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NOTICE OF REMOVAL.

The offices of the "Engineering and Mining Journal" and the Scientific Publishing Company are now in The Postal Telegraph Building, **No. 253 Broadway**, facing City Hall Park.

The announcement that no further plan of reorganization will be proposed for the Reading, and that the general mortgage bondholders are arranging for a foreclosure, is hardly to be taken seriously just yet, the probabilities being that it is rather in the nature of a "bluff," to induce the stockholders and income bondholders to submit to a liberal assessment. In the present complicated situation of Reading a foreclosure of the general mortgage means too many things to be easily undertaken. It is a pity that it could not be done, and this great property, which has within itself all the elements of prosperity, be started once more upon a clear basis—and with a clean management.

THE SILVER PRODUCTION OF GERMANY.

The yearly circular published by the Aachen Mining Union gives the production of silver in Germany as follows. The original table is in kilo grams, which we have reduced to Troy ounces, as below:

	Kilos.	Troy oz.		Kilos.	Troy oz.
Stollberger Co.	58,155	1,869,683	Clausthal, Upper Harz.	37,742	1,213,405
Rheinisch-Nassauische Co.	5,193	166,955	" Lower Harz.	8,276	266,073
Mechernich Works.	14,666	478,081	Freiberg district	95,102	3,057,529
A. Poensgen & Sons, Cail	26,256	844,130	Anhalt Lead and Silver Works	4,108	132,072
Rothenbach Works.	661	21,251	North German Refinery, Hamburg	64,426	2,031,296
Remy Hoffman, Ems.	5,861	188,431			
Goldschmidt, Brausbach	39,439	1,267,964	Totals, 1893	443,315	14,252,577
Walther-Croneck W'ks	1,714	55,105	" 1892	486,515	15,641,457
Friedrickshutte, Tamowitz	6,208	199,587	" 1891	443,268	14,251,066
Mansfold Works	75,308	2,421,152	" 1890	409,212	13,166,166
			" 1889	397,766	12,788,177

The statement, it will be seen, has been made up from the smelters' and refiners' returns. The greater part of the production is from lead, zinc and other ores, only a small portion coming from mines worked for their silver output alone. The production last year, although it showed a reduction of 42,800 kilos., or 8·8 per cent., from that of 1892, was about equal to the output of 1891, and was larger than that of any of the other years given.

The value of the silver output last year, at the average London price, was $11,145,415. For 1892 the value, also at the average price for the year, was $13,686,275. There is not much reason to expect any considerable decrease during the current year, notwithstanding the low price of silver, since the value of the other metals obtained will enable the producers generally to turn out silver with some profit, even in case of a further fall in price.

THE RIO TINTO REPORT

The Rio Tinto Company, an abstract of whose report for 1893 is given in another column, is the third copper mining company in the world as rated by the output of metal, being exceeded in amount of product only by the Anaconda Company in Montana and the Calumet & Hecla in Michigan. The Rio Tinto mines also have historic interest, having been worked by the Romans nearly 2,000 years ago, and probably by the Iberians at a still earlier date. These mines differ essentially from either of their American competitors; the workings are in an enormous bed of pyrites, carrying less than 3 per cent. of copper, and the ore is taken out by stripping and quarrying chiefly. An interesting description of the methods of mining and ore treatment, by Dr. E. D. Peters, Jr., was given in the "Engineering and Mining Journal" for November 11th, 1893, page 498. Unfortunately, the company's reports give no statements of the cost of mining or working ores.

The output of the Rio Tinto mines last year was 1,332,002 tons of ore, of which about two-thirds was reserved for treatment at the mines, and one-third was shipped. The total production of copper was 31,954 long tons, of which 19,990 tons were produced at the mines, and 11,964 tons were contained in ores shipped. The actual amount of copper marketed as metal or in ores was 30,123 long tons. The production of these mines reached its maximum in 1891, and has since been declining; last year it was 104,000 tons below that of 1891. The mines, however, show no sign of exhaustion, and there is every probability that they will continue to be large producers for many years to come. Their uncovered reserves are now estimated at more than 20,000,000 tons of ore.

MORE ERRONEOUS COAL STATISTICS.

The United States Geological Survey has published a preliminary report on the coal production of the United States, which, though having the advantage of the use of "The Mineral Industry" statistics published in the "Engineering and Mining Journal" (March 10th), nearly two months ago, are still very erroneous, as in fact have been the coal statistics collected by the survey for many years past.

It is true the survey figures up very nearly the same aggregate amount as we gave, but in detail it is wild. As the statistics published in "The Mineral Industry" and "Engineering and Mining Journal" are not only

the official returns of the State mine inspectors, whose duty it is to visit every mine in their districts, but have been checked by direct returns from operators and railroads, their authoritativeness is beyond question. The Geological Survey gives about one-half the output of California; is nearly 1,000,000 tons too high in Illinois; 860,000 tons too little in Indiana; is a quarter of a million too little for Kentucky, a part of whose production may, however, have been included in that of West Virginia, which as given is 1¼ million tons too high: this report is 600,000 tons too much in Missouri; nearly 1,600,000 tons too little in Ohio; while in Pennsylvania the survey appears to have accepted erroneous returns first published and afterward corrected by us, for the figures it gives are about 1,100,000 tons too high.

The fact that the totals given by the Geological Survey, 181,448,612 tons of 2,000 lbs., differ but 589,102 tons, or 0·3 per cent., from our total of 180,859,510, shows a laudable effort to be correct in total; it would have been better to have taken the details also instead of making wild estimates, and thus have made the whole correct, though as this is stated to be merely a preliminary report it may yet be changed to the correct figures.

GOLD EXPORTS AGAIN

The continued exports of gold from New York this week, which are noted elsewhere—$1,500,000 having gone in the middle of the week, and some $3,000,000 more being taken for the Saturday steamers—afford no grounds for alarm. As we explained in the "Journal" two weeks ago, these exports do not in any way resemble those which caused so much apprehension a year ago, the conditions being entirely different. The present shipments are simply transfers of unused money drawn from the great surplus collected in New York, and are made in gold, because at the present rates of exchange it costs a trifle less to send it in that form than to buy bills. This week's transfers are nearly all on Berlin account, and the moving cause is doubtless the placing of the new German 3 per cent. loan, which, at the issue price of 87½, offers a good chance for the investment of idle money.

We have referred above to the large balances of money in New York, as shown by the great amount of deposits reported by the banks. The surplus which they now have is due entirely to the sending of money here from interior cities and abroad, in hopes of finding employment, and not to the contraction of loans, as many have supposed. The facts are that there has been a pretty steady expansion of credits ever since the opening of the year, and the last week's statement shows a total of loans and discounts amounting to $460,902,000; an amount which is actually greater by $34,911,000 than that reported at the corresponding date last year, and only $32,176,000 less than in 1892, when business was believed to be unusually prosperous. It is not possible in the statement to separate the items, but it is known that the speculative demand is not unusually large. The only conclusion to be drawn is that the actual volume of legitimate business, as indicated by the demand for loans, has expanded more than is generally believed, and that we are quietly, but none the less surely, coming back to our normal basis of prosperity. The sooner these facts are recognized and accepted, the greater will be our progress, since sentiment is, after all, a far more important factor in business than our utilitarians are ready to admit.

THE LONDON BIMETALLIC CONFERENCE.

The bimetallists find much encouragement in the conference which took place in London on the 2d inst. But a very few years, or even months, ago it would have been impossible to bring together to discuss and advocate international bimetallism such an array of prominent men. Lord Mayor Tyler, of London, presided.

The opening address was delivered by ex-Lord Mayor Sir David Evans. A large number of delegates were present, including some of the best known of British and foreign financiers. Among them were Sir William Houldsworth, M. P.; the Right Hon. W. Lidderdale, ex-Governor of the Bank of England; Sir David Barbour, ex-Secretary to the India Council; the Right Hon. Henry Chaplin, M. P.; Mr. Samuel Montagu, M. P.; Mr. Brooks Adams, of Boston, Mass.; M. van den Berg, President of the Bank of the Netherlands, Amsterdam; M. G. M. Boissevain, of Amsterdam; M. Alphonse Allard, of Brussels; M. George de Laveleye, of Brussels; M. Henry Cernuschi, of Paris, President of the French Bimetallic League; Mr. David Murray, President of the Chamber of Commerce of Adelaide, South Australia, and President of the South Australian Bimetallic League; Mr. Hugh M. Matheson; Mr. Alderman and Sheriff Dimsdale, a London banker; Mr. Thomas Salt, late President of the Bankers' Institute; Sir Malcolm Fraser, Agent-General in London for Western Australia, and Mr. A. J. Balfour, ex-Chief Secretary for Ireland. Letters were read from Archbishop Walsh, of Dublin, and the President of the Bank of France, regretting their inability to be present. A paper was read by Prof. Shield Nicholson on "The Fall in the General Level of Prices in Relation to the Appreciation of Gold, and the Divergence in the Relative Value of Gold and Silver."

Most notable were the remarks of Hon. A. J. Balfour, who is certain to hold a prominent post in the next Conservative cabinet. Mr. Balfour is reported to have said he did not believe that Government regulation of coinage, if it were done in the direction of making it more stable and a fairer measure of value, could be justifiably opposed. They were now, he said, standing face to face with a great danger, which could only be averted by the rehabilitation of silver to its proper commercial function. In order to do this, international action was absolutely necessary.

He said further that there were three questions with which bimetallism had to cope. They were these: Was a double standard possible? Was it just? Was it expedient? Scientists and economists answer these questions with an overwhelming "Yes."

Mr. Balfour said he saw signs of a change in English opinion. The leading commercial men had abandoned their former hostility to bimetallism and had come to the conclusion that the only way to meet the grave danger was to restore silver to its former place as a circulating medium.

Right Hon. Leonard H. Courtney, M. P., read a paper on "The Practicability of Maintaining a Ratio Between Gold and Silver Under an International Bimetallic Agreement," and discussion of the paper followed.

Cablegrams were read from United States Senators Sherman, Voorhees, Aldrich, Murphy, Brice, Platt, Davis, Carey and Cullom, wishing success to the conference in the cause of bimetallism in England.

Letters in support of bimetallism were received from Gen. Francis A. Walker, Archbishop Walsh and Prof. E. B. Andrews, of Brown University. A letter was read from Mr. H. W. Cannon, President of the Chase National Bank, of New York, in which the writer said that the solution of the problem of bimetallism rests with Great Britain.

Doctor Arendt, the eminent German financier, expressed views similar to those contained in Mr. Cannon's letter.

These are unquestionably the most outspoken expressions in favor of international bimetallism which have yet been heard by responsible men in England, and they show, as Mr. Balfour says, a marked change in public opinion there. If intelligent educational work were now done to enlighten Englishmen as to the losses which the present "go as you please" policy, and its resulting disorganization of the industry and finances of a large part of the world, have brought and are bringing on British interests, and, on the other hand, if the vast benefits that would result to British trade and investments by establishing the money of the world on a stable basis under the control of an international monetary clearing-house were pointed out, it would not be long before England would invite the rest of the world to join her in adopting an international control of the world's money and the application of clearing-house methods to international monetary transactions.

THE AMY AND SILVERSMITH DECISION.

The Butte *Inter-Mountain* of April 21st publishes extracts from a petition addressed to the United States Supreme Court by Mr. W. W. DIXON, counsel of the defendant, for a rehearing of the case of *King* vs. *The Amy and Silversmith Consolidated Mining Company*, recently decided by that court on appeal. The decision was published in these columns March 10, 1894, at which time I commented upon it.

The rehearing is asked upon five grounds, which may be summarily stated as follows:

1. It is observed that the decision "seems to be based mainly upon the reason that the Court has heretofore decided the main point in controversy" in the *Elgin* or "Horseshoe" case; and it is asserted that the Elgin decision has not been so understood generally hi herto. This ground of the petition rests upon a misapprehension. Whatever the "Horseshoe" case may have decided, it was the much older *Flagstaff* case—the first important decision of the United States Supreme Court under the present mining law—which laid down the principle re-stated in the recent decision. The following sentence from the *Flagstaff* decision is conclusive on this point:

> "The location of the plaintiffs in error is thus laid across the Titus lode that is to say, across the course of its apex, at or near the surface; and the side-lines of their location are really the end-lines of their claim, considering the direction or course of the lode at the surface."

The present petition for a rehearing says:

> "The decision here, we take it, is that the surface-lines change their character as end or side lines according to the direction or course of the veins with reference to them."

How can it be asserted that this is a new proposition? Substitute for the word "change" the proper word "acquire" or "possess," and it is identical with the principle declared in the *Flagstaff* case, 16 years ago!

2. It is urged in the petition that, in the recent *Amy* decision, the Court, while declaring that it cannot become a locator for the claimant and make new side-lines or end-lines for him, really does that, since "the claimant of the Amy made side and end-lines for his location, and the Court has transposed them, and converted his side-lines into end-lines and his end-lines into side-lines."

This is another strange misapprehension. What the Court did, both in the *Flagstaff* and in the *Amy* case, was to recognize the end-lines made by the claimant, but miscalled by him "side-lines." As it said in the *Flagstaff* case:

"As the law stands, we think that the right to follow the dip of the vein is bounded by the end-lines of the claim, properly so called, *which lines are those which are crosswise of the general course of the vein on the surface.*' (Italics mine.)

This is not changing or transposing anything; it is defining something; and this definition has been for years recognized as a part of the law, and as a guide and warning to lode-locators. It is pretty late in the season to try to pull up the *Flagstaff* case by the roots.

3. The petition refers to the extra-lateral right granted by the statute upon "all veins" apexing within the location, and says that this right is not limited to veins which cross the end-lines. This suggests a question of great importance and interest, but not involved in this case. For the Amy lode in controversy was the *located* lode, and no other was alleged to exist within the Amy claim. The course of the *located* lode determines which are the end-lines of the location.

4. Similar outside questions are suggested in the fourth section of the petition, such as the greater width of location thus established, contrary to the terms of the statute; the problem presented by a vein crossing one side-line and one end-line; the hardship of losing extra-lateral rights by placing a corner of the location only 10 ft. too far in a given direction, and so on. These questions are by no means to be despised, but they are not involved in the Amy controversy, and it is manifestly proper to consider them seriously when they are presented in a definite issue to the Court, and not before.

5. Finally, the petition expresses fear that the Court "underestimates the difficulty, time and expense required to determine the actual course of a vein, either before or after location, for a distance of 1,500 ft. or even less." It is not easy to perceive how a higher estimate of this difficulty could justify the Court in changing the requirement of the statute. At present, the United States sells its mineral lands at prices so low as to be equivalent to free gift. In addition to this, it permits miners to occupy and exploit them indefinitely, without even purchasing. And it gives to the locators of mining tracts of a certain definite kind extraordinary outside rights besides, to which land-locations of other kinds can make no claim. The complaint that it is "so hard to make that kind of a location" sounds a little ungracious, coming from the recipient of this free (and, as some of us think, foolish) donation; but if it be well founded and reasonable, it should evidently be addressed to Congress, not to the Court which administers the gift.

We hear a good deal in this connection of "the rights of the miner"; but it should not be forgotten that in such controversies there are usually at least two miners, and what is taken away from one is given to the other. They are disputing over the division of the gift which the government has offered on certain conditions, and to which neither of them has any natural right, outside of that offer, and the fulfillment of those conditions.

The United States Supreme Court has gone to the limit of indulgence in its treatment of imperfect locations under the statute. It might have said that the statute clearly describes the sort of location entitled to an extra-lateral lode-right; that it must be wholly "on" (*i. e.*, along the course of) a lode, lying on each side of the apex throughout, and having both its professed end-lines crossed thereby, and that it must not be wider than 300 feet on each side of the middle of the lode at the surface, or more than 1,500 feet in length along the lode; and that no location violating these conditions could have any extra-lateral right at all. In that case, the Amy location, being many hundred feet too wide on either side of the middle of the vein at the surface, and being, as to the greater part of its area, not "on" any vein at all, would have been worse off than it is under the present ruling. It is at best an imperfect location; and the Court, by the decision against which protest is made, has simply tried to give it all possible force, consistent with the rights of other claimants.

Consider for a moment the position of an adjoining locator in a similar case. A has made his location crosswise of the lode, not taking the trouble to find out whether the apex crosses his nominal end-lines or not. B comes, takes the trouble to find the apex where it crosses A's side-line, notes and respects the boundaries of A's location, and locates properly upon the apex in unoccupied public land, making part of A's side-line his own end-line, and drawing his other end-line parallel thereto, crossing the same apex. He has complied with the statute, while A has not. And the Supreme Court has uttered itself as to such a situation in no uncertain tone. That same old *Flagstaff* decision, the fountain of so much common-sense and justice, furnishes both in the following sentence, referring to a locator who lays his location crosswise of the vein, contrary to "the intent of the law":

"If he does locate his claim in that way, his rights must be subordinated to the rights of those who have properly located on the lode. Their right to follow the dip outside of their side-lines cannot be interfered with by him."

It must be granted that there are instances in which the application of this principle will involve hardship. But it is equally clear that the present case is not one of them. The Amy lode (according to the diagram in the record of the case) does not take an irregular course, or miss a corner of the location by a few feet only, but crosses boldly and plainly. It is a flagrant instance of mislocation; and the Court's decision concerning it is neither novel nor cruel, nor susceptible of reversal, unless the principles laid down by the same tribunal sixteen years ago are to be reversed.

It does not seem likely, under these circumstances, that a rehearing of the case will be granted upon any of the grounds set forth in this petition. Such a rehearing, however, might do good instead of harm, provided the questions involved were thoroughly discussed on both sides, and the construction of the law were thereby settled beyond further misunderstanding or controversy. The more discussion, the better. Perhaps we may ultimately find the mining communities of the West, convinced at last of the absurdity of the whole system, coming round to the view already held by the rest of mankind, and favoring the simple principle of vertical boundaries, under which most mining is carried on. Under the present lode-location proviso of our law, there is more litigation in the far Western States concerning the simple question of the boundaries of mine-ownership than arises in all the rest of the world put together. In fact, the rest of the world has no litigation at all of that kind. The boundaries of a mine are as easily determined as those of any other piece of real estate. And the extra cost and uncertainty of title which have attended the administration of our peculiar law have far outweighed, practically, the fancied encouragement to lode-mining which it was framed to give. The petition before me says:

"It seems to us that, practically applied, the rule laid down in the decision in this case will result in doing away with all extra-lateral rights on veins, although such rights are expressly given by the statute, and are among the most valuable pertaining to lode-claims. Locations will be practically confined on all sides by vertical planes."

This apprehension is not well founded. What the decision establishes is the necessity of complying with the statute in order to secure a purely statutory privilege. It would be well if the law were abolished; but enforcing it does not abolish it. And if it were abolished, it would still leave all questions of vested rights now existing to be settled by the application of the present statute. The sooner that change takes place, the smaller will be the crop of such residuary nuisances. But meanwhile, the Supreme Court is taking the only legitimate and practicable course in construing the law according to equity and common-sense.

R. W. RAYMOND.

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

A Correction.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR—I am somewhat mortified that, evidently through mistake, you published in your last issue a private letter which I addressed personally to Mr. Rothwell, and of which the language, while permissible in a letter to an old and esteemed friend, is by no means suitable for publication.

BOSTON, May 1st, 1894. HENRY M. HOWE.

The Brooklyn Bridge Terminals.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: With the rest of the public I have to thank you for calling attention to the question of the Brooklyn Bridge terminal stations, which has been allowed to rest too long. The action of the old bridge commission may admit of various explanations, into which I do not care to go now; but, in view of the proposition made by the Rapid Transit Cable Company, it would seem as if their reasons could hardly be creditable ones. The question has been apparently avoided by engineers, perhaps for the reason that they were a little afraid of it, and perhaps, also, because some of them believed that discussion was of no use under the old management. There can be no question that improvement is urgently needed, since the crowding of the cars long ago passed the limit of comfort and is now well past that of safety also. The present terminal switching arrangements might almost be called primitive, and limit the capacity of the bridge to a point far below that which might be reached with a proper system.

That a loop plan is the only one admissible in order to utilize the bridge to its full capacity all engineers will admit, however they differ about details. The plan presented in your columns has many excellent points, but in one respect it seems to me defective. By this arrangement the train must stop, unload, pass around the loop and then stop again to receive its new load, thereby losing several seconds; and on the bridge seconds are valuable, if the best use is to be made of it. Could not the plan be modified so that only one stop would be required? A slight change in the platforms—difficult to explain, perhaps, without a diagram—would effect this, and arriving passengers could pass out of one side of the car, while those departing entered at the other, thus saving entirely the second stop, and allowing the train to pass around the loop at much greater speed. This would not affect the use of the loops and the other parts of the plan, and would be a decided improvement. The main point, however, is the adoption of the loop, and that every one ought to advocate until action is taken.

I may add that this loop system would be of great service on the New York elevated lines, and would save much of the delay now experienced at its terminals; but it is not of much use to suggest any improvement to the Manhattan company as long as the present policy of parsimony and contemptuous indifference to public needs is pursued. ENGINEER.

NEW YORK, April 30, 1894.

THE GENESIS OF THE THUNDERSTORM.

Written for the Engineering and Mining Journal by Wm. N. Page.

In addition to the electrical phenomina attending all thunder storms careful observation will determine other marked characteristics when compared with rainfall from the ordinary condensation process, in which electricity takes no apparent part.

In the first place, thunderstorms, as a general rule, may be confined to certain seasons of the year and atmospheric conditions; being associated with superheated air currents, and confined to time and latitude where vegetation is giving off the maximum quantity of oxygen. The intensity of these storms seem to bear some relation to the luxurience of vegetation, both as to seasons and localities, which association is necessarily connected with climatic heats. It may be observed here that they occur when the greatest amount of rainfall is necessary, with the least interruption of sunshine, or when the wintry condensation process might deprive this stage of vegetation of essential light and heat, as well as the chemical rays of the sun so necessary to absorption of carbonic acid, and the liberation of oxygen gas. This assumption may be accepted upon general evidence, since it is in line with natural laws, the object of which is clear.

In the second place, the thunderstorm is a vacuum producer, frequently —if not invariably—composed of a series of vacuums uniting in one great whole. At some stage in the approach of such a storm cloud, air currents will always be found moving toward it at lower altitudes, and its passage is invariably followed in like manner. But when the storm center is immediately overhead, these currents are baffled, and may be observed in every direction at short intervals. Who has not observed the leaves of a tree turned in several different directions in as many minutes during such a storm?

I have frequently seen dried leaves and straws overhead, receding from a thunder cloud, when the earth current was in the opposite direction.

Thirdly, the rainfall is characteristic in itself, and totally unlike the ordinary condensation of aqueous vapors. The drops descend with greater violence; are often progressive, like waves, and resemble the fall of heavy sheets of water dumped at high altitudes and more or less split and divided in the fall by violent winds. At times a total absence of rain or only a fine spray may be observed between corrugations of heavy drops. Immediately following a flash of lightning overhead, and the first peal of thunder therefrom, there is always a perceptible increase in precipitation, and this peculiarity is invariable when the explosion is in the line of rainfall, and equally marked, whether the descent is practically vertical, or greatly inclined by the wind, demonstrating the fact that the phenomenon is connected with the spark rather than with the air current. I have often verified this under unmistakable conditions, and noted such precipitation follows the flash when no rain immediately preceded it, and the fall ceased immediately after, until another flash or gust of wind disturbed the comparatively quiet conditions. It was once my fortune to witness these characteristics under very favorable conditions.

On the side of a mountain, 2,000 ft. above tide, and just before a hot and sultry sunset, a terrific thunderstorm approached from the northwest, behind the mountain, which continued to rise about a thousand feet higher. Long before any cloud could be seen heavy rolls of thunder shook the mountain. An almost imperceptible breeze sprung from the southeast, turning the foliage toward the storm, still hid from view behind the mountain. This breeze soon grew into a stiff wind, which swept the dry leaves up the mountain slope, when it suddenly changed to the opposite direction, and the storm broke in fury overhead.

Taking refuge in a horizontal mine drift, and going back several hundred feet, I looked—as through a telescope—against a brilliantly lighted southwest sky, through the rain and storm, then just entering the field of vision. The condition of the mine air, brilliant horizon and rainfall, combined into magnifying effects which seemed to render each drop of rain distinctly visible in its course from cloud to earth. Over this line of collimation, detached masses of clouds were moving at high velocities, in different altitudes, and at different rates, but all in comparative close range. The variation in mass and shape, as well as the seperating intervals, were very distinct. The lightning was almost continuously visible, and as the spark seemed to pass through these seperate masses, sheets of water drooped, like the sails of a boat, and were caught up and scattered by under-wind currents, shaping each sheet into parabolic waves which remained separate and distinct until partly merged together near the surface, where the friction of the earth retarded the winds. These curves demonstrated the fact that the greatest density of the waves was at their origin in the clouds, where the greatest resistance to the wind was apparent, becoming less as it was more finely divided in the fall. Between the waves, fine srpay could be detected.

Such observations, in connection with the sound phenomena of the thunder storm—so unsatisfactorily explained—have led me to attribute the cause of these effects to detached masses of oxgen and hydrogen gases, mixed in varying volumes by their well-known property of diffusion. The electric spark, following lines of least resistance, with enormous voltage, is competent to explode every such mass through which it might be conducted, practically at the same instant, and a combination of two atoms of hydrogen and one of oxygen into water is, or would be, the result. As these gases are invisible (the appearance of the thunder cloud being probably due to water and aqueous vapor, necessarily present during action) an approximate illustration of these diffused masses may be seen in the aqueous vapors along mountain ranges of every length, width, shape, and size, yet each is detached by varving intervals. The same effect is also frequently seen in ordinary cloud movements, notably in what is often called "wind clouds."

Upon such an assumption only can the sounds be harmonized with reason or susceptible of reproduction upon a smaller scale. It must always be hazardous to attribute any chemical or physical action to nature, in the establishment of a theory, which cannot be duplicated, or illustrated in the laboratory, since both are founded on nature's laws; there may be differences in degree, but not in action. Such authorities as Deschanel and Ganot cling to the old theory that thunder is produced by the lightning spark causing a disturbance, or vacuum in the air. Ganot says: "Thunder is the noise arising from the disturbance which the electric discharge produces in the air, and which may be witnessed in Kinnersley's thermometer." This thermometer illustrates nothing more than the fact that an electric spark in sealed air will produce a notable disturbance on a connected column of water, and that this disturbance is not due to heat.

That the air is disturbed by the spark no one will deny, but that voluminous sounds like those of thunder, shaking the earth and air for long distances, can be produced by the passage of a force without form or dimensions, surpasses my comprehension. If we substitute a solid shot with infinite velocity, a perfect vacuum under pressure of less than fifteen pounds to the the inch would be the maximum result, including the concussion of the air within its elastic limits. And we know that no sound approaching that of thunder would be thus produced, even under pressure of many atmospheres. The assertion seems the more unreasonable when we find the same authorities have demonstrated the fact that when the electric spark is passed through gases of different mixtures and tension, including filtered air, no sound is produced; the ordinary crackling noise being attributed to fusion of solid particles held in suspension. Deschanel introduces a diagram in explanation of the manner in which these sounds would reach the ear, which if considered in connection with the facts, is—if possible—still more absurd.

Grant that the sounds are produced as Ganot says. The disturbance must be practically uniform along the entire line of the spark, and we would get a continuous sound, more like the scream of a shell, or the passage of a railway train; but in truth, the sounds more nearly resemble the simultaneous discharge of a heavy park of artillery, of different calibers, and at various distances; or just such effects as would clearly be produced by the explosion of these gases of varying mass, and at different altitudes and distances.

Upon such a theory—bearing in mind the intense heats produced by the explosion of these gases—the vacuum tendency in all its details, the characteristic rainfall, and every feature of the approach, behavior, and passage of the thunderstorm, including the electrical conditions, would be simplified and harmonized. The slight rainfall, resulting from explosions of gases in shallow masses, while the heavy and continuous fall would denote masses of greater depth.

It has been suggested that evidence of dry thunder storms would refute such a theory. While there are doubts in regard to correct observation of such a storm, the rain probably falling in such cases outside of the observer's limit, there are evident conditions under which such a storm might occur at high altitudes, and the precipitation so finely divided by winds as to be entirely absorbed in a dry atmosphere before reaching the earth. The fact that it is impossible to locate the position of lightning by the eye, and that the reflection is often mistaken for the spark, might easily lead to such errors of judgment.

Assuming all the evidence pointing to such a theory, the next important consideration is to account for these gases. In doing this, it will be only necessary to investigate their atmospheric presence, since the recognized laws of diffusion will sufficiently explain the mechanical mixtures, and the dissemination of these mixtures can be referred to ordinary cloud assemblage and atmospheric current movements.

Since 23% of the atmosphere is free oxygen, this gas is always present in ample quantities, but, as previously pointed out, thunder storms occur at seasons and in localities where this proportion is probably augmented by vegetation, though the percentage of increase may be too small to detect by analysis; consequently the investigation is narrowed down to hydrogen, the lightest known and most universal of all gases.

As hydrogen is one of the products of electricity in the decomposition of water, refuge might be taken behind this inexplicable force, which not only combines, but separates, H_2O, and no line of argument could refute the assumption that aqueous vapor was decomposed by electricity into its component elements, which are again united by lightning in the thunder storm. Not only can we decompose water in the laboratory by the same force, but such an assumption would be in perfect accord with nature's wise provision in gathering these vapors from the ocean to be decomposed at leisure and precipitated. So little is known in regard to electricity in relation to the earth that we can only direct attention to the subject within a still limited, but recently enlarged, field. Experiments have demonstrated the fact that the earth and its atmosphere are oppositely electrified, and during the thunder storm the sign of the latter is frequently changed within certain limits, probably by induction. Volta first showed that the evaporation of water produced electricity, and Pouillet proved that the vapor from salt waters was electrified positively, while the solution remained negative, but by far the most important discovery in connection with this subject was made by Mr. Tyndall, who found that attenuated aqueous vapors were decomposed by the action of solar rays, by electric light, or by the ray of light common to both. This fact having been established it only becomes necessary to assume sufficient altitude for the attenuation of the vapor, where the sun alone will decompose it.

That aqueous vapors are largely decomposed cannot be doubted, and if nature has made no provision for reunion, the hydrogen would be lost to earth, since its specific gravity is such that it could remain in the atmosphere only by diffusion with a heavier gas. Such loss of a single atom of any element is contrary to every law of nature, and inadmissible, as every chemical decomposition must lead directly or indirectly to some recombination, atom for atom.

Science has about agreed upon the idea that universal space is occupied by hydrogen gas, substituted for the unknown "ether" formerly assumed by astronomers; but not for a moment can science tolerate the assumption that one atom of this ethereal gas has been drawn from the oceans of the earth. Grant, therefore, decomposition of water, either by solar light or electrical currents between the sun and earth, of which latter there is strong presumptive evidence, and the thunder storm is the only probable method by which any considerable quantities of hydrogen gas can be returned to earth. The fact that nearly all meteorites contain hydrogen, and that it is also found free in snow and hail, is evidence of its presence in the atmosphere, and in the latter cases at low altitudes.

The action of the magnetic needle, at one time attributed to magetites near the pole, is now known to be an electrical phenomenon, and "Biot's Hypothesis" seems to express the present theory of earth's magnetic force. Without attempting to argue this subject, I merely wish to suggest that in accordance with the known laws of electromagnets, a spheroid would have the greatest magnetic density at the extremities of the longest diame-

ters (by the law of inverse squares), and not on the earth's polar axis assumed by Biot. If we imagine a continuous current around the earth equatorially, the needle would be deflected to the true north, provided the current conformed to the equatorial great circle, and was absolutely without resistance, neither of which assumptions would be exactly true. Such a current would necessarily require uniform differences in potential, toward the maintenance of which the lightning spark probably plays an important part, by restoring to earth whatever loss it may have sustained, the spark being the result of electrical intensity in excess of resistance. It is not at all improbable that aqueous vapors are present in quantities and form an important part of this explosive theory, both as reservoirs for electricity and for conduction. That oxygen and hydrogen gases are also present, to the explosions of which a large part of the rainfall, and air currents, are due, seems equally necessary to meet all the conditions.

I have often been impressed by the failure of philosophy to assign to lightning any function more important than the production of small quantities of ozone. If this had been nature's prime object, ozone could have been produced more readily by the "dialectric" or "electric effluvium" process. Upon the explosive theory, however, ozone becomes only a valuable bye-product, the primary object of the spark being to restore electrical equilibrium, and to return to earth each and every atom of water taken from it by decomposition of its vapors; thus reconciling the great law of natural economy, by which earth must retain all it has received, excepting only the germ of organic life, which cannot be analyzed by chemistry or weighed by atoms.

REINHARD MANNESMAN.

THE LATE REINHARD MANNESMANN, SR.

On Tuesday last news was received of the death of Mr. Reinhard Mannesmann, Sr., of Remscheid, Germany. In view of the prominent part played by Mr. Mannesmann in the growth of German industries, a brief sketch of his long and busy life will be of interest to our readers. He was born September 14th, 1814. His business education was acquired in a great banking-house at Luxemburg. At the same place he qualified himself as an officer in the German army, Luxemburg being at the time a so-called "Bundesfestung," occupied by Prussian, Austrian and Bavarian troops. He was an ardent lover of poetry, and from his favorite poets, Schiller and Molière, he could recite many stanzas by heart.

The Mannesmann Steel Works were an old and conservative concern, the original books dating back to 1797. This business which his father and grandfather had built up in their conservative way in their family seat in Remscheid, Germany, Reinhard Mannesmann and his brothers took hold of in their turn, and pushed forward to greater and far-reaching results. Their works soon became the leading file works in Germany, displacing in the Continental markets the English makes, the excellence of which it had been commonly considered impossible to equal. The verdict of the juries at the universal expositions of Munich and Paris in 1855 and 1867 was that their products were equal to the most famous Sheffield makes. They were given the gold medals at Paris, and it was proposed by the jury to give them the "croix d'honneur." It is interesting to note as an indication of the feeling which culminated in 1870, that Napoleon III. declined to grant the latter, writing in the margin of the jury's report the words, "To a Prussian, never!" But these results were only achieved by long and patient study of the nature of crucible steel, the relations of iron and carbon in their different forms, the hardening process His researches in the movement of molecules in cementation and blast furnaces were instrumental in bringing the practice to its present advanced state. All these results were transplanted from his works gradually to others all over the country, and the fact that the Mannesmann products had successfully competed in the world's open market with the most famous English makes gave an impetus to German manufacture which has been felt ever since. The present high standard of the German industries in this direction is due to the influence of such men as Reinhard Mannesmann, Dr. Werner von Siemens, Friedrich Siemens, Eugen Langen, Gruson, Krupp, W. Funke and others. At Chicago the Mannesmann products were given five medals and 10 awards.

In 1855 Mr. Mannesmann started in his factory the general Chenot process, with the help of the inventor Dr. Bischoff and other famous chemists of that time; but although the difficulties of using this process for Nassau ores were not overcome, yet this expensive experiment brought about the idea of electro-magnetic separation, which now, through the help of Edison and others, may perhaps lead to the practical working of iron ores which would be worthless without it. Seeing that the direct processes at that time were not ripe, Mr. Mannesmann developed his crucible-steel plant, and introduced into German tool manufacture the idea, now general, of producing specialties with the most perfect division of labor and wages based on piece work. With his sons he invented and manufactured the machine by which seamless tubes are rolled from solid blocks of metal without the use of mandrels.

Socially and politically Mr. Mannesmann was also a very prominent man. He was sent in 1863 to bring the "Huldigung" of his native town to King William at the fête in celebration of the 50 years' union of Rhenish Prussia under the scepter of the Hohenzollerns. He served in 1871 in the same capacity; was prominent in working for the reform of the German tariff in 1879; for 25 years was a member of the Town Council and Reichstag, and for 25 years was president of the Remscheid Bank. It will be seen at once how much his loss will be felt, both in his social life and among his workmen, to whom his relations were almost patriarchal. He was the friend of all the leading men of his time, and his hospitality made his house a gathering place for scientific men from all parts of the world. His care of his workmen was more that of a father than a master. To him they brought their troubles, and his decision in all matters was final. So great was their belief in his justice that during the great strike in 1873 the workmen of Remscheid selected him to represent them, though it was against his own interest as a manufacturer.

Fortunately for all, this family, so useful to the world, does not end with the close of this most valuable life. Six sons, technically trained in their father's calling, are doing their part to carry on and extend the work begun by their greatgrandfather, carried on by his son, and brought to such prominence by his grandson, Reinhard Mannesmann, who died only last week in his 80th year.

ABSTRACTS OF OFFICIAL REPORTS.

RIO TINTO COMPANY, LIMITED, SPAIN.

The report of this copper mining company for the year ending December 31st, 1893, gives the revenue account as follows: Balance from previous year, £73,881; profit on sale of produce ($1.904 per ton of ore taken out), £528,295; rents, exchange, etc., £105,082; total, £707,258. The charges were: Interest, taxes and general expenses, £283,419; depreciation of plant, etc., £32,525; bonded debt paid off, £92,640: total, £408,584, leaving a balance of £298,674. From this there were paid two dividends, making a total amount of £227,500, and leaving a balance of £71,174 to be carried forward to the current year. The dividends were 7% on the stock for the year.

The general balance sheet shows £3,250,000 capital stock; £3,534,360 in 5% bonds; £343,239 in current liabilities, and £184,924 balance of revenue account; a total of £7,312,523. The assets include the mines and plant, carried on the books at £5,782,899; ore and copper on hand, £882,156; stores, accounts receivable, etc., £405,279. Depots and offices in London, Holland and Germany, £45,194; cash, £196,995; making a total of £7,312,523. During the year bonds to the amount of £92,640 were paid off.

The report gives no particulars as to prices received for copper and ore sold, cost of mining and working, or other details.

The total quantity of pyrites extracted last year was, as stated below, 1,332,002 tons, of which 854,346 tons were reserved for treatment at the mines and 477,656 tons were shipped. The total amount mined compares with 1,402,063 tons in 1892 and 1,436,087 tons in 1891. The average copper contents show a small increase, having been 2·996% last year against 2·819% in 1892 and 2·649% in 1891. The amount of pyrites consumed was 469,339 tons against 435,758 tons in 1892 and 432,532 tons in 1891, this item showing a steady increase. The copper contents of the pyrites consumed were 2·659% last year, which compares with 2·509% in 1892 and 2·651% in 1891. The amount of copper produced from ore treated at the mine has varied little, having been 19,990 tons last year, 20,017 tons in 1892, and 21,227 tons in 1891.

The report says the quantity of overburden removed during the year was 605,355 cubic meters. The quantity arranged for this year will represent 600,000 cubic meters, and the whole cost of its removal will be charged to the ore extracted. The balance of the North Lode overburden account now amounts to £100,095. It is proposed to liquidate this amount by an annual charge over a brief period of years. The outlay on extension and development works incurred during the year, amounting to £9,747, was debited to the cost of the ore, besides which there was written off this account £13,547, so that it is now reduced to £182,340.

"The quantity of pyrites extracted for the year was: For shipment, 477,656 tons; for local treatment, 854,346 tons; total, 1,332,002 tons; the average copper content being 2·996%. The quantities invoiced to consumers in the United Kingdom, Germany, Belgium, and the United States amount to 469,339 tons, or 33,581 tons in excess of the deliveries invoiced the previous year. The excess over 1892 would have been greater, but for the coal strike, which affected, to a considerable extent, the consumption of the company's pyrites in Great Britain during the later months of the year. The copper production at the mines during the year amounted to 19,990 tons, and the copper in pyrites shipped was 11,964 tons, making a total of 31,954 tons. The following quantities were brought to market: Refined copper, 18,858 tons; copper in pyrites, 11,265 tons; a total of 30,123 tons."

The stocks of refined copper, copper in process, precipitate and matte at the close of the year amounted to 7,609 tons. A large part of the copper production continues to be obtained from the reserve heaps, which were estimated at the close of the year to contain 101,867 tons of fine copper.

TENNESSEE COAL, IRON AND RAILROAD COMPANY.

The report of the president of this company for the fiscal year ending February 1st, 1894, embraces the operations, since its consolidation with the De Bardeleben Coal and Iron Company and Calraba Coal Mining Company. It states that the acquisition of these companies has added greatly to the value and earning capacity of the Tennessee Coal, Iron and Railroad Company. In acquiring them a large floating debt was assumed as part of the purchase price. During 1893 those holding these obligations required their payment, and to meet this $804,000 of the treasury bonds were sold at from 85 to 90 cents. The money realized from the sale of these bonds enabled the company to meet all obligations during the period of the greatest financial stringency in 1893.

In order to meet the competition of the districts as well as to produce iron at a profit when prices were lower than ever before in the history of the iron trade, every effort was made to increase the efficiency of the company's plant and decrease the cost of production. The results have been remarkably successful, as is shown by a comparison of the output of the various furnaces. In March, 1893, the output at Ensley per furnace was 3,441 tons, and in March, 1894, 6,091 tons. At South Pittsburg the output in March, 1893, was 2,770 tons per furnace, and in 1894 during the corresponding month 4,553 tons; at Cowan, in October, 1892, 1,538 tons, and for March, 1894, 4,200 tons.

This very large expansion of output has necessarily been accompanied by a corresponding diminution in the labor costs and improvements in other directions as well. The present fuel consumption is almost as low as that of the best Northern furnaces which are smelting the rich ores of Lake Superior. This has been accomplished by greater care in the preparation of raw material and the adoption of appliances for disintegrating and washing coal prior to coking. A disintegrator is now in progress of construction at Tracy City which will improve the quality of the coke furnished to South Pittsburg and Cowan furnaces, and two Robinson washers, with a capacity of 1,600 tons of coal per twenty-four hours, are just completed at Blue Creek mine which will supply washed coke to the furnaces at Bessemer and Oxmoor, and also enable the company to fill the growing demand for coke among the lead and silver smelters of the Southwest.

Another eminently successful departure in the direction of cheapening production has been the adoption of the waste gases from coke ovens for the purpose of raising steam. This has been done on a small scale by the company for the past six years, but the system has been so largely extended during the past year that at Pratt mines alone a saving is now being effected of $15,000 per annum in the cost of raising steam for pumping and hauling.

In the early part of the fiscal year experiments were undertaken with a view of demonstrating the ability to treat molten iron or "direct metal" produced by the company's blast furnaces, under certain special methods of treatment protected by patent rights, the liberty to use which has been agreed upon. These experiments extended to the test of several hundred tons of metal, with most satisfactory results. It has been adequately demonstrated, both by the company and by others, that soft steel can be produced from Tennessee and Alabama iron, of the highest quality, and with such facility that it needs only a product on a full working scale to insure extremely profitable results. It was not deemed expedient during the disturbed condition of financial affairs to take any steps toward providing the capital necessary for the construction of works for the production of steel, but the subject is now engaging the close attention of the president and directors, and they are fully alive to the very large benefits to accrue from undertaking this branch of manufacture. The confidence in the profits to be realized, from an undertaking of this kind on the part of the company, is so great that the president does not believe the matter should be longer delayed; and in addition to the direct profits which would be realized from the manufacture of steel, the ownership of a well-equipped steel plant would furnish a regular and profitable market for a large part of the iron product, thus enabling it to obtain a readier sale and better prices for such pig iron as it might desire to dispose of on the general market.

The report of the secretary and treasurer shows the amount of undivided profit brought forward from last year to be $1,322,428.67, from which was deducted $84,128.50 bond premium account, representing the difference below the face value on the sale of De Bardeleben coal and iron bonds after deducting profit on purchases of low-priced bonds for the sinking fund. This leaves a credit of $1,238,300.17, to which is added the year's profit of $685,030.15, making a total of $1,923,330.22. Charging against this coupons, interest and dividend on preferred stock, $695,073.64, there remains a balance to carry forward of $1,228,256.58. This is recommended to be written off in lieu of depreciation of the value attached to permanent or fixed assets.

Last year the net amount of the company's funded debt after deducting sinking fund credits was $9,198,423.82. No fresh bonds were issued during the year, but $77,800 was retired. During the same period the sinking fund securities were decreased $33,753.25, leaving the funded debt this year $9,154,377.07, showing a decrease of $44,046.75.

The capital expenditures for the year have amounted to $103,404.38, of which $38,605.39 was for collieries and coke ovens; $32,499.90 for blast furnaces, and $12,548.52 for railroads and rolling stock. Deducting from this amounts charged off to operating amount $8,605.16 leaves total expenditure for betterments $94,799.22. The working capital or surplus of unencumbered assets over unfunded liabilities shows a reduction of $233,018.06, of which $94,799.22 was expenditures for betterments; $84,128.50 bond premium account; $44,046.75 reduction in bonded debt, and $10,043.59 excess of interest and dividends over the year's profits.

The total assets amount to $33,197,430.15, of which $20,756,620 94 is land account, and $9,392,226.57 permanent investments in furnaces, plants, houses, etc. The liabilities are $20,000,000 common stock; $1,000,000 preferred stock; $9,154,377.07 bonded debt; bills payable, $907,499.68; accrued interest, $144,089.83; sundry creditors, $761,758.24; bad debt reserve and unclaimed dividends, $1,448.65, and profit and loss, undivided balance, $1,228,256.58.

ORIGIN OF THE IRON PYRITES DEPOSITS IN LOUISA COUNTY, VIRGINIA.

Written for the Engineering and Mining Journal by Frank L Nason.

During a recent trip to this section of Virginia, the writer, through the courtesy of Mr. W. H. Adams, of the Arminius Mines; Mr. J. C. Petty, of the Sulphur Mines, and Mr. G. N. Shuman, of the Virginia Pyrites Mining Company, had an opportunity to study this great mineral deposit. Observations were thus made which may throw some light on their origin.

The deposits in Louisa County extend from near Mineral City, on the Chesapeake & Ohio Railroad, to Contrary Creek, about five miles to the northeast. In the immediate vicinity of Mineral City there are no signs of the existence of a great bed of pyrites, or what is usually to be observed on the surface of outcrops in this section of the country, large gossans of limonite, derived from the weathering of pyrite. Occasional fragments of massive and of porous limonite are often found. At the Arminius Copper Mines, so-called, two miles from Mineral City, there is a sudden and great development of this gossan or "iron hat." Following northeast along this outcrop this gossan continues in a somewhat broken outcrop until the second of the great sulphur deposits, known as the Crenshaw Mine, is reached. Farther to the northeast, toward the North Anna River, there are occasional outcrops of gossan, but to the writer's knowledge there is nothing which corresponds in magnitude to the first named mines. If these minor outcrops cover sulphur deposits approaching the former in size no workings show them. Their existence still remains to be demonstrated.

The gossan outcrop at the Arminius was about 60 ft. wide at the widest. A little to the northeast the outcrop seemed to divide (see Figs. 1 and 4), the westerly part of the deposit keeping a straight course nearly parallel to Contrary Creek. The easterly vein at first turned quite abruptly to nearly N. 45° E. until the two veins were separated by about 600 ft. of country rock. This vein then turns to the west, and then, apparently at least, joins the westerly vein a little to the south of the Crenshaw mine. From this point, for a distance of over 1,000 ft., the vein again becomes of great width. The open cut from which the limonite has been removed varies from 30 to 60 ft. in width. About 500 ft. south of the Virginia Pyrites Company's shaft the Crenshaw vein seems to split, the westerly portion keeping nearly a straight course, while the easterly vein becomes separated from the westerly by a distance of at least 200 ft. Whether these two veins again come together is a matter of conjecture, since at this point both pitch under the surface and disappear see Figs. 1b and 2 The course of these veins are shown on the accompanying sketch map (Fig. 1).

The rocks inclosing the pyrite deposit consist principally of talcose and hydromica slates. They have a northeast strike and dip southwest at an angle of about 60°. A loose granular gneiss lies at some distance from the ore beds in both the foot and hanging walls. The slates carry an abundance of minerals, fairly well crystalized; magnetite, menaccanite and staurolite are the most abundant. In fact the rocks are in no way to be distinguished lithologically from the belt of rocks which begins in the island of Newfoundland, run through southeast Canada, Maine, Vermont, Massachusetts, Connecticut, southeast New York, New Jersey, and so on, ending in Northern Alabama. No eruptive rocks are present save a green stone dike in the bed of Contrary Creek. (See Fig. 1 b). In the mine rock of all of the mines opened in this deposit are fine specimens of rhombic dodecahedral garnets, remarkably clear. In the Arminius mine garnets have been found in considerable abundance measuring an inch across the faces. Secondary calcite is also found. Large lenses of remarkably clear glassy quartz also occur in which are numerous crystals of epidote, small crystals of apatite occur at the contact between the pyrite and small lenses of biotite.

In both the foot and the hanging wall side of the mine are narrow bands and stringers of dark crystalline sphalerite, sprinkled occasionally with flecks of galena. The sphalerite occurs in places so abundantly as to be easily cobbed out and thrown to one side. Considerable copper pyrites occurs with the pyrite, but this is usually found in such a manner as to be easily separated. It has every appearance of being a secondary mineral, since it principally occurs with the glassy quartz.

An idea of the shape of the main ore body may be gained by a description of the shaft at the Arminius mine. This starts in the foot wall at an angle of 60°. At a depth of a little over 100 ft. it passes through the first part of the ore body, through a tongue of rock, then into the ore body again, and from this point down it follows the hanging wall of the mine. The ore at the 150 ft. level is nearly 660 ft. from foot to hanging wall. It then narrows down, till, at the 600 ft. level, the ore is hardly more than 10 ft. thick. At this level a cross cut into the hanging wall only 4 ft. long disclosed another body of ore of unknown thickness, as they are still working in it. (See Fig. 5). Drifting along the ore on either side of the shaft there is the same tendency to pinches and swells that is noted in going down the shaft. Following the direction of the thin edge of the ore it is found that this does not lie at right angles to the horizontal plane, from which the dip is measured, but pitches under along the line of strike (to N. E.) at an angle of 45° to 50°. This will be made plain by consulting Fig. 5, where the lines a—b, c—d probably inclose the large lens or shoot of ore x—y. It must be remembered that these lenses lie in a plane which dip to the S. E. at an angle of about 56° to 60°.

In the foot wall of the Virginia Pyrites Company's shaft a lens of ore is struck which at its widest at the 265 ft. level is 13 ft. Toward the northeast this shoot, which is only two inches wide, has developed its full width. The probable outcrop of this lens shows itself as a good sized gossan or iron hat in the bed of Contrary Creek (see Fig. 1 c). There has not been enough work done in this deposit to completely demonstrate the particular shape of this ore shoot, but there is no doubt about its shape. From the Arminius to the Crenshaw mines there is practically a continuous bed of ore. This bed, dipping to the southeast, pinches and opens along its strike, and is split up by horses of mine rock. These pinches and swells do not lie at right angles to the line of strike, but at an angle of about 45° to 50°. The lenses, also, when they occur in either the foot or hanging wall, not showing as surface outcrops, pitch to the northeast.

As has already been stated, at the Arminius mine copper pyrites is found quite abundantly, but the greater part of it appears to be of secondary origin. The lead and zinc, interstratified with the pyrite appear to be contemporaneous with the pyrite. Magnetite, very fine grained and banded, occurs in limited quantities. Quartz appears in two very distinct forms: First, lenses from a few inches to several feet in diameter; these lenses are coated with talcose or hydromica minerals. In fact there seems to be a transition from the pure silica into the micaceous minerals. The lenses also seem to have a conformable position to the schists with which they occur. The quartz in the lenses is also decidedly granular, not glassy. Second, the silica occurs in a clear glassy form, sometimes in large masses, filled with acicular crystals of epidote usually well terminated. The outlines of this glassy quartz is exceedingly jagged and irregular. In short, the granular quartz appears to be a more or less granular sand cemented by silica, a quartzite; while the clear glassy quartz appears to fill cavities, and to be entirely formed by silica deposited from solution or secondary in origin.

I wish here to lay special emphasis on the fact that the principal part of the ore deposit at the Arminius mine is the disulphide of iron FeS_2. In both the foot and the hanging walls of the mine are large lenses, not to say beds, of nearly pure limestone. These lenses or beds are from actual measurements of blocks thrown on the dump upward of one foot thick. They may be and probably are much thicker, but this I could not determine as the points from which they came were inaccessible at the time of my visit.

Fig 1

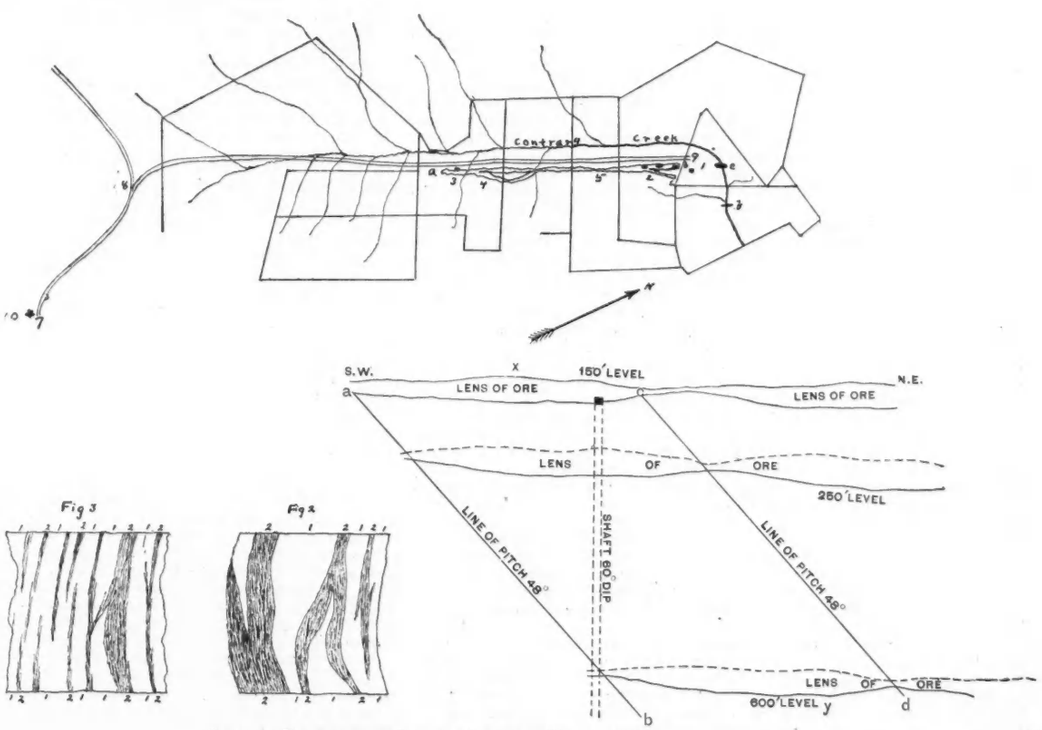

Fig 4 Fig 3 Fig 2

PYRITES DEPOSITS IN LOUISA COUNTY, VIRGINIA.

Next to the schists or slates forming the country rock, the limestone is very impure, being banded with light colored silicates (character not determined). Passing toward the ore body this silicious matter grows gradually less and less. Occasional lines of mica scales are all that is left of the silicious minerals. The limestone now becomes almost or quite pure. Then strings of pyrite begin gradually to come in, and then the great mass of the ore body (see Fig. 4). It must not be understood that this is the invariable sequence. Frequently the massive pyrite lies solidly and abruptly against the schists or slates of the country rock. It is necessary, however, to lay special stress on the fact that a very pure limestone, white and crystalline, lies between the ore body and the slates in places. As in the case of the quartz also, coarsely crystalline, secondary calcite occurs.

The main ore body of the Arminius is generally a very high-grade ore, almost pure pyrite. The pyrite is not massive, but is made up of small more or less perfect cubical crystals about the size of bird shot. When the ore is not purely pyrite the interstitial spaces are filled with carbonate of lime. With this mineral the crystals of pyrite are loosely held together, loosely on account of the friable nature of the cementing mineral, after the manner of concrete. In the higher grades of ore, such as those in which the sulphur-content is high enough to ship without concentration, the ore has no traces of banding or stratification. In case, however, as occurs frequently, the percentage of lime increases, alternate bands of rich pyrite, and of pyrite scattered through the limestone, are plainly visible.

On the Arminius property, 2,000 or 3,000 ft. northeast of the present workings, is an abandoned shaft known as No. 2. Here the nature of the ore is essentially changed. Instead of the loose granular disulphide ore we find the hard, massive, magnetic monosulphide (practically pyrrohotite). Copper pyrites occur here, possibly in greater abund-

ance, and a decided increase of magnetite. At this opening several thousand tons of material was lying around on the dumps and ore piles, but no trace of limestone was to be found. The rapidly decomposing pyrrhotite would of course attack and destroy the carbonate, but the nature of the rocks on the dump plainly show that in the specimens there to be observed, lime carbonate had not existed when the material was mined out.

Still farther north toward the Crenshaw mine, when the vein or bed was split up by diverging lenses, caused by large horses of mine rock, the ore again changed to the disulphide, with the interstitial filling in most cases of lime carbonate, showing a distinct banding.

At the Potty shaft (see Fig. 1, 5) at the south end of the Crenshaw mine, there is also to be observed a great deal of pyrrhotite, though this mineral did not occur so abundantly as to interfere with the use of the ore for sulphur. Magnetite was also observed. Traces of lime carbonate were found, and in the fresher samples of the disulphide ores the same conditions seem to hold as those that were noted at the Arminius mines. The ore body here, as was inferred from the width between the foot and hanging walls of the open cut, is very great. At the Crenshaw mines proper in the pyrite (disulphide), carbonate of lime appeared as a cementing material or matrix of the crystals, and in the leaner ores the same banding is to be noted. Pyrrhotite was not observed at all, neither was magnetite.

In mining here very little country rock has been thrown out and no banded limestone was observed. Owing to a great cave in the mine, caused by a mine fire, it was not safe to go to the head of the former shaft where the rocks were well exposed. North of the Crenshaw mines no outcrop of ore is to be observed save one of limited dimensions in the bed of Contrary Creek. The veins of ore struck are lean, with but little magnetite and some carbonate of lime in the richer portions of the sulphide ores. The principal difference between the two mines at the opposite extremities of the bed are as follows. At the Arminius there are present sulphides of zinc and lead, with considerable copper. At the Crenshaw mine these minerals, with the exception of copper, are conspicuous by their absence.

Summing up the foregoing statements we have the facts briefly stated as follows. At the points in this great deposit where the disulphide of iron is the most abundant, there is more or less of carbonate of lime occurring in such a manner as to all but prove that it is an original or bedded limestone. At other points in the bed pyrrhotite or the monosulphide is the predominant mineral. These facts carefully considered may suggest, with a strong degree of probability, the origin of the deposits. Those who have studied the great magnetic iron ore deposits of New Jersey and New York will see at once that the resemblance between these and the sulphide of iron deposits covers many points. The dip, pitch and strike are the same in both, though differing in amount. Among the iron ore deposits, though, there is a wide degree of variation as regards both pitch and dip. The great Franklinite deposits of Sussex County, New Jersey, show a dip of 55° to 60° and a pitch of 27° to 30° at Franklin Furnace, and about 60° at Stirling Hill. It may be urged against this parallelism that the rocks of the iron ore region in the above States are Archæan, while the pyrites deposits occurring from New Foundland to Alabama are found in rocks upon whose age there is no unanimity of opinion save that they are generally regarded as being post-Archæan in age, many geologists of high authority regarding them as Silurian. In answer to this it may be sufficient to say that the white ore-bearing limestones of New Jersey are coming to be admitted as Cambrian in age, while the magnetic deposits belong to the older Archæan gneisses; however this may be, the general features of the iron ore deposits of the New Jersey Archæan differ in no essential structural characters from the Franklinite deposits of the Cambrian limestones. I do not mean even to assume, in calling attention to these points of resemblance, that the magnetic iron deposits of New Jersey are of cotemporaneous origin with their foot and hanging walls, although I sincerely believe this to be true. If it is true, then the structural resemblance of the pyrite deposits to the magnetite would point to a similarity of origin.

The explanations which have been offered for the origin of the "sulphur" deposits, as pyrites beds are called, are various. Among some which have been strongly urged are the following: In the first place one explanation is given that the pyrite is deposited in great cavities, formed by the buckling of the schists during the process of tilting and folding, and that the cavities thus formed were filled subsequently. Leaving out of consideration for the present the difficulty of accounting for the presence of limestone in the immediate country rock and the banded structure of the leaner calcareous ores we will proceed to consider some of the objections, which seem to me insuperable, on this hypothesis. In the first place the rocks are soft and yielding. In the second place the caverns to be filled must have been enormous. The deposits in Virginia are over two miles in length. They have been exploited to upward of 600 ft. in depth and in width, from foot to hanging rock, as high as 60 ft. of pure ore. The average width of the two worked beds is upwards of 18 ft. Now in order to have such a deposit filled with solid ore it would be necessary for one of two things to have happened. First, the whole cavity must have first been formed and then slowly filled afterward; or, second, we must suppose the buckling to have begun to form the cavity at the same time, the solutions to have begun operations, and both the buckling and the deposition to have stopped at the same time. Any miner or mining engineer would either laugh at the idea of such an immense opening with no supporting pillars, or seriously consider whether the infinite pains and expense to which he had been in timbering and supporting much smaller openings and chambers in mines had not been so much energy uselessly expended. It is unnecessary to add that no workman would risk his life with an engineer who proposed such an experiment. With regard to the second manner the series of concomitant circumstances is too complex to admit without positive proof.

Another theory which has been proposed is that the pyrite has replaced some soluble rock stratum. This hypothesis appears to me to be much more worthy of consideration than either of the others; in fact, it appears to me even now to be well worth considering. The great objection to it from my standpoint is, "How does it happen that at one point the disulphide is abundantly deposited, and at another point only the monosulphide?" The rock stratum removed might easily be limestone—in this it certainly seems to be—and one can easily imagine that all the phases above described could be reproduced, the banded lean ores, the limestone banded with strings of pyrite, and even the massive beds of crystalline ores with the interstitial carbonate of lime. One might even go further and say that the sulphur went as far as possible in converting the iron into disulphide; the balance of the iron was converted into a monosulphide (this term mono-sulphide is used for convenience sake. Strictly speaking, pyrrhotite is not a monosulphide; the iron and sulphur combining the proportion of 7 to 8) and some of the iron deposited as a magnetite. From this point of view, though, it is a little difficult to understand why the monosulphides and the disulphides are not mingled together instead of existing separately, not in the same part of the vein, but at a distance from each other and along the same line of strike.

The idea which suggested itself to me with regard to the origin of this deposit was that it was a cotemporaneously deposited bed partly of limestone and partly iron pyrites. The rocks are without doubt, I think, of sedimentary origin. They appear to have been originally impure sandstones and clay slates. Along this shore line were occasional bays or recesses in the coast where quiet waters prevailed. In some of these places the waters were of sufficient depth to admit of the development of plant and animal life and the waters were generally quiet enough to admit of the retention of their remains. To the presence of crustaceans and shell fishes we refer the origin of the carbonate of lime which later gave rise to the limestone which we now find. The leaching of the bordering shore rocks furnished the iron which was precipitated at the time, or later changed to sulphide of iron, by the decomposition of the organisms then present.

It has already been noted that in the pyrrhotite deposits no traces of limestone have been observed. The formation of the pyrrhotite could, therefore, be explained by imagining that there were places where the supply of iron in solution was abundant, but that the amount of sulphhydric acid was not abundant enough, owing to a lack of organic life, to precipitate the iron as a disulphide, and so the monosulphide was formed.

This explanation appears to do no violence to facts as observed to-day. It is well known that for some reason or other there are points along sheltered bays where in one spot there will be an abundance, while at another point not far distant there is almost an entire absence of all life. The decomposition of the tissues of this animal, and vegetable life as well, gives rise to an abundance of sulph-hydric acid, sufficient to precipitate iron, or other medals which readily unite with sulphur, in the form of sulphides. It is not at all necessary that the organic decomposition should be of animal origin. Algæ and other low forms of vegetable life have much more sulphur in their composition than many animals.* To this fact we can ascribe the accumulation of great beds of deposits of sulphides with a very small amount of carbonate of lime. It may be urged against this view that many sulphide deposits are of evident secondary origin, the sulphur of which could not be derived directly from decomposition of organic matter. Granting this, which is evidently true, it is very easy to imagine the decomposition of a sulphide, giving rise to sulph-hydric acid which would be again reprecipitated as a sulphide at another favorable spot. In fact there is no end to the extent to which this process may be carried on. This has evidently taken place at the mines above described. Much of the copper, as has already been pointed out, has the appearance of this secondary deposition. Some of the pyrite also has this appearance. In the slates and schists forming the country rock there are many cubic crystals of pyrite, some of quite large size. These crystals, all of them, fill a cavity in the slate, not cubic-shaped, but with scales of the slate flowing around them, just as if, as is probably the case, the crystal had grown in the rock and the crystalline force had split and forced aside its surrounding walls. The larger crystals are never perfect cubes, but elongated prisms, with their longer axes parallel to the slaty cleavage. There is no need of calling attention to the similarity of these crystal growths to the development of garnets and other minerals developing under like circumstances. Prof. James D. Dana has described this very clearly, and just as clearly explains this form of distortion to the secondary development of minerals in rocks more or less perfectly formed. In the surrounding country rock where the crystals of pyrite are much smaller, but perfect in shape, the pressing aside of the surrounding material is to be observed.

The above explanation has been made in the hope of throwing some light on the vexed question of the orgin of these great sulphide deposits. Whatever conclusion may be reached by other students of ore deposits, deposits of this nature can never be confused with ore bodies such as are represented by the zinc and lead deposits of the Mississippi Valley. In other words they are not secondary deposits filled by lateral secretion. Neither can they possibly be regarded as being veins filled by ascending waters.

In conclusion I may say that Mr. W. H. Adams has an excellent paper on the economic products of these sulphide deposits in Volume XII., "Transactions" of the American Institute of Mining Engineers. Another very valuable paper by the same author is "Pyrites as a Material for the Manufacture of Sulphuric Acid," Journal Analytical and Applied Chemistry, Vol. V., No. II., November, 1881.

Exports of Spanish Iron Ore.—The exports of iron ore from the chief ports of Spain for the first three months of this year amounted to 1,157,210 tons, compared with 1,198,936 tons in 1893. There was thus a decrease of 41,726 tons, the increases of 13,000 tons at Salta Caballo and of 5,000 tons at Dicido being more than counterbalanced by the decrease at Bilbao.

A College Arctic Expedition.—Dr. F. A. Cook, one of the members of the Peary arctic expedition, is arranging another one on a smaller scale. It will be confined to intercollegiate representatives, and 10 members have already been enrolled as volunteers. They have been taken from Yale, the University of Pennsylvania, the University of Michigan, and Harvard. The object of the expedition is scientific discovery, as well as tourist adventure, and the trip will occupy three months, beginning immediately after the close of the college year, in June.

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* This statement is made on the authority of Professors B. D. Halstead and J. B. Smith of Rutgers College, New Jersey.

THE PHOSPHATE ROCKS OF TENNESSEE.

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

Opportunity has lately been afforded me to visit the phosphate deposits of Hickman County, Tenn., and to draw my own samples direct from the seams. After inspecting some 25 localities, and observing the rock in place at widely separated openings what is here written is believed to be a conservative statement of the situation in that county up to the middle of April. I shall speak only of what I have seen, and the conclusions arrived at are the result of personal observation and of my own analyses.

I am familiar with the North Carolina phosphates, having published in 1883 the first scientific observations on that field; have worked up, as chemist to the Navassa Guano Co., Wilmington, N. C., many thousand tons of South Carolina and Navassa rock, and have spent some weeks in Florida. I make these statements merely to show that the phosphate business is not new to me, and that I look at the situation in Tennessee from the standpoint of actual practice in the treatment of phosphate rock.

No attempt will be made in this or in subsequent papers to discuss the geological features of the deposits beyond a brief outline of the chief facts.

The phosphate seams in that portion of Tennessee with which this article deals occur as regular veins underlying a black shale which is now known as the Chattanooga shale, and which is of Devonian age. They lie almost flat, running in under the shale like a coal seam, but of such color and texture as to forbid any one, having the least acquaintance with the subject, mistaking them for the latter. Prof. J. M. Safford, in a recent paper read before the Engineering Association of the Southwest, and published in this journal April 21st, says that the phosphate seams look like coal. I cannot agree with him, for they do not look like any coal seam I have ever seen, in North Carolina, Kentucky, Tennessee, Pennsylvania or Alabama--neither the color, nor the texture, nor the general appearance of coal. As Professor Safford, as a matter of course, knows coal when he sees it, his description has probably been based on observation of the seams over a restricted territory. This point is important, for active prospecting is now in progress in many portions of the field, and one should not be misled by the reported appearance of the rock he is searching for.

The rock is of at least three different colors, and of three different textures:

1. A blue-back, fine grained, dull looking rock, filled with rounded nodules, some of them extremely small. This rock shades off into grayish black, and sometimes falls to pieces on exposure.

2. A yellowish brown, coarse or fine grained rock, enclosing a center of blue-black or grayish black rock. The exterior portion is often beautifully stratified, and around the black core is a band of light gray.

3. A light gray rock, full of impressions of shells, and resembling a piece of air-dried coquina.

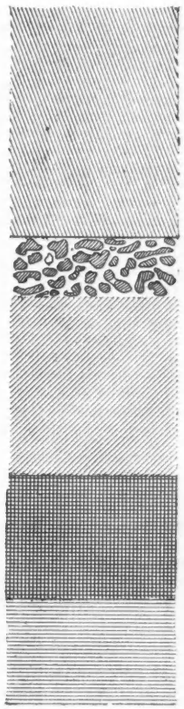
The maximum thickness of phosphate rock which I observed was 40 in., black shale above and grayish-blue limestone beneath. Reports have reached me of some seams of 54, 60 and even 72 in. of good rock, but on measuring one of the so-called 54-in. seams I found it only 40 in., the person taking the first measurement having inadvertently included a 14-in. ledge of limestone. It may be that there are workable seams of greater thickness than 40 in., but I have not seen them. Samples from a 5-ft. seam sent to me proved indeed to be phosphatic, but also very silicious, and are not workable.

There is a persistent seam of grayish black, coarse or fine grained phosphate rock underlying the black shale in Hickman County. It is reported as being 24 in. thick in places, but I have not seen it above 12 in. It will carry from 20 to 30% of phosphoric acid, with from 2 to 4% of alumina, but cannot be profitably mined at any locality visited, unless it should possibly increase in width under cover. As to this point, it may be said that at one place where mining was begun on a 10-in. seam of this black rock it thinned down to 3 in. at the end of the 35 ft. prospect drift, and in the same vicinity an 8-in. seam thinned down to 2½ in. in the same distance. In this connection it is to be remarked that none of the seams inspected had been opened up under cover, so that an opinion, based on actual observation and measurement, of what the seam is under cover, cannot now be given. Arguing from analogy, however, we should expect to find it widening or lessening in width according to circumstances, just as a coal seam or any other seam does. The regularity of the formation in which it occurs is a fact greatly in its favor.

The black shale above the phosphate is from 30 in. to 30 ft. in thickness, being everywhere capped by what is known as the Harpeth shale, a knarled, bluish gray rock, varying in thickness from 3 or 4 to 200 ft. Between this shale and the black shale there is a persistent stratum of phosphatic nodules, rounded and of the most diverse shapes, but rarely more than 6 in. thick. These nodules are imbedded in a bluish-green matrix and contain from 28 to 34% of phosphoric acid. They would make an excellent material for the manufacture of acidulated phosphate if it were possible to mine them, but it is not. As a rule this stratum of phosphatic nodules lies between the Harpeth shale and the black shale, and has all the thickness of the black shale between it and the phosphate seam, but now and then the nodules are distributed in the blach shale itself. At Fall Branch, for instance, near Levi Simmons' house, this occurrence is to be seen. Here, also, the black shale interpenetrates the phosphate seam, and there is a mixture of phosphatic nodules, black shale and phosphate rock, a mixture of some interest but uncertain value. Some of the phosphate rock on Fall Branch is thick enough and rich enough to warrant regular mining operations.

It is as yet too early in the history of the phosphate fields of Tennessee to speak of the extent of the workable seams. Phosphate rock is known to occur over a territory 20 miles wide by 75 miles long, but over a great part of this the seams have received scant attention, and it is not known how thick they are nor of what quality. The best rock I have seen was from the Swan Creek Basin, including Fall Branch, Totty's Bend, Duck River and Wayne County, near Mannie. The rock at Fall Branch and at Totty's Bend can certainly be mined at a profit, provided it does not thin out under cover nor lose in phosphoric acid, as at these places the seams are from 23 to 37 in. thick, and lie advantageously.

A typical vertical section of the rocks in Hickman County from the top of the Harpeth shale through the phosphate seam is as follows:



SECTION THROUGH PHOSPHATE DEPOSIT.

As to the composition of the rock, I will give some analyses of workable seams, which were sampled in person from top to bottom:

				Top to Bottom of II.				
				12″	7″	8′	6″	4″
	I.	II.	III.	%	%	%	%	%
Oxide iron	3·11	4·95	2·32	0·42	5·94	6·92	6·26	5 26
Phosphoric acid	28·27	29·84	29·81	30·19	26·74	29·26	31·94	31·09
Insol. matter	13·24	10·81	6·40	9·80	14·18	13·90	8·64	7·54
Alumina	2·71	2·93	4 00	3·00	2 79	7·06	1·74	0·06
Lime	40·50	36·96	43·60	39·50	36·20	29·60	38·20	41·30
Sulphur	2·80	.....	4·00	.....	.....	.....	.....	.....
Carbonic acid	1·15	.....	1·50	.....	.....	.....	.....	.....
Moisture	0·50	0·48	0·20	0·60	0·40	0·50	0·60	0·30

I. is the 23-in. seam at Peery's Bluff, Swan Creek, Hickman County. II. is the 37-in. seam at Holterfield's, Totty's Bend, Duck River, Hickman County. The sample marked II. was drawn from the five ledges into which the seam is divided, and it is of interest to observe how these ledges, which are in immediate juxtaposition, are composed. This is shown in the analyses. The first 12 in. is grayish black, medium grain; the next 7 in. blackish gray, medium grain; then 8 in. of a yellowish brown sandy looking rock with grayish black core; the two bottom ledges are gray.

The composition of a typical specimen of the blue-black, fine grained rock from Wayne County, near Mannie, is given in III., but I do not know how thick the seam is, as I have not visited the locality as yet.

Nearly all the samples I have had show a considerable amount of fluorine, and all contain sulphur, from the pyrite inclosed. The content of carbonic acid has not exceeded 3%, while the average is about 2%.

The presence of pyrite, sometimes in pieces half an inch across, and distributed irregularly through the phosphate rock, is characteristic of the black phosphate. It occurs also in the black shale, and the sulphates of iron and alumina resulting from the action of the sulphuric acid (derived by atmospheric oxidation of the pyrite) upon the shale can be seen encrusting the shale at several localities. Several years ago I made experiments with a crude phosphate containing considerable quantities of iron and alumina to ascertain if the phosphoric acid could be rendered available, without treatment with sulphuric acid in the ordinary manner. By roasting the finely ground rock with from 3 to 5% of sulphur a satisfactory yield of "available" phosphate was obtained. There is no doubt but that this method could be applied to a sulphurous phosphate, if at any time the alumina should become objectionable. As long, however, as it keeps below 4% it will not seriously interfere with the treatment of the rock in the usual way.

In summing up, the following observations are pertinent: 1. The phosphate rock occurs over a large territory, in certain parts of which only has it been found of sufficient richness and thickness to be mined profitably. 2. There are wide areas within which little or no careful prospecting has been done, although it is known that the phosphate rock is found in greater or less quantity. 3. So far as the analyses show, the content of alumina is not such as to be a serious obstacle in the way of using the rock for the manufacture of acid phosphates. 4. It is not likely that at any place large quantities of rock can be mined in any other way than as coal is mined, i. e., by drift or shaft. 5. Analyses must keep pace with prospecting and mining. There is good rock in Hickman and Wayne counties. Some of it can be mined and treated profitably, and some cannot.

SEGREGATION IN IRON AND STEEL.

In the discussion regarding the various articles presented on the physics of steel at the International Engineering Congress in Chicago, Dr. P. H. Dudley says, referring to Mr. Osmond's paper on "Microscopic Metallography," that for steels requiring hardness and toughness combined, or high elastic limit in proportion to the ultimate strength, no one relies wholly upon chemical composition, except as determining the grade of the steel. The fact that chemical homogeneity by no means necessitates mechanical homogeneity should be extensively disseminated among consumers of steel rails, tires and ordinary grades of steel Even at the present time there are many who suppose that a given chemical composition, irrespective of the form of the section and method of manufacture, means very definite physical properties in the rails and tires. This is largely due to the fact that steel rails, having been once molten, were said, when first introduced, to be homogeneous in contrast to the built-up pile of the iron rails. That crystalline forces, during solidification and subsequent cooling and heating of the metal, form the structure was not considered. From several old rails etched specimens show, at 50 diameters, only a confused structure, the ferrite being distributed in small grains, and the pearlyte seeming to be granular. Each aggregate is so thoroughly interlocked with its neighbor that it is difficult to break it down and cause flow of any or all of its constituents.

Fig. 1 shows a micro photograph of the structure of such steel magnified 50 diameters, the upper part being the top of the rail. The pearlyte and ferrite are thoroug ly intermixed in a confused state, the former predominating, seeming more granular than the lamellar type. Under the microscope, the lamellae seen on the surface of the rails are very small and appear firmly attached.

Fig. 1

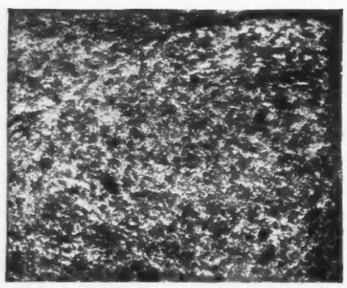


Fig. 2

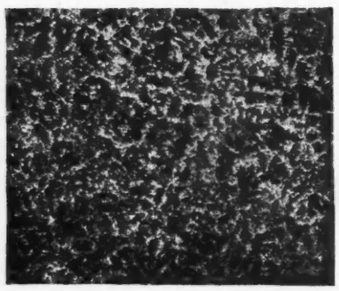
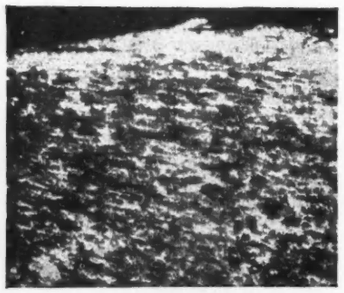


Fig. 3



In the deep-headed type of rails, similarly shown in Fig. 2, the structure is coarser, and the pearlyte and ferrite are entangled with each other, showing on the etchings like vermicular markings. The pearlyte seems to be rather of the lamellar than of the granular type. The lamellae are feebly united, being formed under high temperature; the mineral aggregates are large and friable, and the surface of the rail breaks down more than $\frac{1}{16}$ in. in depth, readily flowing under the wheel-pressures. Under the microscope the rails seem to be formed of scales or lamellae, overlapping each other, of both pearlyte and ferrite. Little fragments are constantly becoming detached from the surface, or aggregates are flaking out, while larger masses are flowing to the side of the head and becoming detached in large fragments. Such rails do not wear smooth. Figs. 2, 3 and 4 are micro-photographs, magnified 50 diameters, of the transverse structure in a deep-headed rail containing 0·26 carbon. Fig. 2 is from the head of the rail, just beneath the uninjured surface, and is very coarse in structure compared with Fig. 1. Fig. 3 is from the upper portion of the rail. The structure shows the aggregates broken down and under flow, even below the portion shown at the bottom of the picture. As the figure indicates, the top of the rail soon becomes a series of thin lamellae, portions detaching as soon as the limits of elongation of the metal are reached. The surface-lamellae of the rails are between the upper and nether millstone, and portions are ground to powder upon the passage of each wheel.

The flow on soft rails is not confined to a few lamellae on the surface but includes the breaking of several aggregates in depth, which finally flow until they overhang the edge of the rail, then accumulate in larger masses and eventually become detached. Many years of experience with steel rails have clearly demonstrated that those which flow the least under wheel-pressure give most service, and those that flow the most wear and abrade with the greatest rapidity. The same remark applies to the flange-abrasion on curves.

As to microscopic examinations, Mr. Osmond observes that "natural illumination will only serve for very low powers, which are usually insufficient for this work." Dr. Sorby makes the same remark, which was strictly true when he made his research Our American opticians were the first to produce wide-angled, low-power objectives, which, admitting so many rays of light, are well adapted for the study of opaque objects by natural illumination. I have found a 2-inch of 9 or 10 degrees aperture and a 1-inch of 30 degrees aperture to work well by natural illumination on either fracture or etchings. They cover a large field and stand deep eye-piecing for amplification. A $\frac{1}{4}$-inch objective of 100 degrees aperture is also serviceable. Higher powers must be used for resolving the fine laminæ For photo-micrography the wide-angled objectives are not essential, because the plate will be sensitive to lines in the spectrum far beyond what the eye can see.

Albert Sauveur, of South Chicago, Ill., said that considerable microscopic work had been done by the Illinois Steel Company with gratifying results. Their method of polishing the specimen consists in taking the specimen piece, $\frac{1}{2}$ to 1 inch square and $\frac{1}{4}$ inch thick, and grinding first on No. 2 emery paper mounted on a smooth board. Following this they use No. 1 and then No. 00 emery paper; thin emery powder spread wet over a cotton cloth stretched on wood; wet tripoli similarly spread, and finally jewelers' rouge used wet on chamois skin stretched over marble. As a source of light an oxy-hydrogen flame playing on calcium or zirconium is used. Using orthochromatic plates, sensitometer 16 to 20, an exposure of 4 to 10 seconds is found sufficient for a magnification of from 50 to 100 diameters. Photographs of spiegeleisen have been obtained magnified 1,000 diameters.

Prof. H. M. Howe, of Boston, Mass., says with regard to Professor Marten's paper on "Micro-Structure of Ingot Iron in Cast Ingots," that while we all must agree in assigning the greatest importance to the study of the micro-structure of steel, yet the study of the fracture should by no means be neglected. Through it very important light may be thrown on the problem. The fracture takes place along planes of weakness. Now, the study of these planes of weakness and of their distribution and size under different conditions and after different conditions of heat treatment may be of incalculable benefit.

The use of specific names for the microscopic components of iron and steel is, on the whole, desirable as a matter of convenience. It is inevitable that in order to convey ideas some kind of name must be used. Before the specific names "Cementite," "Ferrite," etc., were suggested, writers inevitably, even unconsciously, fell into using names which were equally specific, but simply more cumbrous.

Such substances cannot be written about without using some sort of name. That name may be brief like "quartz," or it may be a long phrase like "the intensely hard, transparent, vitreous substance which crystallizes in the hexagonal system," but such a phrase is simply a long inconvenient name. In the early stages of knowledge names must be given provisionally, because it is not possible to fully distinguish the different substances, and it might lead to incorrectly grouping, under a single name, some unlike substances.

Fig. 4

In Mr. Sauveur's paper, there is a tacit assumption that there is a constant and known relation between the coarseness of the grain of steel and its quality or physical properties, and that in general (other things being equal) the finer the grain the better the quality. This assumption is natural and quite proper. But a stage has now been reached in the study of these questions which makes it desirable that direct and accurate testimony should be sought as to the relation between the size of the grain and the physical properties. If the physical properties of every piece of steel which is subjected to microscopic examination were also determined it would be a great help, and the results of microscopic examination could be interpreted very much more confidently. It is knowledge of the physical properties, after all, that is the objective point rather than knowledge of the micro-structure.

The specimens show that, in certain cases at least, the size of the grain as revealed by fracture gives no indication of the physical properties of the metal. Two pieces of the runner of a manganese-steel casting were originally one continuous piece. The fracture of one is reasonably fine. This is the piece before water toughening, and, therefore, while relatively brittle. The fracture of the other is extremely coarse and columnar; this is of the water-toughened and very strong and ductile metal. In short, in one and the same continuous piece, and but a short distance apart, a relatively fine fracture accompanies weakness and brittleness, while a coarse columnar fracture accompanies strength and ductility combined.

New Electric Coal Cutting Machine.—Recently an electrical coal cutting machine, invented by Messrs. Robert and Thomas Clarke, was given an experimental trial at Lidgett Colliery, Tankersly, England. The trials were made with a machine having a cutting wheel about 4 ft. dia. At the first day's trials the machine holed 40 yds. of coal face, 40 ins. underneath, in a little over an hour. The next trial was even more satisfactory, the machine cutting 10 yds., 40 ins. deep, in 12 min., and when certain contemplated improvements are made it is expected to cut a yard per minute.

MINERAL PRODUCTION OF CANADA, 1893.

The following summary of the mineral production of Canada during 1893 has just been issued by Mr. Elfric Drew Ingall, in charge of the division of Mineral Industries and Mines. The figures are still held subject to revision:

PRODUCT.	Quantity (a).	Value.	PRODUCT.	Quantity (a).	Value.
Metallic.			**Structural Materials.**		
Copper (b), lbs.	8,109,856	$875,864	*Bricks, M.	205,000	1,215,000
Gold (c), ozs.	51,609	927,244	*Building stone, cu. yds	220,000	610,000
Iron ore (d), tons	124,702	293,018	Cement, bbls.	134,615	201,583
Lead (e), lbs.	2,135,023	80,996	Flagstones, sq. ft.	40,800	3,487
Nickel (f), lbs.	3,992,982	2,076,351	Granite, tons	22,521	94,393
Platinum, ozs.		1,800	*Lime, bush.	2,400,000	440,000
Silver (g), ozs.	414,975	321,493	Marble, tons	590	5,100
Zinc (h), lbs.	11,733	476	Pottery		180,437
Total metallic		4,582,166	Roofing cement, tons	951	5,441
Non-Metallic.			Sands and gravels (exports), tons	229,116	121,795
			Sewer pipe		194,462
Asbestos, tons	6,473	313,806	Slate, tons	7,112	90,825
Coal, tons	3,719,17	8,422,259	Terra-cotta (o)		55,704
Coke (j), tons	161,796	61 678	*Tiles, M.	16,000	191,000
Felspar, tons	573	4,525	Total non-metallic		14 391,291
Fireclay, tons	540	700	Total metallic		4,582,166
Grindstones, tons	1,600	38,379	Estimated value of mineral products not returned, largely structural materials.		276,513
Gypsum, tons	19,568	196,150			
Limestone for flux, tons	27,797	27,519			
Manganese, tons	228	14,458			
Mica (k)		69,622			
Mineral water, galls.	725,096	108 347	1893. Total		19,250,000
*Moulding sand, tons		1,000	1892 "		19,500,000
Natural gas (l)		365,233	1891 "		20,500,000
Ochres, tons	1,070	17,710	1890 "		18,000 000
Petroleum (m), bbls.	798 406	834,334	1889 "		14,500,000
Phosphate (n), tons	8,198	70,942	1888 "		13,500,000
Precious stones		1,500	1887 "		12,500,000
Pyrites, tons	58,542	175,626	1886 "		12,000,000
Salt, tons	62,324	195,926			
Soapstone, tons	717	1,920			

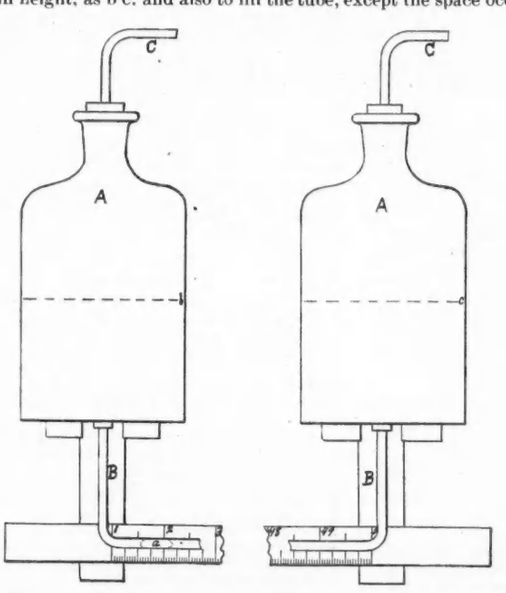
* Estimated.

(a) Quantity marketed, except when otherwise specified. Tons are of 2,000 lbs.
(b) Copper contents of ore, matte, etc., at 10¼ cents per lb.
(c) Nova Scotia and Ontario gold at $19.50, Quebec at $18, and British Columbia and Yukon District at $17 per oz.
(d) Of this quantity 124,653 tons were converted into pig-iron, producing 55,947 tons, valued at the furnaces at $790,283.
(e) Lead contents of ores at 3·7 cents per lb.
(f) Nickel contents of ore, matte, etc., at 52 cents per lb. This represents the final market value of the nickel. In the matte its spot value would be much less, being quoted at 13 cents only in this condition, which would bring the figures for value down to $519,088.
(g) Silver contents of ore at 76 9 cents per oz.
(h) Zinc contents of ore at 4 cents per lb.
(j) Oven coke, all the production of Nova Scotia.
(k) Exports, plus quantities sold to Canadian electrical works and stove foundries.
(l) Gross amount received through sale of gas.
(m) Calculated from inspection returns at 100 galls. crude to 38 refined, and computed at $1.04½ per bbl. of 35 imp. galls. The barrel of refined oil is assumed to contain 42 imp. galls.
(n) Exports, plus quantities sold to Canadian superphosphate works.
(o) Includes porous fireproof terra-cotta.

A DIFFERENTIAL MANOMETER.

Written for the Engineering and Mining Journal by F. W. Sperr.

Two flasks, A A, of equal and uniform caliber are connected by a glass tube, B B, also of uniform caliber. The liquid is made to fill the flasks to a certain height, as b c, and also to fill the tube, except the space occupied



by the bubble, a. Depressing the liquid in either flask will cause the bubble to travel along the tube a distance equal to the depression, multiplied by the area of the cross-section of the flask, divided by the area of the cross-section of the tube, and twice the depression equals the difference of level produced.

In the illustration the flasks have 20 times the diameter of the tube; the attached scale is graduated 20 parts to the inch, and each division represents $\frac{1}{1000}$ of an inch (0·00025 in.) of the liquid column pressure. The safe range of the bubble is about 40 in., making 0·2 in. of vertical column, the maximum difference of level to which this particular apparatus is applicable.

The connecting tube must be so small that the break in the contained liquid may be maintained by the dividing bubble. But the length of the tube and the diameter of the flasks may be made to give any required range and differentiation. The apparatus, it will be seen, is simple and easily made.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Supreme Court of the United States.

Transfer of Claim to Alien Is Not Abandonment.

The transfer of a mining claim by a qualified locator to an alien is not to be treated as an abandonment, nor is it analogous to the casting of descent upon an alien. The alien grantee of a qualified locator of a mining claim takes by virtue of the conveyance, and not by operation of law. His incapacity to take and hold, by reason of alienage, is open to question by the government only; and the infirmity is removed by naturalization before judgment rendered in proceedings on adverse claim to a patent. The Supreme Court of Montana recognized the settled rule that an alien may take and hold land by purchase until officially found, and that, if the alien become a citizen before his alienage has been adjudged, the act of naturalization takes effect by relation, but held that "possessory rights to mining claims on the public domain of the United States," although "endowed with the qualities of real estate to a high degree," did not come within that rule. The argument was that by statute mineral lands are not open to exploration, occupation or purchase by aliens, but only by citizens of the United States, and those who have declared their intention to become such, upon compliance with the laws and local mining rules and regulations as to location and possession, title and possessory rights to mining claims thus acquirable solely by virtue of the statute, and in the manner prescribed thereby, must be regarded as passing as by operation of law, and not as by grant; hence, that mining claims are controlled by the rule which forbids the alien to take or hold real estate by descent, since it is the rule of law and not the act of the party that vests title in the heir, and it would be an idle thing to vest title by one act of law, and then take it away by another. The court was of opinion that, upon principle, the analogy between an alien heir claiming by descent and alien miner claiming under the mining laws, was complete, and that, as an alien was incapable of taking, the conveyance to him by one who was a citizen amounted to an abandonment by the latter. We are unable to concur in this view. We do not think that the transfer of a mining claim by a qualified locator to an alien is to be treated as an abandonment, or that the analogy of such a case to the casting of descent upon an alien can be maintained. Manuel v. Wulff, 14 Su. Ct. Rep., 651.

DIVIDENDS PAID BY MINING COMPANIES DURING APRIL, 1894.

NAME OF COMPANY.	Paid in April.	Paid since Jan.	NAME OF COMPANY.	Paid in April.	Paid since Jan.
Alaska-Tred., Alaska		$75,000	Kennedy, Cal.	$18,000	$192,000
Bald Butte, Mont.	$12,500	50,000	Mayflower Gravel, Cal.	10,000	40,000
Belden Mica, N. H.	5,000	20,000	Mercur, Utah	25,000	110,000
Boreel, Colo.		22,500	Morning Star Drift, Cal.	9,600	28,800
Champion, Cal.	3,400	13,600	Moulton, Mont		20,000
Cop Queen Con., Ariz		50,000	Moose, Colo		6,000
De Lamar, Idaho	100,000	200,000	Napa Con., L. Cal.	10,000	20,000
Elkhorn		32,813	Omaha, Cal	3,600	14,400
Elkton, Colo	6,000	24,000	Quincy, Mich.		200,000
Franklin, Mich		80,000	Rico-Aspen, Colo	25,000	100,000
Golden Fleece, Colo.		24,000	Smuggler, Colo	50,000	250,000
Golden Reward, S. D.	5,000	20,000	Standard Con.		10,000
Harqua Hala, Ariz.	36,000	36,000	Trinity River Hydraulic, Cal.	2,500	10,000
Homestake, S. Dak.	18,750	75,000	Victor, Colo.		30,000
Hope, Mont.		25,000	W. Y. O. D., Cal.	3,000	12,000
Horn Silver, Mont		50,000			
Iron Mount., Mont		20,000	Total	$373,350	$1,851,113

Readers of the "Engineering and Mining Journal" will confer a favor on the publishers if they will notify the "Journal" of any errors or omissions in the above table.

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:

TUESDAY, APRIL 24TH, 1894.

518,582. Apparatus for the Manufacture of Gas. Robert M. Bidelman, Adrian, Mich.
518,599. Water Wheel. Andrew J. Gould Quincy, Cal.
518,636. Clay Working Mill. George S. Tiffany, Tecumseh, Mich.
518,653. Coal Chute Regulator. John F. Schmadeke, Brooklyn, N. Y.
518,662. Furnace for Treating Refractory Ores. Fessenden C. Butterfield, Minneapolis, Minn., Assignor of three-fourths to Louis S. Cass, Sumner, Ia., and Daniel B. Burdett, Minneapolis, Minn.
518,690. Combination Brick Kiln. George C. Firestone, Benicia, Cal.
518,703. Coal Drill. John W. Shallenberger, Canal Fulton, Assignor of one-half to Frank Shallenberger, Massillon, O.
518,711, 518,732. Producing Metallic Zinc. Parker C. Choate, New York, N. Y., Assignor to the Electrical Zinc Company, of New Jersey.
518,762. Steam Boiler or Other Furnace. Donald B. Morison, Hartlepool, England.
518,769. Charging Apparatus for Filling Blast Furnaces. Thomas F. Witherbee, Port Henry, N. Y.
518,794. Liquid Fuel Furnace. Erwin S. Sperry, Bridgeport, Conn., Assignor, by mesne assignments, to the Waldo Foundry, of New Jersey.
518,851. Recuperative Tank Furnace. Reason R. Morrison, Mineral Point, O.
518,870. Boiler Furnace and Smoke Consumer. Robert R. Turner, Columbus, Ohio.
518,874. Furnace for Smelting and Refining Ores. Louis R. Bonehill, St. Louis, Mo., Assignor to William H. Swift, same place.
518,890. Process of Extracting Zinc from Ores. Ludwig Klöz, Leadville, Colo.
518,897. Hydrocarbon Injector Burner. Franklin M. Reed, Anderson, Ind., Assignor of three-fourths to Charles E. Jones, William A. Jones and William H. Ziegler, same place.

PERSONALS.

Col. George W. Scott, of Atlanta, Ga., has been visiting the newly discovered phosphate deposits of Tennessee.

Mr. Thomas W. Williams, of Youngstown, O., has been appointed superintendent of the Hubbard Co-operative Iron Company's mill at Hubbard.

Mr. N. P. Pratt, of Atlanta, Ga., has been visiting Lewis and Hickman counties in Tennessee to examine the newly discovered phosphate beds, in the interest of some Atlanta parties.

Superintendent Evans, who has for some years had charge of the Atlantic Mill near Houghton, Mich., has resigned to accept the position of assistant superintendent of the Boston & Montana Company's works at Great Falls, Mont.

OBITUARY.

John Parkinson, a well-known mine foreman in the anthracite coal regions, died suddenly at Stocken, Pa., on April 29th, aged 60 years.

Birdsall Holly, an engineer and inventor, died at his home in Lockport, N. Y., on April 27th. He invented the Holly water-works system and the Holly district steam-heating system.

Francis Browne Stockbridge, United States Senator from Michigan, died at Chicago, Ill., on April 30th, aged 68 years. He at one time engaged in iron mining on the Menominee Range.

James Younger, consulting engineer of Cramp's shipyard in Philadelphia, Pa., died on April 27th at Germantown, Pa. He was born in Fifeshire, Scotland, 50 years ago. In 1872 he came to this country, and at once entered the service of the Cramp Shipbuilding Company, rising rapidly to the rank which he held at the time of his death. He stood very high in his profession.

Joseph Menge of New Orleans, died recently at Monterey, Mexico. He graduated in 1870 from the University of Louisiana as civil engineer. He became an inventor and was known the entire country over as the inventor of the Menge dredge boat, which has been in use for many years and was adopted by the United States Government. He was also the patentee of a dredging and irrigation pump, which is used on most of the plantations in Louisiana.

Elias Sweet, a pioneer of the Michigan copper regions, died in Ontonagon, Mich., on April 17th, aged 71 years. He was born in St. Austell, Cornwall, in 1823, where he learned the trade of a machinist. He came to this country in 1848 and obtained employment at the Bruce mine. In 1851 he went to Ontonagon County and erected machinery at many of the mines there. In 1854 he was placed in charge of the stamp mill and mining plant of the Ridge mine, which he afterward for several years worked on tribute.

SOCIETIES AND TECHNICAL SCHOOLS.

Missouri School of Mines.—This school, at Rolla, Mo., has now under construction a mining and metallurgical laboratory which will cost $25,000, $15,000 for the building and $10,000 for the equipment. The design of the laboratory is on practical lines entirely, and is especially intended to develop Missouri resources. Consequently, the fitting out will include a complete equipment for the investigation of clays, fuels, economic products, etc., and the dressing and smelting of ores.

University of Wyoming.—The third annual report of the trustees has just been published. The assaying department, which was opened last year, shows a very interesting record. Regarding this department the report says: "The chief aim of the school is to prepare young men for actual service in mining and metallurgy, especially emphasizing practical training, enabling students to thoroughly understand all classes of mining work, so they will be better able to direct and superintend. Owing to the age of the school the equipment is not as extensive as the present requirements demand. The assaying department was made especially strong since the board of trustees authorized the professor of mining and metallurgy to do assaying free for citizens of Wyoming for the college year of 1893-94. This apparatus is augmented by all the necessary requirements to do thorough and rapid work. All wet assays and analyses have been made in the chemical laboratory, since there was no appropriate place to arrange a laboratory for wet assays in connection with the present assay office. The new departure, in the way of making free assays for the citizens of the State, has been, judging from the amount of work sent in, duly appreciated by the people from every county." The addition of a stamp mill and concentrator is recommended.

Western Society of Engineers, Chicago.—This society has issued a catalogue descriptive of the organization. It contains the by-laws and constitution and a list of members. The object of the society shall be the advancement of the sciences of engineering and the interests of the profession. Among the means to be employed shall be the periodical meetings for the discussion of scientific papers and matters of scientific interest, and the cultivation of professional and social intercourse among its members; the collection of a library and the publication of such parts of the transactions as may be deemed expedient. The membership of the society shall include all present members of the Civil Engineers' Club of the Northwest, and shall comprise persons who are or have been engaged in the profession of civil, military, mining or mechanical engineering, architecture, and those who by occupation are connected with engineering works or interested in the advancement of science. Regular meetings are held on the first Wednesday of each month. The membership of the society now numbers nearly 350, and is increasing rapidly. The officers for 1894 are Hiero B. Herr, president; D. W. Mead and H. C. Draper, vice-presidents; Thomas Appleton, secretary and librarian, and David L. Barnes, treasurer. The society offices are in the Lakeside Building.

Engineers' Club of Philadelphia.—At the regular meeting, April 21st, a paper on "The First United States Pneumatic Postal System" was presented by the author, Mr. A. Falkenau, who stated that the year of trial of the first pneumatic system for postal service in the United states had just been completed, and the extension of the system for commercial as well as postal service was contemplated. Before describing the Philadelphia system a brief review was given of what had been done in Europe in the way of pneumatic transmission, and the London and Paris systems were more particularly described as follows: In London the tubes were 2¼ and 3-in. lead pipes laid in cast-iron pipes for protection. The carriers used in 2¼ tubes were but 1¼ in. diameter, the remaining space being taken up by packing. Carriers are dispatched singly. First, vacuum alone was used; later, vacuum and compressed air. The tubes used in the continental cities in Europe were wrought-iron, the Paris tubes being 2¼ in. diameter. There the carriers are dispatched in trains of 6 to 10, propelled by a piston. The carriers and tubes were more fully described, also the method of locating obstructions in the tubes. The two methods of laying pipes on the radial and polygonal systems were fully described. To give an idea of the extent to which this work is carried in Europe, it was stated that the London system has 42 stations with a total length of 34 miles of tubes. Six engines of an aggregate of 216 H. P. constitute the power plant. The Liverpool and Berlin systems were similarly described. In 1892 the Pneumatic Transit Company of New Jersey contracted to install the Philadelphia plant. As the size of tube adopted and laid was 6⅛ in. diam., entirely new problems presented themselves. The velocities adopted in all systems ara about the same, being 30 miles per hour. The distance from the main post office to the sub-station on Chestnut street is 2,928 ft. There being an outgoing and return tube, the total length is 5,856 ft. The apparatus at the two stations was described in detail. The pressure of air at the main post-office is 7 lbs., while at the substation it is about 4 lbs., as the pressure does not fall at a uniform rate. The air passes through the entire system of tubes, returning to the post-office at atmospheric pressure, the end of the tube being practically open to the air. The two air cylinders of the compressor located at the main post-office are 18-in. bore, while the steam cylinders are 10-in. bore, with a piston stroke of 24 in. There has not been a single case of obstruction of the tubes since the plant was first put into operation. Attention was called to the fact that, mechanically, pneumatic propulsion is not economical, about 90% of the work being wasted. It was pointed out, however, that commercially the value of pneumatic transmission was amply proved. It is now proposed to extend the system to cover the greater part of the city. In closing, Mr. Falkenau stated that this first pneumatic postal tube in the United States was the largest of its kind in the world. The paper was illustrated by a large number of lantern slides, showing the details of the operation of the various pneumatic systems in use abroad, and also the special transmitting and receiving machinery which have proved so successful in the Philadelphia line. The paper was discussed at some length. Mr. W. W. Carr, Postmaster of Philadelphia, stated that the tube has carried 30,000 letters per day, and has been working most satisfactorily and without a single stoppage. Great credit is due Philadelphia for introducing the first pneumatic system in the United States. Chicago and other cities are preparing to follow the example.

INDUSTRIAL NOTES.

The new Grant Locomotive Works at Chicago are advertised for sale by the assignees, subject to a mortgage of $225,000. The works were built in 1892.

The Carnegie Steel Company's new 28-in. mill at Homestead, Pa., was started up successfully on May 1st. The working force was reduced from 3,200 to 2,700 men. The changes made in the department were the causes of reduction in the force of employees. The output will be increased.

The Burton Electric Heating Company has been organized as a subsidiary company of the Electric Forging Company for the New England States, and will operate the patents of the company in that district. The capital stock of the new company will be $1,000,000. The factory will be at Woburn, Mass.; its office in Boston. The officers are: George D. Burton, president; F. J. Hutchinson, treasurer.

The Maritime Canal Company of Nicaragua held its annual meeting at the office of the company in New York, May 3d. The president of the company, Mr. Hiram Hitchcock, was present, but the vice-president, Judge Charles P. Daly, was elected chairman. The meeting was well attended, 154,134 shares being represented. The principal business was the election of five directors to replace the five whose term of three years had expired. The ballot resulted in the election of the following gentlemen, who will serve until 1897: C. Ridgeley Goodwin, Frederick F. Thompson, Richard C. Shannon, Franklin Fairbanks and S. E. Killner. There are 15 directors in all. The rest of the business transacted was of a private character.

MACHINERY AND SUPPLIES WANTED.

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

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

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

GENERAL MINING NEWS.

Standard Oil Company.—In Albany, May 3, the Attorney-General of the State of New York gave a hearing on a petition presented by the Central Labor Union of New York, asking that an action be brought by the State for the dissolution of the Standard Oil Company and the forfeiture of its charter. The grounds urged were that the company has established a monopoly in contravention of the law. The attorney-general heard arguments for and against the petition, but reserved his decision.

ALABAMA.

Cherokee County.

(From our Special Correspondent.)

The bauxite mines on this company's land at Dikes Ore Banks are being run on full time, and an average of about 20 tons a day is now being shipped to the Eastern markets. These mines are proving to be the most extensive as well as furnishing the best average grade of this mineral of any in Alabama or Georgia.

Bass Furnace Company.—This company, at Rock Run, is preparing to rebuild the charcoal furnace, which was blown out last winter. Their stockyard contains some 8,500 tons of car wheel pig iron, something unusual at this plant, because the product in ordinary times is utilized by the company at their Fort Wayne car wheel foundry nearly as fast as it comes from the stack and can be shipped.

Bluffton Ore, Land and Furnace Company.—This company, since it went into the hands of a receiver, is proving that good iron ore occurs within the boundaries of its property, which is being shipped at a profit to the coke furnaces of Tennessee. At present lessees are mining at two different points, and have been shipping regularly until the coal miners' strike, which, if continued, will certainly cause these furnaces to be blown out. The car wheel foundry which was built at Bluffton in 1891, at a cost of some $20,000, was recently sold to a firm at Gadsden, Ala., for $2,200. The machinery has been taken out and shipped to that point.

Tecumseh Iron Company.—This company, at Tecumseh, and Warner's resumed active mining operations at both the Baker Hill and State Line ore banks recently, and is still shipping brown ore to South Pittsburg and Dayton, Tenn. This company owns other banks on the line of the East & West Railroad of Alabama, which there was a rumor would be operated last year; but, because of general depression work was not commenced, and now the strike of coal miners' will probably cause the company to curtail operations rather than extend. The Citico furnace at Chattanooga which was receiving large consignments of Baker Hill ore notified the superintendent a few days since to stop further shipments for the present because of the strike.

Randolph County.

(From our Traveling Correspondent.)

The results of assays made by Mr. J. H. Pratt, of Birmingham of nine samples of ore taken from prospect holes, without selection, from the Goldberg gold mining district, for the State Geological Survey, show from 41c. to $23.03 a ton in gold, and an average yield of $7.75 a ton gold. These samples were taken from seven different sections of land, and none were from properties on which any extensive development work has been formed. While the majority of the gold bearing ores in this vicinity will not yield to amalgamation, yet by chlorination from 90% to 95% of their value can be saved. The cost of mining will not exceed 50c. per ton, and often falls lower. The cost of chlorinating by the process adopted by John E. Rothwell will not exceed $2 a

ton; consequently ores of such low grade as the samples treated by Mr. Pratt would yield a handsome profit for working, provided, of course, that extensive work should determine the extent of the ore body to be sufficient to warrant the investment of capital for machinery.

Pinetuckey Mining and Mineral Land Company.—At a special stockholders' meeting on March 29th, held at Edwardsville, Ala., it was resolved that the president be empowered to raise money sufficient to pay off all outstanding indebtedness and carry on active mining and milling operations, but not to exceed $20,000 in amount. This money to be secured by mortgage on the real and personal property of the company.

ALASKA.

Silver Queen Mine.—A small force has been put at work on this mine at Sheep Creek. They are engaged in making an upraise from the lower tunnel to connect with an upper level. In the event that the level gives promise of good results, about 20 men will be put on.

ARIZONA.

Yavapai County.

Yarnell.—At this property the machinery for the new chlorination plant is daily expected. John E. Rothwell, who is well versed in chlorination of ores, says the Prescott "Courier," will have charge of both quartz mill and chlorination works.

CALIFORNIA.

Amador County.

Mayflower Gold Mine.—This property, at Amador City, extends from Rancheria Creek to the north line of the Keystone mine, and includes the Bunker Hill, Mayflower and South Mayflower, the Little Amador and Kling mines, covering an area of near 5,000 ft. in length, with a width varying from 300 to 600 ft. Near the north end of the properties is located the 40-stamp mill and hoisting works of the old Bunker Hill mine, in which region and on the adjoining Mayflower ground the most of the present development work is being done. Some 80 men are now employed, and 20 stamps are at work. It is expected that the additional 20 stamps of the mill will soon be at work crushing the ouptut of this part of the property, says the Amador "Record." The company is preparing to reopen the Johns shaft on the south side of the ridge near Amador City, on the Little Amador property. This shaft was originally sunk to the depth of 700 ft. When cleaned out and repaired, development work and further sinking will begin from that point. As soon as developments will warrant a new 40-stamp mill with all modern improvements will also be erected. Dr. Stephen H. Emmens, general manager, has been overlooking the work in hand.

Plumas County.

Sierra Buttes Gold Mining Company.—The 48th ordinary meeting of this company was held recently in London, Eng. Mr. F. Tendron presided, and moved the adoption of the report, which stated that after carrying $9,600 to the reserve fund, and including $18,514, the moiety of profit from the Uncle Sam mine, a balance remained of $18,888; out of which the directors recommended a dividend of 12c. per share, amounting to $14,700. A distribution of 18c. per share was recommended on the Plumas Eureka working. The chairman said that although they had incurred heavy expense in inspecting other mines which had been offered to them, they had $53,141 left on the year's working. They were paying the usual dividend, and with the amount put to the reserve, that fund now stood at $84,000, while with their moiety in the Uncle Sam and Plumas Eureka, and other sums, they were able at any time to put their hands on $108,000. As to the Uncle Sam mine, since January, 1889, they had taken out ore to the value of $685,440, the profit on which had been $220,500. Of that $59,050 had been used for development, $38,400 carried to reserve, and the shareholders had had equally divided among them $192,970. These results, he thought, were very satisfactory, considering that the property in the first place cost them only $153,600. The motion was adopted.

COLORADO.

The Continental Oil Company, which is the Western name of the Standard oil trust, has, it is reported, absorbed the Vacuum Oil Company, which controls the greater portion of the lubricating oil consumed in the West.

Mineral surveys approved by the United States Surveyor-General for Colorado during the week ending April 21st: 8,352, Leadville, Chantilly Wicklow, Alice A., Roslyn, Mineola and Wyneta lodes and Alice A. mill site; 8,704, Pueblo, Canuck; 8,784, Pueblo, F. R. Belle; 8,716, Pueblo, Ray; 8,809, Pueblo, Moonlight; 8,747, Pueblo, Victor Consolidated and Victor Consolidated No. 2 lodes; 8,875, Pueblo, Rising Sun.

Dolores County.

Enterprise Mining Company.—The Enterprise group is now shipping on an average 15 tons per day to the Rico smelter, and about 2 cars per week of high grade silver ore to Denver. The mine is looking well and the production is increasing, says the Rico "Sun." A contract was let this week on the Jumbo No. 3, which, when completed, is expected to open up some very valuable ore bodies.

Rico-Aspen Consolidated Mining Company.—According to the Rico "Sun," the management has begun preparations for increasing the output of this company's group of mines. The working force will be increased to 150 men. This will increase the output of the mines fully one-third. Some of the richest ore ever mined on Newman Hill is being extracted by the company. Aside from this, it has ground enough opened up to keep the present force steadily at work on good ore for some time. But the management intend to proceed with development, thus deeping the mine in good condition for extensive operations for an indefinite period. During the past few days connection has been made with the Jumbo vein workings with those of the old Snow Flake tunnel. This connection affords excellent ventilation throughout the entire workings of the Rico-Aspen group.

Eagle County.

Belden.—It is reported that this mine is working 35 or 40 men, says the Red Cliff "Times," "and has a body of ore disclosed 15 ft. thick averaging 10 oz. silver, 45% lead and 0·12 oz. gold. Three eight-hour shifts have been put on the lime drift at the 650-ft. level, and it will be driven as fast as possible until the great channel is opened at this level. This work is to the right of the main incline. The level to the left at the same point has been started. Shipments are regular, but development work furnishes the ore."

El Paso County.

Pharmacist Mining Company.—The annual meeting of this company was held in Colorado Springs on April 24th. About 1,000,000 shares were represented. Charles F. Potter was chairman and W. G. Whitlock was secretary. Owing to some dissatisfaction among the larger stockholders with the management of the president and general manager, A. D. Jones was left out of the new board of directors, although he himself voted nearly 400,000 shares. The following is the new board of directors: J. W. Miller, president and manager; J. K. Miller; secretary and treasurer; George Spacht, J. H. Fitzpatrick and E. D. Johnson, vice-presidents. The reports of the various officers were presented, that of the manager being given verbally. A resolution was passed asking for the presentation of a written report.

Hinsdale County.

The shipments of ore from the Ute & Ulay and the Golden Fleece mines of late has been over 300 tons per week. At this rate the output for the month will be the largest ever made from those mines. The Ute & Ulay alone promises to exceed the largest monthly shipments, and will probably reach 1,400 tons for the month of April.

Lake County.

(From our Special Correspondent.)

Dunkin.—A few men are at work, but no shipments are being made.

Hard Chance Group.—This consolidation, including the Hard Chance, Mayflower, Jack and Eagle lodes, is coming to the front rapidly. A good strike has just been made in the Hard Chance workings. The vein, when caught, was 5 ft. wide and has a 3 ft. pay streak. The ore averages 3·2 oz. gold and 40% lead.

Hilda.—Lessees are doing successful work, and a body of good silver-lead ore has been opened up.

Mining Suits.—Clarence Hersey, the head of the Marian lease, is suing F. R. Richardson, of Lincoln, Neb., for a one-fifth interest in the royalties of the Little Johnny gold mine. Hersey claims an agreement was made that he should have an interest in Richardson's royalties, but now that the mine is paying largely, Richardson denies the agreement. Richardson is to receive $12,000 for his share in the property.

Eben Smith has brought a replevin suit against the Excelsior Iron Works for a $10,000 pumping plant that he purchased in the sheriff's sale of the Star of Hope property, but which McCarty & Moore of the iron works company claimed they purchased prior to the sale.

Park County.

The Tarryall Creek Gold Company, Limited, an English company having offices at 33 King street, London, E. C., working mines in Park County, Colo., has been compulsorily wound up in bankruptcy on the petition of a creditor. This company was formed in August, 1889, with a capital of £200,000 in £1 shares to take over the property known as the Tarryall Gold Placer estate, which had been in the possession for two years of the Nouveau Monde Gold Mining Company, and from 1850 to 1887 in the possession of the French Nouveau Monde Gold Mining Company. The unsecured debts are placed at £6,787, and the assets at nothing. It is stated that Mr. Fortune, the manager in Colorado, sued for his salary in the local courts and obtained a lien on the company's property. As his claim was not satisfied in six months the property became, by Colorado State law, vested in Mr. Fortune, and the company therefore entirely lost it. This of course brought matters to an end, for the company had then neither property nor money.

Independence District.—In the early '80s Independence was a promising gold camp, but in 1885 the free milling ore had about run out, and as depth was gained it became so refractory that the ordinary process of milling did not pay. At that time, too, the search for silver absorbed all attention and the gold properties were practically abandoned. It is now reported that J. R. Williams, who is part owner of the Farwell group, and a mining man of experience, will, as soon as the weather permits, begin work on the property. It is thought that, with some improved process of treating ore, it can be worked profitably. Moreover, the neighboring locality will be more thoroughly explored. Mr. Williams has also faith in the Difficult gold district, and has purchased for $8,000 an eighth interest in the New York. He is also negotiating for an interest in another property in the same district. Locations continue to be made below Aspen on gold outcrops. It is stated by those who have prospected the ground north of the Roaring Fork that a well defined gold-bearing vein exists of sufficient value to at least warrant further exploration.

Leadville Gold Belt.—Mr. John F. Campion has published the following in the Leadville "Herald-Democrat": The exploration work started, some three years ago, on the property of the Ibex Mining Company, situated on Breece Hill, within the lines of the territory now popularly called the Gold Belt, was conceived on the theory that the ore chutes of Carbonate and Iron hills were probably more or less continuous through Breece Hill, and that at one time, before the glacial and faulting periods, they were likely connected with the ore chutes of Little Ellen hill; that is, the latter ore bodies were part and parcel of the same system of ore chutes already discovered and explored in the hills first named. The prospecting and exploration work done by the Little Johnnie Company since 1891 seems to confirm the correctness of the assumption on which the enterprise was projected. It will, however, take some considerable time, and quite an expenditure of money yet, before the absolute certainty of the theory shall be demonstrated.

The present known limits of the Leadville gold belt seem to be about four square miles, lying between Big Evans gulch on the north and Iowa gulch on the south. The geological conditions presented in this part of the Leadville district do not seem to differ materially from the known geology of Fryer, Carbonate and Iron hills, except that on Breece hill the overlying porphyry is considerably thicker, and that gray porphyry dikes and intrusive sheets of the same material seem to occur with more frequency than on the adjacent mineral-bearing hills to the west and southwest. The ore horizon, so far as we have been able to determine, occurs mainly upon a bed or layer of intrusive porphyry, varing in thickness from 5 ft. to 70 ft.; next below the porphyry occurs the so-called contact, averaging probably 25 ft. in thickness, and below the latter the blue limestone. We have, however, found one ore body lying between the porphyry and limestone, just as ore is found on Carbonate and Iron hills. We have also found some ore within limestoue walls, and at present we have a very good prospect of finding another body of ore within the limestone. For these reasons it would seem that there are three places in the Breece Hill formation where ore can be intelligently sought for, above the intrusive porphyry which overlies the contact, in the contact proper between the porphyry and limestone, and in the mass of the blue limestone next to the contact. It is probably a reasonable approximation to say that the average thickness of the porphyry of the gold belt district will average 500 ft. In addition to this factor the problem of water will also cut an important figure. It is, therefore, not reasonable to expect much from any of the new enterprises now started, in the way of adding to our output, within a year. The same conditions will apply equally to those shafts which will be started as soon as the heavy snows of winter disappear. Meanwhile the shafts that have already reached contact will go on with a steady production of gold, making it probable that the camp's production of gold for the year 1894 will be the second largest—if it is not the first—of any mining district in the State.

FLORIDA.

Alachua County.

Price & Thayer, at Newberry, 15 miles west of Gainesville, are connecting their phosphate mine with the South Florida Railroad by means of a tramway. Some valuable deposits of phosphate have been discovered in that vicinity recently, and several new mines are being opened.

Hillsborough County.

Buffalo Bone Phosphate Company.—This company has been organized by L. M. Weir, of Tampa, and others.

Marion County.

Compagnie des Phosphates de France.—This company is gradually removing the plant from its mines at Anthony. The company will not withdraw from Florida, but will place its plant elsewhere.

Early Bird Phosphate Company.—This company has, after due consideration, placed an order with McLanahan & Stone, of Hollidaysburg, Pa., for one set of double steel log washers and one improved steel pan conveyor.

Polk County.

Fort Meade Phosphate Company.—Work is being pushed on this company's new plant at Fort Meade.

Suwannee County.

Ocala & Blue River Phosphate Company.—This company, at Luraville, is running on full time, giving employment to 150 men. The company, it is reported, ships daily 160 tons of rock. Eight more log-washers, with a quantity of other machinery, will be placed in the near future, make the plant one of the most extensive in the State.

GEORGIA.

Floyd County.

(From our Special Correspondent.)

The Hartsfelt bauxite furnace, or rather the furnace Charles Hartsfelt erected for manufacturing aluminum alloy from bauxite ore, at Rome, although built in 1892 with the promise of creating a home market and consumption of the Georgia and Alabama bauxite ores, is and has been idle: in fact it has proved an utter failure, as we predicted it would.

Lumpkin County.

Loud Mine.—At this mine last week, says the Dahlonega "Nugget," Captain Courtney found a beautiful specimen in a sluiceway while forking out gravel. The specimen weighed 196 dwts., and was almost solid gold, only about 15 dwts. of its weight being rock. It was worth about $144.80.

Paulding County.

Yorkville Gold Mines.—These mines are in the hands of W. M. Courtis, the well known mining engineer, as trustee, who is preparing to develop them and, if results justify it, to erect a mill. The plan for development is essentially as follows:

The trustee borrows $30,000, giving for it trustee's receipts, which, by an agreement, entitle the holder to a proportionate share in prospective profits. The money so secured is to be used in fully exploring the property, and if the results are such as to warrant it, a stock company with $500,000 capital will be formed.

Of this stock 1,000 shares will go to the present owners of the property; 1,000 shares to those who provide the $30,000; 2,000 shares will be sold to provide working capital with which to erect a suitable mill, etc., and the remaining 1,000 shares are placed at the disposal of the trustee. From it he will pay, in stock, interest on the $30,000 loaned for development, and also 5% on the 2,000 shares sold, until the mill shall have been completed.

In event that the prospecting shows that the deposits would not warrant the erection of a large mill, a small and cheap one will be erected to work up the ore in sight, which, it is expected, will reimburse the expenditures in development. The ore is free milling, and some samples are said to have been very rich, while the average is very good.

The plan appears to be a fair one, and if the mine pans out as anticipated will bring good returns to those interested in it. Mr. Courtis is well known as an honorable man as well as a capable mining engineer, and those who join him will undoubtedly be fairly and honorably treated.

Polk County.

(From our Special Correspondent.)

Etna Furnace Company.—This company have resumed shipments of iron ore to Tennessee. The ore on this company's property carries on an average a less percentage of phosphorus than the Cherokee County, Ala., ore, except those banks known as Dikes and State Line, which produce good ore for car wheel iron. Consequently the Etna ore, since the company built a washer last year, is considered very desirable, especially for charcoal iron. The company's own furnace needs relining and repairing generally, but this may be done during the present year if the demand and price for car wheel iron increase.

White County.

Sal Mountain Asbestos Company.—This company's new plant at Sal Mountain, now nearly completed, is described by the Cleveland "Progress." The main building is built of heaviest oak timbers, and the joints are fitted like cabinetwork. In this building all the heavy rock crushing machinery, defiberizers and other heavy machines will work. These machines are each set upon a distinct foundation of solid masonry built up from the bedrock. The engine and boiler house adjoins. At a distance of 150 ft. above this building, work has commenced taking out the crude asbestos. It is a solid ledge of pure fiber, and can be mined more cheaply than Canadian or Italian asbestos. There is absolutely no waste, and only a drift of a foot or two of earth and gravel on top has to be moved before the solid ledge is reached. A track has been built from the mines to the building, and the cars will be operated by a drum and rope, drawing the material into the building and dumping at the crusher. All the work which has been done on the property has been under personal superintendence of Capt. T. W. Hix, of Rockland, Me., who is treasurer of the company. There is no lack of material, as it crops out and has been tested at many different points on the property. Surveys show it to be 60 or 70 ft. thick from the level of the machinery building and over 300 ft. wide; the depth is not known.

IDAHO.

Alturas County.

Phi Kappa Mining Company.—This company's mine near Ketchum is to be started up shortly.

Star Mining Company.—This company, organized in Utah, says the Hailey "Times," purchased the Star group from Lemp & Falk, the owners, for $110,000. It made several payments aggregating $60,000, and obtained a reduction of $12,000 on the purchase price. This leaves only $38,000 to pay. A part of this is overdue, and now a new arrangement, giving the company more time to make the final payment, is being concluded. As soon as this is done an assessment will be levied and all debts be paid.

Lemhi County.

Italian Group.—This group of claims near Salmon City has been sold to parties from Salt Lake, who are now putting up a 10-stamp mill.

Kirtley Creek Placer Mining Company.—This company is making preparations to begin work on its placers as soon as the weather will permit.

Shoshone County.

Gem.—The shaft has been sunk 25 ft. by hand, and operations have been suspended until the new air-compressor ordered from Fraser & Chalmers can be erected, when the air drills will be put at work.

MAINE.

Hancock County.

Bluehill Mineral Spring Company.—This company has elected the following officers for the coming year: Dr. George A. Phillips, president; Levi B. Wyman, secretary and treasurer; and Charles H. Emery, business manager. The directors are Drs. G. A. Phillips and A. C. Hagerthy and C. H. Emery, of Ellsworth; W. H. Eaton, of Bar Harbor; and K. K. Thompson, of West Trenton.

Kennebec County.

Hallowell Granite Company.—This company has secured contracts for stone for some large buildings in New York.

Knox County.

S. E. & H. L. Shepherd Lime Company.—This company has bought the right to use the Cobb gas process for burning lime, and will apply it to the kilns at Rockport.

MICHIGAN.

Copper.

The Atlantic Mining Company, Central Mining Company, Wolverine Copper Mining Company, Allouez Mining Company, John Stanton and J. R. Stanton have moved into their new offices, at 11 and 13 William street, New York.

Calumet & Hecla Mining Company.—The first cargo of mineral for the smelting works at Buffalo left Houghton on May 2d. Lake navigation is now fully open.

Franklin Mining Company.—A special meeting has been called for May 26th to vote on the question of extending the organization of the company for 30 years from the expiration of the term of the original incorporation.

National Mining Company.—Some 18 tons of mineral have been taken out by tributors. This will probably complete all the work in the newer part of the mine, as the water is rising rapidly.

Quincy Mining Company.—This company's output for April was 800 tons of copper.

Dickinson County.

Northern Michigan Marble Company.—The working force in this company's quarry at Foster City has been considerably increased. The company is making arrangements to build a mill for cutting and polishing its marble.

Iron—Gogebic Range.

Colby.—Work on this mine will begin next week, with about 500 men.

Norrie.—This mine is now employing 1,300 men.

MINNESOTA.

Iron—Mesaba Range.

A dispatch from Iron Mountain, Minn., May 2d, says: All work has been stopped in the eastern portion of the Mesaba range and mob rule prevails in this city. The sheriff, utterly unable to cope with the lawless and reckless miners, has called on Governor Nelson for troops. An armed gang of 300 foreign miners, who struck yesterday at the Oliver, Ohio, Iron King and Franklin mines, reached Iron Mountain to-day and marched through the streets terrorizing the citizens. They forced the miners in the Mountain Iron and Rathbone mines to stop work and join their ranks. The rioters declare that work in all industries must cease. Fifty deputy sheriffs have been sworn in. A conflict is feared.

A Duluth dispatch of the same date says: Between 500 and 600 men who went on strike at the Virginia iron mines yesterday assembled this morning and decided to force the men at Mountain Iron to quit work. They marched across the country to the largest mine of the Rockefeller group and in a short time forced the 312 miners to abandon work. There was no violence. The men on the Mountain Iron property were getting from $1.25 to $1.50 a day. A reign of terror exists and the Governor has been appealed to to send troops.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

Joplin, April 30.

We have but little improvement in the condition of the ore market in this lead and zinc mining district over the former weeks. The zinc mining industry is almost at a standstill and the operators are undecided as to what they should do, as to entirely close down the large producers would mean the flooding of the underground workings, which would result in much damage and a heavy expense to again open. Such mines as have good lead deposits in sight can at the present time be worked at a profit. One particular feature of the present depression in the price of zinc ore is that miners and prospectors are opening up new ground and prospecting for lead. This is of course furnishing employment for a large number of men and at the same time bringing new land into a state of development and increasing the production of lead. The prices of zinc ore for the past week averaged $16 per ton.

The lead ore market opened at $18.50 per thousand, then fell to $18 about the middle of the week, and closed at $18.25. Following are the sales of ore from the different camps:

Joplin, 1,174,340 lbs. of zinc ore and 577,015 lead; value, $19,924. Webb City, 922,170 lbs. of zinc ore and 56,640 lead; value, $8,166. Carterville, 1,100,910 lbs. of zinc ore and 179,400 lead; value, $11,761. Zincite, 52,040 lbs. of zinc ore and 44,590 lead; value, $1,229. Oronogo, 16,310 lbs. of zinc ore and 53,420 lead; value, $1,092. Alba, 42,000 lbs. of zinc ore; value, $336. Lehigh, 34,320 lbs. zinc ore; value, $280. Stotts City, 140,000 lbs. of zinc ore; value, $1,085. Carthage, 125,000 lbs. zinc ore; value, $1,126. Galena, Kan., 1,245,490 lbs. of zinc ore and 211,200 lead; value $10,974.

MONTANA.

The strike of the trainmen on the Great Northern Railroad, which has seriously affected business, especially in the great copper mines and smelters about Butte and Great Falls, was finally settled May 2d, at a conference held by officers of the company and representatives of the men. The latter receive a part of their demands, 75% of the reduction in wages being restored. Traffic on the road was fully resumed on May 3d, the strikers all returning to work.

Deer Lodge County.

Ontario Mining Company.—This company, at Elliston, says the Helena "Independent," has completed the erection of a mill at the mine, which has just been thoroughly tested. The mill was built for 50 tons, but about 75 tons are being put through it daily, and the percentage of waste in the tailings is small. It is the intention to double its capacity by next year. The mill was built from plans drawn by William Carkeek, of the Butte & Boston concentrator. It is built close to the tunnel of the mine and cars run out of the mine right into the mill. The Ontario is owned by Mr. Dyer, who is an old timer in Butte, Cornelius Hedges, O. A. Southmaid and A. C. Logan, of Helena, and William Job, of Elliston, who is superintendent of the mine. The mine produces mostly gold, some silver and a small per cent. of lead and is worked through a tunnel which taps the lead 175 ft. down. A shaft 28 ft. deep is sunk at the end of the tunnel, which is soon to be sunk deeper. It is also the intention to put in another hoist soon and sink another shaft.

Rock Creek District.—A number of placer claims have been taken up in this district west of Phillipsburg and will be worked this season.

Madison County.

Hawkeye Group.—Mr. Moffatt, of Butte, has been examining this group, which includes the Mauch Chunk, Hawkeye and Strongboy lodes, in Ramshorn gulch, about 10 miles from Virginia City. The first-named mine is opened to a depth of 45 ft., with a 60 ft. crosscut, showing silver ore which assays, with a small streak of rich gold ore and a 3-ft. stratum of clay which yields.

Ruby Mine.—This mine, two miles from Virginia City, is now operated by Dacius Brothers, who have a shaft down 127 ft. and are running a tunnel along the vein, which is at present 18 in. wide and shows well in gold.

Ruby.—This mine, at Summit, has been started up again, the water having been pumped out.

Missoula County.

Chickamain Mine.—The new concentrator at this company's mine at Lo-Lo is working well, and shipments of concentrates will soon be made.

Iron Mountain Mining Company.—Since ore shipments ceased at this mine about 40 men have been employed in sinking the shaft and otherwise developing the mine for more extensive operations. The development work has been very satisfactory, and the mine is said to look better as the shaft gets deeper. It has been extended between 300 and 400 ft. since the new work was begun, and the sinking is still progressing rapidly.

Nine-Mile Mining Company.—On this company's property at Martina new work is being pushed as fast as possible on the ore body lately discovered. The only delay is caused by the large amount of water.

War Eagle Group.—Patrick Clark, H. L. Frank and John Noyes have purchased this group of gold claims on Trail Creek. The price was $23,500. Sinking is in progress on the War Eagle. The other claims are the Iron Mask and Virginius.

White Cloud.—On this property Superintendent Hamilton is working two shifts of them on prospecting, and developing the mine. Several new locations have been filed in the immediate vicinity of the bonded property, and farther up Eight Mile Creek the prospect holes and location notices are said to be numerous.

Silver Bow County.

A dispatch from Butte says that the Colorado Smelter in that city, was burned down April 28th. All that remains is the southeast corner of the furnace building. The fire started in the south wing of the smelter, occupied by the O'Harra furnace. The tramway connecting the smelter and concentrator was hastily torn down and in this way the concentrator was saved. The machinery, furnaces, etc., were not greatly damaged. The loss is estimated from $100,000 to $150,000, which is covered by insurance. It is stated that the company will rebuild, but this will take six months. The smelter

employed 150 men and its burning necessitates the closing of the Gagnon mine.

Alice.—This mine has some 60 men working the mine on lease, who are reported to be doing well. The mill is running steadily on custom ore from the leasers.

Amy-Silversmith.—The United States Supreme Court has denied the petition for a rehearing in the noted case of King vs. The Amy-Silversmith Mining Company. This closes the attempt to reverse the decision, which has been fully given and commented on by the "Engineering and Mining Journal."

Boston & Montana Mining Company.—Superintendent Couch some time ago began experiments with the mine water at the Leonard shaft. The analysis of the water shows it to carry copper. This was considered favorable, and Captain Couch immediately had tanks constructed. At the Leonard shaft eight tanks are now catching the copper in solution with old iron, and additional tanks are being made. A considerable quantity of copper is being saved.

Lexington.—Some of the tributors who have been working in this mine have left, owing to a difficulty with the company about the division of expenses.

NEVADA.

Lincoln County.

Jim Crow and Monitor Mines.—The Jim Crow and this gold mine, in the Ferguson district, have been sold to J. R. De Lamar, of Idaho. For the Jim Crow the owners received $66,000, and for the Monitor $90,000. The titles to both mines were in litigation, and the owners could not afford to settle the matter in the courts and therefore parted with their holdings at the prices mentioned. In the Jim Crow the ore body is said to be from 14 ft. to 18 ft. wide, and the rock assays as high as $100 a ton. The ore is hauled by wagon from the mine to Dry Valley and there treated in a 20-stamp mill, of which but 10 stamps are now being operated. The mill is running continuously. The result of a 20 days' run on Jim Crow ore recently returned nearly $30,000.

Storey County—Comstock Lode.

The latest weekly official letters from the superintendents of Comstock mines are as follows:

Belcher Mining Company.—On the 850 level we have cleaned out and retimbered 25 ft. of the main north drift, making its total length 390 ft. from the shaft. Thirty-five tons of fair-grade ore have been hoisted during the week.

Bullion Mining Company.—The west drift from the station, 820 ft. level, is out 760 ft. Progress has been slower than usual, due to soft ground with a considerable amount of water running through it, necessitating careful timbering.

Chollar Mining Company.—The north drift, 100 level, has been extended to a total length of 170 ft.; face in soft vein material composed of porphyry and streaks of quartz. The west crosscut on 100 level, 300 ft. south of north line, has been extended to a total length of 166 ft.; face in porphyry with streaks of low grade quartz through it.

Potosi Mining Company.—The south drift on the 450 level has been advanced to a total length of 369 ft.; face in porphyry, the ore streak having passed to the west of the drift. The south drift, 50 ft. above the 450 level, is out 104 ft.; face in clay and soft porphyry.

Savage Mining Company.—On the 1050 level the north drift from the station was advanced to a total length of 82 ft. The south drift was advanced to a distance of 190 ft. from the shaft; face is in quartz and porphyry. In the west crosscut from the southeast drift, started at a point 225 ft. from the shaft, they have stoped some pay ore. The upraise in the north drift, started from the east drift at a point 85 ft. south of the shaft, is advanced 18 ft.; top is in quartz giving low assays. On the 1100 level the north drift from the shaft was advanced 16 ft., making its total length 178 ft.; face is in favorable looking quartz and porphyry. On the 12th floor we continue to extract some pay ore. During the week they hoisted 34 cars of ore, car samples averaging $36.11.

Sierra Nevada Mining Company.—The south lateral drift from the intermediate tunnel has been advanced to a total length of 659 ft.; face in hard porphyry. The joint west crosscut near north line of Union, from north drift 1,520 ft. west of shaft, 900 level, has been advanced to a total length of 35 ft.; face in hard prophyry. In the Union shaft we have started a joint west crosscut near north line of the Union mine, from north drift 1,520 ft. west of shaft, 900 level, and advanced to a total length of 35 ft.; face in hard porphyry.

(From our Special Correspondent.)

The following is the weekly tabulated statement of ore hoisted from Comstock mines and milled, with the average car sample and battery assays, bullion product, etc.:

Mines.	Ore H'st'd	Car S'mple Assay.	Ore Mil'd	Av. Bat'ry Assay.	Bullion for Week.	Total.
Belcher...	35[1]	.....	.....	.....	.....	.....
Con. Cal. & Va.	38[2]	$76.70	.....	.....	.....	.....
Savage ...	34[3]	36.11	.....	.....	.....	.....
Seg. Belch'r	[4]	.....	.....	.....	.....	.....

[1] Good grade ore. [2] and [3] Cars of ore. [4] Few tons being saved of good grade from the 1,150 level.

Belcher Mining Company.—While the official reports from the mine have not contained any news of a particularly encouraging character, it is now an open secret that a strike of some importance has been made on the 850 level. In 1871, when this ground was first opened, good ore was found, but with the methods then obtaining it was not regarded as rich by any means, and it was neglected.

Consolidated California & Virginia Mining Company.—South of the winze, about 120 ft., and 20 ft. below the side floor of the 1,650 level, 6 ft. of ore has been cut. It is now intended to return to the 1,750 level and endeavor to get beneath the ore exposed on the 1,650 level. While the superintendent's report shows the average assay to have been only $76.70, some of the ore ran as high as $570 per ton.

NEW MEXICO.

Grant County.

Ivanhoe Mining and Smelting Company.—This company's smelter at Ivanhoe started up on April 19th. Everything in and about the works is running well. The smelter is turning out 5 tons of copper matte per day. The matte carries 60% copper, 40 to 50 oz. silver and 1 oz. of gold per ton, says the Silver City "Enterprise." The ore body in sight in the mine is over 20 ft. wide and sufficient ore is now developed in sight for a year's run. A carload of matte was shipped last week and regular shipments will be kept up hereafter. There are several other good prospects in the vicinity of the Ivanhoe.

OREGON.

Baker County.

Shuck & McCord.—This claim is near the Virtue mine, and the owners report a vein 2 ft. wide carrying sulphurets, copper and gold. They are now running a tunnel to strike the vein at a depth of 200 ft.

Union County.

Chicago Gold Mining and Milling Company.—This company has been organized to work a group of nine claims, including the Ollie Woodman mine, in Sparta district. The company's office is in Baker City. The capital stock is $200,000. The following officers and directors have been elected: President, W. H. Hackney; secretary and treasurer, J. C. Austin; general superintendent, L. Durkee; directors, W. H. Hackney, J. C. Austin, P. Basche, J. L. Rand and L. Durkee.

Dolly Varden.—Mr. J. R. Squire, who recently took a half-interest in this mine, has bought a 10-stamp mill, which will soon be in place at the mine.

Gem.—An option on this mine, near Sparta, has been taken by C. M. Donaldson, who has bought pumps and hoisting machinery, and intends to begin work at once.

PENNSYLVANIA.

Anthracite Coal.

The wages of the coal miners and workers of the Schuylkill coal region were materially reduced on April 30th by the drawing of the Schuylkill Coal Exchange Committee of the usual number of 5 collieries. It has been determined that wages are to be 5% below the $2.50 basis to the last half of April and the first half of May. The wages for the preceding month were 1% below the regular basis.

A synopsis of Mine Inspector John Maguire's report for the Eighth Anthracite District shows that 3,066,092 tons of coal were produced in this district last year, against 3,178,009 tons for the year previous. In order to get out this quantity of coal 50,455 kegs of powder and 213,176 lbs. of high explosives were used. There were 10,677 men and boys employed at 42 collieries, and an average number of 208 days were worked. The Lincoln Colliery heads the list with the largest shipment, which was 359,114 tons. During the year there were 27 fatal accidents, as compared with 50 for 1892. In 1893 there were 44 non-fatal accidents. In 1892 there were 52. In 1893 the quantity of coal mined per life lost was 117,704 tons, and the quantity per person injured was 72,227 tons. The ratio of employees per life lost in 1892 was 212, and in 1893 it was 395. The coal mined per employee in 1892 was 294·3 tons, and in 1893 it was 297·6. The 10,677 men and boys employed in 1893 are classified as follows: Inside foremen, 112; miners, 2,773; miners' laborers, 1,011; all other company men, 1,965; drivers and runners, 442; door boys and helpers, 166; total employed inside, 6,440. Outside foremen, 47; blacksmiths and carpenters, 285; engineers and firemen, 390; slate pickers, 1,751; all other company employees, 1,700; superintendents, bookkeepers, clerks, 48; total outside, 4,230.

Coxe Brothers & Co. have notified their employees at Tombicken that the colliery there would be started up on full time as soon as the breaker could be gotten in readiness. The colliery has been idle for some months and is one of the largest in the region. About 500 men will be given work.

Packer Colliery No. 5.—A press dispatch from Pottsville says that the fire in No. 3 slope of Packer Colliery, No. 5, which broke out on May 1st, is still raging fiercely, and the men have been working to extinguish the fire under the greatest difficulties. The men work in relays, and can continue at work only a short time, owing to the bad air. The workmen are now within 200 ft. of the fire. The fire is between the imprisoned men and the rescuers. The work is being pushed with much vigor. It is now certain that the two men are dead.

Slate.

Shipments of roofing slate from Pen Argyl average six carloads per day.

SOUTH DAKOTA.

Lawrence County.

Black Hills Gold and Silver Extraction and Mining Company.—This company's cyanide plant was last week started on ore from the Black Tail Gulch property, to test the crushing machinery. The plant will not be started for continuous operation until rollers shall be adjusted to crush to the degree (40 mesh) desired. This will probably be effected within a week.

Deadwood & Delaware Smelting Company.—Professor Austin, of the Austin pyritic smelting process, recently made overtures to this company for the lease of its smelter, says the Deadwood "Pioneer." His offer was, however, rejected, as the company will shortly blow the plant in for continuous operation.

Homestake Mining Company.—The contract has been let to sink the Star shaft of the Homestake mine 100 ft. deeper, says the Deadwood "Pioneer." The shaft is now down 800 ft. Superintendent Grier will meet delegates from the Central City Miners' Union to talk over the question of the resumption of mining operations in the Caledonia and Terra mines, owned by this company.

UTAH.

Beaver County.

Cactus Mining Company.—This company has closed down its works in Copper Gulch. The company has quite a body of copper ore which will have to be treated on the ground, and it is thought a concentrating plant will be put up when work is resumed.

Copper Mountain Mining and Milling Company.—In Beaver Lake district this company is developing a group of copper claims on which there is a ledge 2 to 14 ft. wide in the lime granite contact. The ledge contains some high grade ore, although the average is not probably more than 9%; the ore also carries some silver and gold, the gold running about $4 to the ton. The company is experimenting with a leaching process. The property is situated about six miles from the railroad and the Beaver River.

Horn Silver Mining Company.—This company has been very active since the fire, and has made quite an improvement already. The old hoist was not destroyed by the fire, and with this the first three levels of the mine can be worked: half the former output of ore will be extracted and shipped. The rebuilding of the hoisting works and mill will be commenced as soon as the material arrives.

Salt Lake County.

The shipments of ore and bullion from Salt Lake City during the week ending April 21 were as follows: Bullion, 539,394 lbs; copper bullion, 33,975 lbs.; silver and lead ore, 1,194,290 lbs. The receipts of ore and bullion at Salt Lake City for the week ending April 25 were to the aggregate of $104,291, of which $79,291 was in bullion and $25,000 in ore. The receipts of Pennsylvania bullion amounted to $19,290; Hanauer bullion, $13,175; base bullion, $16,510; bullion, $6,104, Ontario bullion, $15,590; Daly bullion, $8,602.

Stewart.—The final arrangements for the taking up of the bond on this mine at Bingham have been made, and the property is now in the hands of the Egan syndicate, says the Salt Lake "Tribune." The bond called for $150,000. Of this amount $110,000 has been paid, and the remainder is due in one year. The property was originally owned by Salisbury & Gilmer, and was bonded by T. Egan, E. D. Egan and Jud Bates, who are now the owners. The ore body is in places 200 ft. wide. The ore is free gold, and averages about $9 20 to the ton. There are five Huntington mills on the property, with a daily capacity of about 60 tons. The mill saves about 75% of the gold in the ore. It has been in operation about six months, and over $100,000 has been taken out in gold.

Summit County.

Ontario Mining Company.—In speaking to a Salt Lake "Herald" representative of the recent strike of a heavy flow of water in the Ontario drain tunnel, Superintendent Chambers said: We have withdrawn the men from the face of the tunnel and are working the full force in retimbering the swelling ground along the course of the workings. It may be some time before operations are resumed at the face, for the reason that it has been deemed expedient to allow the water to drain off. Although the flow is gradually reducing, the water is still pouring out of the channel tunnel in a stream 5 ft. wide and 18 in. deep. This water is being carried out of the tunnel under the sills, and, beyond the delay in the work, is causing no inconvenience. Present indications are that the flow will exhaust itself in the very near future, as it is evident the stream is coming from an underground reservoir. The great flow was encountered on April 15th, while I was in California. At both the Daly and Ontario the usual forces of men are being employed and shipments are regular. The hauling of ore from the mines to the mill has been resumed.

VIRGINIA.

Norfolk & Western Railroad Company.—At the annual meeting in Roanoke, Va., May 2d, the following directors were elected: F. J. Kimball, C.

H. Clark, Joseph I. Doran, Richard Brock, Samuel A. Crozer, A. J. Dull, U. L. Boyce, Walter H. Taylor, Howland Davis, Henry Whelen, Jr., Harry F. West, Harold M. Syll, Wm. B. Campbell. The directors subsequently re-elected all of the officers of last year.

WEST VIRGINIA.

Greenbrier County.

Clinch Valley Coal and Iron Company.—This company, it is stated, will soon resume work on its mines at Richlands.

Kanawha County.

Big Mountain Mining Company.—This company has been organized with a capital stock of $200,000. The incorporators are George S. Couch, Neil Robinson, and E. B. Knight, of Charleston, and J. G. W. Tompkins and Amelia Tompkins, of Cedar Grove.

WISCONSIN.

Iron—Gogebic Range.

The first ore boat of the season, the "Frontenac," arrived at Ashland April 27th, and received its load of 2,100 tons of iron ore on the following day.

The railroads have made a reduction of 13c. per ton on ore freights from Gogebic mines to Ashland.

WYOMING.

Albany County.

Big Laramie Placers.—A new district has been organized on the upper tributaries of the Big Laramie River, and a large number of claims have been taken up.

Douglas Consolidated Placer Mining Company.—This company is now controlled by C. W. Bramel, who is making arrangements to develop the property.

Emma G.—In the neighborhood of this mine a new discovery has been made. The vein is said to carry over 60% lead, with a considerable proportion of silver and lead. The vein is to be developed.

FOREIGN MINING NEWS.

BURMA.

The Burma Coal Company, Limited.—The original workings, which consisted of three inclines of 100 ft., were found too steep, and a main incline has been driven to the depth of 600 ft., but the existing appliances will not admit of an increased out-turn. Additional galleries have been driven and faces opened, while the tramway has been resurveyed in order to reduce the heavy gradients and curves which renders it impossible for one locomotive to perform all the hauling. The results for the year 1893 were not encouraging.

FORMOSA.

It is reported that the Formosan Government will soon turn over the Kelung government mines, which cover an area of 2½ square miles, to a syndicate of native miners, and that the government will be charged only $2.25 per ton whenever a demand for coal is made by the Formosa steamers.

MEXICO.

Michoacan.

Luz de Borda.—Recent advices from this mine, says the "Mexican Financier," at Tlalpujahua, confirm the report as to an important strike of ore. The vein is 20 in. wide, and carries as high as 12 oz. in gold and 900 oz. in silver. Development work is being rapidly carried on. The present manager expects to be able to two ship or three carloads to Monterey within a short time.

SIAM.

Through the courtesy of Mr. W. De Miller, director of the Road Department of Mines and Geology, at Bangkok, Siam, we are in receipt of the following outline of conditions under which prospecting licenses and mining laws are granted in that country. The principal minerals found there are gold, silver, lead, copper, tin, iron, coal, rubies, sapphire, occasionally some diamonds, cinnabar, salt and indications of petroleum:

1. Prospecting licenses are granted for a period of 12 months from date of issue and extend over the whole of the province for which they are taken out; the fee is 40 ticals, and necessary passports accompany them.

2. Exclusive prospecting licenses may be taken out for a specific area (of which a sketch plan should be supplied), and the area is secured for prospecting purposes to the holder of the license.

The other conditions are the same as for prospecting licenses except that the fee is 80 ticals; the license gives ordinary rights over all the remainder of the province.

Both the above are renewable.

3. Leases of mining areas are given to holders of prospecting licenses. The application should be accompanied by a sketch plan of the area required, and fairly representative samples.

4. The term is 25 years, renewable if desired.

5. The size of the areas are as follows: (I) 30 acres on a well known lode within five miles of an existing mining area. (II) 80 acres on a new lode within five miles of an existing mining area. (III) 150 acres on a new lode in a new mining district. (IV) 150 acres, 240 acres and 450 acres respectively in the case of quarries, placer, iron and coal mines. (V) 5 acres for mill sites outside mining area when necessary.

6. The number of areas taken up need only be limited by the pecuniary position of the grantee.

7. The stamp fee on the signing of the indenture of lease of each area is 50 ticals (Tics. 50).

8. The royalties payable are: 3% on the gross product on gold and precious stones; 2½% on the gross product on coal, lignite and iron; 4% on the gross product on all other metals and minerals.

9. The yearly rent is at the rate of 2 ticals per acre; royalties and rent are payable half-yearly.

10. Necessary passports accompany the indenture of lease.

11. The lessee's covenants include supplying the department with an accurate map of the area and work, and samples of geological and mineralogical specimens met with, erecting boundary marks, continuing active work, etc. In case any area does not pay, it may be, under certain conditions, surrendered at any time during the 25 years.

12. The lessee of a mining area is required to have an agent in Bangkok registered at the office of the department.

SOUTH ARFICA.

Natal.

The report of the commissioners of mines of this colony for the year ending June 30th, 1893, says that a number of diamond drill borings made at the cost of the government have shown the existence of valuable coal seams, but no new workings have been undertaken. The output of coal for the year was 129,255 long tons, a slight increase over the preceding year. Of this output 105,068 tons were from the Dundee colliery and 12,797 tons from the Newcastle colliery, the remainder coming from eight small workings. The average number of employes was 834, of whom 40 were white men, 630 natives and 104 East Indians. Three men were killed and five injured by accident.

The production of gold reported for the year was 333 oz., of which 224 oz. were from the Alexandra district, and 91 oz. from the Umvoti and Umsinga districts.

The only other product of importance is lime, of which the Aiken kilns at Umzimkulu made 54,000 lbs. during the year, from limestone quarried in the vicinity.

Transvaal.

African Gold Recovery Company.—This company reports that the amount of gold obtained in the Witwatersrand district by the cyanide process in March was 56,000 oz., making a total of 158,500 oz. for the three months ending March 31st.

SOUTH AUSTRALIA.

(From our Special Correspondent.)

In the matter of coal deposits South Australia resembles the United States. For many years it was asserted by geologists that coal could never be found in this portion of the great island continent, although extensive mines had been long worked in the eastern colony of New South Wales. But in the year 1862, when traveling through the bush, about 370 miles north of Adelaide, I noticed certain rocks which appeared to me to indicate the probable proximity of a coal deposit; the rocks were red sandstone, mountain limestone and ironstone. Being engaged in collecting materials for a work on the mines of South Australia, the discovery of the indications alluded to was duly recorded therein. About 22 years after this, and a few miles to the west of the locality where I came upon the rocks named, a discovery of a peculiar coal was accidentally made in the excavation of a reservoir for water for railway purposes. A dark-colored shale was found with impressions of ferns belonging to a carboniferous period, and which on their being shown to me were at once identified. Subsequently two or three pits were sunk and further indications met with, and then two bore-holes were put down; the first, near the eastern edge of the basin-like formation, struck an inferior kind of coal at 129 ft. from surface, and the other, near the center of the deposit and a mile to the southwest of the first bore, struck a seam of coal at the depth of 1,496 ft. 8 in., after passing through about 1,470 ft. of dark shale, with occasional thin bands of sandstone and ironstone. Some of these bands were only an inch thick, and the thickest was 2 ft., one 12 in., one 8 in. Some of the shale contained a little oil and was inflammable. The seam of coal was 17 ft. 10 in. thick, but the nature of it was very different from English or New South Wales coal, being a non-coking coal of a dull brownish black, producing scarcely any smoke, depositing no soot, and once alight burning away, the only residum being a light gray ash. A shaft was sunk near No. 1 bore, cutting through about 25 ft. of carbonacious matter, the central half of which was fairly good fuel, and some of it good coal. It answered well enough for steam raising or for house use, but not being of first-class quality, a second shaft was sunk about 500 yards to the southwest of the first, and a better defined seam of superior coal was cut at 239 ft. from the surface, and proved to be 48 ft. thick, and dipping away in the direction of No. 2 bore, where the same seam was passed through and measuring within 2 in. of the same thickness. There has unfortunately been a great deal of mismanagement in connection with the mine and comparatively little has been done to open it up, but a new board of directors has been elected, who, it is hoped, will shortly get the works in proper order for placing the coal on the market.

The only fault to be found with the coal is that on exposure to the atmosphere for a few weeks it is apt to disintegrate. Consequently, to produce a thoroughly good marketable article, it must be made into briquettes. A trial of the coal was made recently in the boiler furnaces on Block 14 mine at Broken Hill, under my own superintendence; 10 tons 5 cwt. were burned in three furnaces, the time occupied being 15¼ hours, during which 8,300 imperial gallons of water (fed into the boilers at 160°) were evaporated. The conditions were not entirely favorable, as the coal from being roughly knocked about had been broken up very small, and being noncaking considerable waste resulted. However the heat it gave out was superior to Newcastle coal. In comparison with the latter, one ton of Leigh's Creek coal, burning for one hour, evaporated 52·24 gals. of water; and one ton of Newcastle coal evaporated 45·42 gals. under the same conditions, thus giving 6·82 gals., or nearly 14% of heating power in favor of our coal. The mine is situated close alongside the Great Northern Railway line, and 168 miles north of Port Augusta, one of our principal outports. The carboniferous area extends about 16 miles from south to north, along a depression in the land, probably the bed of some old river. Its average breadth is between two and three miles. When the colliery is in full operation it should prove the most important mineral discovery we have ever had in South Australia.

SPAIN.

The following table shows iron ore exports in tons from January 1st to March 31st, except for Bilbao, for which port the figures are brought down to April 5th:

	1893.	1894.
From Bilbao	1,143,085	1,082,025
From Salta Caballo	37,960	51 835
From Dicido	17,891	23,350
Total	1,198,936	1,157,210

There is thus a slight decrease shown—the increases of 13,000 tons at Salta Caballo and of 5,000 tons at Decido being more than counterbalanced by the decrease at Bilbao. The larger part of the exports were to Great Britain, but some ore went to Belgium and to Germany.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 4.

Statement of shipments of anthracite coal (approximated) for week ending April 28th, 1894, compared with the corresponding period last year:

	1894. Tons.	1893. Tons.	Difference.
Wyoming region	396,452	455,744	Dec. 59,292
Lehigh region	138,408	155.665	" 17.257
Schuylkill region	217,480	232,645	" 15,165
Totals	752,340	844,054	Dec. 91,714
Total for year to date	9,992,073	13,200,139	Dec. 3,208,066

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending April 28th and year from January 1st:

Shipped East and North:	1894. Week.	1894. Year.	1893. Year.
Phila. & Erie R. R.	1,573	27,807	40,532
Cumberland, Md.	103.443	1,081,168	1,267,708
Barclay, Pa.	493	8,209	23,506
Broad Top, Pa	*8,721	122,593	263,253
Clearfield, Pa.	13,488	1,111,471	1,425,942
Allegheny, Pa.	8,723	469,862	446,109
Beech Creek, Pa.	†42,721	778,214	617,700
Pocahontas Flat Top	*55,334	791.951	953.143
Kanawha, W. Va.	*55,392	793,833	1,029,975
Totals	289.893	5,123.108	6,067,868

* Week ending April 14th. † Estimated.

Shipped West:	1894. Week.	1894. Year.	1893 Year.
Pittsburg, Pa.	21,463	448,508	435,685
Westmoreland, Pa.	†14,014	485,854	697,866
Monongahela, Pa.	3,144	162,229	219,728
Totals	38,621	1,096,591	1,353,279
Grand totals	328,514	6,2·9,699	7,421,147

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending April 28th, 1894, and year from January 1st, in tons of 2,000 lbs.: Week, 46,565 tons; year, 1,069,137 tons; to corresponding date in 1892, 1,867,321 tons.

Anthracite.

The anthracite coal trade has settled itself to a period of dullness. Business during the past week has been very quiet, the little spurt of the preceding fortnight having been of a spasmodic nature. There has been but little or no more disposition on the part of dealers here to buy at the present time than they have manifested at any time during the past two or three months. That the market will take the May allotment is expected by the producers, but no more.

There is some difference of opinion in the trade as to the probability of an advance in prices next month. Just now, it looks as though no advance would take place. The only argument adduced in its favor by the parties chiefly interested, namely, the producers, is that such a course would "stimulate" business, the dealers hastening to buy at May prices, knowing them to be as low as they will be at any time this year from now on. The consumer continues to believe, however, that he will have no great difficulty in getting present prices for quite some time yet, despite the fact that the operators point to their success in restricting the output as an indication that prices cannot be weakened by an accumulation of stocks. We are informed by a sales agent who was present at last week's meeting that

the matter of June prices was not discussed then. A canvass of the trade shows that the opinions of the agents are divided on this subject. At any rate, the market continues dull and featureless and buyers do not seem to be disturbed by doubts as to whether the advance will take place or not.

Prices for such business as there is are being fairly well maintained. Doubtless, concessions would be made for desirable orders, but that holds true in almost every business. We do not hear of any significant cutting.

The bituminous coal miners' strike continues, but it has not had any effect as yet on the anthracite market. All the talk about burners of soft coal being driven into the use of anthracite has not been founded on either facts or sense.

The Lehigh Valley Railroad Company has made a general reduction on anthracite freight rates from the mines to Perth Amboy and various other points. The reduction amounts to 20c. a ton and applies only to prepared sizes of coal. The rate on pea coal after May 10th will be only 10c. less than on the prepared sizes, instead of 30c. less as it is now. The officials of the company on May 1st issued circulars giving the new rates. The reduction amounts to 20c. per ton in most instances, but on shipments to certain points from 5 to 15c. only will be taken off the present rate. Thus on shipments from the mines to points on the Morris Canal the rate at present ranges from $1.60 to $1.85 per ton, according to locality, while the new schedule will be $1.50@$1.65 per ton. On shipments from the mines to points on the Staten Island Rapid Transit Railroad, and to points reached via the Jersey City Terminal and float, the tolls will be lowered from $2.00 to $1.80, a direct cut of 20c. per ton. The same cut is made in the rate from the mines to points on the Easton & Amboy, and on coal to be shipped from Perth Amboy, which is reduced from $1.70 to $1.50 per ton. This reduction will give Perth Amboy the advantage over Port Richmond as a point of shipment, and it is not unlikely that the Reading company may lower its tolls to conform with those just announced by the Lehigh Valley.

The Reading Railroad reports that its coal shipment (estimated) for last week, ending April 28th, was 190,000 tons, of which 12,000 tons were sent to Port Richmond and 22,000 tons were sent to New York waters.

NOTES OF THE WEEK.

The statement of the Philadelphia & Reading Coal and Iron Company for March and the four months of the fiscal year from December 1st to March 31st is as follows :

	March.	Four months.
Gross earnings	$1,247,509	$6,591,271
Gross expenses	1,320,579	6,678,763
Loss from mining	$73,070	$87,492
Fixed charges	122,209	447,170
Total deficit	$195,279	$534,662

As compared with 1893 the month of March showed a decrease of $727,157, or 36·8%, in earnings, and of $572,644, or 30·3%, in expenses. For the four months there was a decrease of $890,361, or 11·9% in earnings, and of $795,413, or 10·6%, in expenses.

Bituminous.

All soft coal producers whose mines are in operation are overwhelmed with orders from their regular customers, without taking into account demands from others, and they are working their mines to their full capacity in an effort to give to their regular trade all the coal required by it. Full Seaboard Steam Coal Association rates are exacted of customers who have not yet contracted for the season's supply, and only the full contract price of those who have done so. Very little coal has been used to speculate with for higher prices, and that has been done nearly entirely by middlemen who have contracted with the producers for their season's supplies, and are to procure the cargoes in that way. Some of the "shady" customers are being thrown over by the producers; the necessities of consumers are being supplied as well as the circumstances permit. The stocks on hand in vessels loaded with coal mined before the strike commenced, by producers whose men are now out, were much larger than was anticipated, permitting them to supply their customers to a limited extent.

The large shipments of the operators who are now producing have brought about a shortage in some kinds of cars, but, generally speaking, the car supply is good. Those cars that were usually appropriated for regions now on strike have been supplied to the active regions. All rail trade is making its quota of the demands on the present output. The situation in regard to the strike seems to be little changed from last week. There have been reports during the week that the entire New River region was out, but they are hard to verify.

The agitators are very active in both the Pocahontas and the George's Creek regions, but they have met with a great deal of opposition from the miners themselves. Meetings that have been called, time and again, have received no attention and the agitators have adjourned them in several instances with the remark that they were not representative of the miners themselves, most of those who attended being boys under age, and a great portion of the rest outsiders not employed at the mines.

Trade local to the shipping ports stocked up fairly well before the strike commenced, and the necessities of the few who did not are being cared for. New York harbor trade is much in the same condition, and steamer trade is being supplied from the coal stocked in barges before the strike and held since then. The transportation of coal is good and the blockades that were during the last two weeks are gradually working out.

In the coastwise vessel market vessels are in good supply with rates about as they ruled last week.

We quote current ocean freight rates as follows from Philadelphia: To Boston, Salem, Portland, 65 @70c.; Providence, New Bedford, New Haven and Bridgeport, 60c.; Portsmouth and Bath, 65@70c.; Wareham, 80c.; Newburyport and Lynn, 75@80c.; Gardiner, 65@70c. and towages; Bangor, 70@75c.; Allyn's Point, 65c.; Saco, 85c. alongside and towages; Dover, $1 alongside and towages. From Norfolk, Newport News, Baltimore and Georgetown, 5@10c. above these rates. Barges for New York harbor trade are still scarce rates are at 18c. alongside.

Boston. May 3.

(From our Special Correspondent.)

The week has been a decidedly quiet one in anthracite coal, that is domestic sizes; and as far as actual transactions go, we might say that the steam sizes have been quiet also. There has been considerably inquiry for them, but the companies have not had any to sell. Pea coal, which is the most called for, is said to be worth anywhere from $3 to $3.25 per ton f. o. b. New York. The Philadelphia & Reading Railroad Company's local agent says that company has not a ton of pea coal to sell north of Cape Cod this year owing to the great demand there is for it elsewhere. If the strike among the bituminous miners continues for any lengthy period a premium will undoubtedly be offered for these small sizes.

Companies' prices remain about the same, viz.: Stove, $3.75; egg, $3.50; free broken; $3.50, and chestnut, $3.75. Individual's coals are about 10c. per ton less.

In bituminous coal the situation is in a way quite interesting, that is so far as the strike is concerned. As for the Boston market, it is very quiet. No one has any soft coal to sell, and those companies that are operating find it as much as they can do to supply the wants of their somewhat excited customers. Shippers have been making strenuous efforts to secure tonnage to go to Southern ports, and bring forward all the coal they can. Vessels have been chartered at 10c. advance, with rate guaranteed providing there is not a cargo obtainable when the vessel arrives at its destination. Although there are no prices for coal on cars here, as all the coal coming is for customers who have contracted for supplies ahead, the following would be the nominal rate: Bituminous, $3 50@$3.60; New River, $3.35@$3.50, and Clearfield, $3.30.

Freight rates are as follows: From Portland to Boston, Portland and Salem, 65c.; to New Haven, Allyn's Point, New London and Providence, 60c.; to Portsmouth, 70c.; to Newburyport, 85c.; from New York to Boston 50c. for barges and 70c. for vessels; from Baltimore, 75c.; from Newport News, 70c.

The retail trade is quiet and prices are steady. Boston retail prices are: Stove, $5.25; nut, $5.25; egg, $5; furnace, $5; Franklin, $7; Lehigh egg, $5; Leigh furnace, $5; soft coal, $3 75@$4.

Buffalo. May 3.

(From our Special Correspondent.)

The demand for anthracite coal is now quite large, in consequence of the difficulty of obtaining bituminous at any price—through the labor troubles in the mining district. The scarcity of bituminous coal is apparent, for the quotation for steamer use is now $3.50 per ton. Lake vessels are making all sorts of shifts to piece out their fuel: many will draw their supplies in future from Duluth and Superior, where there is large quantities left over from 1893. The particulars of the great coal strike are familiar to the readers of the "Engineering and Mining Journal," therefore further allusion is unnecessary. It is to be hoped that the employers and the employed will come to terms at an early day.

The shipments of coal by lake from April 23d to the 30th, both days inclusive, aggregated 41,740 net tons distributed as follows: 17,650 to Chicago, 10,100 to Milwaukee, 10,165 to Duluth, 2,200 to Superior, 625 to Toledo and 1,000 to Gladstone. From the opening of navigation to May 1st 110,907 net tons in all were shipped as compared with 178,044 net tons in 1893; a decrease this year of 67,137 net tons. The rates of freight in 1894 were 25c. to all ports exceptIng Duluth, which were 15c.; in 1893 the rates were 60c. to Chicago, Green Bay and Milwaukee, 50 to Duluth and Lake Superior ports, 40c. to Bay City and Saginaw and 25c. to Toledo and Detroit.

Two propellers were chartered at Oswego last week with coal. The Milwaukee rate was 50c. and Racine rate 60c.

Two loads of coal were shipped by canal from this port to Syracuse last week; the rate paid was 45 per net ton, owner paying charges for loading and unloading.

The Board of Public Works opened bids Monday for supplying the water-works with fuel; they were as follows: The Buffalo Natural Gas Fuel Company, $3 a million gallons pumped; Charles T. Hall, 25,000 tons run of mine coal, $1.74 a ton; the Delaware, Lackawanna & Western Company, anthracite buckwheat and pea mixed, $2.90 a ton; grate, $3.70, and grate delivered $3.85; Donnelly, Dunham & Co., run of mine, net ton, $1.78, and slack quality $1.40; J. E. Gavin & Co., Pittsburg and Youghiogheny minerun $1.84, and best quality of mine run, exclusive of Pittsburg or Youghiogheny, $1.74 a ton; Bell, Lewis & Yates, $1.62½ a ton, run of mine. The soft coal bids were all conditional on the bidders being able to get the coal from the mines, and to be exempt from liability if the strike cuts off the supply.

The Natural Gas Commission of Canada has decided that it is not advisable to interfere by legislation with the pumping or export of gas. This decision is of considerable importance to Buffalo consumers, as our local companies obtain the bulk of their gas from the Canadian wells at Welland. The effort was made by Canadians who wanted gas for their own consumption to secure legislation that would either restrict or prohibit its export, and the basis of their claim was that the Buffalo companies were draining their wells by pumping so that the supply was becoming less day by day.

Chicago. May 2.

(From our Special Correspondent.)

The accumulation of coal in Chicago, made in anticipation of the coal strike, is fast disappearing, and, should shipments not begin again in the course of 10 days, it is safe to say that there will be numerous manufacturing concerns closed down, and many of the high office buildings will be without fuel to run their elevators, etc. Of course this mainly applies to those concerns and buildings whose storage capacity is limited. The railroads are said to be supplied with coal to last them for a month or so, as all of them made ample provision in anticipation of an extended strike. The miners throughout the State of Illinois have quit work almost to a man. At least the greater part of them are out on a sympathy strike, as they had no grievances whatever. Prices have taken a great jump in the soft coal line, the Illinois and Indiana product having increased from 50c. to $1 per ton, and it is likely that prices will go even higher if the strike continues. There are undoubtedly dealers in coal about town who are holding onto their stocks, hoping to realize handsomely by so doing from the advance that is bound to occur should the strike continue. To quote any prices would be absolutely useless, as there are no stated ones at the present time, and dealers are practically making their own quotations.

Coke is almost a rarity in Chicago. It is impossible to buy any large amount of it, and this fact will soon tell on the many furnaces about this vicinity which cannot operate without it. Like coal, it is useless to quote coke prices.

The Chicago Coal Trade Agency has moved its offices from the Hartford Building to the handsome new Champlain Building, on the corner of State street and Madison.

Mr. C. K. Pittman, shipper of anthracite and bituminous coal and coke, has moved from the Rookery building to handsome and much larger offices in the fine new Old Colony Building, at Van Buren and Dearborn streets.

China.

(Special Report by Wheelock & Co., Shanghai, March 30.)

Steamers to Nagasaki can find such a small amount of coal that they are gradually dropping out of the trade. In Japan a decided improvement is noted, and a comparatively good business is being done in Moji coals of all kinds, most noticeable being sales of Onoura at Tls. 4·00 per ton, and Kanada at Tls. 4·20 per ton ex godown, while Namazuta lump changed hands at Tls. 4·75 per ton. There seems to be a dearth of coal in Japan, one pit, the Shennew, having to be shut down on account of fire, and the others turning out only enough for local consumption. There is very slight inquiry for Cardiff coal.

With Australian—Wollongong—prices not given, as the natives are always ready to undersell, but as deliveries have been larger than for some time past no decline is anticipated. Nothing has been done in American anthracite for some time, nor is likely to be. The following are the prices in taels per ton, and the tone of the market: Cardiff, ex godown, 11·00, steady; American anthracite, ex ship, 11·50, firm; Sydney, Wollongong, steamer cargo, ex godown, 8·50, firm; Newcastle, N. S. W., ex godown, 8·00, no stock; Japan, Takasima lump, ex godown, 6·00, scarce; Japan, Takasima small, ex godown, 4·00, none for sale; Miiké lump, ex godown, 5·75, firm; Miiké small, ex godown, 4·75, firm; Imabuko, ex godown, 3·00; Keelung lump, ex godown, 3·50, no stock; Hayama, ex godown, 4·25, firm; Namazuta lump, ex godown, 4·75, firm; Namazuta, dust, ex godown, 3·50 scarce.

Pittsburg. May 3.

(From our Special Correspondent.)

Coal.—The market at present is so unsettled that correct information is very difficult to obtain, as there are parties so wide apart in their opinions in regard to the future of the trade. The lower markets has the largest stock on hand they have held for many years. Pittsburg April shipments were 9,530,000 bushels. Shipments from January 1st to April 30th were: Cincinnati, 17,283,000 bushels; Louisville, 23,871,000 bushels. Total, 41,154,000 bushels. The River mines are all idle; the men refuse to work at any price; there are in the fourth pool 30 coal mines, employing about 5,000 men. The miners' officials say that the coal supply will be exhausted by May 15th and a general famine will follow. The official statements will bear a large amount of shading before you reach the truth. The manufacturers are very conservative and keep their own counsel. Between the coal on hand, natural gas and oil, the mills can be kept running for some

time. There is some talk of towing coal from Cincinnati, but this would be a very risky business owing to the uncertainty of water this season of the year.

Connellsville Coke.—The reports from the coke regions are so conflicting and contradictory that you are in doubt what to believe or whether there is any truth in any of them. There are many thousand men who are anxious to work, have contracted to do so, that have been driven from the pits by force. This ought to be changed. The most of the region is in the control of an irresponsible mob. The Frick scale is a liberal one, and if the men had been guided by wise advisers, would have been adopted, and the strike prevented.

A record of the region shows 11,450 active ovens and 5,355 affected by the strike and about 6,000 at work. The shipments in cars for the week amounted to 5,556 cars distributed as follows: To Pittsburg, 1,881 cars; to points east, 9,975; to points west, 2,688; totals, 5,556. Prices unchanged.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 4, 1894.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending May 5, 1893.		Week ending May 4, 1894.		From Jan., '94.	From Jan., '93.
	F'ces.	Tons.	F'ces.	Tons.	Tons.	Tons.
Anthracite.	74	34,362	34	17,987	598,367	284,119
Coke.....	146	137,095	92	107,561	2,413,077	1,660,546
Charcoal...	37	9,056	18	4,010	167,925	71 228
Totals....	257	180,513	144	129,558	3,179,369	2,015,883

Pig Iron.—To speak of the course of the iron market in detail, involves a monotonous repetition of discouraging things from week to week, namely, that consumers are buying pig iron as they need it and no more, and that the aggregate volume of business is small. The largest foundrymen in this vicinity are still working on reduced time, owing to the lack of orders, and their prospects for future business are not satisfactory. One of the heaviest iron manufacturing concerns in this city reports that its warehouses are full of unsold manufactured articles and they are not now in the market for any raw material. Another large foundryman reports that he is running but three days a week, finishing up odds and ends of old contracts, and that he has not orders enough on hand to keep him at work very long even on reduced time. Some of the smaller consumers are working on full time, but none is very busy, and the best favored of them has not more than 60 days' work on hand. There is, therefore, a lack of demand for bar iron in this market, and when consumers buy it is for prompt delivery. They allow their stocks to run so low before they order any more that sometimes they find themselves without a pound of iron before it has been possible for the furnace to fill his belated order.

The coke strike has had no effect on this market so far as iron is concerned, because of the dullness which had prevailed previous to the labor trouble, and prevails now. What little iron is needed here can be obtained without difficulty. The agents of one of the largest Birmingham, Ala., furnace companies says that he has been obliged to decline some orders this week because they called for very prompt delivery, and the furnaces which he represented, being banked on account of the dearth of fuel, could not ship the iron. On the other hand, the agent of another large Southern coal and iron company reports that his firm continues with the same number of furnaces in blast that were working previous to the strike and that the convict miners had not been interfered with. The greatest sufferers are, of course, the furnaces, in the Pittsburg and Shenango Valley districts. If the coke strike is prolonged to any extent, the foundrymen then will also suffer from the lack of fuel.

Prices are unchanged. The Lowmoor Iron Company, of Virginia, about two weeks ago reduced the price of its No. 2 iron from $12.50 to $12 on dock to regular customers in order to enable them to compete with other consumers who were buying cheaper grades of iron. This reduced price will hold good on orders placed previous to May 15th. Their No. 1 remains at $13. Quotations at tidewater are as follows: Northern brands, No. 1, $12 50 @$13; No. 2, $11.50@$12.50; gray forge, $10.50@$11. Southern irons, No. 1, $12@$13, No. 2, $11@$11.50; No. 1 soft F., $11@$11.50; No. 2 soft F., $10 50@$11.25. Scotch irons are quoted: Coltness, $21.50@$22; Eglinton, $19.50@$20; Summerlee, $20.50@$21.50.

Billets and Rods.—While no business is reported, prices, owing to the coke strike, are somewhat firmer. We quote this week: Domestic billets, $17.50@$18; wire rods, domestic, $27@$27 50; foreign rods, $39@$40.

Manufactured Iron and Steel.—The past week has been quiet in this market, the orders having been few and small. Prices are unchanged, and we quote: Angles, 1·20@1·40; axles, scrap, 1·40@1·60c. delivered; steel, 1·40@1·55c.; bars, common, 1·15@1·30c; refined, 1·25@1·40c. on dock; beams, up to 15 in., 1·35@1·50c; channels, 1·35@1·50c. on dock; steel hoops, 1·45@1·75c., delivered; links and pins, 1·40@1·65c.; plates, flange, 1·60c.@1·80c.: fire-box, 1·80@2·10c.; flange, 1·60@2c.; marine, 2·45@2·70c.; sheared, 1·80c.; shell, 1·40@1·60c.; tank, 1·25@1·35c.; universal mill, 1·20@1·50c.; tees, 1·40@1·60c., all on dock.

Merchant Steel.—There is nothing new to report of this market. It continues quiet, with no change in prices. Quotations continue as follows: Tool steel, 5·75@6·25c.; it steel, 1·75@1·80c.; toe calk, 1·80@2c.; Bessemer machinery, 1·25@1·50c.; open hearth machinery, 1·90@2c.; open hearth carriage spring, 1·90@2c.; crucible spring, 3·50@3·75c.

Old Material.—The demand for old material has decreased since our last report. The market has been quiet and featureless, with prices as last reported. They can't go much lower, and the chances of an advance, in view of the present dullness, are remote. We quote nominally as follows: Old steel rails, $9@$9.75; old iron tees, $11.50@$12 per ton New York; railroad scrap, $12 per ton delivered at mill and yard scrap at $10 vessel New York; old iron T rails, standard sections, $11.75@$12.00, New York delivery; wrought turnings, delivered at mill, $9; railroad scrap, also delivered at mill, $12: No. 1 wrought scrap at $9.50@$10.50 and No. 1 machinery cast scrap, $9.50@$10.50, old wrought tubes and pipe, $6.50@$7; wrought turnings at $8.50@$9.50 delivered at mill; old car wheel, $10@$11 New York; cast borings, $5.50@$6 delivered at mill.

Rail Fastenings.—The market for track material is exceedingly dull. Quotations are as follows: Fish and angle plates, 1·25@1·35c. at mill; spikes, 1·60@1·90c.; bolts and square nuts, 2@2·25c.; hexagonal nuts, 2·20@2·40c., delivered.

Spiegeleisen and Ferromanganese.—Nothing of interest can be reported of either spiegel or ferro. Little or no business is doing in this market. Quotations remain nominally: Spiegeleisen, 10@12½, $21@$22; 20% $25@$26. Ferromanganese, $51.50@$53.

Steel Rails.—Several orders aggregating a large tonnage will soon be on the market, but so far business in standard sections has continued light; prices for these remain at $24 at mill, or $24.80 tidewater. Light sections and girder rails continue more or less unsettled in price, ranging from $20 to $21 at mill.

Boston. May 4.

(From our Special Correspondent.)

Business continues rather quiet throughout New England, and such orders as are being placed are at extremely low prices. It now looks as though the miners' strike, if prolonged, may put a different phase on the whole iron situation, a number of the furnace companies having closed down, with a prospect of a great many more going out of blast within the next few weeks. This would naturally seem to be a good thing for the furnace companies as a whole, as it will not only materially reduce the present stock of pig iron, but will have a tendency to advance values, so that when the furnaces do resume they will be operating on a paying basis.

It was demonstrated to-day that the Knights of Labor in the iron industry were for the first time compelled to solicit help from the large concerns that employ them. The petition was placed before many of our large concerns in this city by the secretary and treasurer of the organization, and they were able, with earnest and pushing application, to obtain the signatures together with checks for fair sized amounts, to help the organization during these hard times. One of our large bridge manufactures says it has kept their men at work all winter, and still it gave something.

Buffalo. May 3.

(Special Report of Rogers, Brown & Co.)

We note a little hardening in prices—nothing that may be called an advance, but a greater uniformity in quotations—which is brought about by the withdrawal of several furnaces from the market by reason of their stoppage. Within two weeks probably every coke furnace which can reach the Buffalo and New York market will be out of blast, as a result of the strike which cuts off their coke supply. Uncertainty as to how long this will last naturally removes the incentive from furnace owners to push sales of their iron at low prices This enforced stoppage is generally considered the best thing that could happen to the trade, next to influences which might increase the consumption of pig iron. Demand is in no manner improved, but should this curtailment of production and depletion of stocks be followed by an improvement in consumption the business would assume an active and strong position. Bessemer pig iron has advanced 50c. per ton, but that does not affect this market to any extent, as there is very little call for it in western New York. We quote for cash f. o. b. cars Buffalo: No. 1 Foundry strong coke iron, Lake Superior ore, $11.75; No. 2 Foundry strong coke iron, Lake Superior ore, $11.25; Ohio strong softener No. 1, $11.75; Ohio strong softener No. 2, $11.75; Jackson County silvery No. 1, $15.50@$17.00; Lake Superior charcoal, $14.75; Tennessee charcoal, $15.50; Southern soft No. 1, $11; Southern soft No. 2, $10.50; Alabama car wheel, $16@$17.50; Hanging Rock charcoal, $18.50.

Chicago. May 2.

(From our Special Correspondent.)

The past week has developed an uncertainty, brought about by the extensive coal and coke strikes. Numerous rolling mills are reported shut down or about to. There are many signs that dealers in all lines are becoming a trifle more conservative as to prices, although they do not report any increased business. Business for the week is about of the same proportions as last. Should the coal and coke strike continue a few weeks longer, it will limit production, and probably create a considerable demand for all material when the strike ceases and furnaces resume.

Pig Iron.—The scarcity of coke is becoming very apparent, and numerous furnaces are already feeling the want of it. Should the strike continue over next week, many of these furnaces will be compelled to close down. Business in pig iron continues in an unsteady manner, the week having developed no increased tonnage. Orders are mainly for small quantities, which are in number quite numerous, and are divided between all classes of coke brands. The largest sale reported is one of 500 tons of local iron. Consumers continue the plan of buying small lots for immediate delivery, many who heretofore made long running contracts having decided to discontinue that custom and buy from month to month just a sufficient quantity to cover actual wants. Prices are, per gross ton f. o. b. Chicago: Southern coke, foundry No. 1, $11@$11.25; No. 2, $10.25@$10.50; No. 3, $9.75@$10.00; Southern coke foundry soft, No. 1, $10.25@$10.50; No. 2, $9.75@$10.00; Southern car-wheel, $17.50@$18; Tennessee charcoal No. 1, $15@$15.50; Southern silveries No. 1, $11.75@$12; No. 2, $11@$11.50; Bessemer, $12; Ohio Scotch softeners No. 1, $12 75@$13.50; Lake Superior charcoal, $15@$15.50; Lake Superior coke No. 1, $11.50@$11.75; No. 2, $10.50@10.75; No. 3, $10.00@$10.25; Jackson County silveries, $14.50@$15.

Structural Iron and Steel.—There is quite a good demand for beams and channels. Otherwise the market remains dull. Quotations are, f. o. b., Chicago: Angles, 1·35@1·45c.; tees, 1·50@1·60c.; universal plates, 1·35@1·45c.; beams and channels, 1·35@1·45c.

Plates.—The demand for plates has not improved any with the week. Prices are, Chicago delivery: Flange steel, 1·65@1·75c.; best firebox steel, 3·75@4·00c.; tank steel, 1·35@1·45c.; iron and steel sheets No. 10 to 14, 2·00@2·15c.

Merchant Steel.—No increased sales are observed in merchant steel. Tnose now going are few, and confined wholly to very small lots. Quotations are, carload lots: Smooth finished machinery, 1·80@1·90c.; tire steel, 1·60@1·70c.; ordinary Bessemer bars, 1·40@1.50c.; toe calks, 2·05@2·15c.; special brand tool steel, 12@20c., crucible spring, 3·40@3·65c.; tool steel 6½c. and upward.

Galvanized Sheet Iron.—About all the demand for galvanized sheet now is for building purposes, and that is limited mainly to small quantities. Prices are 75, 10 and 5% off on mill shipments. Jobbing quantities are selling at 75% discount.

Black Sheet Iron.—There is quite a little change for the better noticed in black sheet, the sales for the week having been numerous enough to occasion hope for an increased business right along. Prices are f. o. b. Chicago, carload lots: No. 24, 2·20c.; Nos. 25 and 26, 2·30c.; No. 27, 2·40c.

Bar Iron.—As in black sheet, the bar iron market for the week has shown much more firmness, and an increased business is observed. Some of the dealers are standing out for higher prices, and it may be that this will have the effect in regulating them. It is reported that the Calumet Steel Company, of Chicago, will close down next week. The reason given is that prices are to low to warrant running. Prices for bar iron are f. o. b. Chicago 1·10c.@1·15c. according to specifications.

Billets.—Inquiries still remain good for billets. Orders are being refused as the steel works in this vicinity have a sufficient business to keep them busy to July and even throughout that month. Prices are $17.75@$18.25.

Steel Rails.—Steel rails are having considerable call and many good sized orders are being placed. The electric railroad to connect Chicago and St. Louis has really been begun, and this will require a large supply. Quotations are $25@$27.

Nails.—Both wire and steel cut nails are in poor demand. Prices are $1@$1.10.

Old Rails and Wheels.—A good sized sale of old iron rails is noted at about $10. Old wheels are dull at $10@$10.50.

Scrap.—No improvement is noticed in scrap, the demand being confined entirely to small lots and for no special grade. Prices are: Forge, $8.50@$9. Cast borings, $3.50@$4; wrought turnings, $4.50@$5; axle turnings, $6@$6.50; mixed steel, $5@$5.50; tires, $12.50@$13; iron axles, $13@$14.

Philadelphia. May 3.

(From our Special Correspondent.)

Pig Iron.—The coal strike has not affected the market in any way as yet, but all attention is directed to it. Careful inquiry shows that consumers of both forge and foundry iron are pursuing the same policy of buying iron as they need it, so that there is no perceptible change in iron, and demand continues about the same. No. 1 foundry is $12.50, No. 2 $12, forge $10.50@$10.75 with slight variations for brand and size of order and terms of payment. Bessemer has been quoted to quite a number of parties at $12.25.

Muck Bars.—There are increased sales at $20, though $.9.50 has been accepted.

Billets.—The strike situation is the uncertain factor, and the fact of possible scarcity has brought out quite a number of parties who show some anxiety to buy for June delivery. Prices are quoted 50c. higher, viz., $17.50@$18.

Merchant Bar.—There are more small orders dropping in than has been noticed this spring, but

purchases are for very small lots and prices run from 1·15 to 1·40. Eastern mill men expect to have better control of this market this summer.

Nails.—The large production is having an unfavorable influence on the wholesale market, because of the earnest efforts made to push stocks into all markets. Sales are based at 95 New York delivery, large lots.

Skelp.—Several large orders have been finally secured, and Eastern mills are in good condition relatively speaking. Quotations, 1·15@1·25.

Sheet Iron.—Our Eastern mills have picked up enough business to steady quotations on wholesale lots. The new business just secured has been in sight for several weeks.

Merchant Steel.—Tire and spring steel is selling well considering the times, at 2@2·20.

Plate and Tank.—Sales of small lots of tank steel have been made within a day or two at 1·25, but the quality is good. Heavy plates are 1·30 and shell 1·40. The volume of business is far below past seasons.

Structural Material.—The weekly sales are light. Angles are 1·20; beams, tees and channels, 1·40. There is no change in the situation. All manufacturers are seeking for work, and not finding enough to keep them busy.

Steel Rails.—Railmakers repeat what they have so often said, viz., that there are inquiries in the market for large lots of rails, but they do not know when orders are likely to be booked.

Girder Rails are active at 20·50@22.

Pittsburg. May 3.

(From our Special Correspondent.)

Raw Iron and Steel.—Notwithstanding the firmness of iron and steel products and a strong undertone in the market there is no telling how long this condition of affairs will continue. It is true that very little coke is made at present; it is also true a number of works are being run with gas. May is the time that the natural gas companies fix for the mills to use that material; many of them have been using it right along, others will avail themselves of the same. Lima and crude oil will be used for all it is worth; it may cost a little more, but that will not prevent its use.

As a matter of fact the labor unpleasantness in the coal and coke regions in various parts of the country are reflected to a considerable extent in the market products in many cases introducing an element of uncertainty as regards the immediate future of the trade. During the past few weeks the feeling has been gradually improving, based upon a more general demand, and with many concerns the business of the month has been heavier than at any similar period for many months. The advance noted in our last has evidently come to stay. The demand for foundry grades is improving; the consumptive demand here is such that the heavy sales recently recorded will soon be consumed, when stocks must be replenished in order to keep the mills in operation. Southern furnaces have been granted a further reduction in rates by rail and water to Eastern points, aggregating about 50c. per ton on prices previously current.

In steel rails the syndicate rates—$24 f. o. b. at works—are still the ruling figures; another shipment of many thousand tons will be forwarded south by river the first rise.

Coke Smelted Lake and Native Ore.

Tons.	Cash.
5,000 Bessemer, May, June	$10.65
4,000 Bessemer, May, June	10.90
2,500 Bessemer, May, June	10.70
2,000 Bessemer, next 3 mos	10.75
2,000 Bessemer, May June	10.70
1,300 Bessemer, prompt	11.09
1,000 Bessemer, prompt	11.15
1,000 Bessemer, May, June, July Aug.	10.70
1,000 Mill, May, June	9.50
1,000 Gray Forge, May, June, July	9.50
1,000 Off Bessemer, June	10.00
500 White and mottled	9.00
500 Bessemer Valley furnace	10.00
200 No. 1 Foundry	11.75
200 No. 2 Foundry	10.75
75 No. 1 Silvery	13 50
75 No. 2 Silvery	12 50

Charcoal.

100 Warm Blast, mill extra	27.00
100 Cold Blast	24.00
50 No. 1 Foundry	17.00
50 No. 2 Foundry	16.00

Blooms, Billets and Slabs.

3,000 Billets, May, June, at mill	6.60
2,500 Billets and Slabs, May, June, at mill	16.65
2,000 Billets, prompt, at mill	17.00
2,000 Billets, May, June, at mill	16.75
1,500 Billets, prompt, at mill	17 00
1,000 Billets, prompt, at mill	17.25

Skelp Iron.

340 Sheared	1.40 4 m.
300 Wide gr'ved	1.25 4 m.
260 Nar. gr'ved	1.25 4 m.

Skelp Steel.

1,200 Sheared	1.25 4 m.
1,200 Wide grooved	1.05 4 m.
500 Narrow gr'ved	1.05 4 m.

Ferro-Manganese.

200 80% delivered 52.80

Muck Bar.

150 Neutral 19 25

Steel Wire Rods.

350 American at mill 24.00

Spelter.

100 May, June 3.47½

Old Rails.

1,000 Mixed steel	9 25
200 Iron rails	11.75
200 Iron rails	12.00

Scrap Iron.

350 No. 1 R. R. W. S., gross	10.00
275 Old car wheels, gross	9.75
200 Cast scrap, gross	9.00

Billets, spot, advance 25c. per ton.

Bessemer, spot, advance 35c. per ton.

Steel skelp advanced 5@ 12c. per 100 lbs.

Iron skelp advanced 5c. per 100 lbs.

METAL MARKET.

NEW YORK, Friday Evening, May 4, 1894.

Prices of Silver per Ounce Troy.

April.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in $1.	May.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in $1
28	4.88¼	29	63¾	.493	2	4.88⅛	29¼	64¼	.497
30	4.88⅛	29	63¾	.493	3	4.88¼	29¼	64¼	.497
M1	4.88⅛	29⅛	64¼	.497	4	4.88⅛	29	63¾	.493

Silver hangs fire around 29d. per oz. Producers seem more confident than heretofore, and while they do not look for any material advance in the price of bullion, they have good reason for not accepting any concession or putting June or July silver much below current rates. The demand for China and Japan continues to absorb the current output.

The United States Assay Office reports the total deposits of silver for the week to be $94,000.

Gold and Silver Exports and Imports at New York, Week Ending April 28th, 1894, and for Years from January 1st, 1894, 1893, 1892

	Gold.		Silver.		Excess of Ex. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Week	$1. 13,905	$315,189	$965,413	$14,018	E $2,149,811
1894	15,794,978	4 925,922	13,487,949	505,630	E 23,851,375
1893	51,142,422	3,589,811	10,292,890	931,582	E 54,913,919
1892	20,153,403	5,917,619	8,379,773	460,887	E 22,160,670

Of the gold exported for the week $1,200,000 went to London, the rest to France. The silver all went to London. The gold imports were chiefly Spanish coin, part coming from London, and part from Havana. The silver was from Central America

During the five days ending May 3d the exports and imports of gold and silver were as follows: Exports, gold, $3,110,854: silver, $321,994. Imports, gold, $167,142; silver, $6,367. Of the gold exported, $2,850,000 was America coin and bullion, $1,500,000 of which went to Germany, $1,300,000 to London, $30,000 to South America and $20,000 to France. Of the remainder, $23,000 was in Spanish coin and went to South America, and $237,327 French coin. $157,327 of which went to the West Indies and $80,000 to France.

All the silver exported was American bullion. $64,956 of which went to South America and the remainder went to London.

NOTES OF THE WEEK.

Hardly as good a report can be made of general business this week. Trade has been unfavorably affected by Congressional delays, by the widespread strike of the coal miners and by the labor troubles elsewhere. The coal strike has already reached a serious point, and its continuance for another week will compel the stoppage of many furnaces and factories by cutting off their supply of fuel. A disposition to compromise is manifested already, however, and an early adjustment may be hoped for.

Tariff discussion still drags along slowly in the Senate, whose members do not yet seem to realize the popular and universal demand for action. The opponents of the new bill have recently shown a disposition to delay action by long discussions over each clause of the bill; if this is carried out it is impossible to predict when final action will be taken, but on the other hand the Democratic senators, who form the majority, are said to have adopted a compromise which will be passed—let us hope without delay. It will then go to conference with the House, and will receive its final form. Too many of our senators have personal interests to serve and each wants the largest amount of public "boodle" he can get, and apparently without any regard to the people of the country. Let us hope we shall soon be relieved from uncertainty, and that we shall have a tariff bill which will meet the requirements of a wider trade and more advanced civilization.

Gold exports have been continued this week, $1,500,000 going on the mid-week steamers from New York, while nearly $3,000,000 is reported taken for shipment on Saturday, making a total of over $6,000,000 for the week. As we have before noted, these shipments indicate simply a transfer of idle money to a market where use can be found for it; while at current rates of exchange there is some profit in shipping gold rather than buying bills. Most of the shipments this week have been to Berlin order; the moving cause being the placing of a new German government loan, bearing 3% interest at 87½, which has caused an especial demand for money.

The present indications are that no further bill relating to silver coinage will be reported to the House of Representatives at the present session. The Committee on Banking and Currency will not, it is stated, prepare or report any new bill, believing that there is no possibility of bringing forward one that is likely to pass.

The statement of the New York banks for the week ending April 28th shows increases of $1,409,925 in reserve, $1,852,900 in loans, $546,600 in specie, $1,042,000 in legal tenders, and $4,514,600 in deposits | a decrease of $513,500 in circulation. The total reserve was $226,881,400, being $83,417,950 above the legal requirement. This statement shows an increase in loans, although smaller in amount than for several weeks; it also shows an increase in deposits and a continued accumulation of money, although receipts from the interior are reported no less in amount, and there have been some withdrawals of money on foreign account during the week.

In this connection it will be of interest to compare the amounts of the deposits, loans and surplus reserve this year with those of the corresponding week for several years past:

	Deposits.	Loans.	Surplus reserve.
1894	$373,853,800	$160,902,300	$83,417,950
1893	432,224,600	425,990,800	72,156,150
1892	535,778,000	493,078,200	20,036,300
1891	497,165,000	404,465,600	7,443,300

This shows that while the deposits are $141,639,200 greater than they were a year ago, they are only $38,075,800 more than at the same time in 1892. The loans are actually greater in amount by $34,911,500 than they were a year ago, and only $32,175,900 less than in 1892, indicating less falling off in the business demand for money than had been generally supposed.

The United States Treasury on Thursday, May 3d, showed total balances in excess of outstanding certificates amounting to $126,267,059, made up as follows: Gold, $99,483,080; silver, $10,888,765; legal tenders, $5,038,131; treasury notes, etc., $10,857,073. Changes during the week were a decrease of $1,596,156 in the total balance, and a decrease of $1,245,751 in the gold balance, which is now once more below $100,000,000. The reduction in gold was largely due to exchange of legal tenders for gold wanted for export.

The statement of the United States Treasury on May 1st showed the total amount of money coined or issued, and presumed to be in circulation, at that date was $1,691,793,990, or $24.82 per caput, against $1,599,028 335, or $24.07 per caput on May 1st, 1893. The total amount of money, including that held in the treasury on May 1st, was $2,284,835,027, the statement in detail being as follows:

	In circulation.	In Treasury.
Gold coin	$497,894,733	$116,475,990
Standard silver dollars	52,655,121	366,677,908
Subsidiary silver	59,125,312	17,502,120
Gold certificates	69,990,449	102,770
Silver certificates	330,305,980	9,367,524
Silver treasury notes	141,026,114	11,786,958
United States notes	284,443,688	62,237,328
Currency certificates	57,270,000	140,000
National bank notes	193,082,593	8,750,439
Totals	$1,691,793,990	$593,041,037

In addition to the money given above the Treasury held on May 1st $53,716,468 gold bullion and $127,228,337 in silver bullion. The marked changes in circulation during the past year were increases of $87,135,213 in gold coin and of $27,312,278 in national bank notes; decreases of $6,180,262 in silver dollars and of $35,443,429 in United States notes (legal tenders). The last named item was nearly balanced by the increase in Treasury notes and silver certificates. The net increase in circulation during the month of April was $1,079,182.

The following is the official statement of coinage executed at the mints of the United States during the month of April;

Denominations.	Pieces.	Value.
Double eagles	285.720	$5,714,400.00
Eagles	446.960	4,469,600.00
Total gold	732.680	$10,184,000.00
Half dollars	704,000	$352,000.00
Quarter dollars	648,000	162,000 00
Dimes	400,000	40,000 00
Total silver	1,752,000	$554,000.00
Five-cent pieces	250,000	$12,500.00
Total subsidiary	250,000	$12,500.00
Total coinage	2,734,680	$10,750,500.00

No silver dollars were coined during the month. The coinage of gold was large.

The Argentine commercial crisis seems to be in danger of a renewal, a possibility always at hand as long as the business and currency of that country remain in their present unsettled condition. Gold is now at a premium of 285; in other words, the currency or paper dollar is worth only 35 cents in gold. Several commercial failures are reported and others are feared. The Argentine troubles three years ago started the monetary crisis from which the world is just beginning to recover, and the recoil of the wave is now being felt there. The special local causes of the present trouble are the injury done to the crops by a long drought and a proposal to reissue the currency received for conversion, which was supposed to be canceled and permanently withdrawn.

In the British House of Commons, April 30th, the Secretary for India said there was no foundation for the report that it was proposed to reopen the Indian mints to free coinage of rupees.

The Indian money market still continues in an unsettled condition and the banks are maintaining the discount rate at 9%, with some prospect of a further

increase. The scarcity of money is not due to activity of trade, which is really very quiet, but to the locking up of money in the treasury, which still continues to some extent, in spite of the recent free sales of Council bills in London.

The International Bimetallic Conference in London, which has, as noted in another column, attracted unusual interest, held its first session on Wednesday, May 2d, with a large attendance, including many persons of note in financial and political circles. The notable event of the opening session was the address made by Mr. Balfour, both from its strong tenor in favor of bimetallism and the speaker's prominent position as leader of the Opposition in the House of Commons. Other addresses were made, and the meeting fairly opened.

On the second day, May 3d. Sir William Houldsworth read a paper on the fall in the general level of prices. Mr. H. H. Gibbs spoke of the proper basis for an international ratio between gold and silver, and Sir David Barbour read a paper on Indian finance. These papers and addresses were followed by discussions. We hope at an early date to report both papers and discussions more fully than the limitations of cable dispatches will permit at present.

Among the incidents of the opening meeting was the receipt of a dispatch signed by a number of United States senators, headed by John Sherman, and expressing sympathy with the objects of the meeting. It is to be noted that the signers of this dispatch include none of the ultra-silver men in the Senate.

The Bank of England on Thursday, May 3d, reported its gold holdings at £31,940,120, an increase of £7,229,875 as compared with the corresponding date in 1893. The bank continues to hold a large amount of idle money, its proportion of reserve to liabilities being 63.32%, against 41.37% a year ago. During the week the gold receipts from abroad were £449,000, of which £120,000 came from Australia and the remainder chiefly from South Africa.

Exports of silver from London to the East for the year up to April 19th are given by Messrs. Pixley & Abell's circular as follows:

	1893.	1894.	Changes.
India	£2,509,780	£1,997,835 D.	£511,945
China	141,203	1,123,701 I.	982,498
The Straits	790,640	272,400 D.	518,240
Totals	£3,441,623	£3,393,936 D.	£47,687

The great increase in shipments to China is notable. Receipts of silver for the week in London were $178,000, of which £84,000 was from New York. Shipments included £2,150 to India, £301,805 to China and $45,000 to Japan.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars	$.51½	$.52½
Peruvian soles and Chilean pesos	.51	.52½
Victoria sovereigns	4.87	4.89
Twenty francs	3.90	3.93
Twenty marks	4.78	4.82
Spanish 25 pesetas	4.85	4.90

Other Metals.

Copper.—There is a decided improvement in home trade, and large orders have been given out during the last fortnight, so that the decline in London to £39 5s. made hardly any impression over here. Quite a good demand exists for Lake Copper at 9·50 for spot and May delivery, with hardly any metal on hand, as the supplies shipped by Lake have not yet arrived, but there are sellers from first hands at this price for June-July delivery. A good demand continues for electrolytic copper at about 9¼ for first rate brands. Casting copper is somewhat difficult of sale at 8·85@9c. The strike on the Great Northern Railroad being called off, supplies from the Great Falls smelting works may now be again expected.

In Europe the market has been very flat, for what reason we cannot yet make out. G. M. B's touched the lowest price on May 2d, being then quoted at £39 5s., but a firmer tone has existed since then, and we have to-day to quote £39 7s. 6d.@£39 10s. for spot, and 10s. higher for three months. Cables report rather a better demand at the lower prices. It appears that fairly large quantities of second-hand American copper are offered cheap on the other side, and until these are out of the way no improvement can be looked for. Statistics for the second half of April are cabled to us as showing an increase of 100 tons. We quote; English Tough, £41 10s.@£42; best selected, £42 10s.@£43; strong sheets, £48 15s.@£49; India sheets, £47@£47 10s.; yellow metal, 4¼d.

According to the New York Metal Exchange figures, stocks of copper in Europe were as follows at the dates given:

Stocks in gross tons.	May 1, 1894.	April 1, 1894.	May 1, 1893.
Chile bars, Liverpool & Swan..	31,950	31,180	30,830
Fine copper	4,630	4,610	3,970
Foreign copper at London	5,400	5,200	7,200
Chile bars in France	....	....	....
Other stuff in France	1,200	1,700	6,100
Total	43,180	42,690	48,100
Afloat from Chile	2,860	3,100	3,200
Afloat from Australia	300	800	800
Total	46,780	46,590	52,100

Stocks on May 1st were practically the same as on April 1st.

The exports of copper from the port of New York during the week ending May 4th, as reported by the New York Metal Exchange, were as follows:

Genoa—Werra	Ingots	50 tons
Havre—La Touraine	Ingots	75 "
" "	Bars	100 "
Antwerp—Rhynland	Plates	20 "
St. Petersburg—Toledo	Ingots	128 "
" "	Cakes	87 "
" "	Bars	50 "
Rotterdam—Dubbledam	Ingots	65 "
" "	Plates	45 "
" "	Bars	20 "
Hamburg—Rhaetia	Ingots	10 "
" "	Plates	10 "
Liverpool—Nomadic	Pigs	50 "
" "	Ingots	11 "
Swansea—Mohican	Pigs	52 "
Leghorn—Weser	Ingots	20 "
Hamburg—Stubbenhuk	Plates	10 "
St. Petersburg—Galileo	Cakes	20 "
" "	Ingots	107 "
Rotterdam—Spaarndam	Bars	70 "
" "	Ingots	50 "
" "	Plates	108 "
St. Petersburg—Colorado	Cakes	13 "
Swansea—Llandaff City	Plates	87 "
" "	Pigs	50 "
Havre—La Bourgogne	Plates	*29 "
Matte:		
Liverpool—Bovic		40 tons
Swansea—Mohican		100 "
Liverpool—Arizona		100 "

* In bond.

Exports of copper from Baltimore for the week ending May 2d are reported by our special correspondent as follows:

April 30.	Hamburg—Cassius	2,079 bars	225,629 lbs.

The total exports of metals from the port of Baltimore for the month of April are reported by our special correspondent as follows:

Copper, ingots, bars, sheets, etc	1,408,908 lbs.
Lead	560,412 lbs.
Tin scrap	187,189 lbs.
Zinc skimmings	24,000 lbs.
Ferro-manganese	634,046 lbs.
Chrome iron ore	31,779 lbs.
Scrap iron	260,235 lbs.

The lead exported was in one lot, and was Mexican metal.

Tin.—There is a continued good demand for actual consumption, and the arrivals which have come forward during the past week are almost all being transhipped. Prices here follow quite closely those of the London market, where they are more or less regulated by the values of silver. We have to quote 20@20¼, according to quantity and delivery. From the East we hear that shipments for the next two months will probably be light.

At the beginning of the week the London market showed quite an advance, especially when the statistics for the second half of April became known as having decreased 900 tons, when spot was paid for as high as £72 17s. 6d. Meanwhile a reaction has set in, and the market closes weak at £71 12s. 6d.@£71 15s. for spot and £72 5s.@£72 7s. 6d. for futures.

Lead.—The offerings are light, but the demand is not brisk either, and the transactions consequently were rather limited, the price obtainable being 3·40@3·45. Desilverized continues to be rather scarce, but there is a fair supply of other grades.

The European market continues rather languid, and Spanish lead is quoted at £9@£9 2s. 6d., this being the lowest price on record, and English lead 2s. 6d. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: "There has been but little change since last week, some 500 or 600 tons having changed hands, the bulk of the sales being at 3·17½c., with a few lots of common brands selling as low as 3·15c. In the last day or two some few refiners are asking a small advance which has in a measure checked sales.

Spelter.—A large business has been done at somewhat irregular prices. We have to quote nominally 3·50@3·55, but orders for round quantities may be placed at a trifle less.

In London good ordinaries are quoted £15 12s. 6d., and specials £15 15s.

Antimony is inquired for in retail lots only, and we quote Cookson's, 10c.; L. X., 9¼c.; Hallett's, 8¾c.; U. S. French Star, 10c.

Aluminum.—The latest quotations for large lots are given below: No. 1 is over 98% pure metal, No. 2 over 94%; No. 1, ingots for rolling, 70c. per lb.; ingots for remelting, No. 1, 55c.; No. 2, 50c. per lb.; sheets, 80c. per lb.; wire rods, 90c.; wire, 9 to 14 gauge, $1 per lb.

Abroad, the Neuhausen Company continues to quote five francs per kilogram for ingots in large lots. No other recent quotations are made. The price given is at works in Switzerland.

Magnesium.—Only one company is at present manufacturing this metal in commercial quantities. That concern, the Aluminum und Magnesium Fabrik, Hemelingen, Germany, quotes prices as follows: Ingots and cubes, $6.48 per kilogram; bars, $6.24; powder, $8.64, ribbon and wire, $9.12 per kilo. These prices are at the works and for orders of over 10 kilos.; for less than 10 kilos. 24c. per kilo. must be added for ingots and bars, and 48c. for powder or wire.

Platinum.—Prices are steady, with no recent changes to report. For chemical ware, Messrs. Eimer & Amend, New York, quote platinum crucibles and dishes, hammered ware, French make, at 45c. per gram for smaller quantities, 43c. per gram for lots of not less than 100 grams, and 41c. for lots of not less than 250 grams. Wire and foil at 42c., 41c. and 40c. respectively for the quantities named. Current retail price for crucibles is 50c. per gram.

Nickel.—Quotations are steady at 42@50c. per lb., according to grade.

Sodium.—The demand is so small that local quotations are hard to find. In Germany and England the metal is quoted at 90c.@$1 per lb. at factory.

Bismuth.—Quotations on the New York Metal Exchange are $2 per lb. for lots of 500 lbs. or over; $2.25@$2.50 per lb. for smaller lots.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, May 4.

Heavy Chemicals.—Business in heavy Chemicals during the past week has been very quiet. There is always more or less inquiry, but it does not result in sales worthy of mention. As a result the market is dull and featureless. No business is reported for future delivery, and there is only a small jobbing demand for spot or near-by. Alkali and carbonated soda ash are very quiet. Caustic soda has been in fair request. Bleaching powder continues the most active article on the list, and a fair volume of business is reported this week. Prices are unchanged. We quote: Caustic soda, 60%, 2·82½@2·97½c.; 70%, 2·60@2·70c.; 74%, 2·62½@2·72½c.; 76%, 2·70@2·80c. Carbonated soda ash, 48%, 1·05@1·25c.; 58%, 1·05@1·15c. Alkali, 48%, 1·05@1·15c.; 58%, 1@1·10c.; according to package. Sal soda, English, ·90c.; American, ·80@·90c. Bleaching powder, 2·05@2·50c.

Acids.—There has been rather a freer movement of the various acids in this market. The month closed with a slightly improved demand. There is no change in price and we quote: Acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, $1.62½@$1 75; muriatic, 18°, 80c.@$1; 20°, 90c.@$1.10; 22°, $1@$1.25; nitric, 40°, $4; 42°, $4.50@$4.75; sulphuric, 75c.@$1. Mixed acids according to mixture, oxalic, $6.75@$7.25. Blue vitriol is quoted all the way from $3.37½ to $3.75; glycerine for nitro-glycerine, 11½@12½c., according to quality and quantity.

Brimstone.—There is nothing of interest to report of the brimstone market. It continues very dull. Quotations are as follows: Best unmixed seconds, on the spot, $16.75@$17; shipments, $16.50. Best thirds are $1 less.

Fertilizing Chemicals.—There has been no change in the fertilizer market since our last report. The usual quietude which follows the close of the spring season has come and very little business is doing. The season proved better than was anticipated, and at no time did manufacturers accumulate heavy stocks, so that there is some buying of raw materials. Sales are made in small lots, but they tend to keep prices steady. We quote this week sulphate of ammonia $3.62½@$3.65 for gas liquor and $3.30 for bone. Dried blood, $2.30@$2.35 per unit for high grade and $2.15@$2 20 for low grade. Azotine, $2.25@$2.35. Concentrated phosphate (30% available phosphoric acid), 75c. per unit. Acid phosphate, 13% to 15%, av. P_2O_5, 60c. per unit at seller's works in bulk. Dissolved boneblack, 17% to 18% P_2O_5, 95c. per unit. Acidulated fish scrap, $15@$16, and dried scrap nominally $25 f. o. b. fish factory; wet scrap $15 f. o. b. fish factory. Tankage, high grade, $22 50@$23; low grade, $21@$21.50. Bone tankage, $23@$24; bone meal, $24@$25 50.

In lots of 50 tons on contracts we quote: Double manure salts, 48 53% (basis of 48%): New York and Boston, $1.12; Philadelphia, $1.14½; Charleston, Savannah, Wilmington, N. C., and New Orleans, $1.17. High grade manure salts, 90-95% and 96-99% (basis 90%), respectively: New York and Boston, $2.07@$2.11; Philadelphia, $2.09½@$2.13½. Charleston, Savannah, Wilmington, N. C., and New Orleans, $2.12@$2.16.

Phosphates.—Charleston, S. C., quotations are: Acid phosphate 13% available, $6.50@$7 cash in bulk. High grade phosphate rock is $4.75@$5 f. o. b. vessel and cars at mines. Land phosphate rock $4.75 f. o. b. cars or vessels at mines.

Muriate of Potash.—Arrivals this week aggregate only 50 tons, all of which went into immediate consumption. Stocks are light here. In lots of 50 tons, quotations are as follows: 80-85% and minimum 95% basis 80%), respectively: New York and Boston, $1.78@$1.91; Philadelphia, $1.80½@$1.83½; Charleston, Savannah, Wilmington, N. C., and New Orleans, $1.83½@$1.86.

Kainit.—Prices for kainit (minimum 23%) in cargo lots for 1894 delivery are as follows for invoice and actual weights respectively: New York, Boston and Philadelphia, $9@$9.25; Charleston, Savannah, Wilmington, N. C., and New Orleans, $9.75@$10. For sylvinit, 27-35%, prices are as follows per cent. per gross ton, invoice weights: New York, Boston and Philadelphia, 37½c.; Charleston, Savannah, Wilmington, N. C., and New Orleans, 41c. Actual weights, 1c more per cent.

Nitrate of Soda.—The market continues strong. We quote this week: On the spot $2.30@$2.35; near-by arrivals, $2.25@$2.27½; summer shipments, $2.

Messrs. Mortimer & Wisner, the well-known

brokers of this city, send us the following interesting statistics issued under date of May 1st:

	1894.	1893.	1892.
	Bags.	Bags.	Bags.
Imported into A. ports from West Coast S. A., from Jan. 1, 1894, to date	157,185	192,151	236,658
Imported into Atlantic ports from Europe	.....	16,712	.....
	157,185	208,863	256,658
Stock in store and afloat May 1, 1894, New York.	20,403	33,166	52,838
Boston	.....	1,500	.....
Philadelphia	.....	.....	.....
Baltimore	500	.....	4,800
To arrive, actually sailed	223,400	265,950	232,000
Vis. supply to Aug. 15, 1894	244,303	299,666	289,638
Stock on hand, Jan. 1, 1894.	44,938	15,454	53,585
Deliveries past month	44,985	56,578	89,888
Deliveries since Jan. 1st to date	181,220	189,651	232,605
Total yearly deliveries	.....	754,560	685,158
Prices current, May. 1, '94	2·30@2·32½	2¼c.	1·70@1·72½

Included in the deliveries of 1893 are 9,500 bags shipped to European ports.

NOTES OF THE WEEK.

Butterworth & Judson's acid factory in Newark, N. J., was destroyed by fire on May 2d. The losses are partially covered by insurance. It is understood that the plant will be rebuilt as soon as possible.

Liverpool. April 24.

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

It is reported that the United Alkali Company intend to stop all the St. Helens and Widnes works for three to four weeks at Whitsuntide, owing to the depressed state of trade and consequent accumulation of stocks. At present there is no indication of any immediate revival in the demand, and with the exception of bleaching powder the heavy lines of chemicals are very slow. Soda ash is in retail demand, and for Leblanc makes prices are nominal, the spot range according to market being about as follows: Caustic ash, 48%, £3 15s.@£4 per ton; 57-58%, £4 10s.@£4 15s. per ton; Carb ash, 48%, £3 5s.@£3 15s. per ton; 58%, £3 15s.@£4 per ton, net cash.

Ammonia Ash 58% is in fair request at £3 10s.@£3 15s. per ton, net cash, for tierces, and 5s. less for bags. One works which has been shut down for some weeks has restarted again. Soda Crystals are dull at £2 13s. 9d.@£2 15s. per ton, less 5%.

Caustic Soda is slow of sale, and as stocks have accumulated, makers are anxious for orders. Quotations vary according to export market, and are quite nominal, the spot range being about as follows: 60%, £7 15s.@£8 5s. per ton; 70%, £8 15s.@£9 5s. per ton; 74%, £9 15s.@£10 5s. per ton; 76%, £10 15s.@£11 5s. per ton, net cash. For parcels under 10 tons, 5s. per ton extra is charged.

Bleaching powder is only offering to a limited extent and quotations are unchanged at £7 10s.@£8 5s. per ton, net cash, for hardwood packages, according to export market. Chlorate of Potash is in a lifeless state and 7s. is the nominal spot quotation, but there is no business reported.

Bicarb. Soda is moving off at £6 15s. per ton, less 2½% for one-cwt. kegs, with usual allowances for larger packages. Sulphate of Ammonia in light demand; and with holders offering more freely prices have declined, £13 10s.@£13 15s. per ton, less 2½%, being nearest spot range for good gray 24 and 25% in double bags f. o. b. here, according to quality. Nitrate of soda is still fairly strong for spot delivery, although prices are a shade lower at £10 17s. 6d. @ £11 per ton, less 2½%, for double bags f. o. b. here. For May delivery prices are considerably below spot quotations. Carb. Ammonia.—Lump 3¾d. per lb.; powdered, 4d. per lb., less 2½%.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, St. Louis, London and Paris, see pages 430 and 432.]

NEW YORK, Friday Evening, May 4.

The mining stock market is just now undergoing all the delights of a "boom." It is a miniature boom; to speak of it even as a "boomlet" is to give it an unmerited importance, or to lend it an air of dignity which it can wear only in a ludicrous manner.

Briefly stated, it means that the members of the rascally gang known as the "Comstock Ring" are manipulating the stocks as it suits them. "The Engineering and Mining Journal" has shown repeatedly how easy it is for the "insiders" to affect the movement of those stocks which they control. Faith in the grand old Comstock Lode dies hard and although speculators and investors in mining securities, especially those of the Pacific slope, have had their wisdom teeth cut, many are still found who only too eagerly assist in any movement having for an object the advance in the price of stocks in the San Francisco market.

In the market here a little more interest has been shown, but it has been chiefly on the part of a few veteran brokers whose interest, after all, has been of a rather distrustful nature, as if they were wondering what would come next. They, very properly, abstain from any heavy "plunging," their most reckless ventures seldom exceeding a hundred shares at a time. In former years we would have been treated to a large volume of business, thousands and thousands of shares every day. But in these days of greater wisdom, begotten by bitter experience, they think they are doing well if the total sales amount to 6,000 or 8,000 shares per week.

The Comstocks show a decided advance this week. The San Francisco market is higher and stronger, and more activity has been shown than for some time past. Consolidated California & Virginia shows the greatest advance; it opened at $5.50 and closed at $7, with total sales for the week of 789 shares. Comstock Tunnel was in some demand; of the common stock 9,000 shares were sold at 8@9c., and of the scrip 100 shares at 10c. Other sales were: 160 shares of Best & Belcher at $2@$2.25; 300 shares of Mexican at $1.80; 100 shares of Union Consolidated at 95c.; 100 shares of Crown Point at 70c.; 150 shares of Ophir at $3.50; 400 shares of Sierra Nevada at $1.30@$1.45; and 100 shares of Yellow Jacket at 80c.

Transactions in Eureka Consolidated this week amounted to only 200 shares at 50c.

Of the Bodies, Standard Consolidated was the only one to be traded in, the public not believing that the "boom" in some of the others, such as Bodie, is not based on actual developments at the properties. Standard Consolidated was in fair request and 700 shares changed hands at $1.60@$1.85.

There was a solitary sale of 100 shares of Leadville Consolidated at 8c. Of Little Chief 300 shares were sold at 13@14c. No other Colorado stock shows any sales this week.

The only Black Hills stock to be traded in this week was Deadwood Terra, of which 400 shares changed hands at 65c.

At the office, in this city, of the Victor Gold Mining Company, of Cripple Creek, Colo., the report that the property had been sold to an English syndicate was pronounced false. Negotiations are pending for the sale of 192,000 shares of the stock for $520,000 to a New York syndicate. The capital stock of the company is 200,000 shares, of which only 8,000 shares are held by outsiders.

Boston. May 3.

(From our Special Correspondent.)

Copper stocks continue to decline on the weakness of the market for ingot copper, and much lower prices are predicted, especially for the non-dividend paying stocks. The Montana stocks have been pressed for sale the past few days, causing a decline in Boston & Montana from $27 to $25, with a fractional reaction in the latest sales. Butte & Boston declined from $10⅛ to $9½ and is freely offered at about this price.

Calumet & Hecla sold up to $295 early in the week, but lost the advance in later dealings and closed at $290.

Tamarack touched $170 in early dealings, but declined to-day to $165, considerable stock coming out.

Quincy sold at $90 and the scrip at $30. Very little doing in either this week.

Osceola was sold quite freely, on the prospects of reduced dividends for the coming year.

It is argued that with copper at 9@9½c. per lb., the company cannot earn above $1 per annum for the stock, and that $25 is too high price for it. A good deal of stock was put on the market for sale which broke the price from $25 to $22½, with later sales at $23.

Franklin sold at $9, same as last week.

Atlantic declined to 9½ for small lots.

Centennial sold at 2⅛@2¾ on small sales.

Wolverine declined ¼ to $1⅜.

Allouez declined from 45c. to 25c. on the announcement of another assessment.

Arnold declined from $1 to 75c. on sale of 100 shares.

It is rumored on the street that the Boston & Montana management will take advantage of the railroad strike to postpone the resumption of dividends, but we are of the opinion that the price of copper is more liable to affect a dividend unfavorably than anything else.

The general impression is that the demands for silver mining stocks are on the increase. It is reported at our leading mining brokers' offices that the sales are almost double what they were last week.

San Francisco.

BY TELEGRAPH.

SAN FRANCISCO, May 4.—The opening quotations to-day are as follows: Best & Belcher, $2 40; Bodie, $2.25; Bulwer, 13c.; Chollar, 80c.; Consolidated California & Virginia, $7.50; Eureka Consolidated, 50c.; Gould & Curry, $1.20; Hale & Norcross, 82c.; Mexican, $1.90; Mono, 49c.; Navajo, 10c.; Ophir, $4 05; Savage, 99c.; Sierra Nevada, $1.50; Union Consolidated, $1.05; Yellow Jacket, $1.20.

London.

(From our Special Correspondent.)

The quarrel in the Flagstaff Company relative to the election of Professor Vincent as a director in the reconstructed company still continues. At a meeting held a week ago it was announced that out of the 240,000 shares in the new company, 61,094 shares held by 168 shareholders were against the appointment of Professor Vincent, and 56,577 shares held by 17 shareholders were in his favor. As the professor himself has had 45,000 shares in the new company allotted to him, the total in his favor is 101,577 shares. For some reason or other this verdict was not accepted by the meeting of shareholders and the professor's name was thrown out when proposed. A poll is now being taken so that the final decision will be known shortly.

The report of the Stock Exchange for the year ended March 25, 1894, shows a net revenue of £122,352, which with £5,711 brought forward makes the balance of revenue £128,013. An interim dividend of £2 10s. per share was paid in November last, and another dividend of £3 10s. per share is now declared. The total number of members during the year was 3,415.

Paris. April 21, 1894.

(From our Special Correspondent.)

It has been apparent for some time that French investors are taking an increasing interest in mining stocks outside of the narrow circle of securities which have always found a place here. Several English companies could be named whose stocks are beginning to be called for, and others could probably be placed here to advantage.

To quote the copper list first: Rio Tinto has been somewhat heavy at 385 fr., although the dividend of 3½% is the same in amount as last year. Tharsis is steady at 124 fr., on the announcement of a 2½% dividend. Cape copper has fallen a little, and is quoted at 36·25 fr., and Jerez-Lanteira is steady at 50 fr.

In silver Huanchaca, of Bolivia, is a special French favorite. It has fluctuated considerably, closing at 111·25 fr. The Witwatersrand stocks now largely dealt in on the Paris market, have been active and strong on the report of the heavy March production.

Among the miscellaneous stocks Mulfidano (zinc), Italy, has been strong, closing at 2,125 fr., with subscription rights for new stock at 1,620 fr. Vielle Montagne (zinc), Belgium, has been somewhat active in view of the approaching annual meeting, and is quoted at 458·75 fr. Laurium, Greece (zinc and lead), has risen to 558 fr. Nickel (New Caledonia) is somewhat heavy at 500 fr.

The coal and iron stocks are not much in demand just at present, and have been dull. Late quotations are, for Carmaux, 1,260 fr.; Anzin, 4,400 fr.; Aguas Twidas, 540 fr.; Mokta-el Hadid (Algiers), iron, 800 fr., and Dombrowa (Russia), 630 fr., with a general downward tendency.

The stocks of the great iron and steel companies are an important feature in this market, and some quotations may be interesting, as given below: Acieries de France, 805 fr.; Acieries de la Marine (Petin-Gaudet), 367·50 fr.; Forges et Acieries du Nord, 1,035 fr.; Ateliers et Chantiers de la Loire, 477·50. These stocks are generally recovering from a period of depression. On the other hand Societe Generale de Construction is depressed, and only a few sales have been made at 145 fr., chiefly on account of the recent unfavorable reports. A. Z.

DIVIDENDS.

Stanaud Consolidated Mining Company, dividend No 84, of 10c. per share, $10,000, payable May 17th, at the Farmers' Loan and Trust Company, 122 William street, New York City. Transfer books close May 7th and reopen May 18th.

MEETINGS.

Carson River Placer Mining and Dredging Company, at the office of the company, in New York City, May 8th, at 12 o'clock noon.

Church Gold Mining Company, at the office of the company, Nevada Block, No. 309 Montgomery street, San Francisco, Cal., May 7th, at 1 p. m.

Delaware & Hudson Canal Company, at the office of the company in New York City, May 8th, at 10 a. m.

Evening Star Mining Company, at the office of the company in New York City, May 8th, at 2 p. m.

Goleta Mining Company, at the office of the company, No. 330 Pine street, San Francisco, Cal., May 9th, at 1 p. m.

Guild Gold Mining Company, at the office of the company, Rooms 204 and 205 Crocker Building, San Francisco, Cal., May 7th, at 10 a. m.

Justice Mining Company, at the office of the company, No. 309 Montgomery street, San Francisco, Cal., May 7th, at 2 p. m.

Magenta Consolidated Gold Mining Company, at the office of the company in San Francisco, Cal., May 9th, at 12 o'clock noon.

Montecito Mining Company, at the office of the company, No. 330 Pine street, San Francisco, Cal., May 9th, at 1:15 p. m.

Morning Star Consolidated Mining Company, at the office of the company, in New York City, May 7th, at 11 a. m.

Moss Hill Mining Company, at the office of the company in San Francisco, Cal., May 9th, at 1 p. m.

New York Gold Hill Mining Company, at the office of the company in San Francisco, Cal., May 9th, at 2 p. m.

North Star Mining Company, at the office of the company in San Francisco, Cal., May 9th, at 1:30 p. m.

Oregonal Empire Mining and Milling Company, at the office of the company, No. 401 California street, San Francisco, Cal., May 9th, at 2:30 p. m.

Ouray Union Mining Company, at the office of the company in New York City, May 7th, at 11:30 a. m.

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	April 28.		April 30.		May 1.		May 2.		May 3.		May 4.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Belcher, Nev.													
Belle Isle, Nev													
Bodie Cons., Cal													
Bulwer, Cal													
Carysolite, Colo.													
Comstock T. bonds, Nev.													
" scrip., Nev.	.10												100
Con. Cal. & Va. Nev.			5.50						6.00	5.75	7.00	6.25	780
Crown Point, Nev.	.20												100
Deadwood, Dak.			.65										400
Eureka Cons., Nev.									.50				200
Father de Smet, Dak.													
Gould & Curry, Nev.													
Hale & Norcross, Nev.													
Homestake, Dak.													
Horn Silver, Utah.													
Kentuck, Nev.													
Leadville Cons., Colo.									.08				100
Little Chief, Colo.	.14	.13											300
Mono													
Mt. Diablo, Nev.													
Navajo, Nev.													
N. Belle Isle, Nev.													
Ontario, Utah.													
Ophir, Nev					3.50								150
Plymouth, Cal.													
Quicksilver, Pref., Cal.													
" Com., Cal.													
Savage, Nev.													
Sierra Nevada, Nev.	1.35		1.45		1.30	1.45							400
Silver King, Ariz.													
Standard Cons., Cal.						1.60					1.85	1.70	200
Yellow Jacket, Nev.	.80												100

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Apr 28.		April 30.		May 1.		May 2.		May 3.		May 4.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Am. Flag													
Alpha													
Alta													
Barcelona, Nev													
Belmont, Cal.													
Best & Belcher, Nev.									2.25		2.00		160
Brunswick, Cal													
Caledonia, Nev													
Castle Creek													
Chollar, Nev.													
Comstock T., Nev.	.08		.08		.09		.08		.08		.09	.08	9,000
Con. Imperial, Nev.													
El Cristo, Rep. of Col.													
Exchequer, Nev.													
Independence, Nev.													
Julia, Nev													
Justice, Nev													
King & Pembroke													
Lacrosse, Colo													
Mexican, Nev					1.80				1.80		1.80		300
Middle Bar, Cal.													
Mono													
Nevada Queen, Nev.													
N. Standard, Cal.													
N. Commonwealth, Nev													
Overman, Nev.													
Oriental & Miller, Nev.													
Phœnix of Ariz.													
Potosi, Nev													
Scorpion, Nev.													
Seg. Belcher, Nev.													
Union Cons., Nev.													
Utah, Nev.											95		100

*Ex-dividend. †Dealt in at New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 3,333. Non-dividend shares sold, 9,560
Total shares sold, 12,899.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	April 27.		April 28.		April 30.		May 1.		May 2.		May 3.		SALES.
Atlantic, Mich.	9.50				9.25		9.50						65
Breece, Colo													
Bost. & Mont., Mont.	27.00	26.50	26.50		26.50	26.00	26.00		26.25	25.50	25.50	25.00	2,088
Bonanza Development													
Calumet & Hecla, Mich.	295	290	295		290						290		35
Central, Mich.													
Coeur d'Alene, Id.													
Franklin, Mich.											9.00		210
Honorine, Utah.													
Horn Silver, Utah.													
Kearsarge, Mich.													
Lake Superior, Iron.													
Minnesota Iron, Minn.													
Napa, Cal.													
Ontario, Utah.													
Osceola, Mich.	25.50	25.00	25.00		25.00	23.75	24.50	23.50	23.25	22.50	23.00	22.00	1,306
Quincy, Mich	90.25	90.00											25
Quincy Mining Rights	31.00										30.00		125
Silver King, Ariz.													
Tamarack, Mich.	168		170		169	167	166	135¾	166		166	162½	176
Tecumseh, Mich.													

NAME OF COMPANY.	April 27.		April 28.		April 30.		May 1.		May 2.		May 3		SALES.
Allouez, Mich.					.40		.30		.25				650
Arnold, Mich.					.75								150
Astec, Mich													
Brunswick, Cal.													
Butte & Boston, Mont.	9.13		10.00	9.88	9.88		9.88	9.75			9.75	9.50	1,140
Centennial, Mich.					2.75	2.50							65
Colchis, N. Mex.													
Copper Falls, Mich.													
Hanover, Mich.													
Humboldt, Mich.													
Huron, Mich.													
Mesnard, Mich.													
National, Mich.													
Native, Mich.													
Oriental & M., Nev.													
Phœnix, Ariz													
Pontiac, Mich.													
Tamarack, Jr., Mich													
Washington, Mich.													
Wolverine, Mich.											1.75		300

Dividend shares sold, 4,024 Non-dividend shares sold, 2,265 Total shares sold, 6,289.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified.

Acid—Acetic, chem. pure .....17@.19
Commercial, in bbls. and cbys. ..01¾@.02
Carbonic, liquefied, ℔ lb. ..... .18@.25
Chromic, chem pure, ℔ lb 1.00
for batteries ..... .40
Hydrobromic, dilute, U. S. P. ....25@.30
Hydrocyanic U. S. P. ..... .45@.50
Hydrofluoric ..... .26@.30
Alcohol—95%, ℔ gall. ..... $2.30@$2.40
Absolute $3.80
Ammoniated $2.80
Alum—Lump, ℔ cwt ..... $1.75@$1.85
Ground, ℔ cwt ..... $1.85@$1.90
Powdered, ℔ lb ..... .04¼@.05
Lump ℔ ton, Liverpool £5
Aluminum Chloride—Pure, ℔ lb. $1.25
Amalgamating solution, ℔ lb. ..... .60
Sulphate, ℔ cwt ..... $1.90@$2.50
Ammonia—Sal., in bbl. lots, ℔ lb. ..... .07½@.08
Carbonate, ℔ lb., English and German, .07½@.08
Muriate, white, in bbls., ℔ lb. ..... .08½
Aqua Ammonia—(in cbys) 8° ℔ lb. .03@.04
20°, ℔ lb. ..... .04@.05
26°, ℔ lb. ..... .04¾@.05
Antimony—Oxymur, ℔ lb. ..... .04@.06
Regulus, ℔ lb. ..... .10@.11½
Argols—Red, powdered, ℔ lb. ..... .15
Arsenic—White, powdered ℔ lb. .03@.03¼
Red ℔ lb. ..... .06@.07
Yellow ..... .08@.09
White at Plymouth, ℔ ton. £12 2 6
Asbestos—Canadian, ℔ ton. ....$50@$300
Italian, ℔ ton, c. i. f. L'pool. ....£18@£60
Ashes—Pot, 1st sorts, ℔ lb. ..... 4.75@5
Pearl ..... .05¾@.06¼
Asphaltum—
Prime Cuban, ℔ lb. ..... .04@.05
Hard Cuban, ℔ ton. ..... $28.00@$30.00
Trinidad, refined, ℔ ton. ..$30.00@$35.00
Egyptian and Syrian, ℔ lb. ..... .05@.07¼
Californian, at mine, ℔ ton $12.00@$26.00
at San Francisco, ℔ ton. $15.00@$29.00
Barium—Carbonate, pure, ℔ lb. ..... .45
Carbonate, commercial, ℔ lb. .... .05@.10
Chlorate, crystal, ℔ lb. ..... .75
Chloride, commercial, ℔ lb. ..... .05@.10
pure, ℔ lb. ..... .16
Iodide, ℔ oz. ..... .40
Nitrate, ℔ lb. ..... .06¼@.07
Sulph., Am. prime white, ℔ ton $17.50@$19
Sulph., foreign, floated, ℔ ton. ..... $21@$24
Sulph., off color, ℔ ton. ..$11.50@$15.06
Carb., lump, f. o. b. L'pool, ℔ ton. £6
No. 1, Casks, Runcorn, " " ..£4 10 0
No. 2, bags, Runcorn, " " ..£3 15 0
Bauxite—℔ ton $10.00
Bichromate of Potash—Scotch, ℔ lb. ..... .11@.12
American, ℔ lb. ..... .11@.12
Bichromate of Soda—℔ lb. ..... .09¼@.10
Borax—Refined, ℔ lb., in car lots .08@.09
San Francisco ..... .03@.08¼
Concentrated, in car lots ..... .07¼@.08
Refined, Liverpool ℔ ton £7
Bromine—℔ lb. ..... .25@.28
Cadmium Minion—℔ lb. $2.00

Cadmium Iodide—℔ lb. $5.50
Chalk—℔ ton ..... $1.50@$2.25
Precipitated, ℔ lb. ..... .04@.06
China Clay—English, ℔ ton. .$13@$18.00
Domestic, ℔ ton ..... $9@$11
Chlorine Water—℔ lb. ..... .10
Chrome Yellow—℔ lb. ..... .10@.25
Chrome Iron Ore—℔ ton, San Francisco $10.00
Chromalum—Pure, ℔ lb. ..... .35@.40
Commercial, ℔ lb. ..... .02½
Cobalt—Oxide, ℔ lb. ..... $1.60@$1.70
Copper—Sulph. English Wks, ton £20@£21
Vitriol (blue), ordinary, ℔ lb. .03¼@.03¾
" extra ..... .04½
Nitrate, ℔ lb. ..... .40
Copperas—Common, ℔ 100 lbs. ..85@.95
Best, ℔ 100 lbs. ..... $1.35@$1.50
Liverpool, ℔ ton, in casks. ...£2@£2 10s.
Corundum—Powdered, ℔ lb. ..... .04½@.09
Flour, ℔ lb. ..... .03
Cryolite—Pow., ℔ lb., bbl. lots. ...07@.08
Emery—Grain, ℔ lb. (℔ kg.). ... .04½@.05
Flour, ℔ lb. ..... .02½@.04
Epsom Salt—℔ lb. ..... .01@.01½
Feldspar—Ground, ℔ ton. .$6.00@$10.00
Crude ..... $2.00@$3.00
Fluorspar—Powdrd, No. 1, ℔ ton. $20@$30
Lump, at mine ..... $6@$8
French Chalk—
Fuller's Earth—Lump, ℔ ton. $16@$20
Glauber's Salt—in bbls., ℔ lb. ..01@.01¼
Glass—Ground, ℔ lb ..... .09@.10
Gold—Chloride, pure, crystals, ℔ oz. $12.00
pure, 15 gr., c. v., ℔ doz. $5.40
liquid, 15 gr., g. s. v., ℔ doz. $5.50
Chloride and sodium, ℔ oz $6.00
15 gr., c. v., ℔ doz. $2.75
Oxide, ℔ oz. $27.25
Gypsum—Calcined, ℔ bbl. .. $1.25@$1.50
Land Plaster ....
Iodine—Resublimed, ℔ oz. ..... .30@.33
Iridium—Oxide ℔ lb. $90
Iron—Nitrate, 40°, ℔ lb ..... .01@.01¼
47°, ℔ lb. ..... .02@.02¼
Kaolin—*See China Clay.*
Kieserite—℔ ton ..... $9@$10
Lead—Red, American, ℔ lb ...06¾@.07¼
White, American, in oil, ℔ lb. .06¾@.07¼
White, English, ℔ lb., in oil. .08½@.08¾
Acetate, or sugar of, white. ....06@.06¾
Granulated ....
Nitrate ..... .09@.12
Lime Acetate—Am. Brown. ..... .30@.35
" Gray. $1.75@$1.87½
Litharge—Powdered, ℔ lb. .05½@.07¼
English flake, ℔ lb. ..... .06@.09½
Magnesite—Crude, ℔ ton of 1,015 kilos $14.75
Calcined, ℔ ton of 2,240 lbs. $22.00
Brick, ℔ ton of 2,240 lbs. $47.50
Manganese—Ore, per unit. ....23@.28
Oxide, ground, ℔ lb ..... .02½@.06¼
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. ..... .62@.64
Powdered, ℔ lb. ..... .65
Marble Dust—℔ bbl. ..... $1.25@$1.50
Metallic Paint—Brown ℔ ton. $20@$25
Red ..... $20@$25
Mica—In sheets according to size, 1st quality, ℔ lb. ..... $2@$4.00

Mineral Wool—Ordinary slag. ..01½
Ordinary rock ..... .02½
Ground, ℔ ton ....
Naphtha—Black ....
Nitre Cake—℔ ton $10.00
Ochre—Rochelle, ℔ lb. ..... .01¼@$01¾
Washed Nat Oxf'rd, Lump, ℔ lb. .06½@.06¾
Washed Nat Oxf'rd, Powder, ℔ lb. .07@.07½
Golden, ℔ lb. ..... .03@.05
Domestic, ℔ ton. ..... $12@$20
Oils, Mineral—
Cylinder, light filtered, ℔ gal. ...14@.16
Dark filtered, ℔ gal. ..... .10@.13
Extra cold test, ℔ gal. .20@.24
Dark steam refined, ℔ gal., .07½@.12
Phosphorus—℔ lb. ..... .50@.55
Precip., red, ℔ lb. ..... .80@.85
white, ℔ lb. ..... .85@.90
Platinic Chloride—Dry, ℔ oz. $7
Plumbago—Ceylon, ℔ lb. ..... .04@.06
American, ℔ lb. ..... .05@ 07
Potassium—Cyanide, ℔ lb., C. P. .52
67%, ℔ lb. ..... .40
mining. ..... .28@.30
Bromide, domestic, ℔ lb. ..... .28@.32
Chlorate, English, ℔ lb. ..... .18@.18¼
Chlorate, powdered, English, ℔ lb., .18¼@.19
Carbonate, ℔ lb., by casks, 82% .04½@.05
Caustic, ℔ lb., pure slick ..... .05½@.06
Iodide, ℔ lb. ..... $2.58@$2.80
Nitrate, refined, ℔ lb. ..... .06@.08
Bichromate, ℔ lb. ..... .10@.11½
Yellow Prussiate, ℔ lb. ..... .21½@.22½
Red Prussiate, ℔ lb. ..... .39@.42
Pumice Stone—Select lumps, lb. .03¼@.15
Original cks., ℔ lb. ..... .01½@.02
Powdered, pure, ℔ lb. ..... .01¼@.01¾
Pyrites—Non-cupreous, p. units. 10@.11
Quartz—Ground. ℔ ton. .... $6.00@$10.00
Rotten Stone, Powdered, ℔ lb. .03¼@.03¾
Lump, ℔ lb. ..... .06@.07
Original cks., ℔ lb. ..... .04½@.05½
Rubbing stone, ℔ lb. ..... .03¼@.04
Sal Ammoniac—lump, in bbls., ℔ lb. .80½
Salt—Liverpool, ground, ℔ sack. .... .70@
Domestic, fine, ℔ ton. ..... $7@$7.50
Common, fine, ℔ ton. ..... $4.50@$5
Turk's Island, ℔ bush. ..... .26@.28
Salt Cake—℔ ton. ..... $10.00@$15.00
Saltpeter—Crude, ℔ lb. ..... .03¼@.04
Soapstone—Ground, ℔ ton. ..... $6@$
Block and slab according to size.
Sodium—Prussiate, ℔ lb. ..... .22@.24
Phosphate, ℔ lb. ..... .04@.05
Stannate, ℔ lb. ..... .06@.12
Tungstate, ℔ lb. ..... .30@.35
Hyposulphite, ℔ cwt., in casks $1.70@$1.80
Strontium—Nitrate, ℔ lb. .... .08½@.06
Sulphur—Roll, ℔ lb. ..... .01½@.01¾
Flour, ℔ lb. ..... .01¾@.02
Sylvinit, 27@35%, S.O.P., per unit, 3.75
Talc—Ground French, ℔ lb. ....01¼@.01¾
American No. 1, ℔ lb. ..... .01¼@.01¾
American No. 2. ..... .006
Terra Alba—French, ℔ lb. ..... .65@.80
English, ℔ lb. ..... .45@.50
American, No. 1, ℔ lb. ..... .60@.80
American, No. 2, ℔ lb. ..... .40@.50

Tin—Crystals, in kegs or bbls. ....14@.15
" feathered or flossed. .20
Muriate, single ..... .07@.12
Double or strong, 54° B. ..... .10@.15
Oxymur, or nitro ..... .19
Vermilion—Imp. English, ℔ lb. ..... .80
Am. quicksilver, bulk ..... .57 @.59
Am. quicksilver, bags ..... .58 @ .60
Chinese ..... .85 @$1.00
Trieste ..... .90 @ .95
American ..... 11½@ .12
Zinc White—Am., Dry, ℔ lb. .04½@ .06
Antwerp, Red Seal, ℔ lb. .....06¼@.07
Paris, Red Seal, ℔ lb. ..... .07½@.08
Muriate solution ..... .06
Sulphate crystals, in bbls., ℔ lb. .03@.03¼

THE RARER METALS.

The prices given below are the prices in Germany, and are per gramme except where otherwise stated:

Arsenic (metallic), per kilo. $0.25
Barium (ex amalgam). 2.12
" (per electrol.). 7.75
Bismuth (metallic), per kilo. 6.25
Cadmium (metallic), " 2.75
Calcium (per electrol.). 5.25
Cerium (pulv.). 2.25
" (fusum in globulis). 5.50
Chromium (fus.). ..... .40
" (cryst.). ..... .75
Cobalt (metallic), per kilo. 10.00
" (pure), per kilo. 40.00
Didymium (pulv.). 5.50
Erbium-Yttrium (oxydat.). 10.00
Gallium (cryst.). 100.00
Germanium (fus.). 37.50
" (pulv.). 35.00
Glucinum (pulv.). 7.00
" (cryst). 10.75
Indium. 5.00
Iridium (fusum). 1.25
Lanthanum (pulv.). 6.00
" (per electrol.). 11.00
Lithium (in glob.). 5.00
" (wire). 6.25
Manganese (fusum). ..... .25
Molybdenum (pulv.). ..... .12½
Niobium (pulv.). 4.25
Osmium. 1.00
Palladium (wire). ..... .06
" (pulv.). 1.00
Potassium (metal), per kilo. 27.50
Rhodium. 1.63
Ruthenium. 2.50
Rubidium. 6.25
Selenium (cryst.). ..... .50
" (precipitates). ..... .62½
Strontium (per electrol.). 7.25
" (ex amalgam). 3.25
Tantalum. 4.75
Tellurium (fusum). ..... .50
" (precipitates). ..... .22½
Thallium. ..... .03¾
Titanium. 1.13
Tungsten (pure). ..... .06
Uranium. 1.00
Vanadium. 4.00

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total Levied	Date and amount of last.			Dividends. Total paid.	Date & amount of last.		
1	Adams, s. l. c.	Colo.	$1,500,000	150,000	$10	*				$687,500	Jan.	1892	.05
2	Alaska-Treadwell, g.	Al'ska	5,000,000	200,000	25					1,900,000	Oct.	1893	.37½
3	Alice, s.	Mont.	10,000,000	400,000	25	*				975,000	Nov.	1891	.06¼
4	Amador, g.	Cal.	1,250,000	250,000	5	*				31,250	Aug.	1890	.12½
5	American, g.	Colo.	3,000,000	300,000	10	*				225,000	Mar.	1892	.05
6	American Belle, s.g.c	Colo.	2,000,000	400,000	5	*				50,000	April	1891	.12½
7	Americ'n&Nettie, g.s	Colo.		300,000						175,000	Mar.	1892	.05
8	Atlantic, c.	Mich.	1,000,000	40,000	25	280,000	April	1875	$1.00	700,000	Feb.	1891	.00
9	Argyle, g.	Colo.	1,000,000	1,000,000	1	*				20,000	Mar.	1892	.01
10	Aspen Mg. & S., s. l.	Colo.	2,000,000	200,000	10	*				860,000	Dec.	1893	.10
11	Aurora, i.	Mich.	2,500,000	100,000	25					650,000	Feb.	1893	2.00
12	Badger, s	Ont.	250,000	50,000	5					37,500	Mar.	1890	.25
13	Bald Butte	Mont.	250,000	250,000	1	*				170,000	Apr.	1894	.05
14	Bates Hunter, s. g.	Colo.	1,000,000	1,000,000	1					67,500	Dec.	1891	.00¾
15	Belle Isle, s.	Nev.	10,000,000	100,000	100	230,271	Sept	1893	.10	300,000	Dec.	1879	.25
16	Belcher, s. g.	Nev.	10,400,000	104,000	100	3,262,900	Nov.	1893	.20	15,397,000	April	1876	1.00
17	Bellevue, Idaho, s. l.	Idaho	1,250,000	125,000	10	120,000	Dec.	1889	.25	200,000	Jan.	1890	.10
18	Best Friend	Colo.	1,000,000	1,000,000	1	*				90,000	Feb.	1892	.01
19	Bi-Metallic, s. g.	Mont.	5,000,000	200,000	25					1,630,000	June	1893	.10
20	Bodie Con., g. i.	Cal.	10,000,000	100,000	100	714,990	July	1893	.15	1,602,572	April	1885	.50
21	Boston & Mont., g.	Mont.	2,500,000	250,000	10	*				520,000	June	1886	.15
22	Boston & Mont., c. s.	Mont.	3,125,000	125,000	25	*				2,075,000	Nov.	1891	1.00
23	Brotherton, i.	Mich	2,000,000	80,000	25	*				120,000	Mar.	1893	.50
24	Bulwer, g.	Cal.	10,000,000	100,000	10	155,000	July	1893	.15	190,000	Oct.	1892	.05½
25	Bunker Hill & S. s. l.	Idaho	3,000,000	300,000	10	*				150,000	Oct.	1888	.06
26	Caledonia, g.	Dak.	1,000,000	100,000	10	505,000	May	1885	.15	192,000	Oct.	1890	.08½
27	Calliope, s.	Colo.	1,000,000	1,000,000	1					140,000	Jan.	1891	.00
28	Calumet & Hecla c	Mich.	2,500,000	100,000	25	1,200,000				40,350,000	May.	1894	5.00
29	Centen'l-Eureka, s. l.	Utah.	1,500,000	30,000	50	30,000	Mar.	1888	1.00	765,000	Dec.	1893	1.00
30	Central, c.	Mich.	500,000	20,000	25	100,000	Oct.	1861	.65	1,970,000	Feb.	1891	1.00
31	Champion, g	Cali	340,000	34,000	10	150,000				139,700	July	1893	.10
32	Chrysolite, s. l.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
33	Clay County, g.	Colo.	200,000	200,000	1	*				56,000	Nov.	1891	.02
34	Clinton Con, g	Cal.	5,000,000	100,000	5					90,000	Nov.	1891	.10
35	Cœur D'Alene, s. l.	Idaho	5,000,000	500,000	10					310,000	June	1893	.03
36	Colorado Central, s. l.	Colo.	2,750,000	275,000	10	*				502,661	April	1893	.05
37	Commonwealth, s.	Nev.	10,000,000	100,000	100	200,000	Nov.	1893	.10	20,000	Nov.	1890	.20
38	Confidence, s. l.	Nev.	2,496,000	24,960	100	1,589,520	Aug.	1892	.50	199,680	April	1889	1.00
39	‡Cons. Cal. & Va., s. g	Nev.	21,600,000	216,000	100	216,000	Dec	1892	.50	3,682,800	Aug.	1891	.50
40	Contention, s.	Ariz.	12,500,000	250,000	50					2,637,500	Aug.	1892	.20
41	Cook's Peak, s.	N. M.	2,000,000	200,000	10					119,532	Nov.	1892	.05
42	‖Cop. Queen Con., c.	Ariz.	2,000,000	200,000	10					1,610,000	Feb.	1894	.25
43	Coptis	Nev.	10,000,000	100,000	100					67,000	July	1892	.12
44	Cortez, s.	Nev.	1,500,000	300,000	5	*				687,000	Mar.	1892	.50
45	Crescent, s. l. g.	Utah	15,000,000	600,000	25	60,000	Oct	1892	.10	238,000	Oct.	1888	.08
46	Crown Point, g. s.	Nev.	10,000,000	100,000	100	2,750,000	June	1893	.25	11,898,000	Jan.	1875	.00
47	Daly, s. l.	Utah	3,000,000	150,000	20					2,850,000	May.	1893	.25
48	†Deadwood-Terra, g.	Dak.	5,000,000	200,000	25	*				1,140,000	Sept	1892	.05
49	DeLamar, g. s	Idaho	2,000,000	400,000	5					1,350,000	April	1894	.50
50	Derbee B. Grav., g	Cal.	10,000,000	100,000	100	100,000	Sept.	1892	.10	265,000	Mar	1894	.05
51	Dexter, g. s	Nev.	1,000,000	100,000	10					105,000	July	1893	.25
52	Elkhorn, s.	Mont.	1,000,000	200,000	5	*				1,261,000	Mar.	1894	.18
53	Enterprise, s.	Colo.	2,500,000	500,000	5	*				850,000	June	1893	.25
54	Eureka Con., s. l. g.	Nev.	1,000,000	50,000	100	550,000	June	1889	.50	5,112,500	Jan	1892	.25
55	Evening Star, s. l.	Colo.	500,000	50,000	10	*				1,437,500	Dec.	1889	.25
56	Father de Smet, g.	Dak.	10,000,000	100,000	100	200,000	Nov.	1878	1.00	1,125,000	Dec.	1885	.20
57	Franklin, c.	Mich.	1,000,000	40,000	25	220,000	June	1871		1,240,000	Dec.	1893	2.00
58	Glengarry	Mont.	1,000,000	100,000	10					10,000	June	1891	.10
59	Golden Reward	S. Dak	1,250,000	250,000	5					85,000	April	1893	.02
60	Gould & Curry, s. g.	Nev.	10,800,000	108,000	100	4,698,400	Oct.	1893	.10	3,826,800	Oct.	1870	10.00
61	Grand Prize, s.	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	.10	495,000	Mar.	1884	.25
62	Granite Mountain, s.	Mont.	10,000,000	400,000	25					12,120,000	July.	1892	.20
63	Great Western, l. q.	Cal.	5,000,000	50,000	100					388,366	Nov.	1893	.25
64	Hale & Norcross, g. s.	Nev.	11,200,000	112,000	100	5,646,800	June	1893	.50	1,822,000	Aug	1888	.50
65	Hecla Con., s. g. l. c.	Mont.	1,500,000	30,000	50	*				2,055,000	Sept.	1893	.50
66	Hel'a Mg. & Red, s. l. g.	Mont.	3,315,000	663,000	5	*				197,970	July.	1884	.06
67	Helena & Frisco, s. l.	Idaho	2,500,000	500,000	5	*				170,000	July.	891	.02
68	Helena & Victor	Mont.	1,000,000	200,000	5					80,000	May.	1892	.05
69	¶Holmes, s.	Nev.	10,000,000	100,000	100	345,000	Mar.	1890	.25	75,000	Apr.	1892	.25
70	Homestake, g.	Dak.	12,500,000	125,000	100	200,000	July.	1878	1.00	5,156,250	Apr.	1894	.15
71	Hope, s.	Mont.	1,000,000	100,000	10	*				583,250	Mar.	1894	.25
72	Horn-Silver, s. l.	Utah	10,000,000	400,000	25	*				4,930,000	Mar	1894	.12½
73	Idaho, g.	Cal.	310,000	3,100	100					5,489,000	Sept.	1893	2.50
74	Illinois, s.	N. M.	100,000	100,000	1	*				45,000	April	1889	.20
75	Iron Mountain, s.	Mont.	5,000,000	500,000	10	*				245,000	July.	1893	.03
76	Iron-Silver, s. l.	Colo.	10,000,000	500,000	20	*				2,500,000	April	1889	.20
77	Jackson, g. s.	Nev.	5,000,000	50,000	100	247,500	Mar.	1893	.20	60,000	Jan.	1891	.10
78	Kearsarge, c.	Mich.	1,000,000	40,000	25	190,000	Oct.	1887	1.00	80,000	Jan.	1890	2.00
79	Kennedy	Cal.	10,000,000	100,000	100					1,072,000	Dec.	1893	.45
80	Kentuck, s. g.	Nev.	3,000,000	30,000	100	454,180	Oct.	1891	.15	1,350,000	Dec.	1886	.10
81	Leadville Con., s. l.	Colo.	4,000,000	400,000	10	*				316,000	Feb.	1892	.03
82	Lexington, g. s.	Mont.	4,000,000	40,000	100	*				652,200	July.	1893	.90
83	Little Chief, s. l.	Colo.	10,000,000	200,000	50	*				820,000	Dec.	1890	.05
84	Maid of Erin	Colo.	3,000,000	600,000	5					708,900	April	1893	.25
85	Mammoth, s. l. c.	Utah	10,000,000	400,000	50	110,000		1882	.25	1,040,000	Dec.	1891	.10
86	Maxfield	Utah	3,000,000	300,000	10					117,000	April	1892	.03
87	Mayflower, d. gravel	Cal.	1,200,000	60,000	20					128,000	Nov	1893	.10
88	May Mazeppa, s. l.	Colo.	1,000,000	100,000	1					205,000	Oct.	1891	.08¾
89	Minas Prietas, g. s.	Mex.	1,000,000	100,000	10	*				350,000	Dec.	1890	.50
90	Minnesota, c.	Mich.	1,000,000	40,000	25	420,000	April	1886	1.00	1,820,000	Mar	1876	
91	Minnesota Iron, i.	Minn.	16,500,000	165,000	100					2,745,000	April	1893	1.50
92	Mollie Gibson, s.	Colo.	5,000,000	1,000,000	5	*				3,930,000	Dec.	1893	.05
93	Monitor, g.	S. Dak	2,500,000	250,000	10					45,000	Oct.	1890	.03
94	Mono, g.	Cal.	5,000,000	50,000	100	797,500	Feb.	1893	.25	12,500	Mar	1886	.25
95	Montana, Lt., g. s.	Mont.	3,300,000	660,000	5	*				2,619,075	June.	1891	12½
96	Morning Star, s. l.	Colo.	1,000,000	100,000	10					1,025,000	Dec.	1891	.25
97	Morning Star Drift, g	Cal.	240,000	2,400	100					[illegible]	April	1893	3.00
98	Moulton, s. g.	Mont	2,000,000	400,000	5	*				410,000	Nov.	1892	.07½
99	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	June	1880	2.00	225,000	Nov	1893	.30
100	Napa, q.	Cal.	700,000	100,000	7					620,000	April	1894	.10
101	Navajo, g. s.	Nev.	10,000,000	100,000	100	538,714	Sept.	1893	.10	226,111	April	1889	.10
102	New Guston, s.	Colo.	550,000	110,000	5					1,877,500	April	1892	.75
103	North Banner Con	Cal.	1,000,000	100,000	10					20,000	July.	1891	.05
104	North Commonw'th	Nev.	10,000,000	100,000	10	90,000	Jan.	1893	.10	25,000	June.	1891	.25
105	N. Hoover Hill, g. s.	N. C.	300,000	120,000	2½					30,000	Dec.	1885	.06¼
106	North Belle Isle, s.	Nev.	10,000,000	100,000	100	513,075	April	1893	.10	230,000	May	1888	.50
107	North Star, g.	Cal.	1,000,000	100,000	10	20,000		1885	.02	450,000	June	1893	.50
108	Omaha Cons., g.	Cal.	2,400,000	24,000	100					30,000	May.	1892	.15
109	Ontario, s. l.	Utah	15,000,000	150,000	100					13,175,000	Oct.	1892	.50
110	Ophir, g. s.	Nev.	10,000,000	100,000	100	4,391,040	July.	1893	.25	1,595,800	Jan.	1880	1.00
111	Original, s. c.	Mont.	1,500,000	60,000	25	*				138,000	Jan.	1889	.05
112	Oro, s. l. g.	Colo.	500,000	100,000	5					95,000	July	1890	.20
113	Osceola, c.	Mich.	1,250,000	50,000	25	480,000	April	1876	1.60	1,847,500	Dec.	1893	1.00
115	Pacific Coast, b.	Cal.	1,500,000	15,000	100					422,500	July.	1893	1.00
115	Parrot, c.	Mont.	1,800,000	180,000	10					1,569,000	June	1893	.10
116	Petro	Utah.	10,000,000	10,025	100					17,500	July.	1891	.75
117	Plumas Eureka, g.	Cal.	1,406,250	140,600	10					2,696,295	Oct.	1893	.18
118	Plymouth Con., g.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
119	Poorman, g. s.	Idaho	375,000	300,000	1.25	*				68,260	Sept.	1892	
120	Quicksilver, pref., q.	Cal.	4,300,000	43,000	100					1,823,911	June	1891	1.25
121	" com., q	Cal.	5,700,000	57,000	100					643,867	July.	1882	.40
122	Quincy, c.	Mich.	1,250,000	50,000	25	200,000	Dec.	1862		6,670,000	Aug.	1892	3.00
123	Red Cloud	Idaho	1,000,000	200,000	5					153,000	Dec.	1892	.10
124	Reed National, s. g.	Colo.	500,000	500,000	1	*				50,000	Dec.	1890	.01
125	Retriever, l.	S. Dak	1,250,000	250,000	5					20,000	Aug.	1891	.03
126	Rialto, g.	Colo.	300,000	300,000	1	*				50,250	April	1892	.01½
127	Richmond, s. l.	Nev.	1,350,000	54,000	25	*				4,359,887	Oct.	1893	.25
128	Rico-Aspen	Colo.	5,000,000	1,000,000	5					175,000	May.	1894	.02½
129	Ridge, c.	Mich.	1,250,000	50,000	25	219,939	Mar.	1886	.50	99,785	Feb.	1880	.50
130	Robinson Con., s. l.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
131	Savage, s.	Nev.	11,200,000	112,000	100	6,966,000	June	1893	.25	4,460,000	June	1869	3.00
132	Sierra Buttes, g.	Cal.	2,225,000	122,500	10					1,559,933	Oct.	1893	.12½
133	Sierra Nevada, s. g.	Nev.	10,000,000	100,000	100	6,521,910	Aug	1893	.20	102,000	Jan.	1871	1.00
134	Silver Cord, s. l. g.	Colo.	4,500,000	450,000	10					265,000	April	1889	.10
135	Silver King, s.	Ariz.	10,000,000	100,000	100	97,479	Aug.	1892	.25	1,950,000	July	1887	.25
136	Silver Mg. of L. V., s. l.	N. M.	500,009	500,000	1					300,000	Dec.	1891	4.05
137	Small Hopes Con., s.	Colo.	5,000,000	250,000	20	*				3,225,000	Oct.	1893	.10
138	Standard, g. s.	Cal.	10,000,000	100,000	100	100,000	June	1890	.50	3,721,159	Mar.	1894	.10
139	Swansea, g. s.	Colo.	600,000	60,000	10					39,060	Sept.	1893	.10
140	Tamarack, c.	Mich.	1,250,000	50,000	25	520,000	April	1885	3.00	3,670,000	Dec.	1893	4.00
141	Tombstone, g. s. l.	Ariz.	12,500,000	500,000	25	*				1,250,000	April	1882	.10
142	Trinity Riv'r Hydr., g	Colo.	500,000	500,000	1	*				15,000	July.	1893	.00½
143	United Verde, c.	Ariz.	3,000,000	300,000	10	*				207,500	Jan.	1892	.10
144	Victor, g	Colo.	1,000,000	200,000	5					120,000	Dec.	1893	.07½
145	Ward Con., s.	Colo.	2,000,000	200,000	10					20,000	Dec.	1889	.05
146	W. Y. O. D.	Cal.	60,000	30,000	2	22,500	May.	1891	.10	48,000	Nov.	1893	.10
147	Yankee Girl, s.	Colo.	1,300,000	260,000	5					1,405,000	Sept.	1893	1.50
148	Yellow Jacket, g. s.	Nev.	12,000,000	120,000	100	5,556,000	July.	1893	.2	2,184,000	Aug.	1871	1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and am't of last.		
1	Alliance, s. g.	Utah	$100,000	100,000	$1	$120,000	Feb.	1891	.10
2	Allouez, c.	Mich.	2,000,000	80,000	25	1,424,937	Oct.	1891	.10
3	Alpha Con., g. s.	Nev.	3,000,000	30,000	100	209,000	Sept.	1892	.10
4	Alta, s.	Nev.	10,080,000	100,800	100	3,369,880	Jan.	1892	.10
5	American Flag, s.	Colo.	1,250,000	125,000	1	300,000	June	1887	
6	Anchor, s. l. g.	Utah.	3,000,000	150,000	5	560,000	July.	1893	.10
7	Barcelona, g.	Nev.	5,000,000	200,000	5	*			
8	Belmont, g.	Cal.	500,000	500,000	100	*			
9	Belmont, s.	Nev.	5,000,000	50,000	100	735,000	April	1886	.10
10	Best & Belcher, s. g.	Nev.	10,080,000	100,800	10	2,405,275	Aug.	1892	.25
11	Black Oak, g.	Cal.	3,000,000	300,000	100	*			
12	Brownlow, g.	Colo.	250,000	250,000	5				
13	Brunswick, g.	Cal.	2,000,000	400,000	2				
14	Bullion, s. g.	Nev.	10,000,000	100,000	100	2,890,000	Aug.	1892	.25
15	Butte & Boston, c. s.	Mont.	5,000,000	200,000	10				
16	Butte Queen, g.	Cal.	1,000,000	100,000	1	6,000	Jan.	1892	.04
17	Calaveras, g.	Cal.	500,000	500,000	5				
18	Calaveras Con., g.	Cal.	800,000	160,000	10				
19	California, g.	Cal.	1,000,000	100,000	5	9,000	Mar.	1892	.03
20	California Con. l. q.	Cal.	2,250,000	450,000	10				
21	Challenge Con., g. s.	Nev.	5,000,000	50,000	10				
22	Choliar, s. g.	Nev.	11,200,000	112,000	2	1,820,000	May.	1892	.50
23	Colchis, s. g.	N. M.	500,000	150,000	5				
24	Colorado, s.	Colo.	1,625,000	325,000	1				
25	Comstock, s.	Utah.	1,250,000	250,000	100				
26	Comstock Tun.	Nev.	10,000,000	100,000	100	35,000	Mar.	1887	.10
27	Con. Imperial, g. s	Nev.	5,000,000	50,000	50	2,062,500	Jan.	1892	.25
28	Con. New York, s. g	Nev.	5,000,000	100,000	100	110,000	Mar.	1892	.10
29	Con. Pacific, g.	Cal.	6,000,000	60,000	10	198,000	June	1890	.10
30	Crescent, s. l.	Colo.	3,000,000	300,000	100	*			
31	Crocker, s.	Ariz.	10,000,000	100,000	1	165,000	Aug	1892	.05
32	Crowell, g.	N. C.	500,000	500,000	1				
33	Dahlonega, g.	Ga.	250,000	250,000	10	*			
34	Decatur, s	Colo.	1,500,000	300,000					
35	Denver City s.	Colo.	5,000,000	500,000	11	*			
36	Denver Gold, g.	Colo.	300,000	60,000	5				
37	Dickens-Custer, s.	Idaho	2,100,000	420,000	5				
38	Durango, g.	Colo.	500,000	500,000	1	*			
39	El Dorado, g.	Cal.	1,000,000	250,000	4	*			
40	Emma, s	Utah.	625,000	500,000	125				
41	Emmons, s. l.	Colo.	2,000,000	2,000,000	1				
42	Empire, s.	Utah.	10,000,000	100,000	100				
43	Eureka Tunnel, s. l.	Nev.	10,000,000	100,000	100	*			
44	Exchequer, s. g.	Nev.	10,000,000	100,000	100	940,000	Jan.	1892	.25
45	Found Treasure, g. s.	Nev.	10,000,000	100,000	100	130,500	Jan.	1892	.50
46	Gogebic I. Syn., i.	Wis.	5,600,000	200,000	25				
47	Gold Cup, s.	Colo.	500,000	500,000	1	*			
48	Golden Era, s.	Mont.	1,000,000	200,000	10	*			
49	Gold Flat, g.	Cal.	1,000,000	100,000	10	5,000	Mar.	1892	.05
50	Gold Rock, g.	Cal.	1,000,000	500,000	2				
51	Golden FeatherCo., g	Cal.	900,000	180,000	5				
52	Goodyear g. s. l.	Mont.	1,000,000	200,000	5	13,000	Feb.	1892	.01
53	Grand Duke, s.	Colo.	800,000	80,000	10				
54	Gregory Con., g.	Mont.	3,000,000	300,000	10				
55	Harlem M. & M. Co., g.	Cal.	1,000,000	200,000	5				
56	Hartery Con., g.	Cal.	1,000,000	100,000	10	22,000	Oct.	1890	.05
57	Hartshorn, g. s. l.	S. Dak	1,250,000	250,000	5	8,750	Sept.	1891	.00½
58	Head Cent. & Tr., s. g	Ariz.	10,000,000	100,000	100	16,981	Mar.	1892	.03
59	Hector, g.	Cal.	1,500,000	300,000	5	45,000	Jan.	1889	.15
60	Himalaya, g. s. l.	Utah.	1,800,000	80,000	10	12,800	Oct.	1892	.00½
61	Holywood	Cal.	200,000	100,000	2				
62	Huron, c.	Mich.	1,000,000	40,000	25	280,000	May.	1887	3.00
63	Idaho, g. s	Idaho	1,250,000	250,000	5				
64	Ingalls, g	Colo.	100,000	20,000	5				
65	Ironton, i.	Wis.	1,000,000	40,000	25				
66	Iroquois, c.	Mich.	1,250,000	50,000	25				
67	Kentuck Con	Nev.	10,500,000	105,000	00	57,750	July	1892	.10
68	Julia Con., g. s.	Nev.	11,000,000	110,000	100	1,463,000	Jan.	1889	.10
69	Justice, g. s. c.	Colo.	500,000	500,000	1	*			
70	Lacrosse, g.	Colo.	1,000,000	100,000	10	*			
71	Little Josephine, s.	Colo.	250,000	50,000	5				
72	Lone Star Cons., g.	Cal.	500,000	500,000	1	10,000	April	1892	.00½
73	Madeleine, g. s. l.	Colo.	750,000	50,000	1	4,500	Feb.	1892	.00½
74	Mammoth Gold, g.	Ariz.	2,500,000	500,000	5	*			
75	Mayflower Gravel, g	Cal.	1,000,000	100,000	10	*			
76	Mexican, g. s.	Nev.	10,000,000	100,000	100	2,917,560	Oct.	1892	.50
77	Michigan, g. s.	Mich.	2,500,000	100,000	25	40,000	Mar.	1892	
78	Mike & Starr, s. c.	Colo.	1,000,000	200,000	5	*			
79	Milwaukee, s.	Mont.	500,000	500,000	1	*			
80	Modoc Chief, l. s. g.	Idaho	1,000,000	200,000	5	5,000	Jan.	1892	.00½
81	Monitor, g.	Colo.	100,000	100,000	1	12,500	May.	1891	.01
82	Montreal, g. s. l.	Utah.	750,000	150,000	5	4,500	Feb.	1892	.00½
83	Mutual Mg. & Sm.	W'sh	100,000	100,000	1	*			
84	Neath, g.	Colo.	1,000,000	100,000	10				
85	Nelson	Cal.	50,000	10,000	5				
86	Nevada Queen, s.	Nev.	10,000,000	100,000	100	200,000	Oct.	1889	.25
87	New Gold Hill	N. C.	1,750,000	350,000	5				
88	New Pittsburg, s. l.	Colo.	2,000,000	200,000	10	*			
89	North Standard, g.	Cal.	10,000,000	100,000	100	20,000	Nov.		
90	Occidental Con., g. s		10,000,000	100,000	100	245,000	April	1892	.25
91	Oneida Chief, g.	Cal.	500,000	125,000	100	*			
92	Oriental & Miller, s.	Nev.	10,000,000	400,000	100				
93	Original Keystone, s.	Nev.	10,000,000	100,000	100	250,000	Mar.	1892	.10
94	Osceola, g.	Nev.	5,000,000	500,000	10	*			
95	Overman, g. s.	Nev.	11,520,000	115,200	100	4,001,840	May.	1892	.10
96	Pay Rock, s.	Colo.	1,000,000	200,000	5				
97	Peer, s.	Ariz.	10,000,000	100,000	100	190,000	Feb.	1892	.10
98	Peerless, s.	Ariz.	10,000,000	100,000	100	405,000	Oct.	1890	.15
99	Pennsylva'a Cons., g	Cal.	5,150,000	515,000	10	36,050	Feb.	1892	.10
100	Phœnix, g.	Ariz.	500,000	500,000	1	*			
101	Phœnix Lead, s. l.	Colo.	100,000	100,000	1	*			
102	Pilgrim, g.	Cal.	600,000	300,000	2	*			
103	Pioche M. & R., s. g. l.	Utah.	20,000,000	000,000	10				
104	Poorman, Ltd., s. l.	Idaho	250,000	50,000	5				
105	Potosi, s.	Nev.	11,200,000	112,000	100	1,573,000	Mar.	1890	.50
106	Proustite, s.	Idaho	250,000	250,000	1	*			
107	Puritan, s. g.	Colo.	1,500,000	150,000	10	*			
108	Quincy, c	Colo.	3,000,000	300,000	10				
109	Rainbow, g.	S. Dak	1,250,000	250,000	5	4,250	July.	1892	.00½
110	Rappahannock, g. s.	Va.	250,000	250,000	1	*			
111	Red Mountain, s.	Colo.	300,000	60,000	5				
112	Ropes, g. s.	Mich.	2,000,000	80,000	25	167,200	Feb.		.50
113	Ruby & Dun., s. l. g.	Nev.	25,300	506	50				
114	Russell, g.	N. C.	1,500,000	300,000	5				
115	Sampson, g. s. l.	Utah.	10,000,000	100,000	100	288,154	July	1888	1.08
116	Silver Age, s. l. g.	Colo.	2,000,000	200,000	10	*			
117	Silver Bell, s.	Ariz.	850,000	170,000	5				
118	Silver King, s.	Cal.	2,000,000	400,000	5				
119	Silver Queen, c.	Aris.	5,000,000	200,000	25	*			
120	Silverton, s	Colo.	300,000	60,000	5				
121	Siskiyou Con., l.	Cal.	2,000,000	200,000	10	13,000	May.	1892	.01½
122	South Bulwer, g.	Cal.	10,000,000	100,000	100	100,000	May.	1881	.25
123	South Hite, g.	Cal.	10,000,000	100,000	100	195,000	Jan.	1883	.05
124	Stanislaus, g.	Cal.	2,000,000	200,000	10				
125	St. Kevin, s. g.	Colo.	100,000	100,000	1	*			
126	St. Louis & Mex., s.	Mex.	000,000	500,000	10	*			
127	St. Louis & St. Elmo.	Colo.	,000,000	200,000	10				
128	St. L. & Sonora, g. s.	Ariz.	3,000,000	300,000	10	*			
129	Stemwinder, l. s.	Idaho	,500,000	500,000	1				
130	Sunday Lake, i.	Mich.	250,000	50,000	25				
131	Sullivan Con., g.	Dak.	600,000	200,000		*			
132	Sylvanite, s.	Colo.	5,000,000	500,000	10	*			
133	Taylor-Plumas, g.	Cal.	425,000	65,000	5	3,575	Mar.	1892	.01½
134	Telegraph, g. s.	Cal.	325,000	65,000	5	3,575	Mar.	1892	.01½
135	Telegraph, g. s.	Mex.	100,000	100,000	1	70,000	Feb.	1892	.10
136	Teresa, g. s.	Cal.	1,000,000	200,000	5	10,000	Feb.	1888	.10
137	Tioga Con., g.	Nev.	10,000,000	100,000	10	295,000	May.	1888	25
138	Tornado Con., g. s.	Nev.	100,000	100,000	1	*			
139	Tuscarora, s.	Nev.	10,000,000	500,000	20	385,000	Jan.	1892	25
140	Union Con., g. s.	Nev.	10,000,000	100,000	100	370,000	June	1892	25
141	Utah, s.	Nev.	10,000,000	100,000	100	245,000	Aug.	1890	.25
142	Ute & Ulay, s. l.	Colo.	1,000,000	500,000	2	1,500	Mar.	1892	.001
143	Valley, g.	Cal.	575,000	460,000	125				
144	Washington, c.	Mich.	1,000,000	40,000	5				
145	West Argentine, s.	Colo.	750,000	150,000	5				
146	West Granite Mt., s.	Mont.	500,000	100,000	5				
147	Whale, s.	Mont.	5,000,000	500,000	10	*			
148	Wood River, g.	Idaho	2,000,000	200,000	10	3,000	Aug.	1891	.00½
149	Yuma, c. s. g.	Aris.	10,000,000	400,000	2				

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † The Deadwood previously paid $275,000 in eleven dividends and the Terra $75,000. ‡ Previous to the consolidation in August, 1884, the California had paid $31,320,000 in dividends, and the Cons. Virginia $12,390,000. ‖ Previous to the consolidation of the CopperQueen with the Atlanta, August, 1885, the Copper Queen had paid $1,350,000 in dividends. ¶ Previous to this company's acquiring Northern Belle, that mine paid $2,400,000 in dividends against $425,000 in assessments.

COAL AND COAL RAILROAD STOCKS.

NAMES OF STOCKS.	April 28.		April 30.		May 1.		May 2.		May 3.		May 4.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Am. Coal													
Balt. & Ohio					77		77						303
do. pref													
Buff., R. & P													
do. pref													
Cambria Iron													
Ches. & Ohio													
do. 1st pref													
Col. C. & I													
Col. Coal													
Colorado Fuel													
do. pref	70												30
Col., H. V. & Tol.			17¼		17¾				18¼				300
do. pfd													
Col. & H. Coal							7				7		150
do. pfd													
Cons. Coal													
Del. & Hud. C	138¼	138½	139	138¾	138¾	138¾	138¾		138	137⅝			2,127
Del., L. & West			162	160⅝	162	160⅝			160¼	160¼	160¼	160⅛	1,457
Hunt. & B. Top													
do. pref	49		48										28
Lake Erie & Wes													
do. pref	69	68¼	68		69								913
Lehigh C. & N			53⅜		53⅜		54	53⅞	53⅜				72
Lehigh Valley	38	37⅛	37¼	37⅛	37⅜	37⅛	37¼	37⅛	37¼	37			985
Maryland Coal													
do. pref													
Morris & Essex													
New Cent. Coal													
N. J. Central	111				111	110¼	110¾		110		109¼	109	2,540
N. Y., L. & W									113⅛	113¼			420
N. Y., L. E. & W	16		15⅜		16	15⅜	15⅞	15⅜	15⅜	15⅜	15⅜	15½	6,921
do. pref			33¾		32								324
N. Y., Susq. & W	15¼		15¼	15	14⅞						14¾		735
do. pref			41¾	40	40¾	40¾	14¾		40¾	40¼	40		865
N. & West													
do. pref									21¾	21⅛			300
Penn. Coal													
Penn. R. R	50⅝	50⅜	51	50⅝	50⅞	*49¼	49¼	49⅝	49⅝	49¾			2,742
Phil. & Reading	19¼	19	19¼	19	19	17⅜	17⅝	16⅝	17	15⅞	16⅛	16	100,570
Penn. C. & I	17¼	17	17⅜	17¼	18		18	17⅛	17⅜		17⅜	17	1,340
do. pref							63¼						10
Wheel. & L. E	13¼	12⅝	13⅜	12⅛	13½		13	12⅜	12⅝	12¼	12¾	12⅛	1,593
do. pref	50⅝		50		49⅞		49¾		49¾		49⅝		820

* Ex-dividend. Total shares sold, 125,629.

INDUSTRIAL AND TRUST STOCKS.

NAME OF STOCKS.	Apr. 28.		Apr. 30.		May 1.		May 2.		May 3.		May 4.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams Express			153¾	151			153						24
Am. Cotton Oil	30¾		31	30¾	31		30¾	30¼	31	30	30¼		1,640
do. pref	75	74½	74¾	74¾	74¼		75¼	75	76	75¼	75¼	75¼	1,119
Am. Dist. Tel													
Am. Express			112½		103½								70
Am. Sugar Ref	104¾	105¼	105¾	104¾	105¾	104	106¼	104	108¾	106	109¼	107¾	412,595
do. pref	96	95¾	97½	95	96¾	95	96¼	95	97¾	96¼	97½	96¼	11,980
Edison E. Ill. Co					103½								10
Edison Gen. El	39	82¼	38¾	38⅝	40¼	38⅝	40	38¼	39	38⅜	38⅝	38	23,821
Nat. Cord. Co	23½	23¼	24⅝	23½	25⅜	24½	24½	24	25	24¼	25	24¼	24,275
do. pref			48¼	47¼	49½	49	48¼	48	48		48⅜		1,137
Nat. Lead Co	40¾	39½	42¾	40⅜	41⅝	41	42	39	40⅜	39⅝	41¼	39¼	66,707
do. pref	86⅝	81½	88¼	86¼	87¼	85¾	87¾	86	86½	86	86⅝	86	7,570
Nat. Linseed Oil					21								2.0
U. S. Express	57												5
U. S. Rubber			38¾	38½	38½								374
do. pref	90		90	89½	91	90½			81½				619
Wells, Fargo Ex			127	125			127						23
Western Union	84¼	84	85⅜	83⅞	85¼	85	85¼	84⅝	84⅝	84¼	84⅜	84½	26,729

Total shares sold, 578,898.

CALIFORNIA.

San Francisco.

NAMES OF STOCKS.	CLOSING QUOTATIONS. Apr. 27	Apr. 28.	Apr. 30.	May 1.	May 2.	May 3.
Alpha	.42		.48	.45	.47	.47
Alta						
Belcher						
Belle Isle						
B. & Belch	2.25		1.95	1.90	2.35	2.30
Bodie	1.20		2.00	1.85	2.05	2.45
Bulwer	.02		.16	.14	.15	.17
Challar	.65		.67	.65	.70	.82
Com'w'th						
Con. C. & V	5.38		4.85	4.60	5.60	7.00
Con. Pac						
Crown Pt	.80		.75	.83	.90	1.00
Del Monte						
E'reka Con						
G'ld & C'y	1.05		1.05	.95	1.05	1 15
Hale & N	.51		.75	.68	.75	.83
M. White						
Mexican	1.70		1.60	1.60	1.70	1.75
Mono	.36		.45	.45	.49	.56
Mt. Diablo						
Navajo						
Nev. Qu'n						
N. B'lle Isle						
N. Co'w'th						
Ophir	3.65		3.45	3.50	3.60	3.90
Potosi	1.20		1.20	1.25	1.35	1.45
Savage	.85		.90	.87	.95	.94
Sierra Nev	1.25		1.25	1.35	1.45	1.45
Uni'n Con	.96		.95	.95	1.00	1.05
Utah	.08		.10	.10	.09	.14
Yel. Jack	.75		1.00	1.00	1.10	1.20

COLORADO.

Aspen.

April 26.

	Price.
Argentum-Juniata	$0.52
Aspen Contact	.45
Aspen Deep Mining	
Best Friend	
Bi-Metallic	.03
Bushwacker	.09½
Delia. S	
Gold Valley Placer	
Little Annie	.04
Mollie Gibson	1.17½
Pontiac	.03
Smuggler	.65
St. Joe & Mineral Farm	.05½
U. S. Paymaster	

Colorado Springs.

Prices and sales for the week ending April 27th, 1894:

	High.	Low.	Sales.
Cripple Creek (gold):			
Aola	.02⅛	.02	69,500
Alamo	.01⅜	.01¼	6,000
Anaconda Gold	.26½	.22	16,220
Anchoria Leland	.09¼	.09	5,000
Antlers Park-Regt	.04¼	.04	3,600
Argentum Juniata	.39	.34	2,000
Bankers	.05½	.04⅜	24 000
Calumet	.01⅜	.01⅝	18,500
Columbine	.01⅛	.01⅛	2,150
Cripple Creek Con	.03¾	.03½	340,850
Creede & Cripple C	.02	.01⅞	69,500
Golden Dale	4.00	3.00	108,500
Gold King	.11	.10	3,300
Goldstone	7.50	7.00	25,000
Gould	.07½	.07	26,224
Golden Eagle	19.50	17.50	43,590
Gold Standard	.04	.03½	5,000
Granite Hill	9.00	8.50	16,900
Isabella	.18	.17	2,000
Jack Pot	.02	.01⅞	44,000
Lottie Gibson	.01¾	.01⅛	20,000
Mollie Gibson	1.25	1.27½	550
Mt. Rosa	.07¼	.06	53,500
Mutual	.02	.02	3,000
Ophir	.04¼	.04¼	500
Pharmacist	.10¼	.10¼	7,900
Ramona	.04¼	.04	3,000
Star of the West	4.00	4.00	4,000
Summit	.14¾	.14	2,000
Union	.14¼	.12¼	105,400
Virginia M	.02¾	.02¼	35,000
Work	.03⅜	.03¾	38,000
World	.01¼	.01¼	6,900

Denver.

Prices and sales for six days ending April 30, 1894.

	High.	Low.	Sales.
Alamo	.01⅜		3,000
Amity	.00⅜		5,000
Argentum	.40½		500
Antlers Park-Reg't	.05	.04⅞	2,000
Bankers	.05¼	.04⅞	9,200
Big Six	.03½		1,000
Calumet	.01½		33,000
Creede & Cr. Cr'k	.01¾		9,000
Golden D	.00⅞	.00¼	64,000
Golden E	.02	.01¾	8,500
Isabella	.18¼	.17½	4,000
Jack Pot	.02	.01⅞	8,000
Lottie Gibson	.01⅞	.01½	6,500
Mollie Gibson	1.27½		100
Work	.03⅝	.03½	16,000
World	.01½		6,000
Western M	.14		1,000

MARYLAND.

Baltimore.

COMPANY.	Bid.	May 3. Asked.
Atlantic Coal		55@60
Balt. & N. C		0.10
Conrad Hill		.10
Cons. Coal	$0.30	
Diamond Tunnel		14.00
George's Creek Coal	1.04	1.08@1.10
Howard C. & C		1.25
Lake Chrome	.01@.02	
Silver Valley	.13	
Vernon Mining Co	.20	40

MINNESOTA.

Duluth.

May 1.

LISTED STOCKS.

	Par.	Bid.	Asked.
Biwabik M. Iron Co	100	$20.00	$21.00
Cincinnatt Iron Co	25	.25	.30
Clark Iron Co	100		.60
Great Northern Min. Co	100	2.75	3.50
Kanawha Iron Co	100	.10	.20
Keystone Iron Co			.40
Lake Superior Iron Co	25		2.50
Lincoln Iron Co			.50
Mesaba Moun. Iron Co.	100	14.00	17 00
Minneapolis Iron Co	100	.02	.15
Mountain Iron Co	100	50.00	65.00
Shaw Iron Co	100	2.50	3.00
Security Land & Exp. Co.	10	10.00	15.00

UNLISTED STOCKS.

Adams Iron Co	10	$7.00	$9.00
Ashland Iron Co	25		40.00
Buckeye Iron Co	100		2.50
Buffalo Land & Exp. Co.	1		.50
Chandler Iron Co	25	20.00	26.00
Charleston Iron Co	100	.15	.30
Cleveland Cliffs Iron Co.	100	20.00	40.00
Chicago Iron Co	100	.20	.30
Detroit Iron Co	25	.01	02
Elmira Land & Iron Co.	100	.05	.25
Great Western Mining Co.	100	1.90	2.25
Homestead Iron Co	25	.00½	.02
Internat'l Development	10		22.50
Jackson Iron Co	25		60.00
Lake Supr. (Marquette)	25	20.00	27.00
McCaskill Mining Co	10	.01	.03
Mesaba C., L. & Ex. Co	10		6.00
Mesaba Chief Iron Co	100	1.75	2.00
Mesaba Iron Co	30		.20
Metropolitan L. & L. Co.	25	50.00	70.00
Northern Light Iron Co	100		.25
Ohio Mining Co	100	5.00	8.00
Ophir, gold	10		1.00
Penn. Iron & Steel Co	100	.04	.10
Pioneer Iron Co	25		1.00
Pittsburg & Lake A. Co.	100	110.00	125.00
Putnam Iron Co	100		.80

MISSOURI.

St. Louis.

May 3.

Closing quotations:	Bid.	Asked.
Adams	$0.40	
American & Nettie, Colo	.25	$0.30
Bi-Metallic, Mont	2.40	3.00
Elizabeth, Mont	.15	.20
Granite Mountain, Mont	1.25	1.75
Hope		2.50
Leo	.01½	.02
Small Hopes		.50

MONTANA.

Helena.

(Specially Reported by S. K. Davis.)

Stock quotations week ending April 25.

	Bid.	Asked.
Bald Butte (Mont.)	$3.50	$4.00
Benton Group (Neihart), Mont		.25
Combination (Phillipsb'g), Mont		.90
Helena & Victor, Mont		.25
Iron Mountain (Missoula), Mont	.40	.45
Piegan (Marysville), Mont	.15	.25
Poorman (Coeur d'Alene), Idaho	.80	.95
Whitlach Union & MacIntyre		.25

PENNSYLVANIA.

Philadelphia.

May 3.

	Bid.	Asked.
Cambria		$46.50
Edison E. Light Co	$122.50	124.50
Penn. Salt	95.00	100.00
Penn. Steel	25.00	30.00
Washington, D. C., Gas	45.00	
Westmoreland C		52.25

Pittsburg.

May 3.

	Bid.	Asked.
Bridgewater Gas	48	
Chartiers Valley Gas	15	15½
Manufacturers' Gas	33	
Nat. Gas Co. of W. Va	25	
Olive Valley Gas	23	
People's Nat. Gas	22	
People's Pipeage Co	14¼	14⅜
Penn. Gas	10⅝	10⅝
Philadelphia Co	20½	20¾
Wheeling Gas		20
Fisher Oil		53
Tuna Oil	7	
Chartiers Block Coal	35	
N. Y. & Cleve. Gas Coal		48½
Monongahela Water	29¾	
Luster Mining Co	12½	13¾
U. S. Glass Co., pref		91½
" " common	25⅞	27
Westinghouse Air Brake		125
Westingh'se Elect., 1st prf		52¼
" " 2d "	38¼	
" " com	24	

UTAH.

Salt Lake City.

(Special Report by James A. Pollock.)

Stock quotations week ending April 28th, 1894:

	Bid.	Asked.
Alliance		$0.75
Anchor	$1.25	2.35
Centennial Eureka		27.50
Cleveland Con		0.50
Crescent	0.02	0.05
Daly	5.50	7.25
Dalton	0.01	0.02
Horn Silver	2.15	
Mammoth	1.20	1.35
Mecars		0.75
Ontario	9.00	10.00
Silver Spar		1.00
Tetro		0.25
Utah		1.60

London Quotations.

April 5, 1894.

	Buyer. £ s. d.	Seller. £ s. d.
Alaska Treadwell,		
Alaska Ter	2 17 6	3 2 6
Almada & Tirito, Mex.	3	9
American Belle, Colo.	1 9	2 3
Bonanaza Gold, Cal	5 0	6 0
De Lamar, Idaho	1 2 0	1 3 0
Elkhorn, Mont	11 6	12 6
Emma, Utah	3	6
Golden Feather, Cal	7 0	7 6
Golden Gate, Cal	5 6	6 6
Golden Leaf, Mont. & N. M	9	1 3
Harqua Hala, Ariz	17 6	18 6
Holcomb Valley, Cal	1 3	1 6
Idaho Exploring	1 6	1 9
Jay Hawk & Lone Pine, Mont	6 0	7 0
Mesquital del Oro, Mex., P	10 0	1 0 0
Mesquital del Oro, Mex., D	2 6	7 6
New Guston, Colo	5 0	7 0
New Montana, Mont.	6 6	7 6
Palmarejo, Mex	1 6	2 0
Pinos Altos, Mex	5 6	6 6
Plumas Eureka, Cal	12 6	15 0
Poorman Con. Idaho	7 0	7 6
Rajah Gold, Can	1 0	2 0
Richmond Con., Nev.	7 0	9 0
Sierra Buttes, Cal	8 9	11 3
Springdale Gold, Colo.	2 6	3 0
United Mexican, Mex.	1 0	1 6

Paris.

April 20.

	Francs.
Belmez, Spain	665.00
Golden River, Cal	130.00
" " parts	30.00
Laurium, Greece	547.00
Lexington, Mont	42.00
" parts	1.50
Nickel, New Caledonia	585.00
Rio Tinto, Spain	385.00
" " oblig	507.50
" " "	501.20
Tharsis, Spain	125.00
Vieille-Montagna, Belgium	458.75

New York Mining Stocks.

(Latest quotations.)

	May 4. Bid.	Asked.
Alice	$0.28	$0.32
Alta	.30	
Best & Belcher	2.20	
Bodie	0.20	
Breece	0.12	0.15
Brunswick	0.03	0.05
Bulwer	0.10	
Caledonia, B. H	0.30	
Castle Creek		0.03
Challar	0.75	
Chrysolite	0.14	0.18
Colo. Cent. Consol		0.35
Comstock Tunnel	0.07	0.08
Con. C. & Va	6.25	
Crown Point	1.00	
Deadwood	0.50	
El Cristo		0.15
Enterprise	0.40	0.75
Father De Smet	0.12	0.16
Gould & Curry	1.05	
Hale & Nor	0.75	
Holyoke		0.03
Horn Silver	2.45	
Iron Silver		.25
Kingston & Pem	0.20	
La Crosse	0.04	0.06
Leadville	0.08	
Little Chief	0.09	
Mexican	1.50	
Mono	0.45	
Ophir	3.25	
Phœnix Trust Co	0.10	0.25
Phœnix Con Gold		
Plymouth Con	0.60	
Potosi	0.80	
Savage	0.85	
Sierra Nevada	1.35	
Silver King	0.75	
Union Cons	1.00	
Utah	0.10	
Yellow Jacket	1.10	

ASSESSMENTS.

COMPANY.	No.	Dinqt. in office.	Day of sale.	Amt. per sh're
Belcher, Nev	48	Apr. 17	May 8	.25
Bodie, Cal	17	Apr. 16	May 14	.15
Caledonia, S. Dak	18	Apr. 10	May 10	.50
Challenge, Nev	16	May 8	May 29	.05
Chollar, Nev	38	Apr. 24	May 16	.20
Clint. Con., Cal	4	May 14	June 2	.50
Cr'wn Pt., Nev	61	May 28	June 18	.25
Ea. Sierre, Nev	3	Apr. 20	May 11	.05
Eclipse, Cal	8	May	June 2	.03
El D'poldo, Mex	6	May 10	May 21	.01
Even'g Star, Cal	13	May 3	May 24	.01½
Golden Pr., Nev	6	May 26	June 23	.25
Gray Eagle, Cal	36	May 29	June 19	.03
J'ck R'bbit, Cal	6	Apr. 24	May 11	.02
Magnet, Mont	4	May 5	June 2	.01
Osborn Hill, Cal	2	May 7	May 28	.25
Pine Hill, Cal	4	May 19	June 9	.05
West. Con. Cal. & Va., Nev	2	May 12	May 31	.25

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Poole, R., & Son Co.

Grain Elevators
Poole, R., & Son Co.

Grease, Graphite, Etc.
Dixon, Jos., Crucible Co.

Hangers
Poole, R., & Son Co.

Heavy Machinery
Poole, R., & Son Co.

Hopper Locks
Mueller Mfg. Co

Hose, Rubber, Etc.
Allen, Chas. A.
Mineralized Rubber Co.
New York Belting & Packing Co., Ltd.

Inspection and Tests
Hunt, The Robert W. Co

Insulated Wires and Cables
Okonite Co., Ltd.

Insurance Companies
Hartford Steam Boiler Inspect'n and Ins. Co.
Mutual Life Insurance Co

Iron Castings
Poole, R., & Son Co.

Ladles
Obermayer Co.

Lamps, Miners'
Everhardt, J. M. | Stieren, Wm. E.

Lathes
Seneca Falls Mfg. Co.

Lead, White, Machinery
Poole, R., & Son Co.

Locomotives
General Electric Co. | Porter, H. K., & Co.
Hunt, C. W. Co. | Thomson-Houston International Co.

Lubricants
Dixon, Jos., Crucible Co

Machine Molded Gearing
Poole, R., & Son Co.

Machinists
Poole, R., & Son Co.

Marine Railways
Poole, R., & Son Co.

Machinery.

Dealers in Mining, Milling, and Other Machinery
Ætna Fdy. & Mach. Co. | Overland Mach. Co.
Allis, Ed. P., & Co. | Penn Diamond Drill & Mfg. Co.
Amer. Mining & Milling Machinery Co | Pierce & Miller Engineering Co.
Armstrong Brothers.
Becsett Foundry & Machine Co. | Pollock, Wm. B., & Co.
Bostelman, L. F. | Poole, Robt. Son & Co.
Boston Ore Mach'y Co. | Scaife, W. B., & Sons.
Buckeye Engine Co. | Seymour Concent. Co.
Bullock, M. C., Mfg. Co. | Stedman Fdy. & M. Co.
Colorado Iron Works. | Sullivan Mach'ry Co.
Exeter Mach. Wks. Co. | Thomson-Houston International Co
Fraser & Chalmers | Trenton Iron Co.
Griffith & Wedge Co | Union Iron Works.
Hendrie & Bolthoff Mfg. Co. | Vulcan Iron Works.
Jeffrey Mfg. Co. | Walb'rn-Swens'n Mfg. Co.
McKiernan, S. G. & Co. | Webster, Camp & Lane Mach. Co.
Mech'l Gold Extr. Co. | Wright & Adam Co.
Mecklenburg Ir. Wks. | Youngsto'n Bridge Co.
Moore, Sam. L. & Son. | James & Shakespeare
Metal Dealers | Johnson, Matthey & Co.
Abbott, Wheelock & Co. | Lewisona Bros.
American Metal Co. | Mathison Sm'lting Co.
Am. Zinc-Lead Co. | Orford Copper Co.
Baker & Co. | Phelps, Dodge & Co.
Bath, Henry & Son. | Picher Lead Co
Cowles Elec. S. & Aluminum Co. | State Ore Sampling Co.
Eureka Co. | Victor Chemical Co.

Metallurgical Works and Ore Purchasers' Processes
American Zinc Lead Co.
Baker & Co
Balbach Smelting & Refining Co.
Baltimore Copper Works.
Canadian Copper Co.
Kansas City S. & Ref. Co.
Ledoux & Co.
Mechanical Gold Extractor Co.
Orford Copper Co.
Pennsylvania Salt Mfg. Co.
Ricketts & Banks.
Russell Process Co.
St. Louis Sampling & Testing Works.
State Ore Sampling Co.
Wilburn-Swenson Mfg. Co.

Mine Cars
Sheffield Car Co.

Mining and Land Companies
Atlantic Mg. Co. | Golden R'f Mg. & M. Co
Boston & Mont. Mg. Co. | Hicks & Sprague.
Butte & Boston Mining Co. | Mollie Gibson Con. Mg. & M. Co.
Central Mg. Co. | Osceola Con. Mg. Co.
Copper Queen Mg. Co. | Quebrada R. R. L. & C. Co.
Detroit Copper Mg. Co. | Tamarack Mg. Co.
Eureka Co.

Moulding Sand
Garden City Sand Co.

Nickel
Canadian Copper Co.

Nuts, Lock
Young Lock Nut Co.

Ore Cars
Truax Mfg. Co.

Ore Testing Works
Hunt & Robertson. | Ricketts & Banks.
Ledoux & Co. | State Ore Sampling Co

Packing and Pipe Coverings
Brandt, Randolph. | New York Belting & Packing Co., Ltd.
Jenkins Bros. | Wyckoff & Son, A.
Keasby, Robt
Mineralized Rubber Co.

Patents
Atkins, J. L.

Perforated Metals
Harrington & King Perforating Co.
Hendrick Mfg. Co.
Mundt & Sons.

Periodicals
Arms and Explosives. | Financial Times.
Austral'n Mg. Stand'd | Iron & Coal Trades Review.
El Minero Mexicano. | Indian Engineering.
Electrical Plant & Electrical Industry. | Mining Journal.

Phosphates
Trenholm, Paul C.

Phosphor-Bronze
Phosphor-Bronze Smelting Co.

Pile Drivers
Bucyrus Steam Shovel and Dredge Co.

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

Planed Gearing
Poole, R., & Son Co.

Platinum
Baker & Co. | Johnson Matthey & Co.

Plumbago—East India
Obermayer Co.

Powder
Ætna Powder Co.
Laflin & Rand Powder Co.
Law, J. H., & Co.

Pulleys
Poole, R., & Son Co.

Pumps
Ætna Fdy. & Mach. Co. | Knowles Steam Pump Works.
Allen, Chas. A.
Blake, Geo. F., Mfg. Co. | McGowan, John H. & Co.
Cameron, A. S., Steam Pump Works. | Pulsometer Steam Pump Co.
Epping, Carpenter & Co. | Stilwell-Bierce & Smith-Vaile Co.
Groetzinger, A., & Sons
Jeanesville Iron Wks. | Worthington, Henry

Publications
Allison Coupon Co. | Electrical Plant & Electrical Industry
Arms & Explosives. | Financial Times
Australian Mining Standard. | Iron & Coal Trades Rev.
Mining Journal.

Quarrying Machines
Bostelmann, L. F.
Ingersoll-Sergeant Rock Drill Co.
Rand Drill Co.
Sullivan Machinery Co.
Union Wire Rope Tramway Co.

Quicksilver
Eureka Co.

Railroads
Chicago, Milw. & St. Paul R. R.

Railroad Supplies and Equipment
Garden City Sand Co. | Robinson & Orr.
Hunt, C. W. Co. | Young Lock Nut Co.
Porter, H. K., & Co
(See Machinery.)

Regulators, Damper, Heat, Etc.
Eddy Valve Co. | Mason Regulator Co.
Lunkenheimer Co.

Rock Drills. (See Air Compressor.)

Rolling Mill Machinery
Poole, R., & Son Co.

Roofing
Berlin Iron Bridge Co. | Phelps, Dodge & Co.
Holton Iron & Steel Roofing Co. | Pittsburg Bridge Co.
Pencoyd Bridge and Const. Co. | Youngsto'n Bridge Co

Rope Wheels
Poole, R., & Son Co.

Rubber Goods
New York Belting & Packing Co., Ltd

Safety Lamps
Wm. E. Stieren

Screens
Exeter Machine Works Co.
Harrington & King Perforating Co.
Mundt & Sons.
Tyler W. S., Wire Works Co.
(See Machinery.)

Screen Plates
Harrington & King Perforating Co.

Separators
Harrison Safety Boiler Works.

Shafting
Poole, R., & Son Co.

Shoes and Dies
Chrome Steel Works. | Crescent Steel Co.

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

Smelting and Refining Works
Balbach S. & Ref. Co. | Penn Lead Co.
Baltimore Cop'r Wks. | Penna. Salt Mfg. Co.
Bos. & Colo. Smelt. Co. | Penn Smelting and
Cowles Smelt & Alu. Co. | Refining Works.
Kansas City S. & Ref Co. | Phosphor-Bronze
Mathison Smelting Co. | Smelt. Co.
Orford Copper Co.

Steam Fans
Cole, Wm E.

Steel Rails, Castings, Rolls, Drill Steel
Abbott, Wheelock & Co. | King & Andrews Co.
Bethlehem Iron Co. | Moore, S. L., & Sons Co
Chester Steel Cast. Co. | Roberts, A. & P., & Co.
Chrome Steel Works. | Robinson & Orr.
Crescent Steel Co. | Whitney, A., & Sons.
Exeter Machine W. Co | (See Metal Dealers
Garrison, A., Fdry. Co.

Tanks
Pollock, Wm. B. & Co.
Scaife, Wm. B. & Sons.
Williams Mfg. Co.

Tapping Machine, Gas Main, Etc.
Mueller Mfg. Co.

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

Tin Plate Rolling Machinery
Poole, R., & Son Co.

Tools
Pratt & Whitney Co.

Tubes
Pollock, Wm. B., & Co. | Williams Bros.

Tubing-Rubber
New York Belting and Packing Co., Ltd.

Turbines
James Leffel & Co., The.
Poole, Robt. & Son Co.
Stilwell-Bierce & Smith-Vaile Co.

Turbine Water-Wheels
Poole, R., & Son Co.

Valves
Eddy Valve Co. | Mason Regulator
Jenkins Bros. | Sturtevant & Co., B. F.
Lunkenheimer Co.

Ventilators
Bullock, M. C., Mfg. Co.

Vulcanite Emery Wheels
New York Belting and Packing Co., Ltd.

Washers
Hilton Mfg. Co.

Water Pressure Reducers
Mueller Mfg. Co.

Water Pressure Regulators
Mueller, H., Mfg. Co.

Water-Wheels
Poole, R., & Son Co.

Well Drilling Machinery
Bostelmann, L. F.
Penn Diamond Drill & Mfg. Co.
Sullivan Machinery Co.
Williams Bros.

Wheels, Car
Sheffield Car Co.

White Lead Machinery
Poole, R., & Son Co.

Wire Cloth
Harrington & King Perforating Co.
Mundt & Sons.
Tyler, W. S., Wire Works.

Wire Rope & Wire
Abbott, Wheelock & Co. | Leschen, A., & Sons Rope Co.
Broderick & Bascom Rope Co. | Phelps, Dodge & Co.
California Wire Wks. | Roebling, J. A., Sons & Co.
Cooper, Hewitt & Co. | Ropeways Synd., Ltd.
Hunt, C. W., Co. | Trenton Iron Co.
Washb'n & M'n Mfg. Co.

Wire Rope Tramway
Brown Hoist. & Convey. Machine Co
California Wire Works.
Colorado Iron Works.
Cooper, Hewitt & Co.
Hunt, C. W., Co.
Roebling, J. A., Sons & Co.
Trenton Iron Co.
Vulcan Iron Works.

FREE ADVERTISING.

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

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

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

Positions Vacant.

1320 WANTED—AN EXPERT PLACER miner to superintend the installation and operation of hydraulic plant in South America. Address COMPETENT, ENGINEERING AND MINING JOURNAL.

1322 WANTED—AN ENGINEER WHO is familiar with subsoil and spring drainage to report on draining a property near New York City. Address, giving experience and references, SUBSOIL, ENGINEERING AND MINING JOURNAL.

1323 WANTED—A CHEMICAL OR MEchanical engineer capable to erect a bone black and sulphate of ammonia works. Address BONE BLACK, ENGINEERING AND MINING JOURNAL.

1324 WANTED—BRIDGE SALESMAN for each State in the Union, competent to make sales of bridges and superintend erection when necessary. Address, stating age, experience, salary expected, etc, SALESMAN, ENGINEERING AND MINING JOURNAL, lock box 1107, Chicago, Ill.

1325 WANTED—A THOROUGHLY COMpetent master mechanic to take charge of the machinery of a copper mining and smelting concern in the Northwest. Apply, stating age, experience and references. Address letters MONT, ENGINEERING AND MINING JOURNAL.

1326 WANTED—FOREMAN MACHINIST —one who would appreciate an opportunity for advancement; sobriety and ability must be unquestioned; prefer one who has some knowledge of draughting and has had experience in the manufacturing of water-tube boilers; state age, nationality, wages desired and references. Address MACHINIST, ENGINEERING AND MINING JOURNAL.

1327 WANTED—A SALESMAN WELL acquainted with the steel trade, particularly in the Eastern States. Address STEEL TRADE, ENGINEERING AND MINING JOURNAL.

Situations Wanted.

Advertisements for SITUATIONS WANTED will be Charged only 10 cents a line.

LOCATING ENGINEER WANTS SITUAtion on Railroad, Waterworks, Townsite or in office: is good draftsman, has instruments and first-class references. "H.," ENGINEERING AND MINING JOURNAL. No. 16,354, May 12.

SITUATION WANTED BY PRACTICAL Diamond Drill foreman, twelve years' experience drilling all kinds of formations and deep standpipe stand sinking. Can give best references. Address GILL, ENGINEERING AND MINING JOURNAL. No. 16,369, May 12.

MINING ENGINEER, GRADUATE, OPEN for engagement May 15. Twelve years' practical experience in the development and management of metalliferous mines. Can give present employers' and other references. Address COLORADO, ENGINEERING AND MINING JOURNAL. No. 16,350, May 12.

WANTED.—AN EXPERIENCED CORNISH miner and mechanical engineer wants position in the West. Very best of references. Address JOHN O. HOSKING, Houghton, Mich. No. 16,379, May 12.

METALLURGIST, WITH EXTENSIVE EXperience and one of the best records as superintendent for several years of one of the largest smelting works of this country, wishes a change and position with a solid concern who appreciates good, practical and cheap running of their works. Address EXPERIENCED METALLURGIST, ENGINEERING AND MINING JOURNAL. No. 16,188, cow May 12.

A GRADUATE (M. I. T.) COPPER CHEMIST and metallurgist of experience desires engagement; references. Address WEST, ENGINEERING AND MINING JOURNAL. No. 16,205, May 12.

WANTED—SITUATION AS CHEMIST AND metallurgist; have had several years' experience with all classes of furnace supplies and products; technical education. Good reasons given for leaving present situation. Address A. M. H., ENGINEERING AND MINING JOURNAL. No. 16,164, May 19.

WANTED—SITUATION IN SMELTING OR concentrating works; technical education; several years' experience in treating low grade ores. References given. Address SMELTING AND CONCENTRATING, ENGINEERING AND MINING JOURNAL. No. 16,165, June 9.

CHEMIST—DEGREES PH. B. AND A. M.—Desires situation in educational institution in or near New York. Address VOORHEES, 33 W. Forty-second street. No. 16,481, May 19.

POSITION WANTED AS SUPERINTENdent, solicitor, mechanical engineer or designer by competent party, fully familiar with best shop practice, with estimating, calculating, designing and building medium and heavy machinery and structural iron work as mining. Iron and steel plants and machinery, steam and hydraulic engineering. Address VOLKMAR, 3406 Franklin Ave., St. Louis, Mo. No. 16,476, May 19.

POSITION WANTED BY FIRST-CLASS structural draftsman, with five years' experience in all kind of bridge, trestle, roof and especially modern building construction, in calculating, figuring and making shop drawings; quick and reliable. Best of references. Address FIREPROOF, ENGINEERING AND MINING JOURNAL. No. 16,477, May 19.

POSITION WANTED BY AN ELECTRICAL and steam engineer, in any capacity; with central station or isolated plant for lighting or power, or with contractor; thoroughly posted in inside and outside work and construction; first-class references; moderate pay. Address BOX 206, Somerville, N. J. No. 16,397, May 12.

MINING ENGINEER DESIRES POSITION, or will examine and report on mining property; 20 years' experience West and Mexico. ARO, care ENGINEERING AND MINING JOURNAL. No. 16,384, May 12.

POSITION WANTED BY A GERMAN MINing engineer and chemist, 18 years' experience in mining, milling, assaying and surveying. Well up in mining and concentrating gold ores. Speaks Spanish. References. Address "ROCKDRILL," ENGINEERING AND MINING JOURNAL. May 12.

A CERTIFICATED MINE MANAGER AND Mining Engineer desires a position as mine superintendent or mining engineer. Twenty years' experience at extensive mines, including the opening up of new mines, erecting new plants, rope haulage and long wall work. First class references. Address T., ENGINEERING AND MINING JOURNAL. No. 16,483, May 26.

CHEMIST OF NINE YEARS' EXPERIENCE in metallurgical works is open to engagement. Best of references. No. 16,482, tf. H. N. YATES, Lockport, N. Y.

Contracts Open.

PIPING, CASTINGS, VALVES, ETC.—Proposals are wanted until June 21 for furnishing a quantity of water pipe, special castings, gate valves, fire hydrants, etc. Address E. M. BIGELOW, Director of Department of Public Works, Pittsburg, Pa.

ORDNANCE SUPPLIES. — Benicia Arsenal, Benicia, Cal.—Sealed proposals, in triplicate, will be received until June 4th, 1894, for furnishing leather, coal, iron, hardware, lumber, forage, etc., during the fiscal year ending June 30th, 1895. Printed lists of supplies needed, with full instructions, stipulations, etc., can be had on application to Lieut.-Col. L. S. BABBITT, Ordnance Department, U. S. Army, Commanding.

ROPE, IRON, LUMBER, TOOLS, ETC.—Sealed proposals, in triplicate, will be received at this depot until May 21st, 1894, for furnishing rope, iron, leather, lumber, fuel, tools, etc., during the fiscal year ending June 30, 1895. Printed lists of supplies needed with full instructions, stipulations, etc., can be had on application to Major JOHN A. KRESS, Ordnance Department U. S. Army, Commanding Jefferson Barracks, Mo.

PIPING, ETC.—South Bend, Ind.—Proposals will be received at the office of the city water department until May 15, for standard cast iron water pipe, special fittings, valves and hydrants, for extension of water mains to be made in 1894. Specifications of this work to be furnished at the water department office after May 1st. C. A. BREHMER, C. W. CLAPP, C. M. COLLINS, Board of Trustees.

WATER-WORKS.—Aiken, S. C.—Bids will be received until May 15th for the construction of the water-works system. Plans and specifications can be seen at the office of L. J. BARBOT, Engineer, Augusta, Ga.

BRICK, FIRECLAY, CEMENT, PIPE, ETC.—Sealed proposals will be received until May 22d, 1894, for furnishing and delivering supplies, as follows: Brick, grate-bars, bolts, buckets, candles, cement, fireclay, dryer, brass and iron fittings, gaskets, glass, hatchets, hoes, hose, iron, lanterns, locks, lumber, moldings, nails, oils, brass, iron and terra cotta pipe, steam packings, assorted; coloring paints, paris plaster, rakes, wood-screws, shingles, horse and mule shoes, shovels, sole-taps and heel-taps, tacks, timber, tin, turpentine, varnish, white lead. Blank proposals, printed lists and full information as to conditions to be observed by bidders, and terms of contract and payment, will be furnished on application to WM. THOMPSON, Treasurer, Hampton, Va.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., April 27th, 1894.—Sealed proposals will be received at this office until two o'clock P. M. on the 24th day of May, 1894, and opened immediately thereafter, for all the labor and materials required for the approaches to the U. S. Post Office, etc., building at San José, Cal., in accordance with the drawing and specification, copies of which may be had at this office, or the office of the Superintendent at San José, Cal. Each bid must be accompanied by a certified check for a sum not less than 2 per cent. of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, should it be deemed in the interest of the Government to do so. All bids received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked "Proposal for the Approaches of the U. S. Post Office, Etc., Building at San José, Cal.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

STEEL AND IRON WORK.—Treasury Department, Office Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 29th day of May, 1894, for all the labor and materials required to put in place complete the steel and cast iron columns, in 2d, 3d, 4th and 5th stories, steel and iron floor construction of 3d, 4th, 5th and 6th floors, etc., U. S. Post Office Building at Washington, D. C., in accordance with the drawings and specification, copies of which may be had at this office, or the office of the superintendent at Washington, D. C. Each bid must be accompanied by a certified check for a sum not less than 2 per cent. of the amount of the proposal. Proposals must be inclosed in envelopes, sealed and marked "Proposal for the Steel and Cast Iron Columns, Steel and Iron Floor Construction, Etc., for the U. S. Post Office Building at Washington, D. C.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

NAVAL SUPPLIES.—Sealed proposals, indorsed "Proposals for Supplies for the Navy Yard, Mare Island, Cal.," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until May 22d, 1894, to furnish at the navy yard, Mare Island, Cal., a quantity of steel plates, steel angles, steel rivet rods, iron, paints, alcohol, varnishes, linseed oil, turpentine, brushes, lumber, oars, tools, hardware, pipe staves, rubber, oakum, pipe and pipe fittings, washbasins, bath tubs, bolts, nuts, rivets, and metals. The articles must conform to the Navy standard and pass the usual naval inspection. Blank proposals will be furnished upon application to the Navy Pay Office, San Francisco, Cal., the Navy Yard, Mare Island, Cal., or to the Bureau. The attention of manufacturers and dealers is invited. EDWIN STEWART, Paymaster-General U. S. Navy.

FUEL.—Office of the Marshal, Supreme Court of the United States, Washington, D. C.—Bids will be received at this office until May 15th, 1894, for fuel for the Supreme Court of the United States for the ensuing fiscal year. Bids must be on printed forms furnished by the Marshal on application. J. M. WRIGHT, Marshal.

NAVAL SUPPLIES.—Sealed proposals, indorsed "Proposals for Supplies for the Navy Yard, Boston, Mass.," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until May 15, 1894, and publicly opened immediately thereafter, to furnish at the navy yard, Boston, Mass., 32,350 pounds galvanized steel wire. The articles must conform to the Navy standard and pass the usual naval inspection. Blank proposals will be furnished upon application to the Navy Pay Office, Boston, Mass. The attention of manufacturers and dealers is invited. Tie bids, all other things being equal, decided by lot. The department reserves the right to waive defects or to reject any or all bids not deemed advantageous to the government. EDWIN STEWART, Paymaster-General U. S. Navy.

WATER TOWER.—PEORIA, ILL.—Sealed proposals, with full specifications, are hereby invited before May 22d, for a new steel water tower to replace, on the present foundation, the West Bluff water tower recently collapsed, at Peoria, Ill. Dimensions: Height, 120 ft.; diameter, 25 ft. Communicatipns should be indorsed, "Proposal for Water Tower," and addressed to the Receiver of the Peoria Water Company, Peoria, Ill., and accompanied by a certified check for $500 to guarantee making of contract on terms proposed. The right is reserved to reject all bids. CORNELIUS S. GOLD, Receiver.

Continued on page 19.

LANDS AND MINES FOR SALE.

Grand Opportunity for Investment

FROM 4,000 TO 4,500 ACRES

Coal, timber and farming lands, near railroad in Somerset County, Pennsylvania, accessible to Eastern markets, for sale on most reasonable terms, or might consider income property clear in part payment if location satisfactory. Owners have not time to give attention. Title perfect. Inquire of

W. P. HUMES,
Bellefonte, Pa

FINANCIAL.

Golden Reef
Mining and Milling Co.

Capital Stock, 100,000 Shares.
Par Value, $10.
Selling Price, $2.50 per share
Gold and Copper Mines at Norris, Madison County, Montana.

TO INVESTORS.

The Golden Reef Mining and Milling Company, of Chicago, Illinois, offer to investors a limited number of shares of their Treasury Stock. This stock is guaranteed and is absolutely safe. The company's mines have been opened up. Many thousand tons of gold and copper ore of paying quality. All that is required to put the property in a dividend-paying condition is a milling plant. The mill is already built and ready for shipment.

Make all checks, drafts, etc., payable to THOMAS F. THORNE, of the Commercial National Bank, Chicago, Trustee. For prospectus and full information address E. M. TREAKLE, Sec'y, Room 1505, No. 79 Dearborn St., Chicago.

DIVIDENDS.

MOLLIE GIBSON CONSOLIDATED MINING AND MILLING COMPANY.
COLORADO SPRINGS, Colo., December 1st, 1893.
DIVIDEND NO. 41.

A dividend of five cents per share ($50,000) has been declared, payable December 15th, 1893, to stockholders of record on December 8th. Transfer books close December 8th, and reopen December 16th, 1893.

PERCY HAGERMAN, Sec'y-Treas.

STANDARD CONSOLIDATED MINING COMPANY OF BODIE.

SAN FRANCISCO, Cal., April 17th, 1894.

DIVIDEND NO. 84,

of ten cents a share, is payable here and at Farmers' Loan & Trust Co., New York, May 17th. Books close May 7th.

J. W. PEW, Secretary.

WE BEG TO ANNOUNCE THAT OUR Mr. Ede, M. E., leaves here early in April to examine mineral properties in NEW MEXICO, UTAH, Colorado, Oregon and South Dakota. He will undertake other work for private parties or companies. Twenty years' experience. Reference exchanged.

EDE & BURWELL, Mining Engineers,
21 QUINCY STREET, CHICAGO.

THE GOLD AND SILVER EXTRACTION COMPANY

OF AMERICA, LIMITED.

MacARTHUR-FORREST Process.

CAPITAL, £110,000 Sterling.

TO MINEOWNERS and others having Refractory Gold and Silver ores hitherto untreatable at a profit, the **MacArthur-Forrest** (Patent) **Process** of gold and silver extraction offers a solution of the difficulty.

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OFFICE:
McPhee Building, - Denver, Colo.

MACHINERY AND SUPPLIES FOR SALE.

STEEL RAILS,
NEW OR SECOND-HAND.

We can furnish any weight of New Rails. We also have for immediate delivery 400 tons of Second-Hand 60 lb. Steel T Rails, 100 tons 35 lb. Girder and 300 tons 45 lb flat steel; all well fit to relay, and cheap.

ROBINSON & ORR,
No. 419 Wood Street, Pittsburg, Pa.

FOR SALE.

Smelting Plant at Trinidad, Colo.,

all equipped, ready to start up. Situated just outside city limits Trinidad, on a 29½-acre tract of land adjoining a river. Side tracks from two competing railway lines. Description of Smelter Buildings and their contents, also photos of works, may be found at the office of ENGINEERING AND MINING JOURNAL.

For terms apply to **MILWAUKEE AND TRINIDAD SMELTING AND REFINING COMPANY, Milwaukee, Wis.**

FOR SALE CHEAP
A New and Good Instrument.

1 German Mining Theodolite, with extra level for short level work.
1 Eccentric Telescope.
1 Metric Sliding Leveling Rod.
1 Lantern for same (in case).
1 box with metre reel and 6 screws for spreizen-aufleitung of theodolite, and set plate for theodolite on tripod.

Manufactured by LINGKE, of Freiberg, Germany

Address Theodolite,
ENGINEERING AND MINING JOURNAL.

FOR SALE.
A "FREEMAN" DRY SEPARATOR.

Capacity, 50 tons per day. Saves 95 per cent. of the gold. In perfect order. Cost $125, in Los Angeles. Will sell for less than half cost.

Address O. J. CARLETON,
507 12th St. N. W., Washington, D. C.

MISCELLANEOUS WANTS.

WANTED—PARTNER OR PARTNERS TO organize a stock company for manufacturing a patented automatic coal, clay and freight conveyor. In demand; $3,000 stock already insured for $1,500, or for the sale of the same. Illustrated catalogue on application.

Address L. BOUDREAU, No. 170 E. Spruce Street, Manchester, N. H.

BUSINESS OPENING.

A Superintendent wanted for a long established company building Corliss engines and heavy machinery specialties. A man having $10,000 to $25,000 to invest in the business and to take charge of the manufacturing department; only men well up in best methods of low cost work in machine shop and foundry, and having record with successful companies, will be considered. Address "CORLISS," care of ENGINEERING AND MINING JOURNAL.

Notice of Assessment.
(Civil Code of California.)

Silver King Mining Company.—Location of principal place of business, San Francisco, California; location of works, Pioneer Mining District, Pinal County, Arizona.

Notice is hereby given that at a meeting of the Board of Directors held on the 2d day of May, 1894, an assessment—No. 10—of Twenty Cents (20c.) per share was levied upon the Capital Stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, No. 310 Pine street, Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 11th day of June, 1894, will be delinquent and advertised for sale at public auction, and, unless payment is made before, will be sold on Monday, the 9th day of July, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors, J. W. PEW, Secretary. Office, 310 Pine street, Rooms 15 and 17, San Francisco, California.

Contracts Open.

Continued from page 18.

BRIDGE.—State of Georgia, County of Pulaski, Court of Ordinary, Hawkinsville, Ga.—Bids, plans and specifications are solicited for placing two (2) 60-ft. iron spans in place of the present wooden approaches to the drawbridge across the Ocmulgee River in said county. I will pass upon all bids, etc., that may be sent in before the 13th day of June, 1894, at my office in Hawkinsville, Ga. The right to reject any and all plans and bids is reserved. For further information apply to P. T. McGIFF, Ordinary, Pulaski County.

FUEL AND OIL.—Depot Quartermaster's Office, Washington, D. C.—Sealed proposals, in triplicate, will be received here until June 2d, 1894, and then opened, for furnishing during fiscal year ending June 30th, 1895, such fuel and mineral lamp oil as may be required. Information required will be furnished on application to this office. Government reserves right to reject any or all proposals. Envelopes containing proposals should be marked "Proposals for Fuel or Mineral Oil," and addressed to Lieut.-Col. GEORGE H. WEEKS, Depot Quartermaster.

WATER-WORKS.—Sealed proposals will be received at the office of the Water-Works Trustees of the City of Steubenville, O., until May 24, 1894, for furnishing all material and performing all labor necessary for the construction of a new water-works plant for the above city. The work to be done embraces the following: Part 1.—Furnishing cast-iron pipe. Part 2.—Furnishing valves and fire hydrants. Part 3.—Hauling and laying pipes and valves. Part 4.—Constructing reservoir. Part 5.—Constructing pump well and tunnel. Part 6.—Constructing wet well and influent pipes. Part 7.—Furnishing two 3,000,000 gallon pumping engines. Part 8.—Furnishing boiler plant. Part 9.—Constructing boiler and engine house. Plan and specification may be seen and forms of proposals secured at the Council Chamber, Steubenville, or at the office of the Engineers, Westinghouse Building, Pittsburg, Pa., after May 10, 1894. Water-Works Trustees. WILKINS & DAVISON, Engineers.

STEAM PLANT.—Proposals are wanted for installing an 80 H.P. Compound engine, with boiler, pump, heater and extractor and all connections complete. Apply for particulars to W. A. GUTHRIE, Secretary of Electric Light Company, San Angelo, Tex.

WATER-WORKS.—Notice is hereby given that proposals will be received by the Board of Water Commissioners of the village of Dolgeville, N. Y., until the 25th day of May, 1894, for the construction of a gravity system of water-works. Proposals will be received for "The Works" complete, or for furnishing materials and performing work under the following sub-divisions: 1. Furnishing pipe and special castings. 2. Furnishing valves, valve-boxes and covers, and hydrants. 3. Trenching, pipelaying and backfilling. 4. The reservoir. Plans for the foregoing work may be seen and examined at the office of the Board of Water Commissioners in the village of Dolgeville, N. Y. Blank forms of proposal and contract, together with specifications, will be furnished upon application to W. H. Bacon, Secretary of the Board of Water Commissioners. ALFRED DOLGE, President of the Board of Water Commissioners.

FUEL.—Governor's Island, N. Y. H.—Sealed proposals, in triplicate, for furnishing such quantities of fuel as may be required in the Department of the East during the fiscal year commencing July 1, 1894, will be received here, and at offices of Quartermasters at Baltimore, Md.; Boston, Mass.; Buffalo, N. Y.; New Orleans, La.; Fort Niagara, N. Y.; Fort Ontario, N. Y.; Madison Barracks, N. Y.; Plattsburg Barracks, N. Y.; Fort Preble, Me.; Fort Adams, R. I.; Fort Trumbull, Conn.; Fort Monroe, Va.; Newport Barracks, Ky.; Fort Thomas, Ky.; Fort McPherson, Ga.; St. Francis Barracks, Fla., and Mount Vernon Barracks, Ala., until June 6, 1894, and then opened. Information furnished on application to this office, or to Quartermasters at posts named above. Envelopes containing proposals will be indorsed "Proposals for Fuel." CHAS. H. TOMPKINS, Asst. Q.-M.-Gen.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., May 10th, 1894.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 12th day of June, 1894, and opened immediately thereafter, for all the labor and materials required for the erection and completion of the U. S. Post Office Building at Alexandria, La., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Alexandria, La. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked, "Proposal for the Erection and Completion of the U. S. Post Office at Alexandria, La.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

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