plain and Tarred, 65% disc.; Galv., 55% disc.
Boiler Tubes Per cent disc....60%
Rail Fastenings—
Spikes....2 @2·1c.delv'd
Angle Fish-bars....1·8 @1·9c.
Bolts and Sq. Nuts....2·7 @2·8c
" " Hex. "....3 @
Wrought Scrap—
Foreign, *ex store*....$19.00@
No. 1 Yard *to vessel*....19.00@
Cast Scrap....15.50@ 16.50
Old Car Wheels....@ 19 50
Old Rails—Tees....20.00@ 20.50
—Doubles....21.00@
Nails—In car-load lots....1 90@1·95c.
—From store....2·00@2·05c.

Louisville Prices.

Hot Blast Irons—
So. Coke, No. 1....$16.50@$17.50
" " No. 2....15.50@ 16 50
" " No. 2½....15.00@ 15.50
Mahoning Valley (Lake Ore Mixture)....18.50@ 19.50
So. Charcoal, No. 1....17.50@ 18.00
" " No. 2....16.50@ 17.50
Missouri Charcoal No. 1....19.50@ 20.50
" " No. 2....19.00@ 19.50
Forge Irons—
Neutral Coke....$14.00@$14.50
Cold Short....13.75@ 14.00
Mottled....12.50@ 13.00
Car Wheel and Malleable Irons—
Southern (standard brands).$22.00@$24.00
" (other brands)....18 00@ 18 50
Lake Superior....21.50@ 22.50

Pittsburg Prices.

Coke or Bituminous Pig—
Foundry No. 1....$17.00@....
Foundry No. 2....16.00@....
Gray Forge No. 3....14.25@14.50
" " No. 4....14.25@....
White....13.50@....
Mottled....13.50@....
Silvery....16.50@18.00
Bessemer....17.00@....
Charcoal Pig—
Foundry No. 1....23.50@24.50
Foundry No. 2....2[illegible].00@24.00
Cold-Blast....25.00@26.00
Warm-Blast....24.00@25.00
20 p. c. Spiegel....27.50@
Muck-Bar....26.25@26.50
Steel Blooms....28.00@28.50
Steel Slabs....27.75@28.00
Steel Crop Ends....18.00@
Steel Bloom Ends....@17 50
Steel Billets....28.00@28.50
Old Iron Rails....21 50@21.75
Old Steel Rails....20.00@....
No. 1 W. Scrap....19 00@19.50
No. 2 W. Scrap....17.00@18.00
Steel Rails....*31.50@32.00
" light sections....*33.00@34 00
Bar Iron., nominal....1.75@ 1 85
Nails....$1.90 usual discount
Steel Nails....$1.90
Two per cent off for cash.
* At works.

Philadelphia Prices.

Foundry No. 1....$18.00@19.50
Foundry No. 2....17.00@18 50
Gray Forge....15.50@16 50
Bessemer Pig....19.50@20 00
Steel Rail Blooms....29.50@nom.
Foreign Bessemer....19.5 @20 00
Spiegeleisen....26.50@27.00
Scrap, Selected....22.00@22 50
No. 1....21 00@20 00
Cargo Scrap....21.00@20.50
Muck-Bars....27.50@....
Merchant Iron....1.75@ 1.95
Plate Iron....2.00@....
Tank Iron....2 00@ 2.20
Skelp Iron....1.80@ 1.90
Angles....2.00@ 2.10
Beams and Channels....3.30.@..
Nails....1.90@ 2.00
Steel Rails....31.50@33.50
Old Rails....21.00@22.00
Best refined....2@2·1c. base.

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid.	Asked.
Atlantic Coal....	$1.40	....
Balt. & N. C....	.16@ .10	.30@ .25
Big Vein Coal..	...	...
Conrad Hill...	.05@ 08	.10
Diamond Tunnel	....	...
George's Crk. C.	100@102.50	103@ 110
Lake Chrome..	....	....
N. State, Balto..	.10@.15	.29@ .30
Ore Knob....	.05	.11
Silver Valley..	.75@ 85	1.10

Highest and lowest prices bid and asked during the week ending June 21st.

Birmingham, Ala.

COMPANY.	Bid.	Asked.
Ala. Conn. C..	....	25 @ 45
Bir.Min.& Mfg.	...	190 @192½
Bir.Fur. & Mg.	....	23½
Broken Arrow C. & M....	10@10¼	15
Decat. L. Imp. & Fur....	14½@15¾	15 @ 16¾
DecaturMin.L.	....	27½
Enterprise Mfg Co....	35	50
Jagger-Townley C & C.Co.	7½	11 @11½
Mag-Ellen C. & Mg....	40@50	....
No Bus. Crk., C. & Mg....	5	12½
Pioneer M. & Mfg....	12@12¾	13½@ 13¾
Sloss I. & S....	74@75	76 @ 82
*Sloss I. & S..	....	....
Sheffield C & I.	68@71½	70 @ 74
Tenn.C.& I. Co.	25½	27½
*Williamson Iron Co....	....	102
WoodstockS&I	48@50	56 @ 56½

* Bonds.
Highest and lowest prices bid and asked during the week ending June 18th.

Pittsburg, Pa.

COMPANY	H.	L.	Closing.
Allegegheny Gas..	35.00	35.00	35.00
Bridgewater Gas..	......	......	......
Charlotte Mg. Co..	......	......	......
Chartiers Val. Gas.	75.00	69.00	70.00
Columbia Oil Co..	......	3.00	3.63
Consignee Mg. Co.	......	......	......
Forest Oil Co....	......	......	......
Iron City Mining..	......	......	......
Kittanning Gas...	......	......	......
La Noria Mining..	2.25	1.88	2.13
Lustre Mining....	1.75	1.75	1.75
M'f'turers' Gas....	29.88	29.50	29.88
Nat. Gas Co. of W. Va....	62 00	60.00	62.00
N. Y. & C. Gas Coal	35.00	30.00	35.00
N. Y. & Westmoreland G., C. & C..	......	......	......
Ohio Valley Gas..	......	......	......
Pennsylvania Gas.	......	......	......
People's Nat. Gas.	......	......	......
Philadelphia Gas..	44.13	43.00	43.13
Pine Run Gas....	......	......	......
Pittsburg Gas....	60.00	60.00	60.00
Silverton Mining..	......	......	......
South Side Gas...	......	......	......
Tuna Oil Co....	63 00	63.00	63 00
Washington Oil...	50.00	50.00	50.00
W't'h'se Air-Brake	125.00	125.00	125.00
West'house Brake	......	......	......
Westmoreland & Cambria Gas..	47.00	46 00	46.00
Wheeling Nat. Gas.	25.00	23.00	25.00
Yankee Girl Min..	......	......	......

Highest and lowest prices bid and asked during the week ending June 21st.

Foreign Quotations.

COMPANY.	*London.* Highest.	June 9. Lowest.
Alturas Gold, Idaho...	16s. 6d.	15s. 6d.
Arizona Copper, Ariz..	18s. 6d.	18s.
Birdseye Creek, Cal....	9s.	7s.
Carlisle, N. Mex....	24s.	23s.
Centennial Cal....	7s. 6d.	5s.
Colorado United, Colo..	4s	3s.
Columbian, S A....	37s. 6d.	32s. 6d.
Denver Gold, Colo....	2s. 6d.	1s. 6d.
Dickens Custer, Idaho.	7s.	6s.
Eberhardt, Nev....	2s.	1s.
El Callao, Venezuela....	£3	£2¾
Empire, Mont....	£1 1-16	£15-16
Flagstaff, Utah....	4s. 6d.	3s. 6d.
Garfield, Nev....	20s.	19s.
Gold Hill, N. C....	2s.	1s.
Idaho....	17s.	15s.
Ilex, Cal....	17s.	15s.
Josephine, Cal....	£1⅛	£⅞
Kohinoor, Colo....	2s.	2s.
Lady Franklin N. Mex.	6s.	4s.
Mason & Barry, Portugal	£9¾	£9½
Montana Lt., Mont....	£1¼	£1⅛
New California, Colo...	5s. 6d.	4s 6d.
New Emma, S., Utah...	5s. 6d.	4s. 6d.
New Hoover Hill, N. C.	2s.	1s. 6d.
New La Plata, Colo...	1s. 9d.	1s. 3d.
Pittsburg Cons., Nev...	37s. 6d.	35s.
Plumas Eureka, Cal....	£15-16	£13-16
Quebrada, Venezuela...	£4⅞	£4⅝
Richmond Con., Nev...	£4	£3¾
Ruby&Dunderberg,Nev	3s.	2s.
Russell Gold, N. C....	3s. 6d.	2s. 6d.
Sierra Buttes, Cal....	£⅝	£½
Stanly, N. C....	15s.	12s. 6d.
Tolima, Colombia, S.A.	£3	£2
Union Gold, Colo....	4s.	3s. 6d.
U. S. Placer, Colo....	£¾	£⅝
Viola Lt., Idaho....	23s.	21s.
	*Paris.**	June 7.
Boleo....	650	650
El Callao....	77	77
Golden River....	440	440
Lexington....	70	70
" parts....	4.25	4.25
Rio Tinto....	477	477
" obligations...	501.25	501.25
" " 2d.	498.75	498.75
Tharsis....	132.75	132.75

* Francs.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amount of last.			Dividends. Total paid.	Dividends. Date and amount of last.		
1	Adams, S. L.	Colo.	$1,500,000	150,000	$10	*				$555,000	Jan.	1887	.15
2	Alice, S. C.	Mont	10,000,000	400,000	25	*				750,000	Sept	1886	.06¼
3	Alturas, G	Idah.	1,500,000	300,000	5					95,000	Sept	1886	50
4	Amy & Silversmith, S.	Mon.		341,419						247,530	Aug.	1887	.12½
5	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	420,000	Feb.	1888	1.50
6	Argenta, S	Nev.	10,000,000	100,000	100	325,000	July	1885	.10	40,000	Feb.	1880	20
7	Aurora, I	Mich.	2,000,000	100,000	20					155,000	Oct.	1887	1.87½
8	Bassick, G. S.	Colo.	10,000,000	100,000	100	*				400,000	Mar.	1884	1.00
9	Belle Isle, S.	Nev.	10,000,000	100,000	100	145,000	Feb	1887	20	300,000	Dec.	1879	.25
10	Belcher, G. S.	Nev.	10,400,000	104,000	100	2,666,000	Mar.	1888	.50	15,397,200	Apl.	1876	1.00
11	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	57,500	Nov.	1887	25	187,500	Jan.	1887	.10
12	Big B'nd Hydraulic, G	Dak.	1,000,000	200,000	5	*				258,000	Aug.	1887	.03
13	Black Bear, G.	Cal.	3,000,000	30,000	100	22,500	Dec.	1884	.25	895,000	May	1883	.20
14	Bodie Con., G. S.	Cal.	10,000,000	100,000	100	450,000	Feb.	1888	.50	1,295,000	Apl.	1885	.50
15	Bonanza Developm't	C & M	3,000,000	300,000	10					135,000	Oct.	1882	.15
16	Bonanza K'g, Cons. S.	Cal.	1,000,000	100,000	10	*				185,000	Feb.	1885	.10
17	Boston & Mont, G.	Mont	2,500,000	250,000	10	*				520,000	Jun.	1886	.15
18	Breece, S.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1880	.01
19	Brooklyn Lead, L. S.	Utah	500,000	50,000	10					127,000	July	1887	.05
20	Bulwer, G.	Cal.	10,000,000	100,000	10	80,000	May	1888	.20	175,000	Jan.	1884	.10
21	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	40,000	Feb.	1886	.10
22	Calumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000				30,350,000	July	1888	5.00
23	Carbonate Hill, S. L.	Colo.	2,000,000	200,000	10	*				80,000	Apl.	1884	.05
24	Caribou Con., S.	Colo.	1,500,000	150,000	10	*				50,000	Mch	1880	.10
25	Castle Creek, G.	Idah.	100,000	100,000	1					51,000	Oct.	1883	.03
26	Catalpa, S. L	Colo.	3,000,000	300,000	10	*				270,000	May.	1884	.10
27	Central, C.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,860,000	Feb.	1888	2.00
28	Christy, S.	Utah	10,000,000	100,000	100					10,000	Jun.	1885	.10
29	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
30	Colorado Central, S. L	Colo.	2,750,000	275,000	10	*				310,000	Jun.	1888	.05
31	Confidence, S. L.	Nev.		24,960		287,440	Apl.	1887	.50	99,840	Jun.	1888	2.00
32	Cons. Cal. & Va., G S.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	1,900,800	Jun.	1888	.50
33	Con. Gold Mining, G.	Ga.	500,000	100,000	5	*				108,000	Nov.	1888	02
34	Contention, S	Ariz.	12,500,000	250,000	50					†2,587,000	Dec.	1884	.25
35	Crescent, S. L. G.	Utah	15,000,000	600,000	25					210,000	Aug.	1886	.05
36	Crown Point, G. S.	Nev.	10,000,000	100,000	100	2,775,000	Apl.	1888	.50	11,588,000	Jan.	1875	2.00
37	Daly, S. L.	Utah	3,000,000	150,000	20					637,500	Jun.	1888	.25
38	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*				§1,000,000	Nov.	1887	.10
39	Derbec B. Grav., G. S.	Cal.	10,000,000	100,000	100	90,000	Dec.	1881	.10	180,000	May	1887	.10
40	Dunkin, S. L.	Colo.	5,000,000	200,000	25	*				330,000	Apl.	1888	.15
41	Eclipse	Colo.	100,000	100,000	1					20,000	Nov.	1887	.10
42	Elkhorn, G. S.	Mont	1,000,000	100,000	10	50,000	July	1883	.50	170,900	July	1887	.05
43	Empire Lt., G.	Mont	500,000	100,000	5					70,500	Oct.	1887	.37½
44	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	600,000	July	1886	1.00	4,918,500	July	1888	.25
45	Evening Star, S. L.	Colo.	500,000	50,000	10	*				1,400,000	Nov.	1883	.50
46	Excelsior, G.	Cal.	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct.	1880	.25
47	Father de Smet, G.	Dak.	10,000,000	100,000	100	200,000	Nov	1878	1.00	1,125,000	Dec.	1885	.20
48	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun.	1871		720,000	July	1888	2.00
49	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*				190,000	July	1886	.10
50	Fresno Enterprise, G	Cal.	5,000,000	100,000	50		Mch	1883	.10	110,000	July	1882	.10
51	Garfield Lt., G. S.	Nev.	500,000	100,000	5					60,000	Mar.	1887	.12½
52	Golconda, G. S.	Idah.	1,000,000	100,000	10					120,000	May	1888	.60
53	Gould & Curry, G. S.	Nev.	10,800,000	108,000	100	5,251,000	Mar.	1888	.50	3,826,800	Oct.	1870	10.00
54	Grand Central, S.	Ariz.	1,000,000	100,000	10					625,000	Dec.	1882	.25
55	Grand Prize, S.	Nev.	10,000,000	100,000	100	570,000	Apl.	1886	.50	495,000	Mar.	1884	.25
56	Granite, S.	Colo.	125,000	125,000	1					6,250	May	1883	.01
57	Granite Mountain, S.	Mont	10,000,000	400,000	25					4,400,000	Apl.	1888	.50
58	Green Mountain, G.	Cal.	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
59	Hale & Norcross, G. S	Nev.	11,200,000	112,000	100	5,086,000	July	1887	.50	1,710,000	Jun.	1888	.50
60	Hall-Anderson, G.	N. S.	150,000	150,000	1					7,000	Jan.	1882	.05
61	Hecla Con., S. G. L. C.	Mont	1,500,000	30,000	50					1,152,500	May	1888	.50
62	Hel'a Mg & Red, G.S.L	Mont	3,315,000	663,000	5	*				197,970	July	1886	.06
63	Holmes, S.	Nev.	10,000,000	100,000	0	300,000	Sept	1885	10	75,000	Apl.	1886	.25
64	Holyoke, G.	Idah.	200,000	200,000	1					27,000	Feb.	1883	.10
65	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	4,143,750	Jun.	1888	.20
66	Honorine, S. L.	Utah	500,000	250,000	2	25,000	Jun.	1883		125,000	Sept	1887	.05
67	Hope, S.	Mont	1,000,000	100,000	10	*				233,252	Apl.	1888	.25
68	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	* *				4,000,000	Nov.	1884	.50
69	Idaho, G.	Cal.	310,000	3,100	100					4,893,250	Jun.	1888	15.00
70	Ideal, S. L.	Colo.	1,500,000	50,000	10					15,000	Oct.	1886	.05
71	Illinois, S.	N.M.	100,000	100,000	1	*				25,000	Jan.	1887	.25
72	Independence, S.	Nev.	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879	.25
73	Indian Queen, S.	Nev.	250,000	125,000	2					368,750	July	1883	.03
74	Iron Hill, S.	Dak.	2,500,000	250,000	10	101,250	Mar.	1888	.07½	156,250	Nov.	1887	.07½
75	Iron-Silver, S. L	Colo.	10,000,000	500,000	20	*				2,200,000	Feb.	1888	.20
76	Jackson, G. S.	Nev.	5,000,000	50,000	100	10,000	Nov	1880	.20	45,000	Oct.	1886	.10
77	Jay Gould	Mont	2,000,000	40,000	5	*				267,000	Jun.	1888	.09
78	Jocuistita, S.	Mex.	2,500,000	250,000	10					1,200,000	Feb.	1885	.50
79	Jumbo, G.	Colo.	2,000,000	200,000	10					35,000	Oct.	1887	.02½
80	Kentuck	Nev.	3,000,000	30,000	100	342,000	Nov	1881	.30	1,350,000	Dec.	1886	.10
81	La Plata, S. L.	Colo.	2,000,000	200,000	10	*				610,000	Sept	1882	.30
82	Leadville Cons., S.L. L	Colo.	4,000,000	400,000	10	*				423,000	Apl.	1887	.05
83	Lexington, G. S.	Mont	4,000,000	40,000	100	*				565,000	Jan.	1885	2.00
84	Little Chief, S. L.	Colo.	10,000,000	200,000	50	*				800,000	July	1888	.10
85	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*				1,050,000	Mch.	1880	50
86	Manhattan, S.	Nev	5,000,000	50,000	100	230,000	Dec.	1887	1.00	437,500	Feb	1886	.25
87	Marion Bullion, G	N.C.	500,000							15,000	Jan.	1886	
88	Martin White, S.	Nev.	10,000,000	100,000	100	1,150,000	Mar.	1886	25	140,000	Dec.	1886	.25
89	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*				122,500	Feb.	1888	5.00
90	Minnesota, C.	Mich	1,000,000	40,000	25	420,000	Apl.	1886	1 00	1,820,000	Mar.	1876	
91	Mono, G.	Cal.	5,000,000	50,000	100	616,000	Sept	1887	.50	12,500	Mar.	1886	.25
92	Montana, Lt., G. S.	Mont	3,300,000	660,000	5	*				2,010,964	Apl.	1888	.25
93	Morning Star, S. L.	Colo.	1,000,000	100,000	10					775,000	Mar.	1888	.25
94	Moulton, S. G.	Mont	2,000,000	400,000	5	*				380,000	Dec.	1887	.07½
95	Mount Pleasant, G.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
96	Mt. Diablo, S.	Nev.	5,000,000	50,000	100	137,500	Jun.	1880	2.00	100,000	Jun.	1888	.20
97	Napa, Q	Cal.	700,000	100,000	7					290,000	Jan.	1883	.10
98	Navajo, G. S.	Nev.	10,000,000	100,000	100	485,000	Apl.	1888	.30	325,000	Feb.	1885	.25
99	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06¼
100	Northern Belle, S.	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	Apl.	1883	50
101	North Belle Isle, S.	Nev.	10,000,000	100,000	100	250,000	Mar.	1887	.50	230,000	May	1888	.50
102	Ontario, S. L.	Utah	15,000,000	150,000	100					9,275,000	Jun.	1888	.50
103	Ophir, G. S.	Nev.	10,000,000	100,000	100	4,059,440	Aug.	1887	.50	1,595,800	July	1882	1.00
104	Original, S. C.	Mont	1,500,000	60,000	25	*				117,000	Dec.	1887	.05
105	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,122,500	Jun.	1888	1 00
106	Oxford, G.	N. S.	125,000	125,000	1	*				38,500	Oct.	1885	.02
107	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	62,000	Apl.	1888	.15	150,000	Apl.	1887	.10
108	Parrott, C.	Mont	1,800,000	180,000	10					156,000	Jan.	1888	.10
109	Peacock, S. G. C.	N.M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
110	Pleasant Valley, G. S.	Cal.	10,000,000	100,000	100	40,000	Mar.	1884	.10	30,000	Dec.	1882	.05
111	Plutus, G. S. C. L.	Colo.	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
112	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
113	Prussian, S. L.	Colo.	1,500,000	150,000	10					132,000	Jan.	1883	.10
114	Quicksilver, pref., Q.	Cal.	4,300,000	43,000	100					1,417,692	July	1888	1.50
115	" com., Q.	Cal.	5,700,000	57,000	100					151,000	July	1882	.40
116	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec.	1862		4,770,000	Feb.	1888	4.00
117	Richmond, S. L.	Nev.	1,350,000	54,000	25	*				4,312,587	Jun.	1887	1.25
118	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar	1886	.50	99,785	Feb.	1880	.50
119	Rising Sun, S.	Dak.	750,000	150,000	5	*				52,000	May	1881	.07½
120	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
121	Robert E. Lee, S. L.	Colo	10,000,000	500,000	20					100,000	Dec.	1882	.50
122	Rooks, G.	Vt.	500,000	50,000	10	*				61,000	Apr	1885	.30
123	Savage, S.	Nev.	11,200,000	112,000	100	6,324,000	Sept	1887	.50	4,460,000	July	1869	3.00
124	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*				50,000	July	1884	
125	Shoshone, G.	Idah.	150,000	150,000	1					7,500	Apl.	1883	.01
126	Sierra Buttes, G.	Cal.	2,225,000	122,500	10					1,492,557	Apl.	1888	.12½
127	Sierra Grande, S.	N. M.	2,500,000	500,000	5					860,000	Sept	1884	.25
128	Sierra Nevada, G. S.	Nev.	10,000,000	100,000	100	6,100,000	Apl.	1888	.25	102,000	Jan.	1871	1.00
129	Silver Cord, G. S. L.	Colo.	5,000,000	500,000	10					225,000	Nov.	1883	.25
130	Silver King, S.	Ariz.	10,000,000	100,000	100					1,950,000	July	1887	.25
131	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*				80,000	Nov.	1886	.02
132	Small Hopes Cons., S.	Colo.	5,000,000	250,000	20	*				3,112,500	Dec.	1887	.20
133	Smuggler, S. L.	Colo.	600,000	60,000	10					66,700	Aug.	1883	.25
134	Socorro, C	N. M.	250,000	2,500	100					4,000	Mch	1882	.00¾
135	Spring Valley, G.	Cal.	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan	1881	25
136	Standard, G. S.	Cal.	10,000,000	100,000	100	25,000	Oct.	1884	.25	8,595,000	Jun.	1888	.05
137	Stormont, S	Utah	500,000	500,000	1	*				155,000	Nov.	1881	.05
138	St. Joseph, L	Mo.	1,500,000	150,000	10	*				844,000	Dec.	1887	.20
139	Surinam, G.	D. G.	3,000,000	600,000	5					105,000	Nov.	1887	.05
140	Swansea, G.	Colo.	600,000	60,000	10	*				9,000	Apl.	1888	.02½
141	Syndicate, G.	Cal.	10,000,000	100,000	100	38,729	July	1882	.15	48,308	Sept	1885	.10
142	Tamarack, C.	Mich.	1,000,000	40,000	25	520,000	Apl.	1885	3.00	240,000	July	1888	3.00
143	Tip Top, S	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov.	1881	.20
144	Tombstone, G. S. L.	Ariz.	12,500,000	500,000	25	*				1,250,000	Apl.	1882	.10
145	United Verde, C.	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.20
146	Valencia, M.	N. H.	150,000	1,500	100					37,500	Apl.	1886	2.50½
147	Viola Lt., S. L.	Idah.	750,000	150,000	5					222,500	Dec.	1887	.12
148	Vizina, S.	Ariz.	5,000,000	200,000	25					140,000	Apl.	1882	.10
149	Yankee Girl	Colo.	2,500,000	250,000	10					1,275,000	July	1887	.10
150	Yellow Jacket, G. S.	Nev.	12,000,000	120,000	100	5,448,000	Dec	1885	.75	2,184,000	Aug	1871	1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied.	Assessments. Date & am't of last.		
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	*			
2	Allouez, C.	Mich	2,000,000	80,000	25	$657,000	Jun	1888	1.00
3	Alpha Con., G. S.	Nev.	3,000,000	30,000	100	536,250	Jan.	1888	87½
4	Alta, S.	Nev.	10,080,000	100,800	100	2,191,200	May	1888	.50
5	Amador, G.	Cal.	400,000	200,000	2	*			
6	American Flag, S.	Colo.	1,250,000	125,000	10	300,000	Jun	1877	.50
7	Anglo-Montana, Lt.	Mon.	600,000	120,000	5				
8	Appalachian, Lt., G.	N. C.	1,500,000	300,000	5				
9	Aspen Mg. & S., S. L.	Colo.	2,000,000	200,000	10				
10	Barcelona, G.	Nev.	5,000,000	200,000	25	*			
11	Bechtel Con., G.	Cal.	10,000,000	100,000	100	173,500	Jan.	1883	.10
12	Belmont, S.	Nev.	5,000,000	50,000	100	735,000	Apl.	1886	.10
13	Best & Belcher, G. S.	Nev.	10,080,000	100,800	100	2,029,390	Jun.	1888	.25
14	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*			
15	Bi-Metallic, S.	Mon.	5,000,000	200,000	25	*			
16	Black Oak, G.	Cal.	3,000,000	300,000	10	*			
17	Boston Con., G.	Cal.	10,000,000	100,000	100	170,000	Nov	1883	.25
18	Boston & Mont., C.S	Mon.	2,500,000	100,000	25	*			
19	Bremen, S.	N. M.	5,000,000	500,000	10	*			
20	Brunswick, G.	Cal.	2,000,000	400,000	5	*			
21	Bullion, G. S.	Nev.	10,000,000	100,000	100	3,957,000	Aug.	1887	.50
22	Bye and Bye	Ariz.	1,000,000	100,000	10	*			
23	Calaveras, G.	Cal.	500,000	500,000	1	*			
24	Carisa, G.	Wy.	500,000	100,000	5	*			
25	Carupano, G. S. L. C.	Ven.	200,000	100,000	2	*			
26	Cashier, G. S.	Colo.	500,000	250,000	2	*			
27	Cen. Contin'l, G.S.L.	C.&A	2,000,000	200,000	10	*			
28	Charles Dickens, G.S.	Idah.	1,250,000	250,000	5	*			
29	Cherokee, G.	Cal.	1,500,000	150,000	10				
30	Chollar, S.	Nev.	11,200,000	112,000	100	1,208,000	Dec.	1887	.50
31	Cinnamon Mt., G.S.	Colo.	750,000	150,000	5	*			
32	Cleveland, T.	Dak.	1,000,000	500,000	2	*			
33	Comstock, G. S.	Nev.	10,000,000	100,000	100	30,000	Mar.	1887	.15
34	Con. Imperial, G. S.	Nev.	5,000,000	50,000	100	1,175,000	Sept	1887	.25
35	Con. Pacific, G.	Cal.	6,000,000	60,000	100	177,000	Sept	1887	.10
36	Cons. Silver, S.	Mo.	2,500,000	250,000	10				
37	**Cop. Queen Cons, C.	Ariz.	1,400,000	140,000	10				
38	Courtlandt	Colo.	500,000	50,000	10				
39	Crescent, S. L.	Colo.	3,000,000	300,000	10	*			
40	Crocker, S.	Ariz.	10,000,000	100,000	100	105,000	Feb.	1888	.20
41	Crowell, G.	N. C.	500,000	500,000	1				
42	Dahlonega, G.	Ga.	250,000	250,000	1	*			
43	Dandy, S.	Colo.	5,000,000	500,000	10				
44	Dardanelles, G.	Cal.	1,000,000	100,000	10				
45	Decatur, S.	Colo.	1,500,000	300,000	5	*			
46	Denver City, S. L	Colo.	5,000,000	500,000	10	*			
47	Denver Gold, G.	Colo.	300,000	60,000	5				
48	Durango, G.	Colo.	500,000	500,000	1	*			
49	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990,000	Mar.	1886	1.00
50	El Cristo, G. S.	U.S.C	1,000,000	500,000	2	*			
51	El Dorado, G.	Cal.	1,000,000	250,000	4	*			
52	El Talento, G.	U.S.C	1,000,000	500,000	2				
53	Empire, S.	Utah	10,000,000	100,000	100				
54	Eureka Tunnel, S. L.	Nev.	10,000,000	100,000	100	*			
55	Exchequer	Nev.	10,000,000	100,000	100	770,000	Feb.	1888	.20
56	Found Treasure, G.S.	Nev.	10,000,000	100,000	100	12,000	Jan.	1888	.06
57	Gogebic I. Syn., I	Wis.	5,600,000	200,000	25				
58	Gold Cup, S.	Colo.	500,000	500,000	1	*			
59	Golden Era, S.	Mon.	2,000,000	200,000	10	*			
60	Gold Placer, G.	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.25
61	Gold Rock, G.	Cal.	1,000,000	500,000	2	*			
62	Goodshaw, G.	Cal.	10,000,000	100,000	100	*			
63	Grand Belt, C.	Tex.	12,000,000	120,000	100				
64	Grand Duke	Colo.	800,000	80,000	10				
65	Great Remance, G.	U.S.C	1,000,000	500,000	2	*			
66	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*			
67	Gregory Con., G.	Mon.	3,000,000	300,000	10				
68	Harlem M. & M. Co, G.	Cal.	1,000,000	200,000	5				
69	Head Cent. & Tr. S. G	Ariz.	10,000,000	100,000	100				
70	Hector, G.	Cal.	1,500,000	300,000	5				
71	Highland, C	Mich	500,000	25,000	25				
72	Hollywood	Cal.	200,000	100,000	2				
73	Hortense, S.	Colo.	2,000,000	200,000	10				
74	Huron, C	Mich	1,000,000	40,000	25	280,000	May	1887	3.00
75	Iron Gold & Silver, S	N. M.	2,000,000	200,000	10	*			
76	Ironton, I	Wis.	1,000,000	40,000	25				
77	Iroquois, C	Mich	1,250,000	50,000	25				
78	J. D. Reymert	Ariz.	10,000,000	100,000	100	*			
79	Julia Cons., G. S.	Nev.	11,000,000	110,000	100	1,650,000	Apl.	1887	.10
80	Kearsarge, C.	Mich	1,250,000	50,000	25	190,000	Oct.	1887	1.00
81	Laclede	N. M.	2,000,000	200,000	10	*			
82	Lacrosse, G.	Colo.	1,000,000	100,000	10	*			
83	Lee Basin, S. L.	Colo.	5,000,000	500,000	10	*			
84	Lochiel, S.	N. M.	2,000,000	200,000	10	*			
85	Lucerne, S.	Colo.	5,000,000	500,000	10	*			
86	Mammoth Bar., G.	Cal.	10,000,000	100,000	100	50,000	Dec.	1881	
87	May Belle, G.	Cal.	10,000,000	100,000	100	84,000	Mar.	1884	.15
88	Mayflower Gravel	Cal.	1,000,000	100,000	10	325,000	Apl.	1888	.25
89	Medora, G.	Dak.	250,000	250,000	1				
90	Mexican, G. S	Nev.	10,000,000	100,000	100	2,700,760	Jan.	1888	.25
91	Middle Bar G.	Cal.	400,000	200,000	2	*			
92	Mize & Starr, S. L.	Colo.	1,000,000	200,000	5	*			
93	Monitor, G.	Colo.	100,000	100,000	1	*			
94	Moose Silver, S.	Colo.	3,000,000	300,000	10				
95	Native, C.	Mich	1,000,000	40,000	25				
96	Neath, G.	Colo.	1,000,000	100,000	10				
97	Nevada Queen, S.	Nev.	10,000,000	100,000	100	130,000	Dec.	1887	.50
98	New Germany, G	N. S.	100,000	100,000	1	*			
99	New Pittsburg, S. L.	Colo.	2,000,000	200,000	10	*			
100	North Standard, G.	Cal.	10,000,000	100,000	100	20,000	Nov		
101	Noonday	Cal.	600,000	60,000	10	208,000	Dec.	1881	.10
102	Oneida Chief, G.	Cal.	500,000	125,000	4	*			
103	Oriental & Miller, S.	Nev.	10,000,000	400,000	10				
104	Osceola, G.	Nev.	5,000,000	50,000	25	*			
105	Overman, G. S.	Nev.	11,520,000	115,200	100	3,737,180	Aug.	1887	.25
106	Park, S.	Utah	2,000,000	200,000	100				
107	Peer, S.	Ariz.	10,000,000	100,000	10	125,000	Nov.	1886	.10
108	Peerless, S.	Ariz.	10,000,000	100,000	100	345,000	Apl.	1888	.25
109	Phœnix	Ariz.	500,000	500,000	100				
110	Phœnix, G. S.	Ark.	5,000,000	200,000	1	*			
111	Phœnix Lead, S. L.	Colo.	100,000	100,000	25	*			
112	Pilgrim, G.	Cal.	600,000	300,000	1	*			
113	Potosi, S.	Nev.	11,200,000	112,000	2	1,293,600	Nov.	1887	.50
114	Proustite, S.	Idah	250,000	250,000	100	*			
115	Puritan S. G.	Colo.	1,500,000	150,000	1	*			
116	Quincy	Colo.	3,000,000	300,000	10				
117	Rappahannock, G.S.	Va.	250,000	250,000	10	*			
118	Red Elephant, S.	Colo.	500,000	500,000	1	*			
119	Ropes, G. S.	Mich	2,000,000	80,000	1	103,200	July	1887	.50
120	Russell, G	N. C.	1,500,000	300,000	25				
121	Sampson, G. S. L.	Utah	10,000,000	100,000	5	188,157	Mar.	1887	.25
122	San Sebastian, G.	San.S	1,600,000	320,000	5	*			
123	Santiago, G.	U.S.C	400,000	1,200,000	2	*			
124	Security, S.	Colo.	10,000,000	1,000,000	10				
125	Sheridan	N.M.	2,000,000	200,000	10				
126	Silver Queen, C.	Ariz.	5,000,000	200,000	25	*			
127	South Bulwer, G	Cal.	10,000,000	100,000	100	100,000	May	1881	.25
128	South Hite	Cal.	10,000,000	100,000	100	195,000	Jan.	1883	.05
129	South Pacific	Cal.	500,000	100,000	5				
130	Stanislaus, G.	Cal.	2,000,000	200,000	10				
131	State Line, S.	Nev.	250,000	250,000	1				
132	St. Kevin, G. S.	Colo.	100,000	100,000	1	*			
133	St. Louis & Mex., S.	Mex.	5,000,000	500,000	10	*			
134	St. Louis & St. Elmo	Colo.	2,000,000	200,000	10				
135	St.L.& St.Felipe, G S.	Mex.	1,500,000	150,000	10				
136	St. L. & Sonora, G.S.	Mex.	1,500,000	150,000	10				
137	St. Louis-Yavapai	Ariz.	3,000,000	300,000	10	*			
138	Sunday Lake, I.	Mich	1,250,000	50,000	25				
139	Sullivan, G. S. L.	Me.	500,000	100,000	5	125,000	Dec.	1882	.25
140	Sutro Tunnel	Nev.	20,000,000	2,000,000	10				
141	Taylor-Plumas, G.	Cal.	1,000,000	200,000	5	10,000	Feb.	1888	.03
142	Tioga Cons., G.	Cal.	10,000,000	100,000	10	10,000	May	1888	.10
143	Tornado Cons. G. S.	Nev.	100,000	100,000	1	*			
144	Tortilita, G. S.	Ariz.	1,000,000	100,000	2	*			
145	Tuscarora, S.	Nev.	10,000,000	500,000	100	110,000	Oct.	1881	.15
146	Union Con., G S.	Nev.	10,000,000	100,000	100	2,185,000	Nov.	1887	.50
147	Utah, S.	Nev.	10,000,000	100,000	100	95,000	May	1888	.25
148	Washington, C.	Mich	1,000,000	40,000	25				
149	West Granite Mt., S.	Mon.	5,000,000	500,000	10	*			
150	Zelaya, G. S	C. A.	600,000	300,000	2	*			

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid $1,400,000. Non-assessable for three years. § The Deadwood previously paid $275,000 in eleven dividends, and the Terra $75,000. Previous to the consolidation in Aug., 1884, the California had paid $31,320,000 in dividends, and the Con. Virginia, $42,390,000. Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1885, the Copper Queen had paid $1,350,000 in dividends.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	June 16.		June 18.		June 19.		June 20.		June 21.		June 22.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.													
Alice, Mont													
Argenta, Nev													
Bassick, Colo					.17	.16							300
Belcher, Nev													
Blue Isle, Nev.													
Bodie Cons., Cal.							2.20						500
Breece, Colo.													
Bulwer, Cal													
Caledonia, Dak			2.25										200
Central, Mich.													
Chollar, Nev.													
Chrysolite, Colo.							.41	.40					500
Colorado Cent'l, Colo.					1.80				1.80		1.85		400
Cons. Cal. & Va., Nev.	10.50		10 88		11.00		11.00	10.75			10.63		595
Crown Point, Nev													
Deadwood, Dak.									1.50				20
Dunkin, Colo.													
Eureka Cons., Nev													
Father de Smet, Dak													
Freeland, Colo.													
Gould & Curry, Nev.									3.50		3.60		300
Grand Prize, Nev.													
Green Mountain, Cal.											.04		1,200
Hale & Norcross, Nev							7.88				7.88		200
Holyoke, Idaho									.05				100
Homestake, Dak.			10.50		11.25	10.50							116
Horn-Silver, Ut.													
Iron Hill, Dak.													
Iron Silver, Colo.													
Ladville C., Colo.													
Little Chief, Colo.					.33	.32	.32	.30	.32		.32	.30	1,900
Little Pittsburg, Colo											.18		100
Martin White, Nev.													
Mono, Cal.							1.40						300
Moulton, Mont.													
Mount Diablo, Nev.													
Navajo, Nev.	1.85												200
North Belle Isle, Nev.													
Ontario, Ut.			30.50		29.00						30 00	29.00	65
Ophir, Nev.											7.25		100
Plymouth, Cal.					8.00		8.00		8.00		8.00		630
Quicksilver Pref., Cal	37.00								37.50				200
" Com., Cal	10.75												200
Robinson Cons., Colo.													
Savage, Nev.							4.35						200
Sierra Nevada, Nev.			4.50				4.10						200
Silver King, Ariz.			2.75				2.63		2.75	2.25	3.00	2.25	930
Small Hopes, Colo.													
Standard, Cal.													
Stormont, Ut.													
Yellow Jacket, Nev.							5.13				5.13		250

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	June 16.		June18		June 19		June 20.		June 21.		June 22.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alta, Nev.													
Amador, Cal.	2.50		2.55	2.50	2.60	2 55	2.60		2.65	2.00	2.25	2 00	2,700
Am'can Flag, Colo.													
Astoria, Cal.			.27	.25	.26	.25	.27	.25	.26		.27	.26	13,200
Barcelona, Nev.	1.20	1.05	1.25	1.10	1.15	1.00	1.10	1.05	1.20	1.05	1.10	1.05	12,000
Bechtel Con., Cal.													
Best & Belcher, Nev.													
Brunswick, Cal.													
Bullion, Nev.							.15				1		300
Carupano, Venes.													
Cashier, Colo													
Castle Creek, Id.													
Central Ariz., Ariz.													
Cleveland, Dak.													
Confidence, Nev.													
Con. Imperial, Nev													
Con. Pacific													
Denver City, Colo.													
Eastern Oregon													
El Cristo, U. S. Col.	1.30		1.30	1.25	1.25	.97	1.10	1.05	1.10	1.00	1.15	1.10	4,700
Exchequer, Nev.													
Found Treas'e, Nev.													
Hector, Cal.													
Hollywood, Cal.	.33		.34	.33	.34		.40	.34	.41	.40	.41		10,400
Huron, Mich.													
Julia, Nev.	.50		.50										1,000
Kingst'n & Pomb'ke													
Kossuth, Nev.			.20		.20		.20		.20		.20		4,000
Lacrosse, Colo.													400
Lee Basin, Colo.													
Mexican, Nev.	4.90								4.25				500
Middle Bar, Cal.	.40		.41	.40	.43	.41	.43		.43		.43		4,900
Monitor, Colo.													
Ori'nt'l & Mil'r, Nev.													
Phœnix Lead, Colo.									.10				400
Phœnix of Ark.													
Potosi, Nev.													
Proustite, Idaho	1.15		1.35	1.10	1.30	1.25	1.30	1.25	1.30	1.25	1.30	1.25	6,800
Rappahannock, Va.	.13		.13		.16		.14	.13	.13		.13		5,200
San Sebastian, S'nS			.88				.86				.79	.78	500
Santiago, U. S. Col.													
Scorpion, Nev.													
†Security, Colo.				.67									
Shoshone, Idaho	.14	.13	.14		.13	.14	.17		.18	.17	.18	.17	21,100
Silver Cliff, Colo.													
Silver Cord, Colo.									.50	.45			1,400
Silver Mg. of L. V.													
Silver Queen, Ariz.													
Sutro Tunnel, Nev.	.19	.18	.19	.17	.20	.18	.20	.19	.18		.19	.17	17,800
Taylor Plumas, Cal.									.01				5,000
Tioga, Cal.													
Tornado, Nev.	.46												300
Union Cons., Nev.			4.50										100

*Assessment unpaid. †Dealt in at the New York Stock Ex. Unlisted Securities Dividend shares sold, 9,706. Non-dividend shares sold, 113,600. Total New York, 123,306.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY	June 15.		June 16.		†June 18.		June 19.		June 20.		June 21.		SALES.
Atlantic, Mich.											17.50		50
Bodie, Cal.													
Bonanza Developm't	1.50		1.50	1.38			1.50		1.38		1.38		1,200
Boston & Mont., Mont											.25		200
Breece, Colo.													
Calumet & Hecla, Mich							*243		242		241		35
Catalpa, Colo.	.20						20				.21		800
Central, Mich.	.20												10
Chrysolite, Colo													
Con. Cal. & Va., Nev.													
Dunkin, Colo.							.75		.77½	.75			600
Enterprise													
Eureka, Nev.													
Franklin, Mich.	15.00	14.75	13.00	*13½			12.75		13.00		13.25	13.00	998
Freeland, Colo.													
Hale & Norcross, Nev.													
Honorine, Utah													
Little Chief, Colo.	.40												500
Little Pittsburg, Colo.													
Martin White, Nev.													
Napa, Cal.	1.75						1.75		1.75		1.75		650
Osceola, Mich.	20.50	20.25	21.50	*20.			20.50	20.00	20.50	*20.	20.00		530
Pewabic, Mich.													
Quincy, Mich.	72.00	71.25	71.75				72.00		71.00		71.00		293
Ridge, Mich.													
Sierra Nev., Nev.													
Silver King, Ariz.													
Standard, Cal													
Tamarack, Mich.													

NAME OF COMPANY.	June 15.		June 16.		†June 18.		June 19.		June 20.		June 21.		SALES
Allouez, Mich.	1.60						1.13	1.00	1.00		1.00		1,000
Arnold, Mich.													
Aztec, Mich.									.06	.05			600
Bos. & Mont., Mont.	50.75	50.00	50.50	50.00			50.38	49.50	49.00	48.50	48.38	48.00	2,745
Bowman													
Brunswick, Cal.									.13				100
Crescent, Colo.	.10		.09						.09	.08	.09		2,117
Cusi, N. Mex.													
El Cristo, U.S. Col													
Everett													
Hanover, Mich.													
Humboldt, Mich.	.10		.15										450
Hungarian, Mich.											.15		100
Huron, Mich.	4.50		4.50				4.50				4.60		400
Kearsarge, Mich.	6.00	5.75	6.13				6 13		6.25		6.25		600
Mesnard, Mich.			.20										100
National, Mich.													
Oriental & M., Nev.													
Rappahannock, Va.			.13				.13		.13		.13		1,400
Royal, Mich.													
Security, Colo.	.06						.05						1,000
Sampson, Utah													
South Side, Mich.													
St. Marys, Mich.													
St. Louis, Mich.													
Sutro Tunnel, Nev.													
Taylor Plumas, Cal													
Washington, Mich.													
Winthrop, Mich.													

*Ex-dividend. †Holiday. Boston: Dividend shares sold, 5,866. Non-dividend shares sold, 10,612. Total Boston, 16,478.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	June 16.		June 18.		June 19.		June 20.		June 21.		June 22.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Barclay Coal		†16		†16		†16		†16		†16				
Buck Mt. Coal		*4		*4		*1		*4		*4				
Ches. & O. RR	100							2						100
Chic. & Ind. Coal RR.	100													
Do. pref.	100													
Col. & Hocking Coal	100	18¼										19		205
Col., C. & I	100								33¾	33½		33⅜		700
Connellsville Gas Coal														
Consol. Coal	100													
Del. & H. C.	100	108¾	108⅝	108⅞	108⅜	109⅛	108⅜	108¾	108¼	108⅛	108⅝	109		2,197
D., L. & W. RR.	50	128⅝	128⅛	129⅛	128¼	129	128⅜	128⅝	128⅛	129	128½	128⅝	128⅝	28,610
Hocking Valley	100							20				21⅜	21	800
Hunt. & Broad Top		17¾	17¼	18		17⅞	17¾							1,934
Do. pref.		41		41⅝	41	41½								1,150
Lehigh C. & N.	50	48¼				48⅝	48¼			48¼				262
Lehigh Valley RR.	50	53⅜	53¼	52¼	52⅜	52½	52⅜	52½	52⅜	52¼				383
L. & W. C. & I. Co		17½		17½										400
Mahoning Coal RR.	100													
Marshall Con. Coal	100											11		100
Maryland Coal	100													
Montauk Coal	50													
Morris & Essex	100													
New Central Coal	100													
N. J. C. RR.	50	82¼	82	81¾		81½	81¼	81½	81¼			82	81½	1,411
N. Y. & S. Coal	100													
N. Y., Susq. & Western	100			8										100
Do. pref.	100											29¾	29⅜	300
N. Y. & Perry C. & I.	100													
Norfolk & Western R.R.	100			16⅛		16½								300
Do. pref.	50	47	46⅝	47¼	46⅞	47⅛	46⅛	46½	46	47	46⅜	47½	47	8,086
Penn. Coal	50													
Penn. Gas Coal		†50		†50		‡49¼		†49¾						40
Penn. RR.	50	52⅝	52⅜	52⅜	52⅝	52⅞	52⅝	52¾	52⅛					1,474
Ph. & R. RR.**	50	58⅞	58⅛	59¾	58½	59¼	58¼	59	57¾	59⅜	58¾	60	59¼	205,701
Tennessee C. & I. Co.	100							27⅝	26¾	27⅞	27⅛	27¾	27½	700
Westmoreland Coal	100	†70		†70				†70		69				10
Whitebreast Fuel Co.														
Wyoming Valley Coal		†47	*45	†47	*45	†47	*45	†47	*45	†47	*45			

*Bid. †Asked. ‡Ex-dividend.
**Of the sales of this stock, 56,111 were in Philadelphia, and 149,590 in New York. Total sales, 254,693.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS. June 15.	June 16.	June 18.	June 19.	June 20.	June 21.
Alpha						
Alta	1.65	1.60	1.60	1.60	1.50	
Belcher				.55		
Belle Isle	.60					
Best & Bel.	4.45	4.35	4.35	4.15	3.70	
Bodie	2.40		2.35	2.25	2.25	
Bulwer	.80	.81⅛	.85	.85	.80	
Challar	4.05		4.25½	4.10	3.80	
C'm'weal'h				4.60	4.50	
Con. C. & V	10.12½	10.50	11.12½	10.50	10.12½	
Con. Pac.						
Crown Pt.	5.00		5.12	4.70	4.20	
Eureka C.			6.25		6.25	
Gould & C.	3.95	3 95	3.85	3.70	3.30	
Grd. Prize.	1.80	1.85	1.85	1.85	1.85	
Hale & N.	7.75	8.00	8.00	7.75	7.37½	
Mexican	4.55	4.55	4.45	4.20	3.75	
Mono	1.50		1.60	1.40	1.40	
Mt. Diablo	2.90		3.50	3.50	2.45	
Navajo	1.70					
Nev. Queen	4.00	4.00	4.00	4.05	4.00	
N. Belle I.	3.50	3.45	3.45		3.35	
Ophir	7.87½	8.12½	8.12½	7.62½	7.12½	
Potosi	3.80	3.80	3.95	3.85	3.35	
Savage	4.65	4.55	4.70	4.35	4.00	
Scorpion						
Sierra Nev	4.15	4.20	4.25	4.00	3.65	
Sutro Tun.						
Tip Top						
Union Con.	4.15	4.30	4.15	3.95	3.60	
Utah	1.65		1.75	1.65	1.40	
Yellow Jkt.	5.12½	5.37½	5.00	4.90	4.65	

for many weeks past, showed a sudden decline. It opened at $2.75, and has since gone to $2.25, selling to-day at from $2.25@$3.

There were considerable dealings in Rappahannock, at 13@14c.

San Sebastian went from 88 to 78c.

There is little change in the price of Ontario, which remains firm at from $29 to $30.50. The company has declared its 145th dividend of $75,000, making a total to date of $9,275,000.

The largest business of the week was done in Shoshone; the sales amounted to 21,100 shares, and the price advanced from 13 to 18c. Proustite showed an upward tendency, and went from $1.10 to $1.30; Holyoke remains at 5 c.

Four thousand five hundred shares Ely Copper Mining Co., of Canada East, with receipt for assessment paid of 5 per cent per share, $10, were sold at auction in this city on the 20th inst.

Meetings.

Orah Mining Co., 4th and Joplin streets, Joplin, Jasper County, Mo., July 9th, at one o'clock P.M. Special meeting to act upon a proposition to increase the capital stock to $5000.

Tipton Coal and Coke Co., No. 333 Walnut street, Philadelphia, Pa., August 8th. Special meeting to act upon a proposition to increase the indebtedness of the company in order to perform a subsisting contract, and to take the necessary action connected therewith.

Pine Run Gas Co., No. 8 Wood street, Pittsburg, Pa., June 26th, at two o'clock P.M.

Dividends.

Delaware, Lackawanna & Western Railroad Company has declared a dividend of one and three-quarters per cent, payable July 20th.

Daly Mining Company, of Utah, has declared a dividend, No. 16, of twenty-five cents per share, or $37,500, payable at the transfer-agency of Messrs. Lounsbery & Co., 15 Broad street, New York city.

Idaho Gold Mining Company, of Grass Valley, Cal., paid June 7th dividend No. 224, of $15 per share, or $46,500.

Jay Gould Mining Company, of Montana, has declared a dividend, No. 13, of nine cents per share, or $36,000, payable June 7th.

Julien Electric Company has declared a semi-annual dividend of two and one half per cent, payable August 1st, at No. 120 Broadway, New York City.

Mount Diablo Mining Company, of Nevada, has declared a dividend, No. 9, of twenty cents per share, or $10,000, payable June 22nd.

Ontario Silver Mining Company, of Utah, has declared dividend No. 145, of fifty cents per share, or $75,000, payable June 30th, at Messrs. Lounsbery & Co.'s, No. 15 Broad street, New York city.

Penn Gas Coal Company, of Pennsylvania, has declared a quarterly dividend of seventy-five cents per share, or $22,500, payable June 28th, at No. 209 South Third street, Philadelphia, Pa.

Pennsylvania Manufacturing, Mining and Supply Company has declared a dividend, No. 13, of one per cent, payable July 2d, at 1004-1008 Penn avenue, Pittsburg, Pa.

The Roanoke Land and Improvement Company, of Virginia, has called in for redemption series A and B of the capital stock, payable July 2d. The company has also declared from surplus fund a dividend on the entire outstanding capital stock, including series A and B, of 15 per cent, payable July 2 at the Bullett Building, Philadelphia, Pa.

Virginia Mining and Improvement Company will pay the interest due July 1st on the trust mortgage 6 per cent bonds of the company on and after that date, at the office of the Boston Safe Deposit and Trust Company, Boston, Mass.

Assessments.

COMPANY.	No.	When levied.	D'l'nq't'n office.	Day of sale.	Am'nt per share.
Allouez, Mich.	....	June 6	July 25	.....	1.00
Alta, Nev.	37	May 12	June 12	July 9	.50
Alta Idalia, Dak.	1	May 24	June 20	July 16	.001
Anchor, Utah.	6	June 1	July 5	July 26	.10
Arnold, Ariz.	4	May 1	June 4	June 26	.75
Best & Belcher, Nev.	40	June 5	July 10	July 31	.25
Big Hole Pl., Utah.	3	May 7	*J'ne12	Aug.15	.01
Bodie Tunnel, Cal.	15	June 5	July 9	July 31	.25
Bulwer Cons., Cal.	4	May 3	June 7	July 5	.20
Challenge Cons., Nev	4	May 29	June 29	July 18	.50
Concord, N. C.	....	May ..	June30	.. ..	.02
Cora, Dak	2	June 2	July 6	July 27	.00½
Diana, Nev	7	June 5	July 10	July 31	.10
Dickert & Myers, Ut.	1	June 13	July 21	Aug.15	2.50
Florence, Dak.	3	May 10	June 17	July 2	.00¼
Himalaya, Utah.	3	Apr. 26	May 26	June26	.005
Justice, Nev.	46	May 7	June 11	July 2	.25
Last Chance, Nev.	10	May 7	May 8	June30	.10
Mikado, Mich.	....	June13	July 13	.....	.15
New Era, Dak.	4	June11	July 12	July 30	.01
New La Plata, Dak.	2	May 7	June 7	June25	.001
Nye, Nev	1	May 28	July 5	July 24	.05
Pet Gravel, Cal.	5	May 11	*July 2	*J'ly17	.01
Occidental Con., Nev	2	Mar. 3	July 2	July 25	.20
Rochester, Utah.	.	May 15	June 16	July 2	.05
Ruby Bell, Dak.	7	June 9	July 19	Aug. 9	.01
Russell, Cal.	2	June 6	July 9	July 31	.10
Scorpion, Nev	23	May 25	June22	July 16	.10
Seatury-Calkins Dak	9	June 5	July 10	Aug. 1	.00½
Silver Bar, Dak.	1	May 24	June20	July 16	.001
Seg. Belcher Cons., Nev.	1	June 5	July 9	July 30	.25
Summit, Cal.	10	June 8	July 11	July 31	.10
Tioga Cons., Cal.	18	May 1	June 5	June27	.10
Utah, Nev.	4	May 4	June 8	June26	.25

* Delinquent day and day of sale postponed to dates given above.

San Francisco Mining Stocks.

The members of the San Francisco Stock and Exchange Board have decided to adjourn the Board from the close of business on Saturday, June 30th, until 11 A. M. on Thursday, July 5th. This will give a vacation of four days. All contracts falling due during the interval must be taken up on or before the 30th inst. It is expected that the Pacific Stock Exchange will adjourn for the same time.

Pipe Line Certificates.

Messrs. Watson & Gibson, brokers, 49 Broadway, report for the week as follows:

The oil pit at the Consolidated Stock and Petroleum Exchange has presented a lonely appearance for the greater part of the past week, and the price has shown a gradual decline from 77¾c. on Friday last. It touched 72c. on Tuesday, the 19th, but rallied a little from these figures to 75c. on Wednesday, and has again reacted to 73½c., at which figure it closes to-night. Refined oil was advanced ⅛ per cent as soon as any inquiry for it was developed, and it may be that crude will be sustained to obtain better prices for refined. There has been considerable activity in the field, especially about Bakerstown, and the increased use of the drill may bring some unexpected results. One of the best informed of the producers says that on the statistical showing of oil he would be a decided bull, but on the present manipulation of the market he was bearish.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
June 16.	77c.	77c.	76⅝c.	76⅝c.	321,000
18.	76⅜	76¾	72½	73	2,060,000
19.	72⅞	74	72	74	1,582,000
20.	74⅛	75	72	74⅛	939,000
21.	74⅛	74⅝	73¼	73⅝	1,003,000
22.	73⅝	74⅛	73¼	73½	496,000
Total sales in barrels					6,401,000

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
June 16.	77c.	77c.	76½c.	76⅝c.	124,000
18.	76⅛	76⅝	72¾	73¼	555,000
19.	72⅞	74	73⅛	74	614,000
20.	74	75	73⅝	74⅝	403,000
21.	74½	74⅝	73⅝	73⅝	430,000
22.	73½	74⅛	73⅛	73¼	296,000
Total sales in barrels					2,422,000

St. Louis Mining Stocks.

(Reported by our Special Correspondent.)

Name of company.	Opening.	H.	L.	Closing.
Adams, Colo.	3.60	4.00	3.50	3.50
Anderson, Mont.	.69	.75	.67½	.72½
Black Oak, Cal.	.31	.31¼	.26¼	.27½
Bi-Metallic, Mont.	37.50	38.50	37.00	38.00
Caribou, Idaho	.40	.42½	.37½	.39
Central Silver, Ariz.	.....	.....	.....	.....
Cleveland, Colo.	.10	.10	.08	.08
Concepcion, Mex.	.21	.22½	.20	.21
Dinero, Mex.	.18	.18¾	.17½	.17½
Elephant-Ont., Colo.	.35	.36¼	.27½	.35
Gold King, Colo.	.25	.25	.25	.25
Golden Chicken, Colo.	.20	.20	.20	.20
Golden Era, Mont.	.87	.88¾	.75	.75
Gordon	.....	.....	.....	.....
Granite Mt., Mont.	59.00	59.50	59.00	59.00
Grey Eagle, Mont.	.04	.04	.03	.03
Hope, Mont.	7.13	7.25	6.50	6.50
I X L, Colo.	.06	.09	.04	.07½
Jumbo, Colo.	.24	.26¼	.23¾	.23¾
Juniper, Idaho.	.51	.55	.50	.53
La Union, Mex.	.30	.32½	.30	.30
Mascotte, Colo	.69	.70	.67½	.70
Mexican Imp., Mex.	.....	.....	.....	.....
Mountain Key, N. M.	.....	.....	.....	.....
Neath, Colo	.30	.30	.25	.25
Pat Murphy, Colo.	.69	.85	.67½	.83
Peacock, N. Mex.	.15¼	.15¾	.10	.10
Pilot, Colo	.10	.10	.09	.09
Pine Grove, Idaho	.50	1.00	.50	1.00
Queen of the West, Col	.50	.50	.45	.45
Rena, Mont.	.24	.25	.17½	.20
San Francisco, Mont.	1.10	1.60	.92½	1.25
San Pedro, Ariz.	.39	.40	.30	.36
Small Hopes, Colo.	1.20	1.25	1.10	1.10
Silver Age	.49	.50	.47½	.47¼
West Granite, Mont.	.43	.43¾	.28¾	.31
Yavapai, Ariz.	.....	.....	.....	.....

Bid and asked prices during the week ending June 19th.

Boston Mining Stocks. June 21.

[From our Special Correspondent.]

The market continues to rule extremely dull and inactive, and there is little inducement for trading. The copper stocks are inclined to weakness on the reports regarding the syndicate, and there is rather more pressure to sell than has been noticeable for some time past, and in the absence of sustaining orders prices go off easily. Calumet & Hecla sold in a small way at $243@$241, but there is no special demand for it, while holders are generally content to retain their stock for dividends. Quincy declined from $72@$71, with rather more activity in it than usual for this stock. Franklin sold at $12⅞@$13, ex dividend $2 per share, which is about the same as last week. Osceola declined to $20, at which price all sales were made. Kearsarge steady at $5⅝@$5⅞. Sales, 300 shares. The Allouez Mining Company has given notice that an installment of one dollar per share of the company has been called for, payable at the office of the company, No. 76 Wall street, New York, on Wednesday, July 25th, 1888, with interest at six per cent after that date, and that no stock will be transferred on the books of the company after that date unless this installment shall be paid thereon.

Boston & Montana copper advanced to $50¾ early in the week, but large lots coming on the market forced the price down to $48, which was the closing price to-day. Allouez sold at $1 as before. The directors have called for an installment of $1 per share, payable July 25th, 1888. In silver stocks there is nothing doing. Napa Quicksilver sold at $1⅜. Dunkin dull but steady at $75 to $80. Catalpa is offered at 20c., and Crescent sold at 8c. Closing prices: Calumet & Hecla, $240 asked; Atlantic, $17½ bid; Bonanza, $1⅛@$1¼; Boston & Montana, $45¾ bid, $46¼ asked; Osceola, $19 bid; Franklin, $12¾@$13; Huron, $4¼@$5¼; Kearsarge, $5¾@$6; Tamarack, $155 asked; Quincy, $71@$71½.

Latest prices (by telegraph), June 22d, 1 P. M.: Boston & Montana, $46.25; Kearsarge, $5.88; Franklin, $12.88; Quincy, $71; Tamarack, $150.

IMPORTANT.—WILLS, CAPT. T. H. PLEASE send present address to Ledoux & Co., 10 Cedar Street, New York.

DIVIDENDS.

OFFICE OF THE ONTARIO SILVER MINING COMPANY, MILLS BUILDING, 15 BROAD ST., NEW YORK, June 21, 1888.

DIVIDEND NO. 145.

The regular monthly dividend of FIFTY CENTS per share has been declared for May, payable at the office of the Company, San Francisco, or at the Transfer-Agency in New York, on the 30th inst. Transfer-books close on the 25th inst.

LOUNSBERY & CO., Transfer-Agents.

OFFICE OF THE DALY MINING COMPANY, MILLS BUILDING, 15 BROAD STREET, NEW YORK, June 16, 1888.

DIVIDEND NO. 16.

A dividend of TWENTY-FIVE (25) CENTS per share has been declared for May, payable 30th inst. Transfer-books close on the 26th inst.

LOUNSBERY & CO.

CONTRACTS OPEN.

(See also page xix.)

739 BRIDGE over Fishing Creek, near Milledgeville, Ga. Address D. B. Stanton, at Milledgeville, until July 3d.

740 BRIDGE. Address City Engineer, Atlanta, Ga.

741 WATER-WORKS for town of 1500 inhabitants. Address John B. Inman, Troy, Tenn.

742 WATER-WORKS. Address W. H. Campbell, Gainesville, Ga.

743 SEWERAGE SYSTEM, to cost $25,000. Address Mahlon Gore, Orlando, Fla.

744 RESERVOIR, soon to be constructed. Address Robert K. Martin, Chief Engineer Water-Works, Baltimore, Md.

To Stockholders of the Sutro Tunnel Company Who Have Not Assented to the Plans of Reorganization.

A guarantee syndicate having been formed, stockholders who have not assented heretofore to the plans of reorganization, but wish to protect their stock from being rendered valueless through foreclosure, must forthwith deposit their shares with the Union Trust Company, No. 73 Broadway, New York, pay the sum of fifty-five cents per share and receive therefor the Trust Company's negotiable receipts, which will entitle the holder after completion of the reorganization to the same number of shares of stock as now deposited by him and new first mortgage income 4 per cent bonds in the proportion of one dollar for each fifty-five cents cash now paid.

The time for depositing stock and payment of subscriptions expires on July 11, 1888, at 3 P. M.

Payments should be made by check on New York to the Union Trust Company, and should be accompanied by the stock duly indorsed in blank, and an authorization to the Union Trust Company; blank forms for this authorization and copies of circulars can be obtained upon application at the Union Trust Company's office, or at room 19, 7th floor, Mills Building.

For the Reorganization Committee,

H. R. BALTZER, Chairman.

NEW YORK, Jude 21, 1888.