

THE ENGINEERING AND MINING JOURNAL



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

VOL. LIII.

MARCH 26.

No. 13.

RICHARD P. ROTHWELL, C.E., M.E., Editor.

ROSSITER W. RAYMOND, Ph.D., M.E., Special Contributor.

SOPHIA BRAEUNLICH, Business Manager

THE SCIENTIFIC PUBLISHING CO., Publishers.

SUBSCRIPTION PRICE:

Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada, \$4 per annum; \$2.25 for six months; all other countries in the Postal Union, \$7.

Monthly Export Edition, all countries, \$2.50 gold value per annum. REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

THE SCIENTIFIC PUBLISHING COMPANY.

OFFICERS: R. P. ROTHWELL, Pres. & Gen'l Mang. | P.O. Box 1833. SOPHIA BRAEUNLICH, Secy & Treas. | 27 Park Place, New York. Cable Address: "Rothwell, New York." Use A. B. C. Code, Fourth Edition

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THE production of the Witwatersrandt (South Africa) mines showed another noteworthy increase in February, the output having been 86,649 ounces against 84,560 ounces in January. There seems to be good prospect, judging from the increase month by month during the past year, that the hopes entertained in Johannesburg of an output of 100,000 ounces per month will speedily be realized. The *South African Mining Journal* has compiled statistics of the production of all the gold districts of the Transvaal in 1891. They are as follows: Witwatersrandt, 729,238 oz.; De Kaap and Swazieland, 66,598 oz.; Klerksdorp, 10,682 oz.; Lydenburg, 18,576 oz.; Zoutpansberg, 8,573 oz.; total, 833,632 oz., representing, at £3 10s. per ounce, a value of £2,917,702, or \$14,588,510. The figures for Witwatersrandt are those of the Johannesburg Chamber of Mines, and the De Kaap and Swazieland statistics were compiled by the Barber-ton Mining Chamber. It is expected that the Johannesburg Chamber of Mines will shortly extend its operations so as to include the whole of the Transvaal, and, with the co-operation of the mining department at Pretoria, will issue monthly reports, including De Kaap and other producing districts.

The railway companies having yielded to the demands of the Cœur d'Alene mine owners, the latter have decided to resume work in their properties and are preparing to commence ore shipments again. The rate on Cœur d'Alene ore will henceforth be that which ruled in 1890, viz., \$26 per ton, or a reduction of \$2 per ton from the rate of last year. This amount includes both freight and smelting charges, being paid to the smelters, which settle with the railway.

The dark cloud which has been overshadowing the mining industry of this region for some time past has not yet broken away, however. Before the mines closed down last January labor troubles, so serious as a general strike of the miners, were anticipated, as is well known, the mine owners having come to the conclusion that a reduction in wages was necessary. Hitherto all the men in their employ, miners, trammers, and surface men, have been receiving \$3.50 per day. Now, upon resuming work, the mine owners declare that they will continue to pay the miners the old rate, but will pay shovellers, trammers and surface men \$3 per day, only. The miners' union has met this announcement by a refusal to return to work upon the new terms. How firm they will be in this stand it is of course too early to say, but it is certain that with the two months of idleness that have already prevailed in this region, and the difficulties still threatening, the lead production of Idaho this year will be much smaller than in 1890.

THE IRON TRADE SITUATION.

Our reports from the various iron centers this week indicate a better feeling in the pig iron market than has existed at any time during the past three months. Consumers seem at last to have come to the conclusion that prices have finally reached bottom, and that there is now no risk in placing orders for delivery during the summer. The much talked of curtailment of production has not taken place to any serious extent, if at all, and the better tone of the market seems to have resulted rather from the discovery that consumption is about to keep pace with production. The stocks of iron at the furnaces increased in both January and February, but it is worthy of notice that the increase in February, notwithstanding the fact that the production was the largest ever recorded, was not so great as in the previous month.

It is to be expected that consumption during the spring will be much greater than in the winter months, since the melting of iron for use in large contracts for construction during the spring, and summer is not usually done until the spring opens. Production at the furnaces, however, is apt to be just as great in the winter as in the summer months. Nor are the statistics of stock held at the furnaces an accurate criterion of the actual stock of pig iron in the country. In the winter months the stocks at the furnaces may be great while those in the consumers' yards may be small, and in the spring and summer the opposite state of affairs may exist.

The discouraging market reports which have characterized the past three months have been chiefly the reflections of the opinions of the brokers and their customers, and to some extent of the owners of the smaller furnaces whose financial necessities may have made them extremely anxious for prompt sales and fearful of lower prices. On this account the reports are apt to be exaggerations of the actual condition of the market. One strongly encouraging feature of the present situation is the fact that larger companies, and especially those in the South, have refused to contract at current prices for delivery in the latter part of the year, and have been piling up iron in preference to forcing sales or blowing out of furnaces. This fact, together with the persistent refusal of the stronger companies to blow out any of their furnaces, is evidence, we think, of their far farsightedness and of their confidence that prices will ere long experience a reaction.

THE LAST SUPREME COURT MINING DECISION.

In another column will be found the decision of the United States Supreme Court in the "Mike & Starr" cases. From this opinion, delivered by Justice BREWER, Justice FIELD dissented in a vigorous opinion, with which Justices HARLAN and BROWN concurred. The clear and conclusive reasoning of this dissenting opinion will receive comment in another article, accompanied by the publication of its text. I propose at this time to point out some remarkable features in the opinion of the five justices constituting the majority.

In these two cases (practically one) the Iron Silver Mining Company (the plaintiff below) was the appellant, alleging certain erroneous rulings by the Court below, as having influenced an adverse jury verdict. Stripped of unnecessary technicalities, the essential parts were these:

The plaintiff's grantor applied November 13th, 1878, for a placer patent. After survey, advertisement, etc., the claim was duly entered for patent February 21st, 1879; and patent issued January 30th, 1880. On March 10th, 1879, defendant's grantors executed certificates of location of the "Gardiner" and "Goodell" lodes, situated within the said placer claim. These certificates declared that the said lodes had been located February 1st, 1879.

The defendant (The Mike & Starr Gold and Silver Mining Company) subsequently applied for patents on these two lodes; and the plaintiff company filed its adverse claim and began suit, alleging ownership of the ground by virtue of its placer-patent.

The defense (apart from matters stated in pleadings but abandoned upon trial) was, that the two lodes in question were, under Section 2333 of the Revised Statutes, excepted from the grant of the placer patent, as lodes "known to exist" within the placer location. The question, what is a "known lode" under Section 2333? was thus brought up once more, with the correlative questions, Must the said knowledge be brought home to the placer applicant? and, At what time must he have had such knowledge?

The placer patent itself expressly excepted any lodes "claimed or known to exist" within the granted tract at the time of its date of issue, namely January 30th, 1880; but section 2,333 clearly fixes the date of application (in this case November 13th, 1878).

As will be seen from the foregoing, the difference may be very important; for the lode locations were made after the date of application, but before the date of patent.

On the trial of the case, however, the defendant offered testimony to show that although the locations had not been made until February 1st, 1879, the lodes had actually been discovered in 1877, that is, long prior to the application of the placer locator for a patent. These discoveries were alleged to have been made in a tunnel, run to reach the Mike mine, which is not in the placer tract. It was not pretended that any work whatever was done to develop these lodes, or that the discoverers had ever located and claimed them, until after the placer application had been made. Such locations would have been unquestionably conclusive evidence of date of the alleged discoveries, and would have made a strong *prima facie* case as to the existence of the lodes. Moreover, as the Supreme Court has already held, a record of location is notice to all the world, and special proof is not needed to bring the knowledge of it home to a given party.

There is no doubt that the discoverer of a lode may let it lie unlocated as long as he chooses, and may locate it years afterward, provided no adverse rights have in the meantime intervened. If, therefore, the locations of the lodes alleged in these cases were not cut off by the rights of the placer applicant, then they were legitimate proof for the jury, greatly strengthening the defendant's case. For, on any construction of Section 2,333, a lode claim actually located would be a "known lode," and by legal presumption known to everybody.

Now, Judge Hallett, in the Circuit Court, following the language of the patent, ruled that "the patent shown by plaintiff must prevail in these suits unless it has been shown on the part of the defendant that there was a vein . . . at the time of issuance of the patent." (The Supreme Court substitutes in its statement of the ruling below the words "entry and payment" for "issuance of patent"—a significant evidence of carelessness, perhaps, but not important in this connection.) And the Supreme Court declares this ruling to be error, but makes the astonishing declaration that *this error, which admitted as proof for the jury the act of location, could not have affected the verdict.*

How on earth the Court can know that, I cannot imagine. Certainly, if I had been on the jury, I should have found for the defendant, as the jury did, under Judge Hallett's ruling; and I should have found for the plaintiff if he had held, on the point of date, as the Supreme Court now says he ought to have held. For, without the evidence of a location, I should have considered the story of an ancient discovery, neglected for years, as very suspicious, if not utterly worthless. And, moreover, I should have deemed the fact of location the only one presented in these cases connecting by a legal presumption the knowledge of the existence of the lode with the placer applicant.

But having thus reversed the most decisive ruling made below, and yet

divined that the jury could not have been influenced by it, this remarkable opinion takes a further and still more surprising position.

The reader of it will see that the Court says all discovery and all work on these alleged lodes was done in 1877, and that is its reason for assuming that the above erroneous ruling as to later dates has no effect. But, even assuming that the evidence showed real lode discoveries in 1877, how does the Court suppose (the locations being thrown out, as too late) that the jury was convinced of the knowledge of these lodes on the part of the placer applicant, during the years in which their alleged discoverers made no location and no announcement of their discoveries?

Every miner must laugh (if not paralyzed by astonishment) to learn that the existence of the Mike tunnel, with its "large dump of earth," was *prima facie* evidence of the existence of a known lode; and that the placer applicant was bound to take notice of "whatever a casual inspection of this tunnel would disclose." It was "not a little excavation;" oh no; it was a long tunnel; and "the pile of dirt was evidence which no one could ignore!" Perhaps it is unfair, as well as irreverent, to poke fun at worthy and honest gentlemen, who have never pretended to understand the conditions of mining, and who judge mines, tunnels and lodes by ornamental models and diagrams. Yet I cannot think it unfair to say that they would have done well to listen, on this point, to the views of Justice FIELD, who knows a great deal about the subject practically. At all events, I trust that before any other case of this kind shall come before them for adjudication, somebody will have made them understand a few simple and elementary facts like the following:

1. After a 400 foot tunnel in more or less decomposed porphyry and "wash," such as covers Iron Hill at Leadville, has been abandoned for a couple of years, no "casual inspection" can discover anything in it. The casual observer will be lucky if he escapes "casualties" and gets out alive.

2. The dump at the mouth of an abandoned tunnel or shaft is composed of the worthless material taken out. The bigger it is, the more worthless material. If ore has been extracted and shipped away, the dump will show vein material not good enough to ship; and if the dump is only (to adopt the Court's felicitous name) "dirt," the evidence is almost conclusive that no valuable deposit has been exposed within. And the bigger the dump, the stronger this negative evidence.

3. A practical miner, noticing such an abandoned excavation, would first study the dump, and, if that indicated no discovery of valuable mineral, would inquire as to the history of the excavation. In these cases, there was no need of such formal inquiry. The tunnel was named the Mike tunnel. It was run to reach the Mike mine, that is, not for the discovery of lodes, but for purposes of mechanical convenience in mining, such as ventilation, transportation, etc. Its existence, and the amount of "dirt" taken out of it, were no more indications of lodes discovered within it than if it had been a railroad tunnel or a sewer. I say these facts were notorious. But I appeal to no authority beyond the record which was before the Court, and from which, if the majority of the justices had understood practical mining conditions, they would have inferred all that is here asserted. What they evidently do not understand is the absolutely universal certainty with which a miner locates a lode, good, bad or indifferent, upon discovery. I have known of railroad-workmen, stopping to locate a lode cut in their work; I have known of a sexton, discovering a lode while digging a grave, and halting the whole funeral procession until he could locate that lode and accommodate the corpse somewhere else. But I never encountered, in nearly thirty years of practice throughout our mining districts, a prospector who would let a discovered lode of any real or imagined value lie for years open to location by somebody else. There is a flimsy pretense in these cases that the discoverers were too poor to pay the fee for recording their location, though they confess that they were indebted many hundred dollars to parties who expected repayment out their mining luck. Everybody (except the majority of the Supreme Court) knows what this "grub-stake" arrangement between capitalists and prospectors means; and everybody knows that it adds a new motive for locating any discovery. If Mr. TABOR, as one of these parties testifies, advanced him \$1,250, in hopes that he would, by good fortune in mining, be able to repay it, would not the same friend have added \$2.50 to record the location of a new lode?

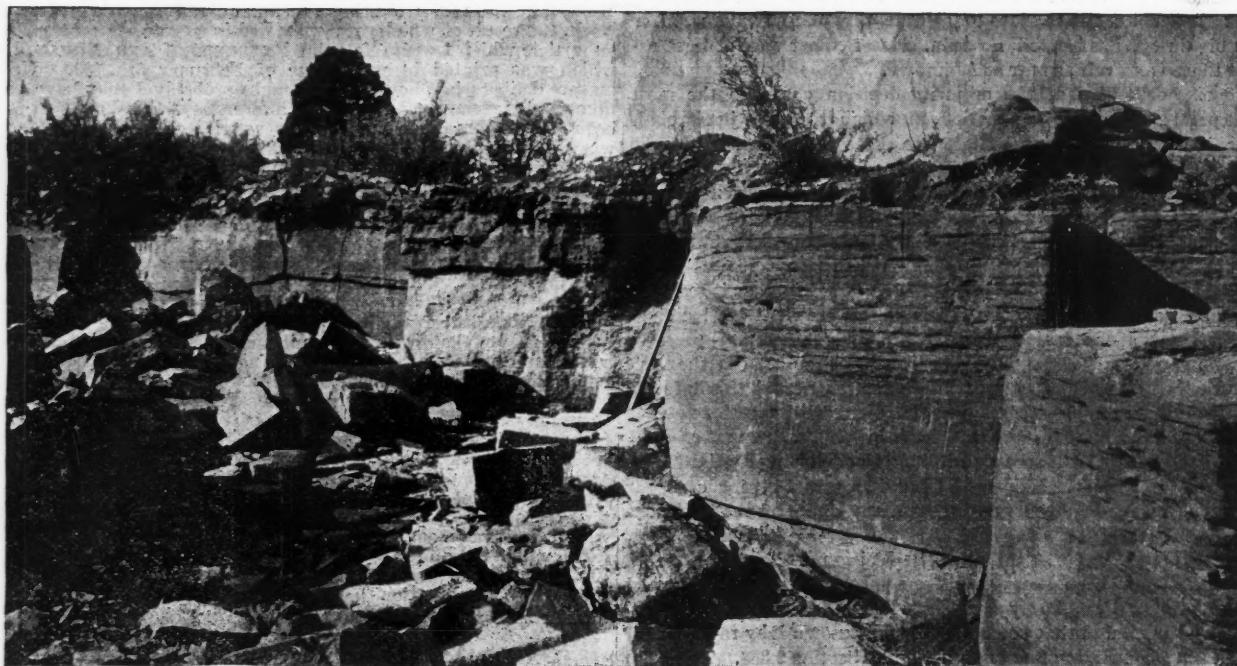
4. I am not now discussing the evidence offered in these cases of the actual existence and discovery of the two alleged lodes. My point now is, that having declared this evidence to be sufficient as to that fact, the majority of the Supreme Court declares, also, that the existence of the Mike tunnel, with its large dump of dirt, proves that the placer-applicant knew, or might have known, or ought to have ascertained, the fact that the lodes had been discovered in it. To the mind of a practical miner, this tunnel, under the circumstances, went to prove the exact opposite; it was stronger evidence of *no lode* than *no tunnel* would have been. The naive statement of the opinion that this tunnel was run in "seeking" the blanket-vein, and hence the lodes discovered in it were very reasonably neglected at the time, is exquisite. The Court really seems to believe that a "horizontal vein" can be "sought" by a horizontal tunnel hundreds of feet above it!

THE BIG BUG ONYX QUARRIES, ARIZONA.

Written for the Engineering and Mining Journal by John F. Blandy, M. E.

In the ENGINEERING AND MINING JOURNAL of December 26th, 1891, was published a very interesting article on the Mexican onyx quarries, which was the first description I have ever read of them. On account of the discoveries near Prescott, Ariz., of deposits of the same stone the article is particularly valuable. The deposit on Big Bug Creek at a point some 30 miles southeast of Prescott was located in 1890, although it had been recognized as a limestone some years before. Since that time the beds have been opened at many points, and much of the stone has been sent to various points, east and west, as samples of the material, and for the purpose of introducing it into the market. The quarries are 30 miles from the Prescott & Arizona Central Railroad, but as there is a good wagon road it can be delivered on the cars at a transportation expense of \$7.50 per ton. The stone weighs about 200 lbs. per cub. ft., or 16 cub. ft. to the ton.

The beds of onyx are exposed for a distance of about 2,000 ft. in a bluff, which forms the east bank of the creek, and extends to the north and east over an area of about 200 acres. The section of the bluff shows a base of breccia or natural concrete of unknown depth (not less than 50 ft.) which extends out under the creek. The top of this deposit is plainly marked in the bluff at the height of 15 ft. to 20 ft. above the water. Upon it lies the first strata of onyx, 12 ft. thick, made up of layers from 6 in. to 2 ft. in thickness. Upon this lies a second bed of breccia 5 ft. thick, and next in super-position a 5 ft. bed of onyx reaching to the crown of the bluff. This exposed section cannot be considered as a type of the whole deposit, since the force which brought down the material of the breccia, varying in size from a pea to a paving stone, was a violent one, and would necessarily scatter the material very irregularly, whereas the materials of the onyx were precipitated in still waters. Judging from the limited explorations in depth which have been made, it would seem that the center of the



BIG BUG ONYX QUARRY, ARIZONA.

basin was some 1,500 ft. to the northeast of the bluff, as at that part of the field no exposures of breccia have been found, and further, the deposit of onyx shows much greater thickness than is shown in the bluff. The finding of large fragments of onyx at points from a mile to a mile and a half further up the creek would indicate that a large area had been entirely denuded.

The boulders and gravel of the breccia are fragments of the rocks of the surrounding country, granites, syenites and crystalline schists, firmly cemented together by lime, etc. Some of the onyx layers carry an appreciable amount of silica, but no analysis has, to my knowledge, been made of the rock.

The large areas of lava "mesa" existing on the hills to the west and north of the onyx field, are no doubt the source whence came the lime-bearing waters. All these lava beds throughout the country are underlain by heavy beds of tufa or volcanic ash, the springs from which have made deposits of various characters. The so-called verde salt (principally sulphate of soda) has no doubt been formed in this way, and in the Eureka mining district are fine deposits of travertine limestone, rich in fossils. In both of these cases the scoria beds are visible in the bluffs above the deposits.

Having seen the exhibit of Mexican onyx at the Centennial Exhibition I think that the stone from the Big Bug quarries compares well with the former both in fineness of grain and beauty. Of course this cannot be said of all the layers, nor has sufficient been done to decide which are the finest layers. No doubt at the Exhibition they showed us their best. In richness and variety of colors nothing finer can be desired than can be found here. The colors are various shades of red, pink, brown, yellow and green, the latter predominating. The darker shades exist in thin waving bands from an eighth to an inch in thickness, and when the stone is sawn nearly parallel with the bedding presents a face of surpassing beauty. Blocks of any desirable size, even up to 20 ft. in length and 6 ft. to 10 ft. in width, can be obtained.

As very little stripping has to be done, and the strata lie nearly horizontal the cost of quarrying will be a minimum. A line of railroad is now being surveyed from Phoenix to Prescott, which will pass quite close to the quarries, and will no doubt be built to that point within the year. This will afford direct transportation either northward to the Santa Fe Railway system or southward to the Southern Pacific system, and thus give a widely extended market.

RELATIVE ABUNDANCE OF GOLD IN DIFFERENT GEOLOGICAL FORMATIONS.*

By W. P. Blake, M. E.

The age of the chief gold-bearing slates of the central gold region of California, where gold was mined in greater quantity than ever before, was for a long time in doubt. The dogma of the Lower Palaeozoic age of most of the gold rocks of the world predisposed observers to regard the auriferous slates as Palaeozoic. But about the year 1864, I had the good fortune to find Mesozoic fossils in the midst of these slates, and thus removed all doubt of their true horizon. These fossils were *Ammonites* in the slates of Placer County near Colfax; *Belemnites* and Jurassic bivalves in similar slates on the Mariposa estate, Mariposa County, and contiguous to the great gold quartz vein known as the Mother Vein of California. Thus the Secondary age of the chief gold-bearing slates of California was established.

It is in this great belt of Jurasso-Triassic. and perhaps, in part, Lower Cretaceous strata, lying enfolded in the western flanks of the great mountain mass of the Sierra Nevada, we find the strongest, richest and the most productive gold quartz mines and placer deposits of California. The Mother Vein at Carson Hill, in Calaveras County, has yielded some of the heaviest masses of gold ever taken from veins. Further, one of the deepest gold mines of the world is in the midst of the same great belt of Mesozoic slates.

The occurrence of gold in California is, however, not confined to any one geological horizon. It is found in close contiguity to limestone of Carboniferous age, as early shown by Dr. Trask, and no doubt in the older rocks of the Sierra Nevada lying parallel with the chief auriferous deposits. Thus at Hite's cove, some miles west of the locality of the Jura Trias fossils of Mariposa, there is an important gold-bearing vein near a stratum of limestone in which I have found encrinural stems, and which is no doubt Upper Palaeozoic. But these older strata in California have never yielded gold so generally and in such profusion as the newer beds further west of them. I would not, however, be understood as claiming that the Mesozoic formations, even in California, give as a rule richer mines than any other formation. So far as the evidence goes, for that region, such a generalization might be accepted, but we know far too little of the laws of the formation and distribution of the noble metals to make any rigid discrimination in favor of one geological horizon over any other. Some of the most valuable gold mines do not occur in stratiform rocks. The celebrated veins of Grass Valley, California, which have been worked continuously for over forty years, are in crystalline granitic rocks of uncertain age. The great Comstock Lode, in Nevada, which has added so many millions to the world's supply of gold as well as silver, is in crystalline rocks which, however, are probably altered Mesozoic beds. The gold of the Deep Creek region, Utah, as I have elsewhere shown, is in altered Carboniferous limestone, thus being in upper rather than lower Palaeozoic.

The best example we have of gold in the oldest rocks is found in the Black Hills of South Dakota in pre-Silurian strata, probably the equivalents of the Cambrian, Montalban, or still older sediments. But here in these ancient strata, although the aggregate quantity of gold is large, the quantity per ton of rock is not. To use the technical phrase it is "low grade rock" as compared with the gold quartz rock of the California Mesozoic.

* From the American Geologist.

The financial success of any gold mining operation is not to be taken as an indication or measure of quantity. Success or failure depends largely upon location, the facilities for working and upon intelligent common-sense management.

In conclusion it is well to note briefly the general absence of gold, so far as yet known, in the ordinary red beds of the Trias of the Rocky Mountains and Appalachians, and from all formations where the iron is in the condition of sesquioxide. I do not, of course, refer to, or include the oxidized outcrops of formations where at water level the normal condition of the contained iron is that of protoxide or of its sulphur compounds. This is the normal state of the California Mesozoic. The auriferous formations there are generally bluish-green and black in color, the diffused iron is in the state of protoxide, or the sulphide, and the formations bear no resemblance to the Trias of the Rocky Mountain region or of the Appalachians.

MINING, WASHING AND CALCINING SOUTH CAROLINA LAND PHOSPHATE.

Written for the Engineering and Mining Journal, by W. de L. Benedict, E. M.

South Carolina land phosphate is found as lumps or nodules, of irregular shapes and sizes, in beds or strata of varying extents and thicknesses lying horizontally, or nearly so. It is of a grayish color, moderately hard and tough, and contains, when thoroughly dried, from 55% to 82% of tricalcic phosphate, or "bone phosphate," as it is usually termed. The strata average, perhaps, 9 in. in thickness, and are sometimes practically continuous for several thousands of acres in extent. They sometimes appear at the surface of the ground, and again are covered to a depth of

formerly covered by the track, starting as before from the end furthest from the railroad.

The mining is divided into "tasks," each task being a space 15 ft. long and 6 ft. wide, and as deep as the phosphate stratum, which averages 5 ft. or 6 ft. Miners are paid 25 cents to 30 cents per vertical foot, according to the hardness and thickness of the overburden. For a depth of 6 ft., therefore, the pay would amount to \$1.50 to \$1.80 per "task" (equivalent in this instance to 15 ft. \times 6 ft. \times 6 ft. = 540 cu. ft., or 20 cu. yds.), or at the rate of 7 $\frac{1}{2}$ to 9 cents per cu. yd. The miners earn from \$1 to \$1.25 each per day.

The stratum is made up of phosphate, more or less mixed with clay and sand, and for each foot in thickness (which is about its average thickness on this property) it will yield about 1 $\frac{1}{2}$ tons of marketable phosphate per task; in this case equal to 15 ft. \times 6 ft. \times 1 ft., or 90 cu. ft. of stratum, or say 60 cu. ft. to the ton. A ton of this phosphate occupies about 24 cu. ft., so the stratum may be said to yield 40% of phosphate, or 726 tons per acre.

After this mixture is mined it is loaded into cars holding about four tons each, and hauled by a locomotive to the "washer." Here the cars are drawn up an incline to the top of the building, and their contents are dropped into hoppers which discharge into the crushers. The latter consist of pairs of rolls about 4 ft. long, and are set about 4 in. apart. The object of these crushers is simply to break up the larger masses and pieces of phosphate so as to have nothing more than about 4 in. in diameter pass into the washers. Most of the nodules are smaller than this, but they are sometimes cemented together in larger masses, containing, also, clay and sand, which it is necessary to remove in order to keep up the grade of the phosphate.

From the crushers the material is discharged into the washers. Two



BIG BUG ONYX QUARRY, ARIZONA.

50 ft. or more. It is doubtful, however, if it will pay to extract the phosphate from a greater average depth than about 10 ft., unless the bed is unusually thick, or the market price for the product unusually high.

The operations of mining the phosphate and its subsequent treatment are substantially as follows (the methods about to be described being those adopted by one of the largest and most successful companies): The land is first "sounded" with a pointed steel rod to determine the depth of the stratum below the surface; then pits are dug to ascertain the thickness of the bed. The variations in the depth of the phosphate are due to the undulations in the surface rather than to any dip in the stratum. As the cost of mining is proportionate to the thickness and hardness of the "overburden," as well as to the thickness of the phosphate, and as it is desirable to keep this cost at about the same figure from year to year, it is of great importance to have an accurate survey of the property in order that deep and shallow places may be selected to balance each other.

After suitable tracts of several acres each have been chosen, the trees are felled, the underbrush is cleared away and trenches are dug around each one in the form of a rectangle, to drain off the water to a depth greater than that of the phosphate. The land is so flat and so near the level of the river it is frequently necessary to pump the water out of the drain trenches. A railroad track is laid along the middle of the rectangular tract, and the land is then ready for the mining operations proper.

To obtain the phosphate, trenches 6 ft. wide are dug adjoining the drain trenches on the long sides of the rectangle, the earth is thrown over the drains and the phosphate is piled on the bank toward the railroad, to which it is wheeled in barrows before the next trench is commenced. The earth from the second mining trench is thrown into the space made by the first trench and the phosphate is piled on the inner bank as before and wheeled to the railroad. This is repeated till the track is reached, when that part of it which is within the limits of the rectangle is taken up, and mining is then commenced on that part which was

kinds of washers are used, but the one called a "log washer" seems to do the cleaner work. This washer consists of an octagonal piece of wood about 27 ft. long and 15 in. in diameter, having cast iron teeth, each about 9 in. high by 5 in. wide, bolted to four of the eight sides in the form of a broken helix. This "log" revolves in a trough, and both are slightly inclined, so that the phosphate is "screwed" up against a current of water, which cleanses it from the sand and clay. The material to be washed is fed in at the lower end and water is discharged into the trough at various places, a strong stream being directed against the phosphate near the point of discharge to give it a final washing. The cleaned phosphate falls on an inclined screen of cast iron, having square perforations $\frac{1}{2}$ in. in diameter; all that passes through this falls on a second screen with meshes $\frac{1}{4}$ in. in diameter, and that which passes through this screen—a very small proportion—contains so much sand that it is wheeled away as "waste."

The water from the washers carries off the finer sand and clay and deposits them on the mud flats of the river, on the bank of which the washer building is placed. The other kind of washer consists of a boiler iron cylinder slightly inclined (or, sometimes, a truncated cone), having teeth similar to those just described bolted to the inside of the shell in the form of a broken helix. As the cylinder revolves the material to be washed is forced up against a down-flowing current of water, as before. This style of washer is said to do more work than the other, but the product is perhaps not so thoroughly cleaned.

The phosphate is now ready for calcination. This is effected in kilns, which consist simply of rectangular brick structures each about 100 ft. long by 40 ft. wide. The floor is of brick also and in it flues are arranged about 5 ft. apart and running parallel to the shorter sides, to supply the air for the combustion of the wood. The walls are about 10 ft. high and are braced on the outside with wooden buckstays. A roof of wood covers the kiln. Each kiln holds 1,000 to 1,200 tons of phosphate and 35 to 40 cords of wood are required to calcine it, or at the rate of about 80 tons per

cord. The wood is piled on the bottom of the kiln and the phosphate is wheeled from the washers in barrows and dumped on the wood until the proper amount is charred, the finer phosphate being reserved to go on the top as a cover. The wood obtained in clearing the land is usually sufficient for calcining the phosphate and for fuel for the locomotives and "washers." It takes from two to five days for the fires in the kilns to burn out, and then the phosphate is ready for market.

The water in the river is deep enough for some of the smaller sailing vessels to come directly to the "washer," but when the phosphate is to be shipped in larger vessels or steamers it is loaded into lighters and towed down into deep water. The ease and simplicity with which the thickness and depth of the South Carolina deposits can be determined, and the uniform grade of the phosphate enables one to estimate very closely the quantity of material in any given tract of land, as well as its value and the cost of mining. All of which stands out in strong contrast with the extreme irregularity of the Florida deposits of rock phosphate; which, because of their great uncertainty as to quantity and quality, require very extensive and costly development and sampling before one can even closely approximate their value in any considerable body of land.

THE MIKE & STARR CASES—DECISION OF THE U. S. SUPREME COURT.

The following decision in two cases of the Iron Silver Mining Company vs. the Mike & Starr Gold and Silver Mining Company, was delivered July 29th, 1892, by Justice Brewer (Fuller, Gray, Lamar, and Blatchford concurring, and Field, Harlan, and Brown dissenting):

This and two kindred cases have been before us for consideration for some time. They have been twice argued, the re-argument having been ordered by the court of its own motion; and on the second argument, at the like instance, very elaborate and complete models, maps and photographs were prepared by the respective parties and presented for our examination. The fact is, there was an earnest inquiry as to whether the court had not erred in its prior and repeated ruling, that a known lode, as named in section 2,333 of the Revised Statutes, is something other than a located lode; and, also, whether, in view of the disclosures made in this, as in prior cases, of the existence of a body of mineral underlying a large area of country in the Leadville mining district, whose general horizontal direction, together with the sedimentary character of the superior rock, indicated something more of the nature of a deposit like a coal bed than of the vertical and descending fissure vein, in which silver and gold are ordinarily found, it did not become necessary to hold that the only provisions of the statute under which title to any portion of this body of mineral, or the ground in which it is situated, can be acquired, are those with respect to placer claims. Of course, such conclusions would have compelled a revising of some former opinions, and have wrought great changes in the status of mining claims in that district. Because of this we have been very careful, and the investigations in these directions have been earnest and protracted. It would serve no useful purpose to state all the arguments which have been advanced and considered by us. It is enough to announce the results. Our conclusions are, first, in respect to the matter of the known vein, that the reasons so clearly stated by Mr. Justice Field, speaking for the court in the case of *Noyes v. Mantle* (127 U. S. 348, 353), are unanswerable, and forbid an adjudication that the term "known vein" is to be taken as synonymous with "located vein," and compel a reiteration of the declaration heretofore made, that the term refers to a vein or lode whose existence is known, as contradistinguished from one which has been appropriated by location; and as to the other matter, that the title to portions of this horizontal vein or deposit, "blanket" vein as it is generally called, may be acquired under the sections concerning veins, lodes, etc. The fact that so many patents have been obtained under these sections, and that so many applications for patents are still pending, is a strong reason against a new and contrary ruling. That which has been accepted as law, and acted upon by that mining community for such a length of time, should not be adjudged wholly a mistake and put entirely aside because of difficulties in the application of some minor provisions to the peculiarities of this vein or deposit. With this explanation of the reasons for the long delay in the decision of this case, we pass to the special matters in controversy.

The questions presented by the pleadings to be tried were, whether there was a vein or lode within the territorial boundaries of the placer; and if so, whether it was a known vein or lode within the meaning of section 2,333. The plaintiff, to maintain its case, offered in evidence simply its patent and other matters of record, together with parol proof of boundaries. By this record evidence it appeared that the application for the placer patent was made on the 13th of November, 1878; that entry and payment were made on the 21st of February, 1879; and that the patent was issued on January 30th, 1880. The location certificate of the Goodell lode was dated March 10th and recorded March 11th, 1879, reciting a location on February 1st, 1879. After the introduction of this testimony the plaintiff rested, and by it a *prima facie* title to the whole placer claim was established. The location of the Goodell lode was some months after the application for the placer patent. The defendant, to maintain its claim, offered the testimony of several witnesses, testimony which established beyond any doubt that in 1877, and more than a year before any proceedings were initiated with reference to the placer patent, the grantors of defendant entered upon and ran a tunnel some 400 ft. in length into and through that ground which afterward was patented as the placer tract; and that in running such tunnel they intersected and crossed three veins, one of which was thereafter, and in 1879, located as the Goodell vein or lode. The vein thus crossed and disclosed by the tunnel was from 75 to 78 ft. from its mouth, of about 15 in. in width, with distinct walls of porphyry on either side, a vein whose existence was obvious to even a casual inspection by any one passing through the tunnel.

With this general statement we notice the two or three matters which are the special objects of contention; and first, it is said that the court erred in giving this instruction:

"If there is a lode in that territory, and it was known to Mover as an existing lode at this time—and by this time I mean the first of February, 1879, or at the time these locations were said to have been made—and the lode had been previously discovered by the locators of these claims, then the placer patent is not sufficient to convey them. In other words, they are excepted by the terms of this statute from the provisions of the patent, and the owners of that title now have no right to them."

In other words, the court ruled that if the vein was known to the placer patentee at or before entry and payment, although not known at the time of the application for patent, it was excepted from the property conveyed by the patent. Into this ruling the court was doubtless led by the language of the patent, which in terms exempts all veins or lodes known to exist at the date thereof; that is, the date of the issue of the patent. In this respect there was error. The time at which the vein or lode within the placer must be known in order to be excepted from the grant of the patent is, by section 2,333, the time at which the application is made. Its language is: "An application for a patent for such placer claim, which does not include an application for the vein or lode claim shall be construed as a conclusive declaration that the claimant of the placer claim has no right of possession of the vein or lode claim." (*Mining Company v. Reynolds*, 124 U. S. 374; *United States v. Mining Co.*, 128 U. S. 673, 680.) There was therefore a technical error in this instruction of the court; but one which obviously wrought no injury to the substantial rights of the plaintiff, because there was not a scintilla of testimony, a suggestion even, that between the year 1877 and the time of entry and payment there was any work done or discovery made on the placer ground in respect to the Goodell lode or in the tunnel. Everything that was done had been done in 1877; everything that was known at the time of the patent was known in 1877; so that the error of date in the charge was one not affecting the substantial rights of the plaintiff. If at the time of the entry there was a known vein, there was the same vein and the same knowledge in 1877, and before the application.

The second matter is this: Was there a known vein at the time of the application for a patent, within the meaning of Section 2,333? It was not then a located vein or lode, and the case was evidently tried by the plaintiff upon the theory that unless it was a located vein it was not a known vein, but that, as we have seen, is not a correct interpretation of the statute. It is enough that it be known, and in this respect, to come within the intent of the statute, it must either have been known to the applicant for the placer patent or known to the community generally or else disclosed by workings and obvious to any one making a reasonable and fair inspection of the premises for the purpose of obtaining title from the government. The proof abundantly establishes that within the last description the vein was a known vein. The placer tract was a small one of 56 acres. The tunnel ran 400 ft. underneath its surface. At its mouth there was a large dump of earth taken from it. No one had a right to enter that ground as placer mining ground, unless he had made such an inspection as to enable him to make affidavit that it was adapted to such mining. No examination could have been made without disclosing the existence of this tunnel. That was a fact upon the surface, obvious to the most casual inspection. No one could be heard to say that he had examined that ground in order to ascertain that it was suitable for placer mining, and in such examination had not discovered the existence of this tunnel. It was not a little excavation, with a few shovelful of dirt at its entrance. The pile of dirt was evidence which no one could ignore, that it was a long tunnel, running far into the earth. It was in mining ground, as all this territory was believed to be, and, therefore, an excavation likely to disclose veins. As an applicant for a placer patent was chargeable with notice of the existence of the tunnel, so, also, was he chargeable with notice of whatever a casual inspection of that tunnel would disclose. He would not be heard to say, I did not enter and examine this tunnel, and, therefore, know nothing of the veins apparent in it. The government does not permit a person to thus shut his eyes and buy. If there be a vein or lode within the ground, it is entitled to double price per acre for it and the adjacent fifty feet, and, with such interest in the price to be paid, it rightfully holds any applicant for a placer patent chargeable with all that would be disclosed by a casual inspection of the surface of the ground or of such a tunnel. The applicant must be adjudged to have known that which others knew, and which he would have ascertained if he had discharged fairly his duty to the government. Surely under the testimony the jury was warranted in finding that this was a known vein.

Another question is, whether this was such a vein bearing gold, silver, cinnabar, lead, or other valuable deposit as that a discoverer could obtain title thereto under sections 2,320 and 2,325. It is undoubtedly true, that not every crevice in the rocks, nor every outcropping on the surface, which suggests the possibility of mineral, or which may, on subsequent exploration, be found to develop ore of great value, can be adjudged a known vein or lode within the meaning of the statute. As said by this court in the case of *United States v. Mining Company* (128 U. S., 673, 683): "It is not enough that there may have been some indications by outcroppings on the surface, of the existence of lodes or veins of rock in place bearing gold or silver or other metal, to justify their designation as 'known' veins or lodes. To meet that designation the lodes or veins must be clearly ascertained, and be of such extent as to render the land more valuable on that account, and justify their exploitation." And yet, in the case of *Mining Company v. Cheesman* (116 U. S., 529, 536), this court sustained an instruction as to what constitutes a lode or vein, given in these words: "To determine whether a lode or vein exists, it is necessary to define those terms; and, as to that, it is enough to say that a lode or vein is a body of mineral, or mineral bearing rock, within defined boundaries in the general mass of the mountain. In this definition the elements are the body of mineral or mineral-bearing rock and boundaries; with either of these things well established, very slight evidence may be accepted as to the existence of the other. A body of mineral or mineral bearing rock in the general mass of the mountain, so far as it may continue unbroken and without interruption, may be regarded as a lode, whatever the boundaries may be. In the existence of such body, and to the extent of it, boundaries are implied. On the other hand, with well defined boundaries, very slight evidence of ore within such boundaries will prove the existence of a lode. Such boundaries constitute a fissure, and if in such fissure ore is found, although at considerable intervals and in small quantities, it is called a lode or vein."

It is, after all, a question of fact for a jury. It cannot be said as a matter of law in advance, how much of gold or silver must be found in a vein before it will justify exploitation and be properly called a "known" vein. In this case the only testimony offered upon this question was that by the defendant, John Hayes, one of the parties who dug this tunnel, testified that his brother was the Territorial assayer of Colorado at the time; and that he assayed the ore from this vein several times, and got from a trace to three-quarters of an ounce of gold. Three-quarters of an ounce would be \$15 a ton. That of itself may not be decisive as to

whether the vein justified exploitation. And yet the proofs filed in the Land Department, under which the patent to this entire placer claim was obtained, show no such amount of mineral. What is sufficient to obtain title from the government is certainly sufficient to demand consideration by a jury. We are told by counsel for defendant that the Father de Smet mine at Deadwood produces ore that runs less than \$5 to the ton, yet is of immense value and constantly worked, because of the large quantity of this low-grade ore. So, here, the amount of the ore, the facility for reaching and working it, as well as the product-per ton, are all to be considered in determining whether the vein is one which justified exploitation and working. Beyond this the defendant produced Fred G. Bulkley, a civil and mining engineer, who testified to an examination of the tunnel, describing the various fissures and veins, and produced before the jury some of the ore taken from this vein. The jury, therefore, had before them samples of the ore from the vein, they were advised as to its dimensions, as to its general course and direction, and as to the actual results of several assays, and upon this testimony they found that it was a known vein.

If it be said that the conduct of the parties who ran the tunnel makes against the present contention, in that when they reached this vein they did not stop and develop it, but on the contrary proceeded with the tunnel, and even after they had finished their work therein did not immediately commence to develop it, a satisfactory answer is found in the testimony. It appears that there was a prevalent belief that a rich blanket vein was underlying the entire country, and this was the object of pursuit by all. The placer claim of the plaintiff was evidently not taken for placer mining, but because outside and at a short distance therefrom it had workings on this blanket vein; and believing that such vein at a slight dip extended under the placer ground, title was sought to the latter in order to prevent intrusion upon the former. In like manner they who ran the tunnel, having a claim on adjacent ground, were seeking the same blanket vein, which, wherever reached, had been found of great thickness and richness. All minor matters and less promising veins were subordinated to the search for this one rich vein. The conduct of the grantors of both of the parties was determined by a belief in the existence of this underlying vein; but whether their belief in its existence was well founded or not, whether their conduct in view of such belief was wise or not, are matters which do not detract from the credibility to be given to the testimony as to the width and character of this vein. We are of opinion, therefore, that the finding of the jury that this was a "known" vein within the scope of section 2333 was based upon sufficient testimony, and cannot be disturbed.

It is urged that there was error in admitting testimony as to this belief in an underlying vein, because the jury may have found against the plaintiff on the ground of the supposed existence of such a vein. It may have been competent as explanatory of the conduct of the parties, as indicated above; but whether this be so or not, the attention of the jury was directed by the court to the vein disclosed by the tunnel as the known vein upon which the rights of defendant rested. It made no reference to this supposed underlying vein, but did say:

"The evidence tends to prove that the discovery of mineral in these claims was made in a tunnel some time in 1877, I believe. The locations were not made on the surface of the ground until 1879, about the first of February. That was after the application for patent and before the entry, which was about the 21st of February, 1879, and, of course, before the patent was issued.

"If there was a lode in that territory, and it was known to Moyer as an existing lode at this time—and by this time I mean the first of February, 1879, or at the time these locations were said to have been made—and the lode had been previously discovered by the locators of these claims, then the placer patent is not sufficient to convey them."

And then in closing the charge, added:

"I think that is all, gentlemen, that there is in the case. I do not know that it is necessary to repeat it again—that the plaintiff's title must prevail in the ground, and that Moyer knew it at the time of making his entry and obtaining his patent, and that a location had been made upon it in a general way; that there was a certificate made; that there was a discovery of mineral within the claims; and that the lode was staked upon the surface, and the like."

As there was no pretense of any discovery of this supposed underlying vein, obviously the attention of the jury was directed solely to the vein disclosed in the tunnel.

These are all the questions we deem important, and in the record there appears no substantial error. The judgment will therefore be affirmed.

Case No. 2, between the same parties, presents the same questions, and the same judgment of affirmance will be entered therein.

Liability for Accident.—Where a person is injured by an accident occurring while the employé of another are engaged in work upon his premises, he may recover if the injury resulted from the negligence of the workman. But if it was an unavoidable accident, untainted with negligence, he is entitled to no damages.—*Stean v. Williamson, Supreme Court of California, 26 Pac. Rep.*

Ancient Method of Silver-Lead Smelting in Peru.—Mr. Otto H. Pfordte, in a paper presented at the Baltimore meeting of the American Institute of Mining Engineers, describes a furnace used in the upper regions of Peru, where fuel is not only scarce but unobtainable, save in the form of *Taquia*, or llama dung. The furnace is a reverberatory with a shallow hearth something like that of a cupelling furnace or Mexican *vosso*. It is built of stone and mortar, while the lining is composed of refractory rock and clay. The chimney is 18 ft. in height, affording a moderate draught. The ores smelted are galena, assaying 37 oz. to 95 oz. silver per ton and carrying from 35% to 55% lead, together with a considerable quantity of gray copper and richer silver mineral, when obtainable. After charging the hearth with a certain amount of lead and introducing several charges of litharge or cersussite, 500 to 600 lbs. of finely crushed ore are added, and the smelting begins. After four hours the slag is drawn and the remaining lead cupelled on the hearth. The litharge is saved and the bullion removed and the process renewed. Artificial draught is not used in the cupellation or smelting. The slags run from 2 oz. to 6-1 oz. silver per ton, and from 34% to 58% lead, about 38% Fe_2O_3 and 12% SiO_2 .

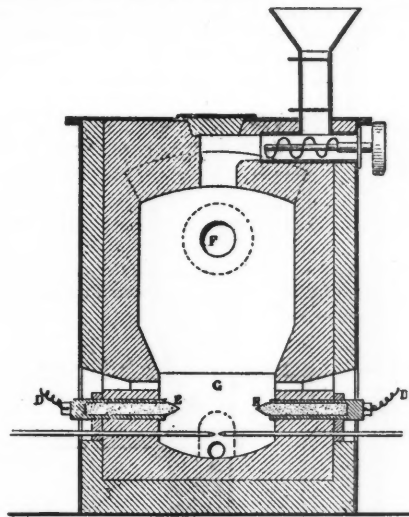
THE MANUFACTURE OF PHOSPHORUS BY ELECTRICITY.

For several years Dr. G. B. Readman has devoted considerable time, thought and money to the production of phosphorus by a cheaper process than that usually adopted. His labors finally resulted in the taking out of a patent for an electrical process; but shortly after his application had been lodged, in 1888, he became aware that Mr. Parker, of Wolverhampton, had seven weeks later also applied for a patent for the production of phosphorus by electricity. The two patentees agreed to join their interests, and the perfected method is now known as the Readman-Parker process. The experimental stage of the work has been carried on at Milton, Staffordshire, England, the electrical energy required being supplied by the Cowles Company. In a paper recently read before the Scottish Section of the Society of Chemical Industry, Dr. Readman gave an outline of the process employed, and the plant used at the experimental works.

The works are near the Milton Station. The dynamo furnishes a current of 5,000 ampères with an E. M. F. of 50 to 60 volts. The current is led to the furnaces by flexible cables. The furnaces are rectangular firebrick troughs 5 ft. in length, 1 ft. 8 in. wide, and 3 ft. deep. Into each end is built a cast iron tube, through which the carbon electrodes enter. Each carbon is 48 in. long and 2½ in. in diameter and weighs 20 lbs. Each electrode consists of a bundle of nine carbons set in a head of cast iron. They are so arranged that it is possible, by means of a screw arrangement, to advance or withdraw them within the furnace.

With the early experiments at Milton great difficulty was experienced in distributing the heat sufficiently. Most of it was concentrated between the electrodes, and so intense was it that all the oxygen in the mixture was expelled, and the iron, aluminum and calcium combined with silicon and phosphorus to form alloys. The difficulty is now obviated in the later furnaces used at Wolverhampton.

After the consolidation of interests by Dr. Readman and Mr. Parker, the Electrical Construction Corporation took the process in hand. Ground was secured at Wednesfield, and a suitable building and plant put up to



D. D. Conductors; E. E. Electrodes; G. Furnace.

carry out the manufacture on a large scale. The electric current is furnished by an Elwell-Parker alternating dynamo, 8 ft. in diameter, giving an output of 400 kilowatts.

The new furnace, shown in the accompanying illustration, is the invention of Mr. Parker. It is 8 ft. square, and is fitted with a hopper at the top, so constructed that the materials to be reduced can be run in without any heat or vapor of phosphorus escaping. The raw materials, all intimately mixed, are thus introduced in the furnace, and the current turned on. The gases and vapors arising from the furnace are then led away to large copper condensers—the first containing hot, and the second cold water—and finally, being free from phosphorus, escape into air. The phosphorus is stated to be deposited in such a pure condition that little refining is needed. For commercial purposes it is cast into cheese-shaped cakes.

The yield of phosphorus obtained is said to be high, and the loss is mainly due to the formation of phosphide of iron, which is found in the slag. Doctor Readman quoted the result of an experiment in which 127 parts of the phosphorus-yielding material were used. This contained 13%, or 16.6 parts of phosphorus. On decomposition in the furnace, 14.3 parts were obtained in the condensers, 2.3 parts being lost, chiefly in the slag, as iron phosphide. The yield was thus about 86%.

The carbons now used at Wednesfield are not those manufactured by the Cowles Company, but are a simple arrangement of gas carbons. The reduction of size in the new furnaces has done away with the difficulty formerly experienced by Dr. Parker. Each furnace turns out about 1½ cwt. of phosphorus per day. When in full working order the new company expects to produce about 1,000 tons per annum, which is half the estimated consumption throughout the world.

Assumption of Risk by Miner.—A miner who had charge of the ventilation of a mine, and whose duty it was to attend to a furnace inside, and to guard certain wooden buildings at the entrance, containing the engine and machinery, was suffocated by smoke occasioned by the burning of the said buildings. There were two entrances to the mine, and the other miners, when they observed the smoke, were able to make their escape. The furnace, however, which the deceased was attending was so situated that his escape was cut off. The proof showed that many well-managed companies used outside buildings, constructed of wood, and located as these were located; and that the State Inspector of Mines had often inspected this mine, and made no complaint. The deceased must have taken to have assumed the risks incident to these buildings.—*Coal Creek Mining Company v. Davis, Supreme Court of Tennessee, 18 S. W. Rep., 887.*

FAILURES IN BOOMED TOWNS—FORT PAYNE, ALA.—II.

Written for the Engineering and Mining Journal.

(Concluded from Page 331)

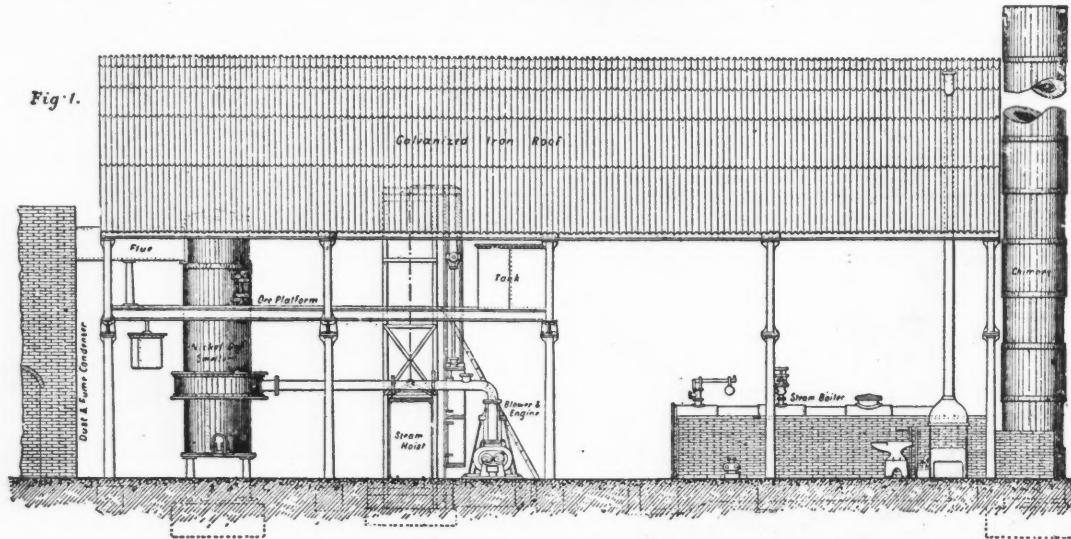
The red ore mines lie on the west side of this same ridge, the seam dipping at an angle of nearly 20° east, going under heavy cover, generally, within a short distance of the outcrop. The seam is a continuous one, running from near Chattanooga to below Birmingham, but varying greatly in thickness. Until the latter place is nearly reached the ore seldom is over 2 ft. thick and as low as 10 in. frequently. Above and below are other small seams which seldom attain a thickness of 5 in. and are generally not above 1 in. Three openings have been made in the main seam by the company. One is back of the town and two miles from the railroad; it consists of a small surface which has been stripped, and a few hundred tons of ore piled up. Thus far it has served no purpose but that of being shown to visitors, who were duly impressed with the magnitude of the piles of ore and paid little attention to its cost. The seam at this point is 19 in. thick, the ore near the outcrop running as high as 48% iron and that 50 ft. away from it dropping to 41%. Further in than this the iron decreases rapidly. Another opening in this seam was made in the gap on the line of the railroad; but as here it was under heavy cover, the lime was found so high and the iron so low, that, after erecting an artistic arch over the opening from the ore mined, it was abandoned.

The mine from which most of the ore used by the furnace, in its short blast, was secured is near the top of the ridge and west of the brown ore mine already referred to. Here the seam has been stripped for perhaps 200 yds. in length on the west side, and nearly 100 yds. on the north where exposed by the gap. On this latter side several entries have been driven parallel to each other into the ore, but none has gone more than 50 yds., as it was found too low in iron to be of value. On the west side the stripping was carried on to a depth of 15 ft. and the work then abandoned; where it was stopped the ore was becoming lean and within a few feet more would have been below 25% in iron and correspondingly high in lime. The average thickness of the seam, as shown by all these openings, is 18 in. and the average distance from the outcrop at which a

for ore, and \$0.65 per ton for limestone. The furnace here will pay \$2.50 per ton for coke, not more than \$0.65 per ton for ore and \$0.45 per ton for limestone. It takes for one ton of iron, one and one-half tons coke, two and one-half tons ore and one ton of limestone. Pig iron can be made here for about \$7.30 per ton. The above facts can be substantiated by any of our friends who will visit Fort Payne and Birmingham." The furnace manager, in a letter to a prominent stockholder substantiates this and further says: "It is claimed that iron is now made at Birmingham, Ala., for \$8 per ton; and I have no doubt the statement is substantially correct. At Fort Payne the cost will be less by the difference in cost of transportation of raw material, safely put at \$1 per ton of iron."

These letters were written to induce people not only to put in sufficient to erect the one furnace started, but also to build another before the first had been completed. The first one went in blast shortly after being finished and continued in operation, at intervals, during the next three months. At the end of that time it was found that the cost of making iron was far above the price received for it, and as the finances of the parent company were too low to allow any more excursions to the place it was determined to blow out. This was done and for the past year the plant has been idle. During its short blast the furnace company became heavily involved in debt both for money borrowed during construction and for operating. An attempt has been made to bond the plant, but it will be a matter for surprise if anyone can be found ready to put more money into such a sink hole as this plant has shown itself to be. It would be easy to show that such pig iron as was made cost over \$18 per ton at the furnace and that the selling price was not above an average of \$10.25 at the same place. The ores used were those already referred to and their average yield of iron in the furnace was only 23%. This furnace cannot be run on a paying basis when using Fort Payne ores and it is doubtful if, purchasing ores and coke from Birmingham, it could be made to pay.

The Bay State Furnace Company commenced erecting its plant before the first furnace was completed and upon the failure of that, work on the former ceased; this was a year ago and now the partially completed plant stands a huge monument to the credulity of those who put their money in it.



A NICKEL SMELTING PLANT FOR NEW CALEDONIA.

40% ore would be found is 20 ft. With an average thickness of 9 ft. of stripping it would be necessary to move nearly 3,600 cu yds. of soft rock and earth to secure 1,000 tons of ore; and estimating this, the cost of handling the ore, interest, and the various other expenses connected with such work, it is not likely that the ore could be placed on cars at the foot of the incline leading from the mine to the railroad for less than \$1.50 per ton. Such ore as would be mined underground would cost 30% more than this on account of the thin seam, hardness of the ore and increased cost of handling.

Analyses of picked samples of this ore from near the outcrop show as high as 52% iron, but an average from the same place gave only 43%, which, probably, is close to the average of the outcrop of the entire seam. The hard ore, picked samples, showed under 30% iron, and two samples taken by officers of the company to prove the excellence (?) of the ore gave the following disappointing results: (1) Iron, 15.23%; silica, 4.70%; carb. of lime, 71.54%. (2) Iron, 10.20%; silica, 5.80%; carb. of lime, 77.62%.

At various places along the ridge within three or four miles of Fort Payne, prospectors have made openings on this same seam of ore in hopes of finding it thicker, but, with the exception of one place where it was found 22 in. thick, they have only proved its continuity.

Of course, in order to use these ores and the coke it was necessary to have a blast furnace. Upon the representations made by the parent company a number of persons, with its assistance, formed the Fort Payne Furnace Company, and erected a 60-ton furnace. Some doubt appears to have existed in the minds of the investors as to the cheapness with which iron could be made, but these were apparently set at rest by a letter from a gentleman who carefully examined the Birmingham furnaces and their disadvantages and wrote that he had been investigating the cost of making iron at that place, as follows: "Pig iron is being made in Birmingham for \$8 per ton by people who own their coal, coke ovens and ore beds, and the same parties are getting about \$15 for their iron f. o. b. in Birmingham. I also found a furnace there of the same capacity as the one nearly completed here, that is, buying all its coke, ore and limestone. This furnace, from the best information obtainable, is making pig iron for about \$9.50 per ton and selling this iron for about \$14.50 per ton f. o. b. in Birmingham. This concern is paying \$2.75 per ton for coke, \$1.25 per ton

As the coal mine was opened so far from means of transportation it was, of course, necessary to build a railroad from it to the town. An engineer surveyed the route and estimated the cost. His instructions were to make his estimate of the entire cost below \$100,000, and as he was unable to do this the matter was placed in the hands of a man of more accommodating ideas. He estimated everything at \$80,000 for the ten miles of road and necessary switches and upon the strength of this it was built; when done it was found that the entire cost exceeded \$250,000. There was much talk on the part of the stockholders at this large sum in excess of the estimate, but the usual excuses of unforeseen difficulties, etc., carried it through without an investigation which, had it been made, would have been damaging. There were certain matters in relation to the purchasing of right of way and of some important tracts of land along the line which clearly show poor management at least.

This short road was to be part of a larger system which was to run from Guntersville, Ala., to Port Royal, S. C., but it is hardly probable that any more will be built, as it would have to go over rough country in which there are many streams, small in the dry season, but large and swift after the heavy rains prevalent in fall winter and spring; moreover, it would, between Fort Payne and Guntersville, pass through a country poor in both mineral and agricultural wealth and which could do little to help support it. The terminus at the latter place would be on the Tennessee River, but it would make no connection with any other road. A railroad has been built from Guntersville to Attalla, 25 miles below Fort Payne on the A., G. S. R. R., and this alone will give sufficient outlet to all the trade that will be found in that section of the country. Continuing the road east from the mines, a connection could be made with the Chattanooga Southern within six miles, but this would be over an exceedingly broken country and have to descend Lookout Mountain. The only advantage to be gained by it would be securing ready access to the iron ores tapped by this latter road, but as there is already a connection between it and the A., G. S. at Attalla, it would hardly pay to spend such a sum of money as would be required, just for the sake of shortening the haul on the small amount of ore needed.

It is unnecessary to enumerate the enterprises which were established in Port Payne upon the representations, and largely with the money of

the Fort Payne Coal and Iron Company. There were not many of them and they all have the great faults which are found in such towns; that is, all of their money in the plant and none for working capital, heavy indebtedness, and little attention paid at the start to the actual value of the town's location for their particular business. Another fault was the thoroughly incapable management shown in both the industries and the parent company, and, what was quite as harmful, lack of conscientiousness and discipline among officers. When excursions were brought to the place, all manner of expedients were used to prevent the visitors from seeing the actual conditions of things. When an excursion went to the mines, the custom was to fill all the coal cars and keep them in the mine until the people arrived; then to rush them out, thus giving the impression that coal was being continually mined at this rate. When the last excursion visited the place, the manager of the furnace had orders to blow out as soon as they were gone and, in fact, commenced while they were there; they were shown around the plant and told how cheaply it was making pig iron, and had barely left the town the next day when it was shut down with no prospect of being started again.

An exhibition hall was one of the main places through which visitors were shown; they were told that all of the products there were made in the town, but the persons in charge of the place knew otherwise; a piece of terra-cotta drain pipe said to have been made there was picked out of a lot shipped to the town by a Chattanooga firm; a handsome fan made of different woods came from a large lumber concern in the same city; and various pieces of ore, pig iron, steel, coke and other things were of equally doubtful origin. It was perhaps natural that, with so few resources, mineral or otherwise, on their property, the originators should use all means within reach to make a good showing, but it is to be regretted that some of the people who have been so deceived have not made an effort to see in how far they were legally responsible.

An attempt has been made by the Coal and Iron Company to place \$300,000 in bonds secured by mortgage on a part of its property, and, while the security is apparently sufficient, the objection to the bonds is that the amount received from them will barely cover the indebtedness of the company, and, as it has no income except from a few rents, the property will necessarily go into the hands of a receiver. The

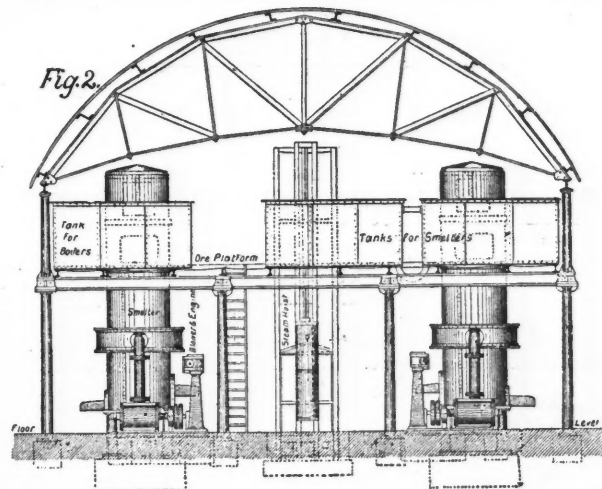
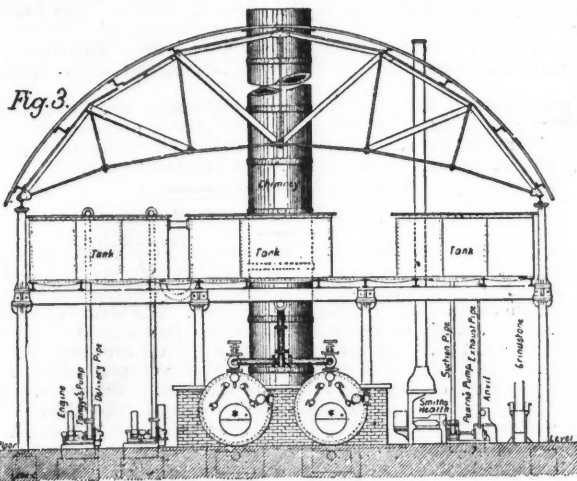
A NICKEL ORE SMELTING PLANT FOR NEW CALEDONIA.

The accompanying illustrations, for which we are indebted to *Engineering*, show a smelting plant constructed for the reduction of New Caledonian ores by Thwaite Bros., Limited, of Bradford, England. The plant is duplicate, and consists of two of Stewart's "rapid" water jacket cupolas (see Figs. 1, 2 and 3), each capable of smelting 30 tons of ore and fuel in 24 hours. The principal dimensions are as follows: Diameter inside water jacket, 4 ft.; outside, 5 ft.; length, 10 ft. 5 in. The water jacket is supplied with water circulating pipes, safety pipes, overflow pipes and regulating valves. The jacket is surrounded with an air belt, below which are six tuyères; from the air belt to the tuyères are attached elbow branch pipes, in which are fitted shut-off valves and peep-holes with movable lids. The air belt is connected to the blower by a cast iron blast main, and is provided with a wing shut-off valve. The cupolas are mounted upon cast iron base plates and four cast iron pillars, and stand upon a strong bed plate fixed upon the brickwork foundation. At the front of the jacket provision is made for the matte tapping spout, and at the back it is arranged for a movable slag spout. Riveted on the top of the water jacket is a wrought iron chimney 5 ft. in diameter, which is lined inside with refractory materials and covered in at the top with a firebrick dome.

On a level with the ore platform are the charging doors, opening from the centre. Near the top of the chimney is a square flue, lined with firebricks, leading into the fume and dust collectors. A blast pressure gauge is attached to the air belt to indicate the pressure, which is equal to a hydrostatic head of 16 ins. The jackets are constructed of Siemens mild steel with flanged joints, and are tested by hydraulic pressure to 100 lbs. per square inch.

Copper ore is reported to have been discovered in the French Congo.

The Construction of Good Roads.—Even the best flints make poor road metal, and partly decomposed flints are not worth the cost of laying, says the *Engineer*. Mr. C. Carus-Wilson attributes the abnormal quantity of slush on the surface of Poole and Bournemouth road (England) to the fact that the road has again and again been mended with rotten flints, by



A NICKEL SMELTING PLANT FOR NEW CALEDONIA.

report has been circulated that an English syndicate is considering the matter of loaning the company a large sum of money to carry on its plans and that as soon as an expert comes over and examines the place this will be forthcoming. If there is any fact in this report it is probable that any budding hopes will be withered when the expert makes his examination, as no man of any ability as a business man or engineer would report favorably to such an undertaking unless the consideration was the entire surrender of any and all property of the Coal and Iron and other companies, and the money consideration was inside of a conservative estimate of the value of such property less the indebtedness now on it. Even if such conditions were secured it is difficult to see how the investment would ever pay for itself. The town can never be more than a small feeder to Chattanooga, and with so many unfavorable conditions to work against, it will in all probability remain as it is, a monument over dead hopes and thoroughly bad management.

The Gold Production of Queensland in 1891.—The total gold yield for Queensland for the past year is stated at 559,392 ozs., the last quarter showing a total of 147,009 ozs., as compared with 139,941 ozs. in the September quarter. The year's yield is less by 51,195 ozs. than for 1890, but the latter half of the past year shows up with an advantage of 14,503 ozs. over the first half. The Charters Towers field contributed 211,605 ozs., Rockhampton, 149,567 ozs.; Croydon, 63,114 ozs.; Gympie, 58,887 ozs.; Etheridge 21,384 ozs.; Ravenswood, 13,424 ozs.; Eidsvold, 10,713 ozs.; Palmer, 10,719 ozs.; Gladstone, 6,504 ozs.; Clermont, 3,549 ozs., and Gayndah, 445 ozs.

Rumpfitz—A New Mineral.—To the east of St. Michael, in Upper Styria, pinolite was recently discovered on dolomite, according to *Chemiker Zeitung*, March 5th, 1892. In addition there was also found a cleavable, fine-scaled, white mineral, of inferior hardness and of a density of 2.675, which has been christened rumpfitz. It is infusible before the blow-pipe, but becomes somewhat brown. In the closed tube some water is given off. Neither hydrochloric acid nor sulphuric acid decompose it. The analysis gave: SiO₂, 30.75%; Al₂O₃, 41.66%; FeO, 1.61%; CaO, 0.89%; MgO, 12.09%; H₂O, 13.13%; which corresponds to the formula: H₂Mg, Al₁₀Si₁₀O₆₅.

which he means flints that have become decomposed to such an extent that there is very little true flint left. These flints are surrounded by a thick zone of soft white material. This is rapidly removed from the flinty nucleus by the grinding and the pressure to which it is subjected; while the true flinty nucleus, being thus denuded of its outer covering, becomes too small to bear much crushing weight, so that it quickly breaks up, and forms a fine flint sand.

The Results of Improved Coke Ovens in Europe.—At the meeting of the Society of German Ironmasters, held on January 31st, in Düsseldorf, Herr F. W. Lürmann, of Osnabück, read a paper on "Coke Oven Progress, with Special Regard to Obtaining By-Products," of which the following is an abstract: For obtaining by-products in coke oven working, which began some thirty-five years ago, and at first met with little acceptance, the Hoffmann-Otto oven takes first rank, there being at present in Germany 1,205 of these ovens. The installation of a group of sixty ovens costs 300,000 marks (the mark is equivalent to 23.8 cents), and the necessary condensation apparatus 420,000 marks. Such a group treats in the course of a year from 57,000 to 70,000 tons of coal, with an average result of from 65% to 77% of coke, 2.5% to 4.5% of tar, and 0.8 to 1.25% of sulphate of ammonia. The Semet-Solvay oven, the construction of which permits of a stronger formation of the covering masonry, attains a very high temperature, and good coke can be obtained with an addition of from 23% to 27% of thin coal. From the same cause the yield is greater than, for example, that of the Coppée oven, which, however, is also a satisfactory oven, 1,000 being in use in Great Britain. For some three years benzine has been obtained direct from the coking-gases; the necessary apparatus, invented by Herr Franz Brunck, is a secret; it costs 5,000 marks per oven. From 3 to 7 kilos of benzine are obtained from 1 ton of coal. The value of the by-products amounts, for a Hoffmann-Otto oven, irrespective of benzine, to from 3,400 to 5,000 marks, the average being 4,600 marks; for all the ovens of this system in Germany 5,600,000 marks. The old idea that in obtaining by-products the quality of the coke is prejudiced no longer appears to hold good. In the discussion which followed, Herr Hüßener mentioned that a certain water-contents, according to the quality of the coal, from 10% to 17%, is advantageous in coking, and that coals poor in gas are not suitable for obtaining by-products; the limit is about 80% to 82% coke-yield in the crucible.

COAL CUTTING MACHINES IN ENGLISH COLLIERIES.

The most noticeable feature of Wharnccliffe Silkstone Collieries, near Barnsley, Yorkshire, says a writer in the *Colliery Guardian*, is the coal-cutting plant, carried out on a more extensive scale than is to be found anywhere else in England. The introduction of these machines dates from some twenty years ago and since that time the system has been gradually extended and developed. Nearly all the various well-known coal-cutters have been tested, but an improved type of the Gillott & Copley machine has been finally adopted, the Silkstone and Thorncliffe thin seams being almost entirely worked in the undercutting by means of them. It is not claimed that there is any saving in the cost of working by the adoption of these machines, as compared with undercutting by hand, but an advantage is gained in the increased production of large coal. The coal-cutting machines in use here are thirteen of the Gillott & Copley type and one of Mr. Reginald Stanley's double-heading machines. About three-fourths of the coal raised at these collieries is got by means of coal-cutting machines.

In the Gillott & Copley improved machine the cutter works from back to front, thus throwing out the small coal or debris, if above the floor. If below, this material can be cleared out to a considerable extent by a guard fixed behind the rotary wheel. It is a lighter machine and is capable of cutting harder coal or under-clay than others generally used. The latest and most improved machine has two cylinders, 9 in. x 10 in., having crank shaft, intermediate shaft, spur wheels and a bevel wheel gearing into slots on the upper side of the cutter wheel, which is 4 ft. in diameter. The chisels or cutters are fixed in boxes on the periphery at opposite angles, so as to bring the cutters into action when the machine is cutting the reverse way. The machine is drawn forward automatically by a wire rope and drum and other gearing.

Messrs. T. & R. W. Bower, of Allerton Main Collieries, near Leeds, have recently introduced electrical power to actuate coal cutters. Although this power may not yet be provided in a form where it can be used with absolute safety in mines producing firedamp, it gives considerable advantages where conditions are suitable for its use. The following is the result of some experiments with Messrs. Bower's electrical coal cutting machine of West Allerton Colliery, on January 15th, 1890, and with a "Gillott & Copley" compressed air machine at Wharnccliffe Silkstone Colliery, January 17th, 1890:

West Allerton Colliery.			Wharnccliffe Silkstone Colliery		
Length of face cut.		Time.	Length of face cut.		Time.
Yds.	Min.	Sec.	Yds.	Min.	Sec.
8	14	0	8	11	20
16	33	45	16	24	55
..	..	..	24	37	15
..	..	..	34½	60	0

RELATIVE COST OF GETTING COAL BY MANUAL LABOR AS COMPARED WITH COST BY MACHINE AT WHARNCLIFFE SILKSTONE COLLIERY.

	In a seam 2 ft. 6 in. thick. Description of holing.			In a Seam 1 ft. 6 in. thick. Description of holing.		
	Favorable.*	Hard.	Very hard.	Favorable.	Hard.	Very hard.
Price for getting coal by hand per ton.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Percentage of slack by hand.....	1 10	2 0	2 2	3 2	3 6	3 10
" " by machine.....	40	45	70	45	50	55
Av. selling price per ton, hand.....	20	20	20	30	30	30
" " machine.....	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Price for filling out coal when holed by machine, including taking bottom up	4 7.2	4 5	4 3	4 5	4 3	4 1
Yards holed by each machine per day of 16 hours	5 4	5 4	5 4	4 11½	4 11½	4 11½
Holed by 8 machines per week, say (tons).....	1 3	1 4	1 5	2 0	2 1	2 2
Holed by 8 machines in 48 weeks, say (tons).....	200	160	120	100	160	120
Cost per ton (based on previous estimate) for holing by machine (labor one man at 6s. per day, one man at 5s. per day).....	6,900	5,400	4,100	4,000	3,500	2,450
Allowance for first cost of plant, £900 per annum.....	331,200	259,000	196,800	192,000	156,000	117,600
Allowance for first cost of power, £1.210 per annum.....	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Total cost of getting coal by machine.	0 1.8	0 2.4	0 3.0	0 3.1	0 3.9	0 5.1
Saving as compared with hand labor.	0 0.6	0 0.8	0 1.1	0 1.2	0 1.5	0 1.9
Saving in yield of coal (value).....	0 0.9	0 1.1	0 1.5	0 1.5	0 1.8	0 2.5
Total saving.....	1 6.3	1 8.3	1 10.6	2 5.8	2 8.2	2 11.5
	0 3.7	0 3.7	0 3.4	0 3.2	0 2.8	0 10.5
	0 8.8	0 11.0	1 1.0	0 6.5	0 8.5	0 10.5
	1 0.5	1 2.7	1 4.4	1 2.7	1 6.3	1 9.0

* Round (including nuts), at 6s. per ton. † Slack, 2s. 6d. per ton.

The work assigned to each machine per shift of sixteen hours is taken from actual experience to be 200 yds. where the holing is favorable, reduced to 60 when the holing is harder, and 120 yds. when it is very hard. Where it is possible always to have a clear face and unobstructed course for the machine to work at, and when the coal is firm and does not fall and obstruct the cutters, nearly twice the work given above might be accomplished.

The most favorable system on which the faces of longwall of sufficient length and in continuation of each other could be arranged is the four sides of a square, for instance, or the six sides of a hexagon; this would be an arrangement where the machine could work right around without losing time in removing to distant points of operation; generally, a continuous long face gives better results than a series of short faces, if the former can be attained.

At the Last Meeting of the Porvenir Quicksilver Company it was stated the success attendant on the establishment of the excellent furnaces invented by Engineer Señor Gascue, and his assistant, Señor Rodriguez, some years ago, continues. The production in 1891 was 1,968 bottles of quicksilver, and the profits about \$30,000. The ores in 1891 averaged 0.97% of quicksilver, while those of Almaden are about 8%.

OFFICIAL REPORTS.

Mechernich (Rhenish Prussia) Mining Company.

The report of the managing director of this company for the year 1891 was less favorable than that for the year preceding. The lower percentage of lead contained in the sandstone which has been raised during 1891, the high price of coal and coke, the increased wages and the low price of lead made it impossible to attain an equal result.

The increasing competition of foreign lead, especially that of Australia, has made it almost impossible for the Mechernich Company to sell in France, Belgium and Holland, which formerly took about one-third of its production. Notwithstanding the fact that the production of lead in Germany exceeds consumption by about one-third, the importations of the metal are constantly increasing, as is shown by the following table:

IMPORTS OF LEAD AND LITHARGE INTO GERMANY.

	1888.	1889.	1890.	1891.
	Tons.	Tons.	Tons.	Tons.
From Belgium.....	2,966	6,470	8,676	8,404
" England.....	256	1,709	2,243	6,334
" Spain.....	2,709	451	684	1,632
" Holland.....	256	697	438	592
" Austria.....	201	995	656	637
" Other countries.....	971	433	833	839
	7,359	10,455	13,550	18,458

The by far greater part of the importation from Belgium, England and Holland consists of Spanish and Australian lead.

In consequence of the low price of lead several important producers in the Eifel and elsewhere have been obliged to close their works. The working, which last year was confined to "Meinertzhagener Bleiberg" mine, produced 631 tons Potter's ore and 31,895 tons lead ore, of which 48.96% was raised out of shaft Virginia, 31.82% out of shaft Schafsberg and 19.22% out of the open workings. The working of the latter, after having been stopped for five years, was again commenced in 1887, but had to be restricted in the autumn of last year, as the high cost of removing the earth roof and the low price of lead rendered the same unprofitable. The percentage of lead in the sandstone raised was 2.210%, against 2.318% in 1890.

At the smelting works, 14 roast and 7 blast furnaces were at work, and produced 21,550 tons lead and 27,061 kilos of silver. The number of men employed by the company at the beginning of 1891 was 3,048; at the end, 2,827; average number for the year, 2,960. The wages of the workmen in 1891 amounted to mks., 2,140,118, against mks., 2,095,816 in 1890.

The net profits for the year were 842,609.53 marks (the mark is equivalent to 23.8 cents), and after deducting 2,000 marks for donation to the workmen's relief fund, and a dividend of 8% on the capital of the company (9,600,000 marks), a balance of 754.93 marks was carried forward.

A 500-TON ICE MACHINE.

The De La Veigne Refrigerating Company, of New York, has just completed an artificial ice machine of extraordinary size for the Anheuser-Busch Brewing Association, of St. Louis, Mo. A horizontal cross-compound engine of 600 H. P. furnishes the power. The steam cylinders are of 32 in., 64 in. and 48 in. stroke. The engine and machine occupies a floor space 37 ft. 4 in. x 22 ft. 3 in. Two fly wheels are used, each being 14 ft. 8 in. in diameter. The crank shaft which accommodates the connecting rods of the engines and machine is 15½ in. in diameter. The excessive strain on this piece demands great strength, and the checks are banded with wrought iron straps 2 in. thick; these straps are shrunk on. The shaft weighs 20,820 lbs.

The compressor is arranged vertically, the cylinders being 24 in. in diameter and 48-in. stroke. The connecting rods of the compressor weigh 3,400 lbs., while the engine rods weigh 3,800 lbs. The phosphor-bronze used in the connecting rods and bearings weighed in the rough 4½ tons. The approximate weight of machine when finished will be 175 tons.

The capacity of this machine running at a speed of 40 revolutions per minute will be equivalent to melting 500 tons of ice in 24 hours. The height of the machine is 28 ft. The supporting frame is divided in two galleries for convenience in oiling. The pressure cylinders are arranged with oil-packed piston. It is estimated that the engine when packed for shipment will occupy 15 railway cars. All parts of the machine are subjected to a test pressure of 1,000 lbs., hydraulically applied.

A deposit of mineral paint of great purity is said to have been discovered 20 miles from Newcastle, Northumberland County, New Brunswick.

According to the returns of the British Board of Trade the exports of tin plates from England to the United States in January, 1892, were 17,554 tons, and in February, 23,268 tons, against 26,253 tons in February, 1891. The exports of block tin in January, 1892, were 235 cwt., and in February 150 cwt., against 697 cwt. in February, 1891.

The Saltpetre Discovery at Kilima-Njaro—Further particulars have now come to hand regarding Dr. Peters' discovery of saltpetre in the Kilima-Njaro district, says the *European Mail*. The possible existence of this alkali was first reported by Dr. Fischer after he had made an examination of the Donjongai volcano. He found that in the neighborhood of the crater there were a series of curiously shaped veins of a white-colored substance which he supposed were either saltpetre or soda. Another explorer named Jarler, as early as 1879, stated that it was probable that large quantities of sulphur would be found in the crater. Not far from the volcano there lie large swamps where soda is found. It is extensively collected by the natives, who sell it in Masailand, and on the coast. A regular market for soda exists in Pangani, where it is sold at \$3 to \$5 for about 40 lbs. weight. Dr. Fischer further announces the existence of many hot springs, resembling geysers, in the so-called soda lake. The whole district appears to be in an actively volcanic condition. The German East Africa Company had intended, before the outbreak of the Arab rebellion, to fit out an expedition to make a thorough exploration of the whole region. In view of Dr. Peters' confirmation of Dr. Fischer's observations, it is probable that the expedition will now be finally organized.

WIRE ROPE TRAMWAY AT THE MARYLAND GRANITE CO.'S QUARRY.

One of the latest companies to adopt the Roebling system of wire rope tramway, as manufactured by the Union Wire Rope Tramway Company, has been the Maryland Granite Company, of The Rocks, Md. This application of cable to transportation is particularly interesting from the fact of the amount of load the cable is capable of transporting, and also the length of span. The construction and operation are as follows:

As will be noticed by reference to the accompanying illustration one end of the cable is about 75 ft. higher than the other end. The 2½-in. Roebling cable is anchored in solid rock at the upper end by a very heavy lewis, which is set in a drill hole in the rock 4 ft. deep. The cable is then drawn over the upper tower, which is made of oak, 16 in. x 16 in. timbers, and down the incline, across the wagon road, creek and railroad to the lower anchorage. Here another heavy lewis is set and the rope passed around a thimble in the upper end of it, and strongly clamped. The sheave at the lower end is set in a heavy iron framework, directly under the standing cable, and four other sheaves are placed in the tower over these sheaves.

All the fall and traversing ropes are ¾ in. in diameter. There are two fall ropes which are wound upon two independent drums. One of these drums operates a single line, which can be carried to some distance to either side of the cable, and drags in under the cable granite blocks of various sizes up to 12 tons. It can also be used advantageously for quick lifts of light loads up to 3½ tons. The other drum, which operates a double fall block with the application of steam, lifts these 12-ton blocks, and by means of a traversing rope, which is connected to a third drum, the load of granite is landed in the dressing yard, or directly upon cars at the siding.

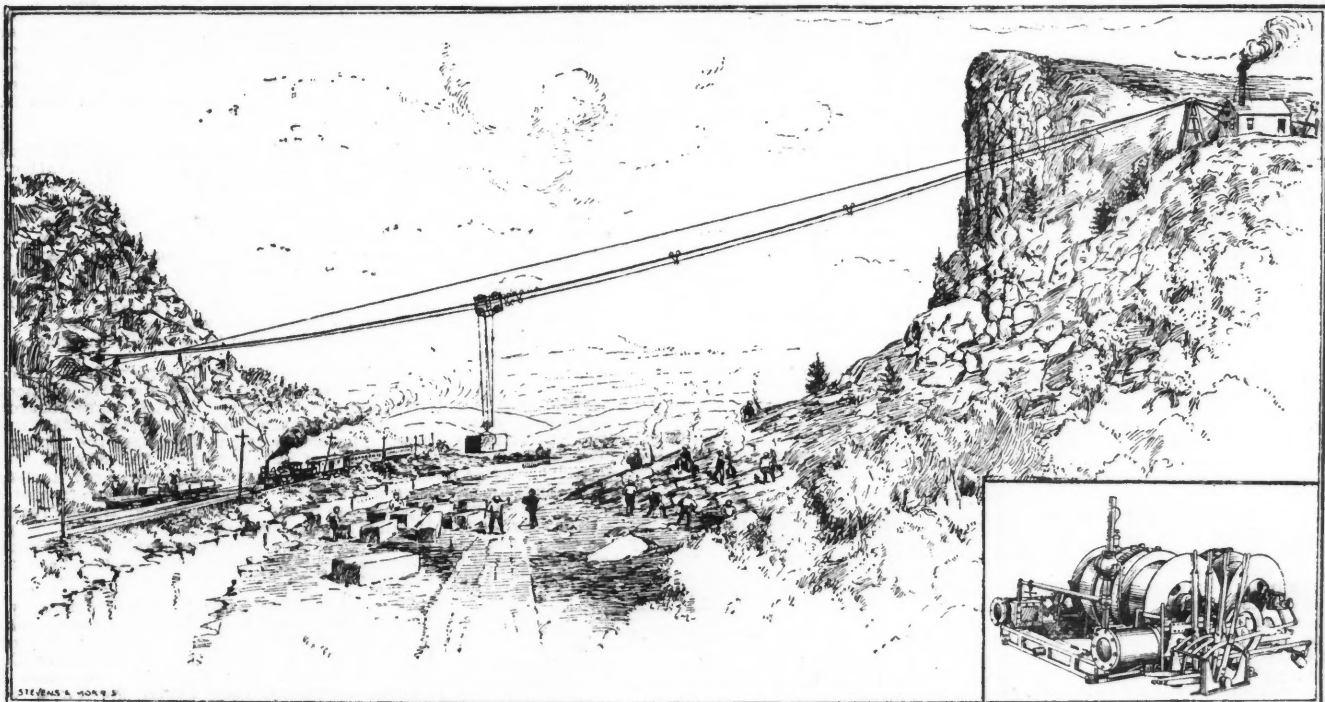
The engine, which is located about 50 ft. back of the tower at the upper

The Manufacture of Nickel in France.—A new company has been formed at Havre for the manufacture of nickel and is having a factory constructed on the Tancarville Canal, and has concluded an important contract with the government for nickel-plating Lebel rifles. The mineral used is to be imported from Canada.

The Consumption of Steel Rails in France.—According to the *Iron and Coal Trades Review* the quantities of steel rails taken by the leading French railway companies during the year 1891 were as follows: The Nord, 18,237 tons; the Ouest, 18,977 tons; the Est, 18,265 tons; the Paris-Lyon-Méditerranée, 19,320 tons; the Orléans, 22,700 tons, and the Midi, 15,358 tons; total, 122,857 tons. The table given below, of the total quantities of rails taken in each year by the French railway companies, may be considered as representing approximately the consumption of rails in France during the last ten years:

Year	Tons	Year	Tons
1882	200,979	1887	108,898
1883	341,334	1888	93,868
1884	284,031	1889	68,046
1885	249,416	1890	66,844
1886	170,595	1891	112,857

The Pollok Chlorination Process.—J. H. Pollok, of Glasgow, has patented a modification of his chlorination process, which is designed to reduce the weight of the chemicals used and to make them more efficacious, thus saving freight and extracting a larger proportion of gold. As described in previous patents, the inventor formerly used nitre cake or bisulphate of soda, but he now melts the nitre cake down with a certain small proportion of sulphite of soda, and if it is desired to increase the proportion of acid in the nitre cake he melts it down with sulphuric acid and adds the sulphite of soda afterward. This addition of the sulphite of soda removes any trace of nitric acid present, which is found to have a detrimental effect in preventing the precipitating of a certain propor-



WIRE ROPE TRAMWAY AT MARYLAND GRANITE CO.'S QUARRY.

end, is a very powerful one, especially designed for this work. The steam cylinders are 10½ in. in diameter by 14 in. stroke. The drums are 34 in. diameter. Two are located on the same driving shaft, and are carried by heavy bracketed bearings cast with the engine frames, and the other is set forward, but is carried on the same bed. All three drums are provided with strong friction brakes. The engine is reversible through its link motion. The levers of the engine (including throttle, reversing, three friction and three brake) all are brought together on one side of the engine for convenience in operation. Each lever is provided with a series of stops, so that it remains precisely where it is set, until it is moved to some other notch in the quadrant. By this arrangement one well trained engineer operates all the levers without difficulty or confusion.

The cable carriage is of simple construction and yet strong enough to lift any load that the cable will sustain. The boxes are solid, attached to the frame by U bolts and arranged for self-oiling. The carriage wheels are made with deep grooves and plenty of metal in the bottom of the groove for wearing. The iron in these wearing wheels is not chilled, on the principle that it costs less to renew the wheels than it does to buy new ropes; so the wear is taken up by the wheels and the rope saved the excessive wear that chilled wheels would give them. The sheaves in the tower turn loosely on shafts, and are free to move back and forth in front of the drums, so as to prevent chafing while the ropes are winding on the drums. This arrangement also permits of the ropes being wound uniformly backward and forward upon the face of the drums.

In working the quarry the single line is used to clear up for the splitting and breaking of heavy blocks. As rapidly as these are ready they are pulled out by the single line and dragged under the standing cable. The double line is then brought into use and the block lifted and moved down the incline to the dressing yard or to the car on the siding. By having the cable laid at some considerable height above the quarry it is possible to reach to some distance to either side of the standing cable, and handle the material very economically.

tion of the gold on the subsequent addition of ferrous sulphate. Whereas, crystallized ferrous sulphate or ordinary copperas was formerly used to precipitate the gold, according to the present improvements the ferrous sulphate is dehydrated or partially dehydrated, so that it can be easily packed in iron drums and is more efficacious.

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, March 22d, 1892.

- 471,103. Ore Triturating and Amalgamating Apparatus. Gustavus L. Cudner, New York, N. Y. Assignor of four-fifths to Jacob Ruppert, Jr., George E. Metz and Adam E. Schatz, same place.
- 471,174. Process of Concentrating Ores. Charles B. Hebron and Carrie J. Everson, Denver, Colo.
- 471,258. Ore Concentrator. James M. Thompson, San Francisco, Cal.
- 471,264. Ore Roasting Furnace. Horace F. Brown, Butte City, Mont. Assignor to Mary C. Brown, same place.
- 471,268. Ore Conveyor and Method of Arranging Ore Thereon. Thomas A. Edison, Llewellyn Park, N. J.
- 471,291. Apparatus for Destructive Distillation of Mineral Oils. John Laing, Edinburgh, Scotland.
- 471,290. Annealing Furnace. Olof J. Winlund and August L. Larson, Worcester, Mass.
- 471,300. Tripod for Rock Drills. Albert Ball, Claremont, N. H. Assignor to the Sullivan Machine Company, same place.
- 471,319. Concentrator. James Tulloch, Angel's Camp, Cal.
- 471,322. Clay Separator. Charles A. Wyman, Hutchinson, Minn.
- 471,367. Amalgamator for Free Milling Gold Ore. Alfred Woodhouse, Bremgarten, Woking, England, Assignor of one-half to William Linn Allen, Newark, N. J.
- 471,412. Concentrating Table. John Alves, Melbourne, Victoria.
- 471,423. Process of Chloridizing Gold Ores. Maximilian J. Hartung, Sydney, New South Wales.
- 471,434. Mining Machine. James C. Robertson, Glen Campbell, Pa.
- 471,437. Apparatus for Coating Metal Plates with Tin. Philip Rogers, Swansea, and John Prayer, Clydach, near Swansea, England.

PERSONALS.

Prof. Elihu Thomson, of Lynn, Mass., has presented the Paris *Académie des Sciences* with the sum of money won by him in the Paris Municipality's electric meter competition.

Mr. E. J. Schmitz leaves to-day on a Southern trip, and may be addressed to the City of Mexico, in care of Gustavus Struck & Co., until April 12th, and later on in care of Prof. James Douglas, Bisbee, Ariz.

Captain Mein, formerly manager of the Treadwell mine, Douglas Island, Alaska, has assumed the management of the famous Robinson mine at Johannesburg, South Africa, whither he went several months ago.

W. R. Eckert, mechanical engineer, of San Francisco, has been in De Lamar, Idaho, during the past week for the purpose, it is said, of inspecting the site for the new mill of the De Lamar Mining Company, the construction of which will be in his hands.

Mr. Edmund C. Peebin, mining engineer, of Roanoke, Va., has resigned his position as General manager of the Virginia Development company and of the Consolidated Mining Company, his resignation to take effect June 1st. Mr. Peebin's address will continue to be Roanoke, Va.

Mr. A. N. Humphreys has been appointed general superintendent for the Westmoreland Coal Co., with office at Irwin, Pa. Mr. Humphreys was, before his promotion, the company's chief engineer, and had charge of the mines in Westmoreland and Allegheny counties, where the company operates heavily in gas coal.

Information is desired concerning the whereabouts of Allen Mitchell, who was last heard of at Shakespeare City, Grant County, N. Mex., in 1880, being at that time engaged in mining. Any one with knowledge concerning him is requested to communicate with Mrs. W. H. Dodge, 1,002 Arsenal street, St. Louis, Mo.

Sir Frederick Abel and Mr. Boverton Redwood have undertaken to investigate on behalf of British shipowners the subject of the proposed transport of petroleum in bulk through the Suez Canal. Mr. Redwood has already gone to Egypt with a view of collecting information in respect to the local conditions under which the traffic would be conducted.

OBITUARY.

Frank Mahoney, a mining man well known all over the Pacific Coast, died on February 20th, at Douglas City, Alaska. He was credited with being the first discoverer of gold in the Silver Bay district, about 15 miles from Sitka. In the early days of California he had a varied experience, but for over 20 years past was identified with mining in Alaska. Mr. Mahoney was 65 years of age at the time of his death and was buried at Juneau.

Herman Kopp, professor of chemistry at the University of Heidelberg, Germany, died in that city at the age of 75 on the 20th ult. He was born at Hanau in 1817, and after studying at Marburg went to Giessen to work under Liebig. He afterward worked in conjunction with Liebig and Bunsen, and was on the closest terms of friendship with the latter. Kopp devoted himself chiefly to the history of chemistry, on which his work in four volumes remains a standard authority. He did not neglect recent research, and edited, along with Liebig and Will, the "Annual of the Progress of Chemistry," and, with Wöhler, the "Annals of Chemistry." After 1871 he lived in retirement.

Charles J. Van Depoele, one of the pioneers of electric traction in this country, died at his home in Lynn, Mass., on the 18th inst., after an illness of four months. Mr. Van Depoele was born in Liebertvelde, Belgium, in 1846. In 1869 he came to America and located at Detroit, where with a Belgian friend he engaged in the manufacture of furniture. In 1877 he built an electrical laboratory and there constructed a number of dynamos with which exhibitions were given and from which his large shop was brilliantly lighted by arc lamps. In 1881 the Van Depoele Electric Company was formed to exploit his inventions. In less than a year 100 men were employed in the shops of this company, and a successful business was well under way. Mr. Van Depoele's first experiments in the propulsion of street cars by electricity were made in 1882, and the first road was equipped in 1885 at South Bend, Ind. Within three years from that time Mr. Van Depoele had 13 roads in operation on his system. In March, 1888, the Van Depoele Electric Company was absorbed, so far as the electric railway system was concerned, by the Thomson-Houston Electric Company, and Mr. Van Depoele joined the latter concern as the electrician of the railway department. For several years past Mr. Van Depoele has devoted himself to the application of electricity to mining work, the Thomson-Van Depoele Electric Mining Company, an offshoot from the Thomson-Houston, having been organized to exploit his inventions in this field. His most important invention was the reciprocating engine, the principle of which was applied in electric percussion drills and pumps.

SOCIETIES.

New York Tax Reform Association makes the following statement of receipts and expenditures for the past year: Receipts, including one contribution of \$500, \$8,501. The expenses were: For literary staff \$351.50; postage, \$1,464.27; printing and stationery, \$1,732.67; lectures and traveling expenses, \$1,370.41; stenographers and other clerical help, \$1,661.04; typewriting machines and office furniture and rent, \$478.52; miscellaneous expenses, \$280.04. The amount of cash in the bank was \$662.57. There was an indebtedness of \$490.75, which has since been paid.

The Engineering Association of the South held its regular monthly meeting at Atlanta, Ga., on March 11th, President A. V. Gude, of Atlanta, presiding, with twenty members and about thirty visitors present. Mr. Hunter McDonald presented a paper on "Steel Rails," which received very extensive discussion. The paper gave the history, chemical analysis, rate of wheel wear, results of bending tests and of tensile tests of three steel rails laid at different times on the N. C. & St. L. R. R. Mr. A. V. Gude presented a paper on the "Granite Quarries of Lithonia, Ga." The paper gave comparative results of the crushing strength of granite from the quarries at Richmond, Va., Stone Mountain, Ga., and Lithonia, Ga., and described fully the quarrying operations at Lithonia. Mr. J. K. Peebles, of Petersburg, Va., presented a description of the Petersburg, Va., quarries. Owing to the length of the session and to the unavoidable absence of Mr. James A. Fairleigh, at Chattanooga, his paper on "Municipal Engineering in Chattanooga" was deferred until the April meeting.

The Engineers' Society of Western Pennsylvania held its regular monthly meeting in Pittsburgh, Pa., on March 15th. Sixteen applicants were elected members. The meeting was devoted to discussing Mr. Metcalf's paper "On Smoke," read at the February meeting. Mr. J. W. Langley opened the discussion by stating that one side of the smoke question is sometimes overlooked, viz., that certain industries produce smoke necessarily because of the requirements of the material which is being treated. In good practice steel furnaces do not produce any large amounts of smoke, but puddling furnaces, coke ovens and household fires are large producers of smoke. Next to these last is undoubtedly boiler fires; in Pittsburgh they probably equal all other causes of smoke combined, and it is to them that the coming inventor needs to direct his attention. The mechanical stoker can only be used in large establishments; small ones cannot afford them, and it is from the small ones collectively that the largest part of the smoke comes. A smoke laden atmosphere has one evil effect, and that is that it is mentally depressing; that smoke is injurious to bodily health has never been proved by testimony. Several characters of smoke consumers were then described by their representatives. After a lengthy discussion, engaged in by many of the members, a committee on smoke prevention was appointed, consisting of Messrs. Dempster, Johnson, Hyde, Scaife and Langley. The next regular meeting of the society will be held on April 19th. M. George S. Davison will read a paper on "The Hydraulics of Large Rivers."

INDUSTRIAL NOTES.

Furnace F, at the Edgar Thompson Steel Works, is being relined after turning out 253,000 tons of metal.

Theodore Alteneder & Sons, of Philadelphia, have issued a new illustrated catalogue of their drawing instruments and engineers' supplies.

Furnace No. 1 of the Ashland Coal and Iron Railway Company will be blown out in April to put in a new lining and a new battery of boilers.

The Norton Iron Works, Ashland, Ky., has given the contract to the Babcock & Wilcox Water Tube Boiler Company for a battery of boilers of 500 H. P.

The Lackawanna Iron & Steel Company is completing extensive improvements in the finishing department of the Scranton Steel Company, acquired last year.

The plant of Ashland Steel Company, of Ashland, Ky., has been in operation since January 1st, and is now making an average of 150 tons per day of soft steel for nail slabs and billets.

The Kelly Nail and Iron Company, of Ironton, O., has closed its nail factory in an effort to reduce wages. It will be followed by the Belfont Iron Works Company in a few days. It is probable that the reduction will be accepted.

The employés of the press shops of the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., have been granted an increase in wages, which went into effect on Wednesday, the 2d inst. The increase amounts to 13 per cent.

The works of the Palge Tube Company, at Warren, Pa., which were badly damaged by an explosion recently, throwing 200 men out of employment, are being rebuilt. New boilers have been ordered, and it is expected that within 20 days operations will be resumed.

E. M. Freese & Co., of Galion, O., have issued an original little pamphlet entitled "A Clear Case," which relates to the "Ohio" brick machine made by that firm. The book is made up entirely of artistically reproduced autograph letters from prominent concerns using these machines.

The Thomson-Houston Company is building an electric locomotive designed to develop 500 H. P. It is proposed to haul with this locomotive passenger trains of moderate weight, such as elevated railroad or suburban trains, at 40 miles an hour, or perhaps faster. This engine is built for the purposes of experiment and exhibition.

The Gautier Steel Department of the Cambria Iron Company, Johnstown, Pa., informs us that it has heretofore been furnishing cold rolled steel shafting in sizes from 1/2 in. to 3 ins., inclusive; but that owing to the demands of the trade for larger sizes it has made arrangements at its mills to make turned shafting larger than 3 ins.

F. E. Brandis' Sons & Co. will remove their factory and office from 54 Fulton street, New York, to 754 Lexington avenue, Brooklyn, on May 1st. The firm's name will be changed to Brandis' Sons Co. A valuable range finder constructed by this firm for the Ordnance Department, U. S. A., which was placed at Fort Wadsworth, was totally destroyed by fire last week, the house in which it was kept being burned to the ground.

The new engine and machinery department of the Cramps, formerly the plant of the I. P. Morris Company, near Philadelphia, has work sufficient to keep it running for some time to come. Several contracts are on hand for heavy engines. Nine are being constructed for the Calumet & Hecla Copper Mining Company, of Michigan. Two have been completed and shipped. For the same company a number of boilers, weighing about 90,000 lbs. each, are being built, and two hoisting drums, 25 ft. in diameter, with grooves for 5,000 ft. of 1 1/2-in. rope.

The Hartlepool Rope Company, of Hartlepool, England, is introducing a new preservative for wire ropes called glissantoline, which is said to have given remarkable results. Wire rope was immersed for three weeks in solutions of dilute sulphuric acid, cold and at a temperature of 130 degrees C.; ten weeks in steam; eight weeks in a solution of salt water (25 per cent. salt); ten weeks in water at a temperature of from 130 to 170 degrees F., and eight weeks in sea water. In all the above tests the samples when coated with the new composition were said to be totally unaffected.

The Abendroth & Root Manufacturing Company, of New York, in its new descriptive catalogue, gives some very interesting particulars regarding the general application of its spiral riveted water pipe. The company has furnished the Ponce de Leon Hotel, of St. Augustine, Fla., with 30,000 ft. of its 8-in. pipe to bring water from a distant source of supply. Another recent order was for pipe for use in the Nicaragua Canal construction, 12 miles of pipe being shipped thither. This pipe is also being used very extensively in the mining districts of the West, and also in phosphate mining in the South.

The Union Wire Rope Tramway Company, of New York, reports the following recent applications of its Roebling cableway system: A double rope cableway for the Howland Falls Pulp Company, Howland, Me.; a double rope line for Clinton Stephens, Tilly Foster, N. Y.; a coke handling plant for the Austral Otis Company, Australia; a twin cableway across the the Youghiogheny River, near Dawson, Pa., for transporting 600 tons of coal daily from mines to coke ovens. Among a number of orders lately received are the following: Two cable lines for the Stranahan Phosphate Company, of Anthony, Fla.; lines for the Maryland Phosphate Company, and Miller & Lutz, of the same place; Roebling skidders for the Ruddock Cypress Lumber Company, and from Letcher & Moore, of Louisiana; a Roebling gravity plane, 6,000 ft. long for the Glasgow Development Company, of Glasgow, Va.; a power incline, 3,700 ft. long, for the Orange Cable Company.

The Phoenix Iron Company, which has a number of Government contracts for the erection of light-houses, went into the hands of a receiver on the 19th inst. Wilson D. Havens, President of the company, made the application, and the Vice-Chancellor of New Jersey appointed Joseph Stokes, the superintendent of the company, as the receiver. Mr. Havens is the largest stockholder, and in his petition he sets forth that the liabilities of the company amount to \$136,783, while the resources, outside of the real estate and machinery, are only \$26,987. The real estate, he alleges, is valued at \$95,000 and the machinery at \$62,646, but the whole would not now bring over \$75,000. There are mortgages upon them amounting to \$87,500. The debts of the company consist of bills payable to the amount of \$16,776, accounts unsettled, \$32,506, along with interest and mortgages amounting to \$86,000. The resources are principally bills receivable to the amount of \$14,539, stock on hand worth \$8,300, and book accounts, \$4,000. The stockholders of the company are W. D. Havens, \$99,500; Frank Schumann, \$10,000; H. J. Baker, \$10,000; R. H. Moore, \$5,000, and John S. Murphy, \$500.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column, and his address will be furnished to any one desiring to supply him.

Any one wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

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, thus enabling the purchaser to select the most suitable articles before ordering.

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.

GOODS WANTED AT HOME.

- 2,610. Tremolite, or short refuse asbestos, to be used as filler in making plaster slabs. District of Columbia.
- 2,611. Water-works complete for a town. South Carolina.
- 2,612. Machinery for a pottery. Georgia.
- 2,613. Gearing and chain for marine railway; capacity of vessels, 150 tons. Georgia.
- 2,614. All kinds of machinery for mining, washing, drying, and conveying phosphates. Florida.
- 2,615. Stone channellers, steam hoisting derricks and machinery for sawing and polishing marble. Kentucky.
- 2,616. A 25-H.P. detached engine and a 30-H. P. portable boiler on skids. Alabama.
- 2,617. A small saw mill, capacity 5,000 to 10,000 ft. per day. Alabama.
- 2,618. Machinery for a cannery to cost about \$3,000. Texas.
- 2,619. Outfit for a barrel factory to cost about \$5,000. Texas.
- 2,620. A double stand of 6 x 12 smooth rolls and an 8 ft. flour dresser; second-hand if in first-class order. Tennessee.
- 2,621. Ice machine for manufacturing ice in a Southern city of 10,000 inhabitants; give full estimates and information generally. Idaho.
- 2,622. Machinery for crushing sand and limestone. Georgia.
- 2,623. Engine, boiler, pulleys, belting and six excelsior machines. Indiana.
- 2,624. Second-hand locomotive about 12 x 18 in. cylinder, weighing in working order about 40,000 lbs., saddle tank preferred, and to burn wood. North Carolina.
- 2,625. Edger and exhaust fan. West Virginia.
- 2,626. A semi-portable engine and boiler about 30 H. P.; also mills for reducing 10 to 15 tons bituminous coal slack daily, to No. 40 powder. Virginia.
- 2,627. A full line of clay-working machinery for washing, drying and preparing for the market kaolin or china clay; also engine, boilers, etc. Florida.
- 2,629. A complete outfit for foundry and machine shops. Virginia.
- 2,630. A passenger elevator for a three-story and basement building. Georgia.

AMERICAN GOODS WANTED ABROAD.

- 2,598. Catalogues, price lists and circulars of refrigerators, coolers, and small ice machines of from 100 to 1,000 lbs. capacity. Central America.
- 2,628. Machinery to grind and finish fibrous talc or asbestine. Canada.

GENERAL MINING NEWS.

According to a dispatch from Pittsburg the revival of the interstate conference between the coal operators and miners of Pennsylvania and Ohio, which the officials of the United Mine Workers earnestly hoped would result from their efforts, will not take place. There will be no interstate conference and no interstate agreement this year.

STANDARD OIL TRUST.—Nearly 250 stockholders of the Standard Oil Trust, representing 796,720 shares out of a total of 950,000, met on the 21st inst. at the office of the trust, in New York, pursuant to a call for a meeting to decide whether the organization should be continued or should be dissolved. John D. Rockefeller was chosen chairman and John D. Archbold, secretary. S. C. T. Dodd, the solicitor of the trust, offered a resolution to the effect that the agreement dated January 2d, 1882, commonly known as the Standard Oil Trust agreement and the supplement thereto, dated January 4th, 1882, be terminated in the following manner: All property held by the trust except stocks of corporations shall be sold by trustees at private sale and the proceeds thereof, together with any money belonging to the trust, shall be distributed to the owners of trust certifi-

cates according to their respective interests. All stocks of corporation held by trustees shall be distributed to the owners of trust certificates *pro rata*. Messrs. John D. Rockefeller, Henry M. Flagler, William Rockefeller, John D. Archbold, Benjamin Brewster, Henry S. Rogers, Wesley H. Tilford and O. B. Jennings were appointed trustees to wind up the affairs of the trust, which it was provided should be accomplished within four months from date. It is also provided that several companies which have outlived their usefulness shall be dissolved and their business and assets taken over by other companies, the capital stock of which is to be increased for this purpose.

Part of the proposed increase in capitalization will be made in the following companies: The Standard Oil Company, of New York, raised from \$5,000,000 to \$7,000,000; the Standard Oil Company, of New Jersey, \$3,000,000 to \$10,000,000; the Atlantic Refining Company, of Philadelphia, \$500,000 to \$5,000,000; the Standard Oil Company, of Indiana, \$500,000 to \$1,000,000. Where the other increases will be made is not yet decided. Of the 30 companies now in the trust, 10 or 12, all refining companies, will be wiped out, and their capital transferred to other companies. Among those which the officials say have outlived their usefulness are the Pratt Manufacturing Company, of Brooklyn; the Sone & Fleming Company, of New York; the Atlas Refining Company, of Buffalo; the Mix Oil Company, of Cleveland, and the Acme Oil Company. The Macksburg and the Connecting Pipe Line companies, of Ohio, will be merged in the Buckeye Company. The Standard Oil Company, of Kentucky, will absorb several of the small companies in the South and Southwest.

It was reported on the street, after the meeting, that the trust had an enormous surplus to be divided. Mr. S. C. T. Dodd said that this report was not well founded. The trust had on hand perhaps \$2,000,000 in cash and a few bonds, representing undivided profits. The rumors about a great surplus fund, he added, might have grown out of the fact that the companies in the trust had earned more than had been paid out in dividends. At the time of the last annual reports this account represented about \$18,000,000, but it could not be looked upon as a trust surplus, inasmuch as trust certificates had been issued against it, the trust issue representing the assets of the companies, and therefore exceeding their capitalization.

There was no need of any surplus, Mr. Dodd explained, to provide for the increase in the capitalization of companies which would absorb their weaker companies. Under the new arrangement of Standard properties it was aimed to have one company look after the refining in its State, and so on. In spite of reports that the number of companies left in existence would be reduced to about twelve, Mr. Dodd said that his original estimate of eighteen still stood.

SOCIETE ANONYME DE MINES DE LEXINGTON.—The output of this company's properties during February amounted to \$61,700.

TENNESSEE COAL, IRON AND RAILROAD COMPANY.—DE BARDELABEN COAL AND IRON COMPANY.—A statement was given out on the 21st inst. by the directors of the Tennessee Coal and Iron Company regarding the consolidation of that concern and the De Bardelaben Coal and Iron Company. Counsel for both companies on the 21st inst. presented a basis of agreement, which was agreed to by the two boards of directors and signed by their presidents. Now there remain only the legal conveyances to be prepared. The statement adds, among other things:

"The common stock of the Tennessee Company will be increased from \$9,000,000 to \$17,000,000; of the \$8,000,000 increase, \$7,700,000 will be paid to the stockholders of the De Bardelaben Company in exchange for the \$10,000,000 of stock of that company, thus reducing the combined capitalization over \$2,300,000.

"The remaining \$300,000 will, in proper form, be left subject to the control of the Tennessee Company as paid up stock. The bonded debt of the two companies will not be increased in any way. It will remain substantially as at present, to wit, that of the Tennessee Company at \$5,300,000 and that of the De Bardelaben Company at \$3,000,000.

"Since this matter has been arranged there have been elected members of the board of the Tennessee Company, H. F. De Bardelaben, of Birmingham, David Roberts, of Bessemer, Ala., A. T. Smythe, of Charleston, S. C., as representing the interest of the De Bardelaben Company in the Tennessee Coal and Iron Company. These parties were elected in the place of Enoch Ensley, deceased; Napoleon Hill, of Memphis, Tenn., and W. C. Sheldon, of New York, who resigned."

ALASKA.

According to a telegraphic dispatch received yesterday the missing Wheelock party had arrived safely at Yakuta. The dispatch gave no further particulars.

(From an Occasional Correspondent.)

SILVER BOW BASIN MINING COMPANY.—This company's placers and other assets have been turned over to the Nowell Gold Mining Company, which has issued \$300,000 in bonds to pay off the mortgage and the notes due on the purchase of the Alaska Chief and Harrison claims; also to purchase or settle all minor claims and erect a stamp mill.

ARIZONA.

PINAL COUNTY.

MAMMOTH GOLD MINES, LIMITED.—The manager reports: "That in consequence of heavy rains interfering with haulage the mill ran only 20½ days during February, crushing 1,947 tons of ore and producing bullion valued at \$9,700. The expenses were \$10,250, including timbering of new stopes."

YAVAPAI COUNTY.

A rich strike has been made near the Congress mine that is said to run \$40 per ton in free gold. The vein is about 8 ft. wide. F. M. Murphy, one of the owners, has a force of men at work developing the claim. It is thought by those who have seen the prospect that it will turn out to be a big mine.

CALIFORNIA.

AMADOR COMPANY.

WILDMAN.—The ledge has been cross-cut at the 900 ft. level and some excellent rock has been found. As soon as the foot-wall is reached drifting will be commenced. Ten of the 30 stamps are running.

INYO COUNTY.

The mines about Darwin, which have been neglected for many years, are said now to be in fair condition. A fine body of ore is showing in the Promontory as well as in the Relief.

LOS ANGELES COUNTY.

CHANDLER & FONDA.—Members of this firm say in regard to the Puente oil field: "We have two oil wells on our land, which is in the Puente hills. One well, which we have down 675 ft., is an eight-barrel well. The other well is down 400 ft. and is not yet on the oil contact. We own about a mile of land along the oil belt, and there are thousands of tons of asphaltum in sight. We get \$2.25 per barrel for the oil and sell all we can get up. The demand is greater than the supply. The hills of Puente are reeking with oil. There are 22 wells in the belt now."

MONO COUNTY.

BULWER CONSOLIDATED MINING COMPANY.—During the recent run of the Bodie mill on ore from this mine 913 tons were crushed, with an average assay of \$42.70, and yielding \$39.57 a ton, the total proceeds amounting to \$36,130.88. The mine is said to be looking well.

STANDARD CONSOLIDATED MINING COMPANY.—At the recent annual meeting of this company, held at the secretary's office 310 Pine street, San Francisco, Mr. J. W. Pew was re-elected secretary, Mr. W. H. Oscanyan, of New York, was continued in the office of vice-president, and Mr. Thos. H. Leggett, the manager, was also made president. vice Mr. Tom. C. Grant, resigned. The manager presented a very satisfactory report, showing two dividends of \$10,000 each recently paid and a surplus in bank of \$35,000. The report shows good ore reserves in the mine, and a fair outlook for a continuance of quarterly dividends. In fact, another dividend has just been declared, payable April 26th. The following directors were elected: C. H. Badeau and Wm. Borrowe, of New York (vice P. N. Lilienthal resigned); John Mason and A. P. Brayton, of San Francisco.

NEVADA COUNTY.

ORO FLAT.—This property, near the Massachusetts Hill Mine, has been purchased at sheriff's sale for \$36,003.91 by L. Gilson, of the Omaha Consolidated Mining Company.

W. Y. O. D. MINING COMPANY.—Frank Richards of Grass Valley has brought suit on behalf of himself and eighteen others for 3,054 shares of the stock of this company or its value, \$30,540, against the company itself, claiming that the shares were received in payment for labor with the understanding that they were non-assessable. They were assessed, however, and the stock sold by the company.

PLACER COUNTY.

MAYFLOWER GRAVEL MINING COMPANY.—Two years ago in working up the channel in this mine, they cut through another channel at right angles, which they named the Oreno, and after crossing the latter a distance of 200 ft., they again came into the Mayflower channel, which they have worked for 8,000 ft. Recently, however, they have commenced work on the Oreno, of which channel they own 7,000 ft. The returns are encouraging; one run of 29 tons yielding \$6 a ton, and another of 94 tons yielding \$7.75 a ton. The channel averages over 100 ft. in width.

SANTIAGO COUNTY.

CARGO MUCHACO.—An electric lighting and power plant has been installed at this mine on the Colorado River, a short distance above Yuma. The mill, offices, boarding houses and other buildings are lighted with 16 and 32 c. p. lamps. The same dynamo that furnishes the light also furnishes power for electrical hoisting machines, which are placed in a drift 550 ft. below the surface.

SAN BERNARDINO COUNTY.

(From our Special Correspondent.)

It is reported that the fabulously rich Peg-ieg mine has been rediscovered, about 85 miles southeast of Redlands. The prospectors who stumbled across the mine were attracted by a curious looking hummock of rusty, dark red ore, which looked like iron. Upon a lump being knocked off the

broken ore glistened with leaf gold. Claims were staked out, and the two burros loaded with ore, which was roughly valued at \$1,000 upon the arrival of the party at Redlands. Hundreds of people have gone to the new find, and new claims have been staked for four miles along the ledge.

COLORADO.

BOULDER COUNTY.

LIVINGSTONE.—This mine at Sugar Loaf is to be operated again. Dr. Everts returned from the East on the 16th inst. and will have charge of the operations.

DOLORES COUNTY.

ENTERPRISE MINING COMPANY.—The directors have declared a dividend (No. 2) of 10 cents per share, payable April 5th. The directors have issued a circular stating that they have determined that the interests of the stockholders will be best served by the payment of a regular monthly dividend instead of quarterly dividends. The aggregate amount of this monthly dividend will be \$50,000. Whenever the earnings of the company shall be greater than is sufficient to pay this amount, the surplus will be, from time to time, distributed to the stockholders by means of an extra dividend, in such amount as may be available for that purpose.

The official reports from the mines are of the most satisfactory character. Within the last few months large bodies of ore have been developed, and the directors have renewed and increased reason to think highly of the present and prospective value of the property. Owing to the severity of the weather, and to the fact that the sidetrack from the railroad station to the mouth of the Group Tunnel has not yet been completed, it has been almost impossible for some time past to move the ore which has been taken out from the mines to the railroad; but that condition of things will very soon be corrected, and the directors see no reason to apprehend any further obstacles in the way of regular and uninterrupted shipments.

Messrs. George C. Stone, of St. Paul, and S. V. White, of New York, recently had the company's property examined by Prof. Albert H. Chester, M. E., Ph. D., Professor of Chemistry and Mineralogy in Rutgers College, New Brunswick, N. J. He has just returned and has rendered his report to his clients, who have accordingly become largely interested in the company. They have kindly furnished the directors with a copy of Prof. Chester's report. The following extracts are a fair summary of the whole:

"My examination of this group of mines convinces me that they form a property of great value, and they will continue to furnish a large quantity of high grade ore for a long time to come. Notwithstanding the showing of such an amount of ore, which often causes lavish expenditure and wasteful methods, these mines are worked with the utmost care and economy, both of labor and expense, and all care is taken to get the ore out and market it cheaply as possible.

"Taking into consideration the facts presented, the past history of the mines, the large amount of ground now open, and the still larger amount practically proved though not developed, and the possibilities of future discoveries on the contacts above and below, I do not hesitate to say that the Enterprise group of mines constitutes a property of great value and one which will continue to afford large profits to its owners for a long time to come."

GILPIN COUNTY.

The following stamp mills in Black Hawk are running: Randolph, stamps 40; New York, 50; Bohtail, 100; Polar Star, 40; Meade, 40; Hidden Treasure, 75; St. Louis-Gunnell, 15; total, 360. The Hidden Treasure, St. Louis-Gunnell, Meade, Polar Star, New York and Randolph mills, says the Central City Register Call, are long will be run altogether by water power, as well as a portion of the stamps in the Bohtail mill. By the middle of April the Bohtail will run to its full capacity of 125 stamps. In the northerly portion of the County are the Peterson, 15 stamps, and the Rollins, 25 stamps, as also the Daisy, 15 stamps, and the Caladonia, 20 stamps, which are not employed just at present. The last four mills named are run exclusively by steam power.

HINSDALE COUNTY.

UTE AND ULAY MINES, LIMITED.—Improvements at the Ulay are progressing and one side of the mill will be started up shortly. The entire new plant will be put in motion in about 20 days. The company will employ about 300 men.

LAKE COUNTY.

(From our Special Correspondent.)

BIG CHIEF MINING COMPANY.—This company is doing considerable work, though all the ore is hoisted through the Maid of Erin shaft. From 8 to 10 tons a day of lead carbonate is about all, however, that is now being mined.

CASTLE VIEW MINING COMPANY.—This company is now shipping about 12 tons a day of very fine lead carbonate ore. No attention is being paid to the further sinking of the shaft, as was contemplated. In fact, so encouraging are the prospects on the 600-ft. level, where a large streak of this class of ore has been disclosed, that it is extremely doubtful if the changes in plant or the sinking will be undertaken for some time.

CONTINENTAL CHIEF.—This mine is doing excellently, and the outlook for a prosperous season is very good. The concentrating mill is saving about 70 per cent. of the assay value of the crude ore, and plenty of water has been obtained by the sinking of two new wells.

GREY EAGLE MINING COMPANY.—This company will doubtless begin to unwater the Penrose shaft very soon, as a meeting of the different interests involved—including the so-called Sixth street properties—has been held at which it was decided to take united action. This means a great deal to the mines within the city limits, and assures the success of the Bohn shaft of the Star of Hope, and will have the effect of starting up with renewed vigor the Capital, Hope, M. E. C., and other city mines.

LADY ALICE.—While the deep shaft on the Lady Alice has not been touched for about two years, a considerable amount of prospecting has gone on in the west shaft, which has attained a depth of about 500 ft. The principal work, however, was done at 360-ft. level, where some fine copper sulphide ore was met with, but the plant was not an efficient one, so later developments have gone on in that ground from the shaft of the Morning Glory. So satisfactory have been these developments, that a new shaft is to be sunk on the Morning Glory, while the west shaft of the Lady Alice will be supplied with a new and powerful plant.

MAHALA.—The shaft is still being sunk, and as there is but 55 ft. of an intrusive sheet of grey porphyry to be cut through before the second contact, containing some 10 ft. of good sulphide, is met with, this should soon be accomplished and the Mahala again take place among the shippers.

PAVNOLOS.—The shaft is now supplied with a big plant, the water is out of the mine, and the pump in position in lower station and sinking will be at once resumed.

SMALL HOPES CONSOLIDATED MINING COMPANY.—This company still continues the drifting from the bottom of the Robert Emmet shaft, and is now out into the leased ground of the Marian Mining Company. Some trouble has been experienced from water lately, but this is now under control, and will doubtless remain so. In the main workings of the company some 90 men are employed, and about 80 tons a day of good high grade ore are being mined and shipped. This will soon be largely increased, as large contracts have been signed, and the roads are gradually assuming passable conditions.

OURAY COUNTY.

IRONCLAD GOLD AND SILVER MINING COMPANY.—The news of the strike at this property contained in our last week's issue is confirmed. The high grade ore is said to run \$30@40 and the low grade \$12@20 per ton in gold. There are great quantities of chlorides and honeycomb quartz in the cave. The ore is 4½ ft. thick and appears to be a blanket vein. A later dispatch says that trouble is brewing over the boundary lines of the Ironclad mine, and if the company goes beyond the side lines it will have a lawsuit, as the new strike is said to be so valuable that parties owning adjoining claims are expecting daily to strike the same ore body and are jealous of every foot of ground.

SAGUACHE COUNTY.

COMMODORE.—It is reported that an ore body 5 ft. wide, assaying high in silver, has been uncovered in this mine at Creede. It is thought to be a continuation of the Bachelor vein.

SAN MIGUEL COUNTY.

Shipments of ore and concentrates from Telluride for the week ending March 15 were:

	Cars.
From Sheridan Con.	51
" Smuggler Union	25
" Hector Mining Co. (Cimarron).....	1
Total	77
Total shipped since January 1st.....	695

KEYSTONE PLACERS COMPANY.—Superintendent Pitcher is at present driving a prospecting tunnel into one of the gravel bars owned by this company. Only a small force is working now, but as early as practicable in spring the working force will be increased, says the Telluride Journal, and the operations of this company will be carried on on a more extensive scale than heretofore.

SAN MIGUEL CONSOLIDATED GOLD MINING AND MILLING COMPANY.—According to a dispatch from Telluride, published in the Denver Times, the corporation papers of this company were filed for record and recorded on the 8th inst. as were 19 deeds of gold mining claims, three mill sites and mills, flume and water right of the Illium mill, and the electric power line and station, formerly known as the Gold King.

We commented upon the schemes of this company in our issue of December 19th, 1891.

SUMMIT COUNTY.

PENNSYLVANIA.—The Decatur syndicate has taken possession of this property after appointing Mr. Clinton Butterfield, of Denver, as general manager. It is said that a very large sum was paid for the mines comprising the group.

IDAHO.

The Mine Owners' Association of Coeur d'Alene, at a meeting held on the 19th inst., at Wallace, decided to resume work. The railroads have restored

the old rates on ore shipments to the East, being a reduction of \$2 a ton. Work will be resumed about April 1 if enough miners can be had. When the mines were closed down in the winter, 2,000 miners left the country, and a similar number must return before operations can be resumed on the old magnitude. Heretofore wages have been \$3.50 a day, alike to miners, trammers and surface men, but in the future the mine owners declare that they will pay this rate to miners only, and \$3 to others. This reduction, however, seems to have met with considerable opposition from the Miners' Union, for, according to a late telegraphic dispatch, it intends to resist the cut, and has requested miners to keep out of the country until the differences are settled.

LOGAN COUNTY.

QUEEN EXTENSION No. 1.—A strike has been made in this mine, the next claim adjoining the Queen on the west. The ledge is from 2 to 3 ft. wide. By the assays made so far the ore gives an average of \$168 in silver per ton. A drift has been run along the ledge some 150 ft., and drifting will be continued until the lessees have completed arrangements for hauling and shipping ore, when stopping will be commenced. The ore deposit is not more than 70 ft. from the surface, and the tunnel which taps the ore starts into the hill at an elevation of several hundred feet from the bottom of the cañon.

OWYHEE COUNTY.

DE LAMAR MINING COMPANY, LIMITED.—During February the mill crushed 2,300 tons of ore, producing hullion valued at \$60,250. The estimated value of ore sold to smelters was \$15,000, and miscellaneous revenue amounted to \$500, making the total revenue for the month \$75,750. Expenses on revenue account were \$35,500. When this company was organized Capt. De Lamar took in part payment for the property 205,000 shares. A number of his employes and friends of the promoters in Montana purchased several thousand shares in addition, so that considerably more than half the capital stock of the company is owned in the United States. By provision in the articles of incorporation, however, the first 50 shares held by one individual is entitled to 10 votes, and each additional 50 shares to but one vote. Hence the minority shareholders have the control of the company, such a large hock of stock being held by one man.

PHILLIPS & SULLIVAN.—Suit has been brought against this group by Wm. Knott. The properties involved are the Seventy-nine, the Nigger Gulch and the Blue Gulch, owned by Mr. Knott, and the Phillips & Sullivan and the Belfast, owned by Messrs. Phillips and Sullivan. Five suits have been brought claiming that the survey of the latter properties was wrongfully made, as the claims were caused to overlap.

TRADE DOLLAR.—A strike of good ore has been made on the hanging wall side of Tunnel No. 2. The ore is said to carry considerable gold and to average about \$50 higher than the other ore exposed in the mine.

SHOSHONE COUNTY.

BUTCHER.—An important strike has been made on this claim to the east of the Sullivan and between the lead belt at Gardner and the dry belt at Osborne. The strike is of gray copper and galena.

BLIND GODDESS.—This mine in Meadow Mount district, although it has been but slightly developed, is said to be looking well. The ledge is 12 ft. wide, carrying not less than 2½ ft. of galena. The balance of the ore contains copper, gold and silver, as well as quite a percentage of iron.

COEUR D'ALENE MINING COMPANY.—On the War Eagle a cross-cut tunnel has been run 500 ft. to cut the vein at a depth of 300 ft., and another tunnel now in 500 ft. to cut the vein at a depth of 700 ft.

HECLA.—A large interest in this mine has been sold to Milwaukee parties by Patrick Clark and B. C. Kingsbury. Work will soon be started on an extensive scale.

LAST CHANCE MINING COMPANY.—This company's tunnel to cut the vein at the depth of 500 ft. is now in 2,000 ft. It is 8 ft. high and 12 ft. broad, double tracked throughout. When completed it will drain the mine and do away with hoisting.

TIN CUP.—This claim, together with the Keystone and Lee, has been bonded for \$45,000 by Chas. A. Wing and W. E. Mann, of Wallace. The mines are about three miles from Wallace. Four hundred ft. of tunnel has been run on the Tin Cup, 80 ft. on Keystone and a shaft 50 ft. deep has been sunk on the Lee. All the properties are said to look well.

WASHINGTON COUNTY.

It is reported that capital has been secured by the Seattle, Boise & Salt Lake Railroad to build a branch from the Oregon Short Line at Payette to Seven Devils to open up the promising copper district.

INDIANA.

JACKSON COUNTY.

Developments at the shaft being sunk at Rockford are such as to indicate rich deposits of zinc

ore, according to press dispatches. A company was formed recently to prospect at this place and the shaft is being put down for this purpose. The company is headed by Senator A. R. Shroyer and C. H. Stevens, of Logansport and Charles Harley and Landis Ricketts, of Delphi. The company has leases on 1,000 acres of land, and arrangements are being made to sink several additional shafts. Experts declare that the ore compares favorably with that found in the zinc mines of Missouri.

KANSAS.

BARBER COUNTY.

(From an Occasional Correspondent.)

An English syndicate has engaged in the manufacture of plaster of paris at Medicine Lodge in this County and is making a success of the undertaking. It is said to have a secret process for finishing the product, which I am informed is used for the manufacture of staff with which the walls of the buildings of the World's Fair are being covered. The company has a large bed of hard and soft rock. The material is hauled 5½ miles to the end of the Atchison, Topeka & Santa Fe branch at Medicine Lodge, whence it is shipped.

CHEROKEE COUNTY.

During the week ending March 19th the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 483,460; rough ore, pounds sold, 534,540; zinc ore, pounds sold, 325,300; lead ore, pounds sold, 49,330. Sales aggregated a total value of \$3,339.

RENO COUNTY.

KANSAS SALT COMPANY.—This company, of Hutchinson, Kas., has filed a complaint with the Railroad Commissioners against the St. Joseph & Grand Island, Atchison, Topeka & Santa Fe, Burlington & Missouri River, Chicago, Rock Island & Pacific, Kansas City, Fort Scott & Memphis, Kansas City, Wyandotte & Northwestern, Missouri, Kansas & Texas, St. Louis & San Francisco, Union Pacific and Missouri Pacific railway companies for alleged discriminations in favor of Michigan salt mines. The Kansas company does not complain that the rate given the Michigan companies is too low, but that the tariff under which it is compelled to ship is too high. The Kansas Salt Company owns all the wells and works at Hutchinson.

KENTUCKY.

CARTER COUNTY.

LITTLE SANDY COAL AND SAND COMPANY.—This company will commence opening a coal mine near Grayson in this County, at once.

MARYLAND.

COAL.

CONSOLIDATION COAL MINING COMPANY.—The new shaft of the company, 16 ft. by 10 ft., is down 175 ft., and will be sunk until it cuts the 14 ft. vein at the depth of 240 ft. It was sunk for the purpose of relieving the Hoffman mine of the body of water which filled it at the time of the fire, to ascertain if encroachments on the property had been made by neighbors, and to facilitate the handling of coal.

MICHIGAN.

GOLD.

ROPES GOLD AND SILVER MINING COMPANY.—An unfavorable state of affairs is shown by the recent report of the company. During the past year 21,355 tons of ore were moved, yielding \$3.38 a ton in bullion and concentrates. Notwithstanding there had been assessments amounting to \$20,000 during the past year, and with cash on hand amounting to \$3,409.05 at the beginning, the indebtedness for labor and supplies now amounts to \$22,402.46. The shaft is 765 ft. deep, and is being sunk deeper. During the year 1,463 ft. were drifted and the shaft was lowered 126 ft.; 14,000 tons of ore are estimated to be in sight.

COPPER.

ALLOUEZ MINING COMPANY.—This company advertises for sale at public auction at 76 Wall street, New York, April 12, all stock upon which assessments of 50 cents per share, payable February 26th, 1891, and 50 cents per share, payable October 10th, 1891, remain unpaid. The stock standing in the name of Michigan parties will be sold at Allouez on the same date.

CENTENNIAL MINING COMPANY.—The report of this company for 1891 shows that the mine produced 777,635 lbs. of mineral, which yielded 68.414% or 531,983 lbs. of refined copper. The report gives a cash account and a statement of assets and liabilities for the year, which are as follows:

CASH ACCOUNT.

Cash on hand January 1st, 1891	\$195,849.95
Received from sales of copper, 350,281 lbs. at 10.54 cents	36,933.99
Received from interest	2,172.37
	\$234,956.31
<i>Contra:</i>	
Cash paid on mine agent's drafts	\$197,07.25
Smelting freight, brokerage	4,598.89
Insurance and expense	6,857.30
	208,533.44
Cash on hand December 31st, 1891	\$25,693.47

ASSETS AND LIABILITIES.

<i>Assets:</i>	
Cash on hand	\$25,693.47
Copper on hand, 25,000 lbs. at 10.8 cents, since sold	2,720.00
Copper on hand, 156,702 lbs. at 10½ cents	16,378.71
Cash, supplies, wood and coal at mine	25,438.88
	\$70,431.06
<i>Liabilities:</i>	
Drafts outstanding	\$20,301.35
Bills payable (smelting, freight, etc.)	3,129.63
Balance due merchants at mine	12,483.99
Balance due men at mine	10,140.38
	46,055.35
Balance assets over liabilities	\$24,375.71

The valuation of machinery, tools, buildings, etc., not included in the account given above is \$119,250. Since December 1st, 1888, there has been expended \$38,036.16 for new machinery. The mine agent's account shows: total expenditures at mine prior to 1891, \$199,127.72; 1891, mine expense, \$177,271.94; total, \$376,399.66; supplies, fuel, new machinery, etc., \$63,475.04; total, \$439,874.70.

FRANKLIN MINING COMPANY.—According to a Boston dispatch, the assets of this company—cash or its equivalent, figured January 1st—were equal to \$13.50 per share for the stock. This was taking its copper at 10½ cents per pound, and leaving out its real estate, machinery, etc.

HANCOCK MINING COMPANY.—This company has held its annual meeting and re-elected the following officers: President, Edward Ryan; secretary and treasurer, August Mette; trustees, Edward Ryan, C. T. Harrington and August Mette, of Hancock; William Edwards, of Cleveland, O., and J. T. Cuddihy, of Red Jacket. Over 26,000 shares were represented at the meeting. Nothing was done by the stockholders with reference to reopening the mine.

KEARSARGE MINING COMPANY.—This company produced 94½ tons of mineral in February against 95 tons in January and 80 tons in February, 1891.

QUINCY MINING COMPANY.—According to local papers, the water cylinders of the new Worthington pump have begun to crack and leak like its predecessor. The company will not accept the pump, but will lose some time in consequence of the break.

TAMARACK, JR., MINING COMPANY.—The mine continues to look well. The north chute is widening materially as work progresses in that direction. The work of sinking No. 2 shaft to that lode is being pushed rapidly, and it is expected that it will be reached in five or six weeks.

TORCH LAKE MINING COMPANY.—At a recent meeting of this company the following directors were elected: Thacher Loring, Charles W. Loring, Charles Van Brunt (vice Joseph Clark), Frank B. Cotton, Horace Loring, La Fayette Burr and R. R. Goodell. Nothing save routine business was transacted.

WOLVERINE MINING COMPANY.—The monthly product of this company is from 48 to 49 tons of mineral, yielding fully 40 tons of ingot. Some 75 men are employed.

IRON—GOGEBIC RANGE.

AURORA.—While the greater portion of the ore from this mine has been taken from the Vaughn "forty," the west end of the property has been explored and shows considerable ore, and No. 1 shaft, which has been worked in quartzite slates and mixed ore for four years, is now yielding excellent ore. The outlook for the mine seems somewhat brighter.

IRON—MARQUETTE RANGE.

CLEVELAND IRON MINING COMPANY.—This company has let a contract to B. C. Howell, of New York, to pump out Lake Angeline under which it is working. A centrifugal pump with a 20 in. suction and a capacity of 20,000 gallons per minute will be placed on a scow in the middle of the lake. The lake covers an area of 153 acres with a maximum depth of 43 ft. and a mean depth of 20 ft. It is estimated that it contains some 800,000,000 gallons of water. The expense will be shared by the Cleveland and the Lake Angeline iron mining companies.

IRON—MENOMINEE RANGE.

CHAPIN.—This mine is now employing 960 men. One thousand eight hundred and ninety-eight tons of ore were hoisted and sent to stock in 24 hours last week from "D" shaft alone. It is expected, however, that this record will be soon broken.

LUDINGTON.—The water in this mine has risen to nearly 150 ft. from the surface and is rising at the rate of 2 ft. per day. The company has taken no decisive action as yet. Some 40 men are employed and the output is about 70 tons per day.

MINNESOTA.

IRON—MESABA RANGE.

The following companies have filed articles of incorporation to work properties on the Mesaba range: Athens Iron Company, capital stock, \$3,000,000; Duluth Iron Mining Company, capital stock, \$2,000,000; Waukooteah Iron Company, capital stock, \$3,000,000; Elmire Sand and Iron Company, capital stock, \$2,000,000; Cosmopolitan Iron Company, capital stock, \$4,000,000; Kentucky Iron Company, capital stock, \$1,000,000; Pennsylvania Iron and Steel Company, capital stock, \$3,000,000; Swedish American Iron Company, capital stock, \$2,000,000; Mesaba Chief Iron Company, capital

stock, \$3,000,000; Putnam Iron Company, capital stock, \$3,000,000; Great Western Mining Company, capital stock, \$6,000,000; Comstock Iron Mining Company, capital stock, \$5,000,000; Iron Cliff Mining Company, capital stock, \$3,000,000.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, March 21.

Sunday morning opened the new week with a regular western blizzard, which continued up to Thursday morning, stopping all outside mining operations. The small mining companies using hand jigs to clean their ore only made an average of two days' work during the week. The large companies with their concentrating mills and works inclosed put in full time, giving an average output. The zinc ore market remains unchanged from the previous week. Lead ore declined 50c. per thousand, closing at \$23.

Following are the sales from the different camps as far as reported:

Joplin mines, 459,420 lbs. zinc ore and 120,480 lbs. lead; value, \$7,952.35.
Webb City mines, 385,970 lbs. zinc ore and 13,900 lbs. lead; value, \$4,274.45.
Carterville mines, 1,883,230 lbs. zinc ore and 55,700 lbs. lead; value, \$21,055.40.
Zincite mines, 288,692 lbs. zinc ore and 2,000 lbs. lead; value, \$2,563.
Lehigh mines, 15,310 lbs. zinc ore; value, \$352.15.
Oronogo mines, 83,300 lbs. lead; value, \$1,936.75.
Carthage mines, 81,800 lbs. zinc ore; value, \$923.
Wentworth mines, 41,000 lbs. zinc ore; value, \$430.50.

Galena, Kan., mines, 225,300 lbs. zinc ore and 49,380 lbs. lead; value, \$3,339.

District, total value, \$42,826.60.

This unusually small output for the district is a fair demonstration of how the mines of this region are operated. That is to say, the major portion of the ore is produced by the small operators with the use of inadequate machinery, and the greater portion of that out in the open, exposed to all kinds of weather, so that a severe storm like that of last week shuts them down.

Mr. A. V. Weise, who was sent abroad last year by the Southeast Missouri and Southeast Kansas Lead and Zinc Mining Association to induce European zinc smelters to enter this market for ore, has made his report, of which the following is a brief abstract:

"Last year there were different lots of spelter exported from Joplin to Europe, which had a marked effect upon prices there, and foreign miners dread the continuance and increase of such importations. Heretofore the zinc people whom I saw, and they represent the industry in Europe, had no idea of what we have, how much and of what quality.

"I was less successful in my endeavors to bring them over here as buyers or investors and for good reason. They did not need any ores; they had all they could make use of close at hand, secured by long contracts at satisfactory prices. It is not an easy undertaking to divert to new fields a long established trade and custom. In order to accomplish that object one must be able to show great advantages in prices and goods over the old ones.

"Now I could offer them a vastly better quality of ore, but as to prices I could not give them any inducements. Furthermore, their manner of doing business is so different from ours that it naturally takes a longer trial and some palpable advantages to make them change a long established business policy. I came to an understanding with the Vieille Montagne Company, whereby it agreed to buy blende shipped to it at Antwerp. But in the course of further negotiations it withdrew and combined with other companies in a joint offer for a trial lot of 1,000 tons, the proposed contract for which was forwarded to you for acceptance, but was declined by you as not coming up to prices obtained here."

Mr. Weise concluded that so long as the agreement between the European zinc producers for the restriction of output was maintained there would be little chance for the introduction of Missouri ore in Europe, for not only is there now an abundance of ore there but rates of freight are against mines so remote as those of Missouri.

MONTANA.

ANACONDA MINING COMPANY.—During February this company shipped to its smelter 3,015 cars of ore, averaging 25½ tons each. This is a daily average of over 3,100 tons.

BEAVERHEAD COUNTY.

GOLDEN LEAF, LIMITED.—Mr. J. Henry Longmaid, general manager of this company, has made the following report for February, as follows: "Empire.—60 stamps ran 27 days, crushed 4,300 tons, producing in gold bullion, \$12,600; store and sundries, \$800; total, \$13,400; deduct revenue cost for month, \$9,900; estimated profit for month, \$3,500. (No concentrates produced during the month.) Golden Leaf.—During the month the mills crushed 1,420 tons ore, yielding in gold bullion, \$6,000; net estimated value of concentrates, \$7,000; estimated profit from store and sundries, \$1,100; total, \$14,100; deduct revenue cost for month, \$6,000; estimated profit for the month, \$8,100; total estimated profit, \$11,600. Expended on capital and development work: Empire, \$4,000; Golden Leaf, \$6,000."

DEER LODGE COUNTY.

BIMETALLIC EXTENSION MINING COMPANY.—A strike is reported in the north cross-cut of this mine. The diamond drill core is said to have shown 3 ft. of rich ore in 7 ft. of vein matter. The officers of the company neither affirm nor deny the rumor.

COMBINATION MINING AND MILLING COMPANY.—This company of late has been a steady shipper of bullion. The ore is being worked up to 92% whereas in former days but 72% was extracted. The pay roll amounts to about \$22,000 per month.

SOUTHERN CROSS.—After experimenting for several months with a patent electrical process for the treatment of its ores, the works have been shut down. The mine, however, is able to make a small amount by shipping its auriferous limonite, carrying about 45% iron to the smelters at Butte.

JEFFERSON COUNTY.

ELKHORN MINING COMPANY, LIMITED.—During February the mill worked 27 days and crushed 1,070 tons of ore. Bullion produced in the mill, \$31,660; 278 tons of smelting ore sold, \$27,962; total produce, \$59,622; total expenses, \$24,725; estimated profit for the month, \$34,897. The directors have declared an interim dividend of 2s. per share for the three months ending February 29th, 1892.

OBELISK.—A five-stamp mill has been completed on this property near Basin. The shaft is down 320 ft. The ore runs 40 oz. in silver and 5% lead.

LEWIS AND CLARKE COUNTY.

MONTANA COMPANY, LIMITED.—The secretary of this company reports that the total output for February was \$53,400, and the working expenses for the month, \$41,600. In addition to 7,110 tons of ore crushed in the mills during February, 1,150 tons of tailings were treated, yielding \$5,300, at a cost of \$2,900, which figures are included in the above return.

MEAGHER COUNTY.

WHITLATCH UNION & MCINTYRE GOLD MINING COMPANY.—This company has been organized with a working capital of \$25,000 to develop the Whitlatch Union and McIntyre mines, abandoned since 1873. The trustees are: W. G. Bailey, Henry M. Parchen, Nick Kessler, George E. Boos and W. H. Clark. Henry M. Parchen was elected president; Nick Kessler, vice-president; W. G. Bailey, treasurer; Geo. E. Boos, secretary, and Michael Cooney, general manager.

SILVER BOW COUNTY.

AMY AND SILVERSMITH MINING COMPANY.—At the recent annual meeting of this company the old trustees, with the exception of C. S. Warren, who has removed from the State, were re-elected. J. V. Long was elected instead of Mr. Warren. The board as it now stands is as follows: Marcus Daly, G. W. Irvine, J. V. Long, M. B. Brownlee, J. E. Forbis, John Morris, P. Clark, F. E. Sargeant. The lease of the company's mine to H. L. Haupt, A. J. Davis and Frank Grimes for the period of 18 months was ratified, and an agreement entered into with the lessees by which they are to be repaid for all permanent improvements they make in case of sale of the mine before the expiration of the lease.

BUTTE & BOSTON MINING COMPANY.—The output of this company for February was 1,496,000 lbs. of refined copper against 1,968,000 for January and 1,050,000 for February, 1891.

NEVADA.

ELKO COUNTY.

NAVAJO MINING COMPANY.—During the week ending March 12th this mine put out 36 tons of ore, assaying \$550 a ton, and six cars assaying \$803.

(From our Special Correspondent.)

The following amounts have been received for ore sold to the sampling works at Tuscarora: Navajo Mining Company, \$14,661.43; North Belle Isle Mining Company, \$572.22; Del Monte Mining Company, \$11,060.63. * *

ESMERALDA COUNTY.

INDIAN QUEEN.—This company has won its suit against the Poorman, receiving \$1 damages and the Poorman mine.

EUREKA COUNTY.

CORTEZ MINES, LIMITED.—The fourth ordinary general meeting of the shareholders of this company was held in London on the 10th inst. The chairman stated that although the showing for the past year was not so good as in the two previous years, still it was quite satisfactory. The expenses both in London and in Nevada had been continually reduced year by year. The first year of the company's existence the average expenditure was £6 18s. 7d. per ton of ore raised, whereas it is now only £5 16s. 11d. The receipts, however, have fallen from £13 1s. 10d. per ton to £10 6s. 11d. This has been due to the fall in the grade of the ore which in 1889 averaged 64.41 ozs. per ton; in 1890 54.29 ozs., and in 1891, 51.69 ozs. Mr. Wenban, the managing director, reports that during the year new bodies of ore were developed that promise to equal, if not surpass, anything ever found in the mine. In fact the prospects for the future prosperity of the company were never brighter than at present. Some important development work was undertaken during the past year, among other things being the Polar tunnel. When Mr. Wenban first began to work on this property about 25 years ago he found valuable bodies of ore

on the surface of the St. Louis claim, but gave up working there for what he considered an inferior portion of the ground as far as mineral was concerned, because it was nearer the mill which he had erected. The Polar tunnel which has now been commenced is aimed to develop the St. Louis ground which has been neglected during all these years. This tunnel is to be 4,100 ft. long, 546 of which have already been driven at an average of 30 ft. per week. The company declared a dividend of 5 1/2% or \$95,000, making a total of 13% for the year ending September 30th, 1891, and a total of 46% on the capital of the company (£300,000) paid during the past three years.

EUREKA CONSOLIDATED MINING COMPANY.—The secretary has made the following statement for the month of February: Receipts—Ore sales, \$1,101.99; sundries, \$57.05; superintendent's drafts out (Feb. 29), \$4,567.58; cash (Feb. 1), \$50.35; cash in bank, \$20,960.80; sundries, \$1,020.75; total, \$27,758.42. Disbursements—Mine, \$3,499.28; smelting, \$14.51; Expense, Eureka, \$275; expense, San Francisco, \$705.60; New York office, \$113.68; U. S. patents, \$40; drafts carried over, (Jan. 1) \$3,934.90; cash (Feb. 29), \$26.40; in bank (Feb. 29), \$18,047.16; sundries, \$1,101.89; total, \$27,758.42. The assets were as follows: Lead on hand, \$2,400; ores, \$4,186.89; wood, \$995; zinc, \$1,133.76; coke, \$2,283.53; coal, \$405.24; cash, \$26.40; cash in bank, \$18,047.16; due on ore shipments, \$1,101.89; total, \$30,579.87. The liabilities were \$4,567.58 for drafts out and \$795.99 for unpaid bills. Assets exceeded liabilities by \$25,216.30.

(From our Special Correspondent.)

STOREY COUNTY—OOMSTOCK LODGE.

BELCHER MINING COMPANY.—Information was received in San Francisco on the 17th inst. to the effect that a great improvement had taken place on the 1,300 ft. level, where the ore is very rich, although only showing in bunches.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—During the month of February the company ran behind \$17,158.59, thus leaving \$15,986.90 cash on hand after all expenses were paid. A bullion shipment, the first on March account, has been made to the Carson mint, valued at \$15,184.30.

HALE & NORCROSS MINING COMPANY.—Messrs. Flood and Messer have returned from the Comstock after taking formal possession of the mine. Superintendent Regan has been instructed to continue the extraction of ore until the ore bins are filled. Meanwhile arrangements are being made to obtain a mill to crush the ore. The Occidental mill has a capacity of 60 tons per day, and as cartage to that mill will cost only 75 cents per ton, a lease of the property is under negotiation.

On the 16th inst., the day appointed by Judge Hebbard to hear argument in the suit of M. W. Fox vs. the Hale & Norcross directors *et al.*, all the shining lights of the mining world, with the exception of W. S. Hobart, occupied seats in the court room.

Attorney Baggett opened his argument in behalf of the plaintiffs by depicting the records of the men connected with the Nevada Mill and Mining Company in scathing terms, referring especially to Evan Williams, the superintendent of the mill, and H. M. Levy, the president of the Hale & Norcross Silver Mining Company. Mr. Baggett then proceeded to analyze the evidence. "During the time covered by the complaint—January 1st, 1887, and July 1st, 1890—there were mined 88,887 tons of ore," he said, "of a value by car sample of \$3,505,361.37. The total bullion yield was \$1,826,873.80, leaving a balance of \$1,678,487.57 unaccounted for. According to Mr. Mackay's testimony the ore should have produced not less than 65% of the car or mine assay, over and above the milling. On this basis the ore should have yielded the mine \$2,278,484.89 and the mill \$622,209, or a total of \$2,900,693.89. As the bullion actually returned was but \$1,826,873.80, there was a shortage of \$1,073,820.09. To each of these calculations should be added the value of the ore which is alleged to have been unaccounted for, viz., 6,207 tons, of \$39.43 per ton average value, representing a total of \$247,742; 65% of this amount would be \$159,082.30. (There were 101,164 cars of ore hoisted from the mine, which weighed 1,880 lbs. each = 95,094 tons; but 88,887 tons of ore were accounted for.) Moreover, there should be added the loss in moisture and the loss in milling 3,498 tons of low grade ore—averaging between \$5 and \$14 per ton. Milling this ore costs the company \$7 per ton, or \$24,489.50. This is the loss figured on Mr. Mackay's basis, or the old method, but it is fair to presume that with more modern methods not less than 75% @ 80% of the assay value of the ore would have been saved. The records of the Consolidated California & Virginia Mining Company showed that under the Jones contract 75% of the car sample assays was returned. Extracts from the books of the Hale & Norcross Silver Mining Company showed that on 1,259 tons of ore but 36% was returned; on 4,579 tons, 41%; on 3,900 tons, 51%; on 3,973 tons, 36%. The average percentage on all the ores worked was 52.12. The average car sample was \$39.43 per ton. All ore that did not assay \$29.40 per ton at the mine was worked at a loss to the company, while Mr. Mackay's testimony showed that the \$14 ore of the Consolidated California & Virginia yielded a profit. Taking the difference between \$14 and \$29.40, and multiplying by the number of tons, the product is

\$1,368,850.80, which, after deducting \$268,661 for milling, leaves a sum of \$1,102,189 appropriated by the mill owners."

Mr. Baggett next reviewed the testimony regarding car sample and battery assays, and the efforts made by the defence to throw doubt on the value of the former. Their witnesses alleged that \$3 per ton should be allowed for slimes and moistures, and when a calculation was made it was found that there was a difference of but 18 cents per ton. On June, 1888, 2,100 tons gave a battery assay of \$29.37; settler sample, \$3.74; to be returned, \$25.63 per ton, or a total bullion yield of \$53,823. The amount actually returned was \$53,445.77, showing a loss by slimes, etc., of but \$377.23.

"The value of the ore," continued Mr. Baggett, "is further established by much convincing circumstantial evidence.

"First. The deposit in the Bullion & Exchange Bank of \$717,928.93 in bullion belonging to unknown owners.

"Second. The sale by W. S. James to J. M. Doyles of bullion amounting to more than \$160,000.

"Third. The midnight rides of Evan Williams along the lonely toll road from Empire to the Assay office of his brother-in-law James, 'loaded to the water's edge' with suspicious looking bags.

"Fourth. The shipment of many bars of bullion of great value from James' Assay Office to T. R. Hoper, at Carson, the same being deposited in the United States Mint as 'unstamped' bars; the place whence they came 'unknown,' and finally paid by the Mint to the clerks of the Bullion & Exchange Bank, notwithstanding these bars were all stamped and were known to have come from the James office.

"Fifth. The refusal of Hofer and the clerks—Peters and Brown—to disclose the ownership of the bullion.

"Sixth. The large shipments made by the Mexican mill (while running on Hale & Norcross ores) to W. S. James, the assayer, and never accounted for to the mining company.

"Seventh. The working of the 3 pan annex.

"Eighth. The bribes (Levy's checks).

"Ninth. The fugitives from justice (Levy and Keating)."

Summarizing the various points of his argument Mr. Baggett went on: "Here are a body of men who have solemnly assumed the duties of trustees, and willfully and fraudulently violated their trust. An ore body of \$3,500,000 to \$4,000,000 has been worked out and the stockholders have not only not received a cent, but have paid \$112,000 in assessments. We have seen how the directors were elected, how the president was bribed, and for a moment I would like to speak outside the record, to call attention to the fact made public in the daily press, that H. M. Levy, the purchased tool of these conspirators, has transferred all his real estate in this city and county to J. Wolberg, the stockbroker. Have we not a right to assume that this man Levy did this because he saw the day of judgment was at hand?"

At this startling remark of plaintiff's counsel, Attorney Waters jumped to his feet exclaiming "How do you know this?" "From the record of real estate transactions published in the city," was the reply.

Mr. Baggett concluded his argument with a brilliant peroration, denouncing in unmeasured terms the record of the "mill ring." The arguments are to be resumed on the 22d inst. * *

WHITE PINE COUNTY.

OSCEOLA GRAVEL MINING COMPANY.—It is said that this company has closed the purchase of W. T. Gregory's, George Robinson's and Robert Wilson's water rights, paying Gregory \$5,000, Robinson \$1,000, and Wilson \$3,000. This water is to supply in part the new ditch the company made two years ago. The new ditch was made too high up the mountain to catch the water which runs in Lehtuan Creek; hence the purchase.

NEW JERSEY.

STANDARD OIL COMPANY, OF NEW JERSEY.—This company has amended its title by filing a new certificate with the Secretary of State. It is now simply the Standard Oil Company, dropping the words "of New Jersey." Its capital is raised to \$10,000,000, an increase of \$7,000,000. This increase was authorized at a meeting held on March 4, 1892.

NEW MEXICO.

GRANT COUNTY.

Little is being done at Pinos Altos outside the Pacific Gold Company's property. Since the collapse of the Mountain Key and the Aztec companies there have not been more than half as many men at work in the district as there were when these companies were operating their mines and mills. The Aztec company has been reorganized, but the new company, which is known as the Manhattan Gold Mining and Milling Company has not commenced operations yet.

MIMBRES CONSOLIDATED MINING COMPANY.—This company will start up the Mimbres mill, three miles below Georgetown, as soon after the first of April as the mill can be put in order. It has been idle about a year, but operations have been going on in the company's mines steadily, and there is now said to be about \$75,000 worth of ore out and ready to be milled. This will keep the mill running about three months.

SURPRISE.—One of the largest bodies of carbonate ever discovered in Cook's Peak district was struck in this mine recently, it is reported. The extent of the ore body is not yet known, but it is certain that it is at least 18 ft. wide, 26 ft. deep and 75 ft. long. This is the extent of the development work up to this time. The ore is a high grade carbonate and runs well in silver. The output of the camp is steadily increasing, and what was one of the most insignificant districts in southern New Mexico six years ago is now the leading lead-producing camp of the Territory.

OHIO.

COAL.

OHIO & WESTERN COAL COMPANY.—George B. Okey, Master Commissioner, at Columbus, O., has reported on the claims against this company, ordering that the mortgage for \$3,500,000, held by the Boston Loan and Trust Company, be paid in full before all other claims.

PENNSYLVANIA.

COAL.

HILL FARM.—The bodies of 23 of the miners who met their death in this mine at Dunbar, June 16, 1890, were found on the 24th inst. There are still in the mines the bodies of five men. These were in the dip at the time of the explosion, and their bodies will not be recovered until all the water is pumped out. The bodies were found in flat No. 1, showing that they had rushed deeper into the mine. Six of the miners took refuge in one little room. When found they were piled on top of one another in ghastly shapes. A short distance away were three miners, two of whom, the brothers Courtney, were clasped in each other's arms. The fourteen other miners were entangled in a space 13 ft. square. The search for the bodies has been carried on unremittingly by the owners of the mine since the disaster, 20 months ago, at a cost of over \$100,000. After two weeks' work the searchers were compelled to abandon the work for a time till the fire which followed the explosion could be extinguished. The mine was then sealed up and flooded to subdue the fire, after which months were required to clear it of water.

READING COAL AND IRON COMPANY.—It is reported this company has purchased A. Packer's original mortgage on the Paterson Coal Company's tract at Mount Carmel. The sum of \$725,000 is named as the consideration. The tract consists of 2,500 acres of Mount Carmel's richest coal land.

Orders were issued on the 23d inst. to close all of the company's collieries from Thursday night until Monday morning. Two collieries, however, were exempted from the rule—Brookside, at Tower City, and Lincoln, near Tremont. The only cause given is the stagnation of the coal trade and the consequent necessity of curtailing the production.

OIL.

CRESCENT PIPE LINE.—A dispatch from Pittsburgh on the 22d inst. said: The Standard Oil Company is expected by many producers to purchase soon another independent pipe line and remove its most formidable competitor from the field. It is the line almost completed between the McDonald oil field and Linwood on the Delaware, below Philadelphia, and is being constructed by the Crescent Company, of which W. L. Melton is president. A brother of Joseph Craig, the wealthy oil producer, is the engineer in charge of the construction of the Melton line, which the petroleum producers expect to pay for indirectly. The Crescent people will be pumping oil to the seaboard within three months, and have commenced the construction of 300 miles of telegraph line, which will follow the route of the oil pipe. The line starts at Craig station, on the Pittsburg, Cincinnati, Chicago & St. Louis Railway; runs in an air line to Riverton, a suburb of McKeesport, and in its journey to the old Bedford pike, across the Alleghany Mountains, passes the towns of Irwin and Greensburg. Thence the line runs through the counties of Huntingdon, Franklin, Cumberland, York, Lancaster and Chester. The telegraph poles are now being distributed. The route is the shortest to the East. The line is believed by outside producers to have been built as a squeezer on the United Pipe lines, otherwise the Standard Oil Company, and they expect to pay for it indirectly by the further forced decline of crude oil, possibly to the low figure of 40 cents a barrel. This is the prediction of some producers who believe the absorption of the Crescent line will forever put an end to competition with the Standard.

UTAH.

JUAB COUNTY.

The suit to determine whether the town site of Eureka is mineral land or not has come up for trial in Salt Lake City. P. H. Lannan, Michael Powers and Tim Sullivan have located the ground occupied by some four hundred dwelling houses and stores. A committee of business men was organized to fight the claim.

SALT LAKE COUNTY.

AMERICAN NATURAL GAS AND OIL COMPANY.—It is reported that Major C. T. Doxie, of Indiana, has bought a half interest in this company, of Salt Lake City, for \$250,000. The company has let to him a contract to pipe natural gas from the lake shore to Salt Lake City, a distance of 12 miles. The company has just struck gas in the third well at a depth of between 700 and 800 ft. Major

Doxie says the gas will be piped into Salt Lake City by September 1st. The capitalization of the company is \$5,000,000, in 500,000 shares.

When the boring tools in well No. 4, at the lake shore, penetrated the sandstones after passing through the overlying shales, there was a roar and the tools, weighing over 1,500 lbs., were blown out of the well. There is a steady flow of gas at high pressure. Other wells will be sunk.

NIAGARA MINING AND SMELTING COMPANY.—The suit brought by the Old Jordan Mining Company against this company has been decided for the defendant by Judge Anderson. The Old Jordan Company claimed that the Red Warrior, one of the Niagara claims, overlapped its property. The plaintiffs made a strong case at first, but the Niagara people proved that the Red Warrior lines were 35 ft. north of the survey lines claimed by the Old Jordan people. The Niagara people will at once start work, while Prof. Holden, it is thought, will take an appeal.

OLD JORDAN MINING COMPANY.—Andrew Burt has brought suit against this company and William Shaughnessy, asking for an accounting of all copartnership dealings since the commencement of transactions under a verbal agreement between plaintiff and defendants. Burt claims that Shaughnessy has taken exclusive possession of the Hanson lease, the property in question.

FOREIGN MINING NEWS.

UNITED KINGDOM.

ENGLAND.

In the House of Commons on the 23d inst. Mr. Robert Leake moved the second reading of the miners' eight-hour bill. He said the measure would affect 531,000 men. All the miners in Great Britain excepting those in Durham and Northumberland favored the bill. Mr. Thomas Burt, secretary of the Northumberland Miners' Mutual Association, moved the rejection of the bill. Mr. Joseph Chamberlain supported the bill. He said he did not believe a reduction of hours would lead to a diminution of the output. Factories in Massachusetts, he declared, produced an equal amount per man with ten hours' work as did factories in New York with 11 hours' work, while wages were as high in the former State as in the latter. Home Secretary Matthews said he did not think a single argument had been advanced showing that the bill was for the good of the community. The bill was finally rejected by a vote of 272 to 160.

There was rioting on the 22d inst. at the Heburn Colliery, in Durham, owing to the engineers there employed refusing to join the strikers.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, March 25.

Heavy Chemicals.—During the past week the market for heavy chemicals has been quiet, although a very fair volume of business for future delivery is reported. The colliers' strike in England is settled, except in Durham and Newcastle, and it did not affect the market as much as was anticipated. Owing to bad weather the arrivals of chemicals have been light, and spot trading was interfered to some extent, but sales were made for forward shipments.

No new feature is to be observed in the market. Quotations are as follows: Caustic soda, 70%, 2.90@3c.; 74-76%, 2.92@3.02½c.; 77%, 3.06½c. Carbonated soda ash, 48%, 1.62½c.; 58% (basis 48%), 1.45@1.47½c. Alkali, 48%, 1.60@1.65c.; 58%, 1.45@1.47½c. Bleaching powder, 2.15@2.20c.; sal soda, English, 1.05c.; domestic, .90@1c.

Acids.—Manufacturers report a good business at unchanged prices, although in some quarters we hear that an upward tendency is to be noticed. Prices remain unchanged.

We quote this week for 100 lbs. of acid in New York, in lots of 50 carboys or more: Acetic, \$1.60 @ \$2, according to quality; alum, lump or ground, \$1.55@1.80; muriatic, 18", \$1; 20", \$1.12@1.25; 22", \$1.25; nitric, 40", \$4; 42", \$4.50@4.75; sulphuric, 90c.@\$1.10; mixed acids, according to mixture; oxalic, \$7.25@7.75. Blue vitriol is quoted all the way from \$3.25@3.50. Glycerine for dynamite 11½@12½c. according to quality and quantity.

Brimstone.—The market has been quiet and somewhat unsettled owing to the steady decline in prices, which during the week reached the lowest point since last July. There are no thirds here, but best unmined seconds in store are held at about \$25. To arrive, April-May shipments, the quotations are \$22.25@22.50 for best unmined seconds, and \$21.50 for best unmined thirds. About 2,000 tons of Japan brimstone has been sold recently at prices said to be the same as for the Sicilian article.

Fertilizers.—During the week there has been a fair demand for most of the raw materials. The Northern trade has proven better than was expected. The condition of the South, on the other hand remains unrelieved, and it is not probable that a heavy demand for fertilizers will come from that source. Several sales have been made during the week and prices in some cases have advanced. Quotations are as follows: Sulphate of ammonia, 2.95@3c. for spot. Dried blood, \$1.95 per unit for high grade and \$1.85 for low grade. Acidulated fish scrap, \$13.50 f. o. b. factory. Dried scrap, \$23.50@24. Azotite, \$1.80. Tankage, \$16.50@20, according to grade. Bone meal, \$22@23.

Double Manure Salts.—Quotations are about as follows for winter shipments, ex-vessel New York, in lots of 10 to 50 tons; 48%-53%, 1.18@1.28½c.; 90-95%, 2.18@2.23½c.; 96-99%, 2.21@2.23½c.

Kainit.—Some sales for future delivery have been made during the week. Quotations at New York are: \$3.75 for invoice weight and \$9 for the actual weight.

Muriate of Potash.—About 900 tons have arrived since the 16th inst., all of which have gone into consumption. Some small sales are reported.

Phosphates.—Nothing of importance has been done in this market. Prices are as follows: F. o. b. Charleston, \$5.50@5 for dried. Freighters are: \$1.50@1.75.

Messrs. Couper, Millar & Co. say: The general trade of the United Kingdom continues very depressed. Fertilizer manufacturers are experiencing increased competition, the continued fall in prices of all raw materials upsetting calculations, while the severe weather delays deliveries of manufactured manures. There has been a further serious drop in prices of all American phosphates, and the prospects in the immediate future are not by any means bright. High-class Canadian will be in very limited supply next season. Florida, 75% rock is offered at 8½d., while river pebble, testing about 60%, has been sold as low as 7½d. It is, however, now held for more money. South Carolina river and land rock offering at 7½d. per unit. Ground Somme phosphate might be secured at 11½d. for 75%, and 10½d. for 70%, c. i. f. London, or to other ports at the higher range of freights in addition. Ground Belgian and Osso there is not much inquiry for. Bedford coprolites might come at 2s., and Cambridge at 4s., free on rails.

Nitrate of Soda.—The market for nitrate on the spot is quiet, with quotations at \$1.92½@1.5. Futures (due in one month) are held at \$1.85@1.87½. August and late shipments are \$1.70.

NOTES OF THE WEEK.

Fire broke out in the fertilizer factory at P. White's Sons, on Barren Island, about 3 A. M. March 20th, and all the factory buildings were burned to the ground. The loss is estimated at over \$100,000. Practically no insurance had been placed upon the property.

Liverpool.

March 16.

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

Our market for heavy chemicals is unsettled, owing to the "coal crisis," and manufacturers decline to give any firm offers.

The only change in prices reported, so far, is an advance of 5s. per ton for caustic soda.

There are more inquiries in the market this week from buyers who are a little apprehensive of their supplies being cut off.

Soda Ash.—There are a number of inquiries in the market, but so far no large business is reported. On the spot the minimum spot quotations for the commoner qualities are as follows: Caustic ash, 48%, £5 6s. 3d. per ton; 57%-58%, £6 7s. 6d. per ton; cart ash, 48%, £5 9s. 9d. per ton; 58%, £6 12s. 9d. per ton.

Ammonia ash, 58%, £6 7s. 6d. per ton, all net cash. For special brands a considerable advance on above figures has to be paid.

Soda crystals are in request at £3 10s. to £3 12s. 6d. per ton, less 5%.

Caustic Soda.—This is the article to be affected by the coal strike, as manufacturers are economizing their fuel as much as possible for their chlorine products, and in a number of cases are shutting down their caustic soda plant. Taking advantage of the situation the "Union" this week has advanced the price of caustic soda by 8s. per ton and nearest spot values are: 60%, £9 7s. 6d. per ton; 70%, £10 10s. per ton, all net; 74%, £11 10s. per ton; 76%, £12 7s. 6d. @ £12 15s. per ton, cash. For parcels under 10 tons 5s. per ton extra is charged. The Union will not sell on this market for export to the States.

Bleaching powder is steady at £7 15s. to £8 per ton, net cash for hardwood, but nothing offering on this market for export to the States and Canada.

Chlorate of potash is practically unobtainable for prompt delivery, while for April to June 7d. per lb. is asked, and for July to December, 6½d. per lb.

Bicarb soda is firm at £6 15s. to £7 per ton less 2¼% for one cwt. kegs, according to brand and quantity, with usual allowances for larger packages.

Sulphate of ammonia is rather steadier, quotations show little change and nearest spot values are about £10 7s. 6d. to £10 10s. per ton for good gray 24% and £10 13s. 9d. to £10 17s. 6d. per ton for 25%, both in double hags less 2¼% f. o. b. Liverpool

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Deadwood, Dak., Pittsburg, St. Louis, London and Paris, see pages 365 and 368.]

NEW YORK, Friday Evening, March 25.

The mining market during the past week has been entirely featureless. The dullness continues unabated, and business appears to be at low ebb.

Comstock Tunnel stock appeared in demand during the week, 19,900 shares being sold at 16@17c. Of this company's bonds \$4,000 was sold at 27. There was a sale of 100 shares of Consolidated California & Virginia at \$5.25. Among other Comstock sales

we notice 320 shares of Ophir at \$3.10@3.15; 100 shares of Savage at \$1.55; 200 shares Yellow Jacket at \$1.25; 350 shares Best & Belcher at \$2.40@2.50; 500 Mexican at \$2@2.15; 100 Potosi at \$1.20; 100 Union Consolidated at \$1.65, and 400 shares Utah at 40c.

Of the Tuscaroras a sale of 200 shares of Nevada Queen at 75c. is reported.

Among the California stocks Bodie Consolidated shows sales of 200 shares at 51@55c. Belmont, according to the lists, had sales of 2,100 shares at 60@70c. The superintendent of this mine telegraphs as follows: "The tunnel and the shaft are connected. We will resume work in the shaft immediately."

The official sales lists show also that 16,300 shares of Brunswick Consolidated were sold during the week at 10@11c. Mr. H. R. Lounsbury, the treasurer of this company, has received the following telegram from the superintendent of the mine: "The quartz is rich. Of two assays made the first returned, \$599 gold and \$7 silver; the second, \$543 gold and \$7 silver." It is the intention of the company to drift on ledge at 600 ft. depth. The shaft is now down 565 ft.

There was a sale of 100 shares of Plymouth Consolidated at \$1.95. Standard Consolidated advanced from \$1.10 to \$1.50. During the week 625 shares were sold.

Among the Colorado stocks we note a sale of 200 shares of Breece at 35c. and 500 shares of Chrysolite at 21c. Little Chief shows transactions aggregating 1,000 shares at 25c. Sales of Leadville Consolidated this week amounted to 10,490 shares; the price declined from 19 to 17c.

Crescent, which has not been dealt in for a long time, shows sales of 1,250 shares at 15c. We note sales of 200 shares of Horn Silver at \$3.60. During the week there was a sale of 1,000 shares of Castle Creek at 3c. El Cristo shows sales of 800 shares at 55@75c. Among the Black Hills stocks there were sales of 500 shares of Father de Smet at 26@35c. Phoenix of Arizona was dealt in to-day at 45c.

Boston. March 24.
(From our Special Correspondent.)

The past week has witnessed quite an active and booming market for copper stocks, based in part upon the advance of ingot copper and in part upon the desire of the short interest to close out their contracts and get over to the other side. The indications at the close of last week pointed to a sharp advance, but it was hardly expected to be so strong as it developed, and prices were carried up to figures that could not be maintained, and a reaction naturally followed.

Boston & Montana as usual has been the leader, and the orders to buy the stock advanced the quotation from \$39 to \$45½, with reaction to-day to \$43½, a net gain of \$4½ per share for the week, which must be very gratifying to holders who have patiently waited for the good time to come. Sales aggregated over 17,000 shares. Butte & Boston also came in for good buying, which advanced the price from \$15 to \$17½, reacting to \$15½.

Calumet & Hecla scored an advance from \$268 to \$280, with a good investment demand. Later sales were at \$275, for a small lot. Tamarack opened at \$162½ and advanced to \$175, with later sales at \$170.

Centennial was quite active owing to the short interest trying to cover, and touched \$13½ as the highest price for the week. The publication of the annual report yesterday caused a desire to sell the stock to-day, resulting in a decline to \$10½, with recovery to \$11.

Franklin has been in good demand by parties who are well posted in regard to the mine and sales were made as high as \$16½, declining with the balance of the list to-day to \$15. Kearsarge sold up to \$15½, with subsequent reaction to \$14½. Osceola advanced from \$30 to \$34½, closing at \$33½, a net gain of \$3½ for the week.

Atlantic also shared in the general advance early in the week and touched \$13½ as the top price, reacting only to \$12½, at which it holds firm.

Wolverine sold up to \$3½, a gain of \$¾ for the week. Alouez was quite active and sold at \$1.55, closing at \$1½.

Arnold advanced from 80c. to \$1¼, reacting to \$1. At the close National sold up to \$2, with loss of \$½ only in final dealings.

There was quite an active trading in Santa Fe on good reports recently received from the mine, which advanced the price from 37½ to 45c. Bonanza was also active and sold up to 55c. Ridge came out at 75c. @ \$1.00.

There is more disposition to trade in the silver stocks, and Catalpa advanced from 25c. to 30c., and Crescent from 15c. to 17½. Dunkin was in good request at 40c. and Breece at the same price.

3 P. M.—The market for copper stocks shows evidence of overtrading and inclined to weakness. The advance has been very rapid and a healthy reaction will be welcomed.

We hear of sales of Quincy during the week at \$120@125. This stock should be at once restored to the list of the Exchange so that quotations may be made public.

BOSTON. March 25.

1 P. M.—By Telegraph.—Copper shares weakened still further to-day. Boston & Montana was at \$42½; Centennial, \$9½; Osceola, \$32½; Franklin, \$14½; Butte & Boston, \$15½; Kearsarge, \$13½; Atlantic, \$12½; Calumet & Hecla, \$270; Tamarack, \$175, offered.

Chicago. March 24.

The National Mining and Stock Exchange Company held on March 21st, 1892, its first annual stockholders' meeting and elected directors, viz.: Fernando Jones, vice-president; Thomas D. Randall, treasurer; A. P. W. Skinner, secretary and manager; R. C. Smyers and La Fayette Seaman, directors.

Denver.

Prices and sales for the week ending March 19th:

Company.	Open- ing.	H.	L.	Clos- ing.	Sales.
Mines.					
Allegany.....	109	02	102	01½	1,100
Amity.....	05	05	04	04	5,10
Bangkok-C.B.....	65a	55	55		5,200
Bates-Hunter.....	03½	*04½	04	03½	5,900
Brownlow.....	16½			17½	
Calliope.....	03	103½	03	03	10,600
Claudia J.....	15		11½		
Cash.....	*48a	*48	45½		5,400
Clay County.....	40a	*30	27	23	2,000
Emmons.....	48a			06	
Gettysburg.....	40	41	40	41	900
Gold Rock.....					
Leavenworth.....					
Little Rule.....					
Lexington.....					
May-Mazepa.....					
Matchless.....		275	275		100
Oro.....	03½	04½	04	04	3,500
Pay Rock.....	02	02	02	102	100
Puzzler.....	105	04	04	103½	9,000
Paul Gold.....					
Reed-National.....	105a				
Rialto.....	35a				
Running Lode.....	05			09	
Whale.....	16a	10	10		1,000
Bal. Smuggler.....	24			24	
Sutton.....					
Prospects.					
Argonaut.....	15	20	20	20	1,500
Big Indian.....	10a				800
Big Six.....	04	04	04	04	2,200
Century.....	07	08	07½	08	3,500
Diamond B.....	*04	*04	03½	03½	8,200
Nat. Gas. & Oil Co.....	07	09	07½	07	67,300
Golden Treasure.....	12	23	12	15½	1,600
Ironiad.....		¾	¾	¾	27,300
John Jay.....	16	*17½	16	15½	4,900
Justice.....		39	39		
Morning Glim.....	07			06	
Park Consolidated.....	01½	02	01½	01½	500
Potosi.....					
Total.....					167,300

* Buyer 30. † Buyer 60. ‡ Seller 60. § Seller 30. a Asked.

San Francisco. March 19.

(From our Special Correspondent.)

The mining stock market has flattened out to such an extent that to-day only 6,600 shares changed hands in both of the regular sessions. With the "chippers" ruling things, and in the absence of any news either good or bad to agitate the market, any change for the better is scarcely to be anticipated within the next few weeks. The general stagnation has been rendered still more pronounced by the termination of the Hale & Norcross, or rather by the close of that now celebrated suit so far as the plaintiff is concerned. It is regarded by mining men as a certainty that Mr. Fox will get a verdict, when the case will go to a referee who will estimate the amount due him.

Meantime Hale & Norcross stock has advanced a trifle during the week, selling on call to-day for \$1.45, as compared with \$1.10 last Friday.

The north end Comstocks were the liveliest to-day, if such a term can be applied to any stocks on the list. Consolidated California & Virginia sold for \$4.80 and later in the day strengthened 10 cents. Andes at 45c., Mexican at \$1.90, Ophir at \$2.90, Sierra Nevada at \$1.65 and Union Consolidated at \$1.55 sold steady at ruling rates, with light sales.

The middle group of Comstocks showed no strength until shortly before the close, when Hale & Norcross sold for \$1.40; Best & Belcher, \$2.40; Chollar, \$1.05; Gould & Curry, \$1.45; Potosi, \$1, and Savage, \$1.45. On call the sales of all these stocks were nominal and those recorded before the close were only in small lots.

In the Gold Hill and south end stocks, with the exception of Belcher, no variation took place in ruling prices, nor were the sales in any case of large amount.

The Belcher mine, according to latest reports, is showing up so well that this afternoon a lively demand, considering the general dullness, was displayed. Nearly 1,500 shares were sold at \$1, an advance, however, of only 10 cents during the week. Alta sold for 85 cents; Consolidated New York, 30 cents; Consolidated Imperial, 10 cents; Caledonia, 25 cents; Challenge, 80 cents; Justice, 30 cents; Overman, 95 cents; Segregated Belcher, 35 cents, and Yellow Jacket, \$1.05.

The dealings in outside stocks have been more active during the week than heretofore and at better prices.

In the Tuscarora group Belle Isle has been selling for 20 cents; Commonwealth for 10 cents; Navajo, for 20 cents; Nevada, for 65 cents; North Belle Isle, for 10 cents, and North Commonwealth, for 20 cents. Nevada Queen has shown an advance of 100%.

Of the Bodes nothing can be said but that they have barely held their own, with Bodie Consolidated selling for 45 cents, Bulwer Consolidated for 35 cents, and Mono for 80 cents.

Scattering sales have been made of Crocker at 5 cents, Peer at 5 cents, and Eureka Consolidated at \$2.

SAN FRANCISCO, March 25—(By Telegraph).—Opening quotations to-day were as follows: Best & Belcher, \$2.40; Chollar, \$1.15; Consolidated California & Virginia, \$5.12½; Gould & Curry, \$1.50; Hale & Norcross, \$1.50; Mexican, \$1.90; Ophir, \$2.95; Savage, \$1.50; Yellow Jacket, \$1.10.

The financial condition of mining companies, whose shares are listed on the San Francisco board on March 1st, was as follows:

CASH ON HAND.		INDEBTEDNESS.	
Andes.....	\$1,170	Independence.....	\$148
Alpha.....	11,184	Julia.....	8,129
Alta Con.....	43,562	Justice.....	8,723
Benton.....	72,400	Kentuck.....	2,018
Best & Belcher.....	304	Lady Washington.....	7,752
Bodie.....	5,939	Mexican.....	16,485
Bulwer.....	15,437	Mono.....	3,823
Caledonia.....	8,511	Mt. Diablo.....	5,155
Challenge.....	1,825	Occidental.....	4,502
Con. Cal. & Va.....	33,145	Peerless.....	4,091
Con. Imperial.....	1,833	Scorpion.....	3,577
Con. New York.....	1,916	Seg. Belcher.....	382
Coptic.....	3,039	Silver Hill.....	2,076
Crocker.....	5,163	Silver King.....	2,037
E. Sierra Nev.....	618	Stanard.....	36,548
Eureka Con.....	13,074	Summit.....	20
Exchequer.....	18,216	Syndicate.....	1,772
Gould & Curry.....	15,724	Union Cons.....	14,709
Belcher.....	\$30,837	Nevada Queen.....	\$6,598
Belle Isle.....	14,773	North Belle Isle.....	\$39,068
Bullion.....	7,424	North Common-wealth.....	500
Chollar.....	154	Ophir.....	7,293
Commonwealth.....	26,935	Overman.....	36,975
Confidence.....	10,601	Peer.....	\$3,986
Crown Point.....	813	Potosi.....	5,085
Del Monte.....	20,464	Savage.....	22,089
Grand Prize.....	8,606	Sierra Nevada.....	3,480
Hale & Norcross.....	14,978	Utah.....	6,270
Holmes.....	40,735	Weldon.....	766
Navajo.....	\$26,040		

* With bullion on hand of \$3,592. † With \$7,902 of bullion on hand. ‡ With \$12,800 due on pumping account. § Ore account, check for \$8,712 on hand.

St. Louis. March 23.

(From our Special Correspondent.)

Mining matters continue rather dull. Prices were much stronger, however, and dealings amounted to about 25,000 shares.

Opening at 9c., 3,000 shares of Central Silver sold at 9@8½c., followed by sales of 8,300 shares at 9@7½c. A reaction was experienced on Friday and 3,200 shares brought 9@9½c. The following day no sales were effected, the market going to 8c., and then on Monday dropping to 7@6½c., with sales 250 shares; on Tuesday 500 shares brought 6c., the market closing very weak and unsettled at 5c.

Granite Mountain opened at \$16; 75 shares sold at \$16.50@16.25, and from then on alternated between \$16 and \$16.25, selling on Tuesday 75 shares at \$16.50; it closes strong at \$16.25.

Elizabeth opened at 58½c. and closes at 56½c. On the opening figure down to 56½c., 400 shares sold, followed by a steady decline to 53½c.; on Saturday 500 shares sold at 57½@60c., and the next day saw a sale of 100 shares at 55c. Tuesday 50½c. was the best figure for 100 shares. The market closes at 56½c.

Little Albert had one sale (1,000 shares) at the present market figure, 4c. There is no inquiry for stock and little doing.

Bi-metallic was on the market this week, and from an opening of \$20, 20 shares sold at \$22.50 on Friday. The market closes very strong at \$22.75 bid.

Yuma opened at 6c., 100 shares going at that figure; subsequently it fell as low as 3c., closing at 4c.

Small Hopes advanced from 75c. to 80c.; no sales. Pat Murphy fell to 3½c., Adams rose from 85c. to 95c. and American & Nettie from 75c. to 82½c.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Am. per share.
Andes, Nev.....	38	Mar. 8	Apr. 11	Apr. 29	.25
Belcher, Nev.....	43	Mar. 8	Apr. 12	May 3	.50
Best & Belcher, Nev.....	51	Mar. 3	Apr. 7	Apr. 29	.25
Consolidated, N. Y., Fall River Cons., Cal.....	7	Mar. 10	Apr. 12	May 5	.10
Guasucaran & California, B. C.....	6	Feb. 24	Apr. 2	Apr. 25	.02
Lew Wallace, S. Dak.....	3	Feb. 16	Apr. 18	May 7	.001½
Little Pittsburg, Utah.....	1	Feb. 23	Mar. 28	Apr. 13	.01
Modoc Chief, Idaho.....	1	Jan. 28	Mar. 21	Apr. 11	.00½
Montreal, Utah.....	1	Feb. 17	Mar. 26	Apr. 13	.10½
Norway, Utah.....	1	Dec. 24	Feb. 1	July 21	.02
Overman, Nev.....	63	Feb. 10	Mar. 16	Apr. 6	.50
Peer, Ariz.....	12	Feb. 24	Apr. 6	Apr. 28	.10
Pennsylvania Con., Cal.....	1	Feb. 23	Mar. 24	Apr. 9	.05
Pine Hill.....	1	Feb. 11	Mar. 24	Apr. 15	.04
Teresa, Mex.....	7	Feb. 19	Mar. 21	Apr. 6	.10
Telegraph, Cal.....	3	Mar. 8	Apr. 16	May 2	.01½
Utah, Nev.....	14	Mar. 8	Apr. 12	Apr. 29	.25
Weldon, Ariz.....	5	Feb. 2	Mar. 15	Apr. 14	.05
Yellow Jacket, Nev.....	1	Feb. 8	Mar. 4	Apr. 2	.60

DIVIDENDS.

Cook's Peak Mining Company, dividend No. 3, of 50 cents per share, \$100,000, payable April 5th, at the office of the company, in Colorado Springs,

Colo. Transfer books close April 3d, and reopen April 6th.

Enterprise Mining Company, dividend, No. 2, of 10 cents per share, \$50,000, payable April 5th, at the office of the company, No. 33 Wall street, New York. Transfer books close April 1st, and reopen April 6th.

PIPE LINE CERTIFICATES.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.					
	Opening.	Highest.	Lowest.	Closing.	Sales.
Mar. 19.....	56 7/8	56 7/8	56 7/8	56 7/8	7,000
21.....	56 7/8	57 1/8	56 7/8	56 7/8	20,000
22.....	57	57	54 3/4	54 3/4	140,000
23.....	54 3/4	55	52 3/4	52 3/4	105,000
24.....	52 3/4	54 1/4	52 1/4	54 1/4	95,000
25.....	54 1/4	55 3/8	54 1/4	55 3/8	35,000

Total sales in barrels..... 402,000

NEW YORK STOCK EXCHANGE.					
	Opening.	Highest.	Lowest.	Closing.	Sales.
Mar. 19.....	57	57	57	57	10,000
21.....	57 1/2	57 3/4	57 1/2	57 1/2	2,000
22.....	56	56	54 1/4	54 1/4	32,000
23.....	55	55	54	54	6,000
24.....	53 1/4	54	52 1/4	54	43,600
25.....	55	55	55	55	5,000

Total sales in barrels..... 98,600

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 25th.
 PRODUCTION OF BITUMINOUS COAL for week ending March 19th, and year from January 1st.
 Statement of shipments of anthracite coal (approximated), for week ending March 19th, 1892, compared with the corresponding period last year:

Regions.	1892.		1891.		Difference.
	Tons.	Value.	Tons.	Value.	
Wyoming Region	312,708	297,171	Inc.	15,537	
Lehigh Region	78,828	97,448	Dec.	18,620	
Schuylkill Region	182,001	189,686	Dec.	7,685	
Total.....	573,537	584,315	Dec.	10,778	
Total for year to date.....	7,935,810	7,362,796	Inc.	573,014	

EASTERN AND NORTHERN SHIPMENTS.

	1892.		1891.	
	Week.	Year.	Week.	Year.
Phila. & Erie R. R.....	3,910	21,427	33,069	35,069
Cumberland, Md.....	8,049	671,925	873,101	38,533
Barclay, Pa.....	13,056	45,990	38,688	144,080
Broad Top, Pa.....	11,360	175,059	999,529	307,926
Clearfield, Pa.....	69,227	780,537	529,756	501,409
Allegheny, Pa.....	18,189	245,511	475,013	3,990,601
Beach Creek, Pa.....	39,075	494,859	501,409	475,013
Pocahontas Flat Top.....	32,475	533,097	475,013	475,013
Kanawha, W. Va.....	40,728	521,022	475,013	475,013
Total.....	275,469	3,439,427	3,990,601	3,990,601

Estimated.

WESTERN SHIPMENTS.

	1892.		1891.	
	Week.	Year.	Week.	Year.
Pittsburg, Pa.....	22,150	281,625	238,533	460,310
Westmoreland, Pa.....	44,043	396,733	130,949	829,812
Monongahela, Pa.....	8,132	96,251	130,949	829,812
Total.....	74,325	774,609	460,310	1,319,934
Grand total.....	349,794	4,214,036	4,730,413	4,730,413

PRODUCTION OF COKE on line of Pennsylvania R. R. for the year ending March 19th, 1892, and year from January 1st, in tons of 2,000 lbs.: Week, 106,762 tons; year, 1,288,220 tons; to corresponding date in 1891, 737,157 tons.

Anthracite.

The market has been firm but quiet, with quite a hopeful feeling for the future. Stocks at tide water are accumulating to a certain extent, but not nearly as much as last month. Operators report a fair demand for all sizes of coal.

A number of collieries have been shut down, some belonging to the larger collieries completely, while others for as many days in the week as is necessary to come within the allotment. This allotment of 2,500,000 tons will doubtless be exceeded but by a comparatively small amount.

The bill legalizing the Reading deal in New Jersey is in the same condition this week as last; it is still in Governor Abbott's hands, and no one can safely prophesy what his action will be although it is generally believed that he will sign it. But if he does not it is not thought that his action will have any effect either on the legality of the bill or the continuance of the deal.

The discussion of the profits of middlemen occupied the time of the New York senatorial investigating committee last Saturday. It was manifest from the testimony that no such abnormal profits could be made by the middlemen as had been previously stated. It was said also that the retail trade in New York was controlled by ten men who sometimes arbitrarily advanced the price. It was thought by the majority of the witnesses that the combination would not advance prices, but would work advantage by maintaining them.

Matthias Arnot has filed an amended bill against the Reading deal, naming as additional defendants the Lehigh Valley Coal Company, the Philadelphia & Reading Coal and Iron Company, and the Lehigh & Wilkes Barre Coal Company.

The Parish Coal Coal Company, Hanover Coal Company, Annora Coal Company, and the West End Coal Company have agreed to sell their entire product to the Reading Company. Charles Parish,

however, will continue to handle the product for the Reading Coal and Iron Company.

The Delaware, Lackawanna & Western is surveying into the Hanover field. The Ontario & Western is contemplating a new issue of bonds for the purchase of new rolling stock and the construction of terminal docks and trestles at Cornwall, as their present facilities at Weehawken are inadequate for their rapidly increasing coal business. The Wilkesbarre & Eastern, it is said, is endeavoring to secure coal lands, and not without success.

There has not been a great amount of trading in the coal stocks during the past week, the rumors having come so thick and so contradictory; first that Governor Abbott had signed the bill, then he had vetoed it, and so on.

Philadelphia & Reading opened Saturday at \$50, falling on Monday to \$54, moving irregularly through the week, and closing to-day at \$58. Sales for six days in Philadelphia were 100,129 shares and in New York 458,202 shares, a total of 557,331 shares. Delaware & Hudson was dealt in more freely during the past week, and the stock showed considerable steadiness. It opened on Saturday at \$139, rose on Monday to \$143, and then receded a point; on Tuesday it wavered a little, and to-day closed at \$142. Sales for six days amounted to 14,790 shares. Delaware, Lackawanna & Western opened on Saturday at \$158, was steady through the week, reaching \$161 yesterday, and closing to-day at \$160, bid and \$161 asked. Sales for six days amounted to 9,986 shares.

Bituminous.

The bituminous coal market is much weaker than it should be at this season. There seems to be incomprehensible attempts from certain operators to break prices to an alarming extent. The more conservative operators, however, are holding off, knowing well that the cut-rate people cannot supply the whole demand, and some of them are making contracts with their steady customers at much better figures.

It was stated by a number of soft coal men in recent interviews that if anthracite coal were raised in price to any extent, bituminous would enter into sharp competition with it, and eventually force a reduction of rates. This, however, is not believed by all, although bituminous is coming more and more into general use.

An important competitor, in the person of the Standard Oil Company, has entered the field in Chicago, where the World's Fair directors advertised for bids for the coal supply for the Fair. Among those who bid were: Weaver, Getz & Co., Shawnee coal No. 1, \$2.44 per ton; No. 2, \$2.38; Roods & Ramsey, Little Mud Creek, lump, \$2.60; New Pittsburg Coal and Coke Company, \$3.08; Silver Creek and Morris Coal Company, \$3.95, and the Standard Oil Company 70c. a barrel for oil in 1892 and 72c. in 1893. The estimate of the calorific efficiency of petroleum was three barrels of 42 gallons to the ton of coal. Estimating on this basis, the contract was awarded to the Standard Oil Company. It is thought that 225,000 gallons will be required.

The Coal River Valley Railroad to connect with the Ohio branch of the Norfolk & Western has been chartered, with a capital of \$1,000,000, to build a road up Coal River from St. Albans to Oceana, a distance of 200 miles. The incorporators have purchased 10,000 acres of coal land along the way.

The old suit pending between the Georges Creek Coal and Iron Company and the new Central Company for trespass upon coal lands has been settled out of court. The terms of settlement are not known.

There is no change in ocean freights, but there is a rather better supply of vessels.

NOTES OF THE WEEK.

The freight agents of the railroads running through the Pittsburg, Ohio and West Virginia coal fields met at Pittsburg on the 22d inst. to arrange rates for the Lake and Northwestern coal trade for the ensuing year. The Pittsburg operators complained that the rates thence were too high for successful competition with the Hocking Valley, and after a session lasting all day, the following schedule was adopted: Hocking Valley district, 85 cents per ton; Pittsburg district, 85 cents per ton; West Virginia district, \$1.02 1/2 per ton. This is a decrease of 5 cents in the Pittsburg rate and an increase of 2 1/2 cents in the West Virginia rate. The roads represented were the Pennsylvania lines, Pittsburg & Lake Erie, Lake Shore, Newport, Lake Erie & Western, Baltimore & Ohio, Hocking Valley, Columbus, Shawnee & Hocking, Cleveland, Lorain & Wheeling, Cleveland & Canton, Toledo & Ohio Central, Wheeling & Lake Erie, and Pittsburg & Western.

Boston. March 24.

(From our Special Correspondent.)

The anthracite trade is still unsettled. What buying there is mostly in a small way to piece out stocks. Prices under the circumstances are rather a-v. We quote net prices New York: Stove, \$3.75; egg, \$3.60; broken, \$3.50; chestnut, \$3.40; Lykens Valley; broken, \$4.00; egg, \$5; stove, \$5.40; chestnut, \$4.50.

Freights continue to be low from all points. We quote: From New York to Boston, 60c.; from Philadelphia to Boston, 75c.; from Philadelphia to Portland, 80c.; to Bath, 95c.; to Providence, 70c.;

from Baltimore to Boston, 90c.; Newport News to Boston, 70c.; Sound points, 60c.

In soft coal there has been great activity during the past week, almost wholly however, in contract work. In spot coal trade has been light and prices have ruled low. Coal on cars here is quoted at \$3.70 per ton.

Of late quite a number of contracts have been closed, but just what they were is hard to state. The Boston & Maine Railroad Company has closed. About 100,000 tons of the coal it bought was Clearfield. The Grand Trunk Railroad Company closed for 40,000 tons of Pocahontas. The Amoskeag Mills have closed, and so have the Hamilton Manufacturing Company, of Lowell, Mass., and the Appleton Manufacturing Company, of Lowell, Mass. Each of these concerns took about 16,000 tons. It is believed that the Arlington and Merrimac mills have not closed yet. The price generally obtained is said to be \$2.50 f. o. b.

In a retail way there is very fair business doing. Prices on about all kinds are firm. The retail trade is carrying but a light stock waiting to see what the coal combination will do before buying heavily.

We quote: Stove \$5.50; nut \$5.50; egg \$5.25; furnace \$5.25; Franklin \$6.75 @ \$7.00 all sizes; Lehigh egg \$5.50, furnace \$5.50; Wharf prices 30cts. less than the foregoing.

The receipts of coal at this port for the week ending March 19th were 35,487 tons of anthracite and 8,088 tons of bituminous, against 27,875 tons of anthracite and 39,327 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 258,981 tons of anthracite and 121,079 tons of bituminous, against 254,961 tons of anthracite and 276,262 tons of bituminous for the same time last year.

Buffalo. March 24.

(From our Special Correspondent.)

Changeable weather prevailed for several days, but the thermometer stood on an average of 22 degrees, and it was not until Wednesday that a thaw for 24 hours set in. Of course this continued cold precludes the possibility of an early opening of navigation.

There is no particular change in the coal trade. Family orders for anthracite come in sparingly; manufacturers' requirements for bituminous are moderate. Prices are unchanged, and supply fully adequate for all demands. The large stocking yards of the several companies are being steadily filled with anthracite.

The representatives of the railroads engaged in hauling soft coal met in Philadelphia a few days since, and it was agreed that the freight rates for 1892-3 should be the same as those ruling in 1891-2.

The contracts for gas and electricity for this city's use have not yet been awarded. If a five years' bargain is made private consumers of gas will also benefit to the extent of 10c. per 1,000 cu. ft. from July 1st; this is held out as an inducement by the gas companies in order to get a five-year contract.

Chicago. March 24.

(From our Special Correspondent.)

Of the wholesale anthracite trade there is little to be said; business is quiet, and tonnage moving light, but prices on all sizes of all-rail coal now coming forward are steady at \$5. We hear of no deviation from that figure, the only exception being a trifling concession by those who desire to clean up odd lots of old stock on dock or yards, and this shading is almost entirely confined to chestnut. Country trade tributary to this section is now of a hand-to-mouth character and ranges from one to ten carloads. Retail business locally and in suburban towns is fairly active and satisfactory to dealers. The continued cold weather necessitates a goodly consumption of fuel and as a large proportion of consumers laid in minimum supplies last year, the present activity is accounted for. Speculation is still rife as to price of coal at the breakers next season, but agents appear to be as much in the dark as outsiders. The majority of the larger shippers are of the opinion that stocks to be carried over at the close of the season at this point will be very light.

Bituminous coal, outside of regular contracts, is not only marked by a masterful inactivity, but it is absolutely dull. A lessened demand is noted in many lines, and though the market has been relieved of much of the glut which characterized it several weeks ago, there is still a large surplus. Miners and soft coal operators have come to the conclusion that even the absorbing capacity of Chicago is not unlimited, and the lesson learned has been to them more or less a costly one. The action of the World's Fair Exposition officials in deciding to burn fuel oil at Jackson Park is severely denounced by the trade.

Coke is naturally affected by the blowing out of the iron furnaces, but demand for foundry grade is steadily gaining.

Some of the inferior cokes have been and are selling at lower figures, while the price of "Frick Coke" is held firmly at circular rate of \$5.05 Chicago.

Quotations are \$4.65 furnace, \$5.05 foundry, Connellsville; West Virginia, \$3.90 furnace, \$2.10 foundry; New River foundry \$4.90; Walston, \$4.65 furnace, \$5 foundry.

Circular prices are unchanged at the following rates: Lehigh lump, \$6.25; large egg, \$5; small egg, range and chestnut, \$5. Retail prices per ton

are: Large egg, \$6.00; small egg, range and chestnut, \$5.75.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, \$3.15; Hocking Valley, \$3; Youghioheny, \$3.25; Illinois block, \$1.90@2; Brazil block, \$2.35.

Pittsburg. March 24.
(From our Special Correspondent.)

Coal dealers report the market dull, and prices weak all along the line. The decline in the New Orleans market is sufficient to show that stocks of Pittsburg coal in the Southern market are large. For several months the bulk of the shipments from here were sent to New Orleans. There were no shipments by the Ohio River during the week. Pittsburg operators are jubilant over the new freight rates, which are reported in another column.

CConnellsville Coke.—Trade during the week showed an improvement, notwithstanding the depression in the iron market. The week's business shows an increase of 218 cars. The average running time of the various plants of the region have increased nearly a half day, owing principally to the large number of ovens put out of blast by the Frick Company, which, rumor says, will make still further reductions.

Thirteen plants of this company, with a total of 2,441 active ovens, ran six days, and nine plants, with 2,706 active ovens, ran five days. The McClure Coke Company has 1,546 active ovens in its eleven plants; all made six days. Rainey's five plants, and others, amounting to 5,660 ovens in blast, made six days. Shipments for the week aggregated 133,434 tons, distributed as follows: To Pittsburg, 2,082 cars; east of Pittsburg, 1,650; points west of Pittsburg, 3,681; total, 7,413 cars. Prices are maintained, being the same as those established January 1st, 1891.

METAL MARKET.

NEW YORK, Friday Evening, March 25, 1892.

Prices of Silver Per Ounce Troy.

March.	Sterling Exch. ke.	London. Pence.	N. Y. Cents.	Value of sil. in \$1.	March.	Sterling Exch. ke.	London. Pence.	N. Y. Cents.	Value of sil. in \$1.
19	4 87½	41½	89½	.685	23	4 87½	40½	88½	.685
21	"	"	89½	.684	24	"	40½	88½	.684
22	"	41	89½	.682	25	"	40½	88	.680

Silver has declined rapidly and closes weak at the lowest point ever reached. No new causes of depression are at work, but the old one of large supply and small demand outside of Government purchases has produced an uneasy feeling, which will bring about in all probability lower prices still.

The United States Assay Office at New York reports the total receipts of silver for the week to be 109,000 ounces.

The Secretary of the Treasury, on the 10th inst., reported to the House of Representatives that \$569,069,806 in gold certificates were issued from July 1st, 1877, to January 1st, 1892, and \$680,708,000 in silver certificates from May 9th, 1878. Of gold certificates, \$445,088,561 were redeemed principally in gold coin or bullion, and of silver certificates, \$356,311,682 in new silver certificates. The paper money outstanding July 1st, 1886, amounted to \$921,431,194; January 1st, 1892, to \$1,097,281,512.

Platinum.—The price of platinum has been undergoing a rapid decline during the past four months. On December 1st, 1891, the metal was worth \$12 an ounce in New York; on January 1st the price had fallen to \$10.50@11, and is now \$9@9.25. The market is strong at this figure, however, and there are indications of a rise.

Quicksilver.—The quicksilver market is very quiet. Quotations remain unchanged. London £7. 2s. 6d. New York \$41.50@42.

Messrs. Joseph Bennett Bros. make the following report of the imports, exports, and stocks of quicksilver in London for the first two months of the current year:

	1890.	1891.	1892.
Imports, Jan. 1 to Feb. 29—bot- tles, about	23,069	17,007	11,763
Exports, Jan. to Feb. 29—bot- tles, about	10,389	7,330	5,997
Imports for February—bottles, about	11,853	16,505	5,573
Exports for February—bottles, about	4,611	3,370	3,572
Price per bottle, about	£9 5 0	£8 12 6	£7 2 6
Stock in London to Feb. 29—bot- tles, about	53,500	36,500	28,000

Silver Bullion Certificates.

	H.	L.	Sales.
March 19	.....	.....	.....
March 21	90	89½	19,000
March 22	89½	88½	51,000
March 23	89	88½	88,000
March 24	.....	.....	.....
March 25	88½	88½	55,000
Total sales	.....	.....	243,000

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars
Mexican dollars
Peruvian soles and Chilian pesos
English silver
Five francs
Victoria sovereigns
Twenty francs
Twenty marks
Spanish doubloons
Spanish 25 pesetas
Mexican doubloons
Mexican 20 pesos
Ten guilders
Fine silver bars

Copper.—The market has been very firm and a large business has been doing all through the week at gradually hardening prices. Hardly anything has been heard about the proposed agreement to restrict production, and to our knowledge no definite understanding has been arrived at so far, negotiations still being pending, and most likely will take some time before actually carried through. In the meantime the business which has been done was mainly *bona fide* consumers' business, and the price for Lake has now advanced to 12½¢@12¾¢. At this the Calumet and Quincy companies are entirely out of the market, but the smaller companies have freely supplied consumers. The latter are very busy indeed and are eager purchasers of all copper which is offering a little below the market value.

Should this demand continue for some time, a great proportion of the copper which had to be exported during the last eighteen months will be consumed in this country, and the relief thus given Europe, which has had to carry the burden of our overproduction for all this time must soon be felt. We hear that orders for electrical purposes have been rather large lately. Casting copper is in very good demand, and prices keep closely up to those of Lake, the quotation being 11½¢@11¾¢. In Arizona copper about 1,000 tons changed hands at 16c., but since then producers have raised their price to 10½¢@10¾¢.

The London market has been more or less guided by the quotations over here, and in the middle of the week prices for G. M. B.'s advanced to £47 5s. @£45 7s. 6d., but later on they gave way, touching £46 15s., and are closing at £46 12s. 6d. @£46 15s. for spot and £47 2s. 6d. @£47 5s. for three months prompt. Good business is reported in consumer's copper, which we quote: English tough, £48 10s. @£49; best selected, £50 10s. @£51; strong sheets, £60@£61; India sheets, £50@£50 10s.; yellow metal, 5½d.

The margin between the unrefined and the refined copper is now somewhat larger than it has been for several months past, and the probabilities are that statistics in Europe will show a considerable improvement within the next two or three months.

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

To	Copper Matte.	Lbs.	Value.
To Liverpool	.....	.....	.....
S. S. Runic	7,632 bags.	836,484	\$48,000
" Rosse	2,219 bags.	210,630	15,000
" Greece	3,013 bags.	323,856	22,800
To Hamburg	.....	.....	.....
S. S. Amalfi	80 bbils.	100,000	\$1,050
" "	128 bars.	44,816	4,930
To Rotterdam	.....	.....	.....
S. S. Werkendam	72 casks.	90,000	\$10,000
" "	1,275 pigs.	323,976	32,400
" "	1,011 bars.	161,933	17,472

Tin has shown rather great firmness, and values have advanced quite materially. Shipments from the East for the first half of the month to England and America together amounted to 1,900 tons, but, considering the light shipments of the first two months, this is not a large figure, the total shipments of March of last year having been 3,400 tons. For the first time since the middle of last year there was an actual scarcity of spot tin, for which 15c. premium was paid, and, with a firmer market in London, prices have advanced to 20@20½¢ for spot and April.

The London market has also shown great firmness, and the metal is now held at £89 15s. for spot and £90 2s. 6d. for three months.

Lead.—After a period of dullness a sudden demand has sprang up and there being few sellers, prices quickly advanced to 4½¢. and since then sales have taken place at 4½¢., but even at this figure very little is offering from the West, where the non-delivery of the Idaho ores is being heavily felt by some of the smelters.

The London market is a trifle easier and Spanish lead is quoted at £10 17s. 6d. and English at £11.

Chicago Lead Market.—H. P. Post telegraphs us as follows: "Market is strong and higher. Sales 600 tons desilverized at 3½¢@4c. At the close 4c. is bid, and 4½¢. asked."

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: "Lead is firmer and worth 3½¢. At the close offerings appear light and sellers generally look for higher prices."

Spelter has also been in good demand and is quoted somewhat higher. It is reported to us from the West that ores are rather scarce and firmly held and the demand having been good producers

were able to advance their prices somewhat, and we have now to quote 4½¢@4½¢. delivered in New York.

The English market has also advanced and the closing quotations are £21 7s. 6d. for good ordinaries and £21 12s. 6d. for specials.

Antimony is quiet but firm, Cookson's at 14½¢@15c., L. X. at 13½¢@13c. and Hallett's at 11@11½¢.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 25.

Pig Iron.—In so far as concerns the New York iron market, the main features which have characterized it for some weeks past are practically unchanged. While it is still very dull, yet there is a firmer feeling, and owing, probably, to the present low prices more activity has been experienced. Mr. B. G. Clarke, president of the Thomas Iron Company, states that it has sold a good deal of iron since the reduction of \$1.50 in its prices, and in other quarters we hear similar reports. There is a firm belief among the trade that prices will remain stationary until the fall, when an advance will be in order. Both producers and consumers show a disinclination to make contracts at current prices for long delivery. We are informed that one of the most prominent Southern furnaces refused an order for 10,000 tons at current prices, the delivery to extend over the year.

Reports of sales at low prices come from the South as usual. The representatives of those companies which manufacture standard brands assert that only in the poorer grades of the smaller furnaces—mottled or gray forge—has this taken place. From other sections of the country the reports would indicate that a more hopeful feeling prevails. We quote this week: Northern No. 1 X, \$16; No. 2 X, \$15; Southern No. 1 X, \$15.50@16; No. 2 X, \$14.50@15.

Spiegeleisen and Ferro-Manganese.—Nothing of interest can be reported of this market. The dullness which has prevailed for several weeks past has continued unabated. Quotations are as follows: 20% spiegeleisen, \$26.50@27, and 80% ferro-manganese, \$62@63.

Steel Rails.—There have been some rumors of large sales of rails by Eastern mills, but at the offices of all the prominent concerns all knowledge of these was disclaimed. The market is exceedingly quiet and devoid of features of interest. Quotations remain \$30 f. o. b. and \$30.75 tide water.

Rail Fastenings.—Nothing is doing in this market. A canvass of the most important makers fails to show that a sale of any magnitude has been made recently. We quote nominally as follows: Fish and angle plates, 1'70@1'80c.; spikes, 2'10@2'15c.; bolts and square nuts, 2'70@2'80c.; hexagonal nuts, 2'80@2'85c.

Merchant Steel.—Manufacturers report an average amount of business at unchanged prices. We continue to quote: Mushet's special, 43c.; English tool, 15c. net; American tool steel, 7@8c.; special grades, 13@18c.; crucible machinery steel, 475c.; crucible spring, 375c.; open hearth machinery, 225c.; open hearth spring, 250c.; tire steel, 225c.; toe calks, 225@250c.; first quality sheet, 10c.; second quality sheet, 8c.

Tubes and Pipe.—The usual amount of business has been done in this market during the past week. Prices remain unchanged. We continue to quote ruling discounts as follows: Butt, black, 57½%; butt, galvanized, 47%; lap, black, 67%; lap, galvanized 55%; boiler tubes, under 3 in. and over 6 in., 55%; 3 in. to 6 in., 60%.

Structural Material.—The market for structural iron and steel continues exceedingly quiet. No transaction of any magnitude has been reported during the week. Our quotations are as follows: Beams, 2'30@2'50c.; angles, 1'90@2'10c.; sheared plates, 1'85@2c.; tees, 2'40@2'60c.; channels, 2'40@2'50c. Universal plates, 2'10c.; bridge plates, 2'10c. on dock.

Old Rails.—We hear of no business doing in this market. In the absence of actual transactions upon which to base prices quotations must be regarded as nominal as follows: Old tees, \$18.50@19; wrought iron scrap, \$18@19.

NOTES OF THE WEEK.

Of the 15 furnaces in the Mahoning Valley, 10 were in blast March 15, producing 10,039 tons. The total amount of pig iron in the furnace yards through the Mahoning Valley on March 1, not including that in mills or in transit, was 52,615 tons, an increase during the month of February of nearly 11,000 tons.

A dispatch from Birmingham, Ala., yesterday afternoon says: The railroads have conceded the demand of the Birmingham iron masters for reduced rates on pig iron to points north of the Ohio River, and a reduction of about 50 cents per ton will go into effect on March 28th. As a result no iron is now moving northward, shipments being withheld till the new rate goes into effect. The reduction is believed by iron men here to make their position impregnable, and it will be followed by a corresponding reduction in the price of their product.

At a recent meeting of the Central Traffic Asso-

ciation held in Chicago, rates on pig iron, ferro-manganese, spiegelisen, manganese ore, muck bar, billets, blooms, scrap iron and steel, borings, old rails, old car wheels and axles, wire rods, mill cinder and scale, ground iron ore, skelp iron, nail plate, tack plate and tin-plate bars and cast iron pipe were reduced as follows: From Pittsburgh to Chicago, Ill., \$2.40; East St. Louis, Ill., \$2.75; Indianapolis, Ind., \$2; Cincinnati, O., \$1.80; Louisville, Ky., \$2.60; Portsmouth, O., \$1.80; Anderson, Ind., \$2; Muncie, Ind., \$2; Terre Haute, Ind., \$2.40; Buffalo, N. Y., \$1.60; Detroit, Mich., \$2; Columbus, O., \$1.70; Evansville, Ind., \$2.75; Zanesville, O., \$1.55; Ironton, O., \$1.80; Milwaukee, Wis., \$2.80; Burlington, Ia., \$3.55. The above rates, which are on car load lots of 12 tons, will go into effect on the 28th inst., and will continue in force until September 30th.

At the same meeting of the Central Traffic Association the rates on a number of articles of iron and steel manufacture heretofore taking fourth and fifth classes were reduced to fifth and sixth classes as follows:

From Pittsburgh to:	Old rate.	New rate.
Chicago, Ill.	20c.	17½c.
East St. Louis, Ind.	25	22
Indianapolis, Ind.	18	15
Cincinnati, O.	17	15
Louisville, Ky.	22	19½
Portsmouth, O.	17	15
Anderson, Ind.	18	15
Muncie, Ind.	17	15
Terre Haute, Ind.	20	17½
Buffalo, N. Y.	13	10½
Detroit, Mich.	17	15
Columbus, O.	14	11
Evansville, Ind.	21	21
Zanesville, O.	14	11
Milwaukee, Wis.	23	19½
Burlington, Ia.	32½	27

The above rates also go into effect on March 28th, and will continue in force until September 30th.

Chicago. March 23.

(From our Special Correspondent.)

This market is essentially in buyers' favor and concessions on crude iron the order of the day. Orders have been a trifle more numerous, but transactions have been small. Notwithstanding the enormous consumption of pig iron, the market gives evidence of continued weakening which can only be accounted for by the unprecedented production. The movement of block and galvanized sheets, old material and scrap iron is particularly light. Bar iron, structurals and plates are in better inquiry and demand for the very near future is more encouraging.

Pig Iron.—Demand for local coke iron is a trifle better than a week ago, but prices are probably a little worse. It would be rather difficult to say what is the lowest price on pig iron to-day, though there is a point below which large producers refuse to go, and other furnace companies have declined to duplicate prices made two weeks ago. A number of inquiries are in the market for 200 to 500 tons of coke and Southern soft iron, but the effect of the recent low quotations has made consumers diffident about placing orders, excepting for immediate requirements. There is very little doing in Southern foundry coke. Lake Superior charcoal iron continues inactive, but values are relatively firmer than on coke iron.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, \$16.75@17.25; Lake Superior coke, No. 1, \$14.50@15; No. 2, \$14@14.25; No. 3, \$13.75@14; Lake Superior Bessemer, \$16.50; Lake Superior Scotch, \$15.50@16; American Scotch, \$17@17.50; Southern coke, foundry No. 1, \$15; No. 2, \$14.50; No. 3, \$14; Southern coke, soft, No. 1, \$14.50; No. 2, \$13.75; Ohio silverles, No. 1, \$17.50; No. 2, \$17; Ohio strong softeners, No. 1, \$17.50; No. 2, \$16.50; Tennessee charcoal, No. 1, \$17.50; No. 2, \$17; Southern standard car wheel, \$20@21.

Structural Iron and Steel.—The volume of inquiry is broadening and the outlook locally very promising. The aggregate of small orders foots up a good tonnage. Regular quotations car lots f. o. b. Chicago are as follows: Angles, \$2@2.10; tees, \$2.20@2.30; universal plates, \$2.05@2.15; sheared plates, \$2.10@2.15; beams and channels, \$2.25@2.50.

Plates.—Excepting for large lots mill orders stand little chance of going forward on account of the big stocks carried by agents and dealers. Demand is improving, though tubes are very irregular. Steel sheets, 10 to 14, \$2.40@2.50; iron sheets, 10 to 14, \$2.20@2.30; tank iron or steel, \$2.10@2.15; shell iron or steel, \$3@3.25; fire-box steel, \$4.25@5.50; flange steel, \$2.75@3.25; boiler rivets, \$4.10@4.25; boiler tubes, 2½ in. and smaller, 55%; 7 in. and upward, 65%.

Merchant Steel.—Shipments of soft steels from mill are heavy and tardy, and on that account some consumers are forced to supply immediate needs from jobbing houses. There is a fair amount of new business. We quote: Tool steel, \$6.50@6.75 and upward; tire steel, \$2.25@2.30; toe calk, \$2.40@2.50; Bessemer machinery, \$2.10@2.20; Bessemer bars, \$1.75@1.90; open hearth machinery, \$2.40@2.60; open hearth carriage spring, \$2.25@2.30; crucible spring, \$3.75@4.

Galvanized Sheet Iron.—Demand is very quiet, though better than a week ago. Discounts are

weak but unchanged at 70% off on Juniata from mill, and 67½% off from warehouse, and 67½ and 5% off on charcoal.

Black Sheet Iron.—Jobbers are feeling the market, but mill agents decline to quote on contracts covering deliveries further than July. Current business is light at 285c. for mill lots or No. 27, common; dealers quote 3@3.10c. from stock.

Bar Iron.—There is a fair amount of inquiry in the market from consumers, but there is a good deal of hesitancy in closing business; prices are more or less irregular. Quotations are \$1.60 @ \$1.63 f. o. b. Chicago, though these are shaded. Warehouse orders are filled at \$1.75 @ \$1.85, as to quality.

Nails.—There is little activity in factory orders for either wire or steel cut nails. The former are weak at \$1.85 in mill lots and \$1.90 from store; steel cut are \$1.60 average specification and \$1.70 from stock.

Steel Rails.—We understand that the Eastern mills have taken general contracts for large amounts during the past two weeks, and this would appear to be a fair division, as the previous big business in heavy sections has come mostly to our local mills. Standard and light weight rails are in fair demand in small quantities from 500 to 2,000 tons, and price steady at \$31.50. Other track supplies are in moderate demand at 1'80 @ 1'85c. for steel or iron; spikes at \$2.15 @ \$2.25 per 100 lbs.; track bolts, hexagonal nuts, \$2.65 @ \$2.70.

Scrap.—The bottom is out of scrap. A sale of 400 to 450 tons of No. 1 is reported at an inside figure to a local consumer. No. 1 railroad, \$17; No. 1 forge, \$6; No. 1 mill, \$2.50; fish plates, \$18; axles, \$21; horseshoes, \$17; pipes and flues, \$9; cast borings, \$7; wrought turnings, \$9.50; axle turnings, \$10.50; machinery castings, \$10; stove plates, \$8.50; mixed steel, \$11.50; coil steel, \$14; leaf steel, \$15; tires, \$15.50.

Old Material.—Consumers now offer \$19 for iron rails, but holders want more. No transactions worth mentioning. Steel rails are weak at \$13.50@15 as to length, and old wheels are dull at \$16 in small lots; less for quantities.

Louisville. Mar. 19.

(Special Report by Hall Brothers & Co.)

The volume of business has considerably increased during the past week for deliveries scattered through the next six months. Some orders have been given out for twelve months delivery, which were taken by some furnaces, while on the other hand others are disinclined to make engagements beyond six months; prices have invariably ruled low. With the exception of one or two sales of large amounts composed of several grades, nothing beyond the ordinary trading has occurred. The exact price of the large transactions, consisting of No. 3 foundry, grey forge and bright irons for long delivery has not been made known, but it is said that grey forge has probably sold for less than \$9.25, and other grades in proportion. Stocks of iron being so very heavy, the outlook for any improvement in prices is not very encouraging.

Hot Blast Foundry Irons.—Southern coke No. 1, \$14@14.25; Southern coke No. 2, \$13@13.50; Southern coke No. 3, \$12.75@13; Southern charcoal No. 1, \$16@17; Southern charcoal No. 2, \$15.50@16; Missouri charcoal No. 1, \$17@17.50; Missouri charcoal No. 2, \$16.50@17.

Forge Irons.—Neutral coke, \$12.50@12.75; cold short, \$12.25@12.50; mottled, \$11.50@12.

Car Wheel & Malleable Irons.—Southern (Standard brands), \$18@18.50; Southern (other brands), \$17@17.50; Lake Superior, \$19.50@20.50.

Philadelphia. March 24.

Pig Iron.—The week's business in Eastern Pennsylvania shows a moderate increase over the preceding week and a remarkable increase in inquiries and offers, and in request for options not only on crude iron, but on certain finished products. At the same time it would not do to say that a general improvement is at hand, although it may be so. Prices are extremely low, and will probably continue so until the bulk of spring and early summer requirements are provided for; hence there will be very little margin in iron making for the first half of the year. Furnace people are very anxious indeed to secure business and will book all orders offered at present prices. A little uneasiness exists over the fact that two or three Southern companies have sold considerable iron for Northern delivery. Good No. 1 Pennsylvania foundry is selling at \$17, No. 2 best at \$15.50; while good Virginia irons are offered at \$16 and \$15, respectively, and some lots are being taken. Forge irons range from \$14 to \$14.50, as usual, and companies which handle large quantities say that next month will witness a very heavy demand. This statement is based upon the fact that inquiries are in this week for very large lots from quite a number of mill owners.

Muck Bars.—Only a moderate business is being done on a basis of \$25@25.25.

Steel Billets.—A good week's business has been done in steel billets, and two or three concerns have advanced quotations, nominally at least. There is talk of a firmer feeling.

Merchant Iron.—About the same condition of things exists at the merchant bar mills, and there

will be no improvement announced until the expansion in trade now probable has become more apparent.

Nails.—Nails are selling quite freely for Eastern delivery, at \$1.60 in large lots, \$1.75 for small lots.

Sheet Iron.—There is a steady increase in small orders for sheet iron, both refined and soft steel. Offers have been made for large lots of galvanized at cut rates, but were not accepted.

Merchant Steel.—There is quite a demand for small lots of merchant steel, and those who handle it expect a general improvement.

Plate Iron.—A further shading in steel plate has been made to secure large orders, and specifications are arriving daily which indicate that the market is about turning. Shell is sold as low as 2'10c. and flange 2'35c. A good deal of material will be wanted for delivery at western points, and Eastern mills will have a share of it.

Steel Rails.—Rail people have more news this week from outside markets than at home. Quotations are \$30, and small orders are being booked.

Old Rails.—Old rails are very strong at \$20; some parties are asking more.

Scrap.—The best figure paid this week for No. 1 scrap was \$20; the supply is limited.

Pittsburg. March 24.

(From our Special Correspondent.)

During the past forty-eight hours the feeling of the market has improved. There is decidedly a stronger under-current, and sales continue to show up fairly well. Iron dealers, generally, feel that the worst is about over, that prices have touched the lowest point, and that a steady improvement may be looked for in the near future. Last week's prices were fully maintained, while there are some outside furnaces still anxious to realize. There are others which show no anxiety, being satisfied that their time will come before long. A number of furnaces are now engaged on contracts made some time since for future delivery; when they are filled it is expected that better prices will prevail.

There has been as yet very little decrease in the number of furnaces in blast. The production continues at the heavy rate noted on the first of the month, especially in the South, where if anything the capacity of the stacks in blast has somewhat increased. In certain sections the railroads have shown a disposition to assist the furnaces to hold the market in the competition with the iron from other sections, and a reduction has been announced in freight rates on pig iron, from the Mahoning and Shenango valleys. There is also a probability of reduced rates of freight on coke and limestone.

Prices of iron ore have been reduced since the first of the year. A few days ago Bessemer ores, for delivery the present year, were offered at 25 cents per ton below last year's prices.

The condition of the steel rail market is unsatisfactory, regular orders being taken, and those of small proportion. One lot of 5,000 tons was taken by an Eastern mill for the Baltimore & Ohio Railroad. Prices continue \$30 at the mills.

Coke Smelted Lake and Native Ores.

4,000 Tons Bessemer, May, June, July	\$14.50 cash.
4,000 Tons Bessemer	14.75 cash.
3,000 Tons Bessemer, June, July, August	14.80 cash.
2,500 Tons Grey Forge	12.85 cash.
1,000 Tons Grey Forge	13.00 cash.
1,000 Tons Bessemer, April	14.75 cash.
1,000 Tons Bessemer	14.75 cash.
1,000 Tons Grey Forge	12.75 cash.
500 Tons Grey Forge, at furnace	12.55 cash.
500 Tons Grey Forge	12.80 cash.
500 Tons Bessemer	14.85 cash.
300 Tons Bessemer	14.75 cash.
200 Tons No. 1 Foundry	15.25 cash.
200 Tons No. 2 Foundry	14.25 cash.
100 Tons No. 1 Silvery	17.00 cash.
10 Tons No. 3 Foundry	13.50 cash.

500 Tons Cold Blast, Extra	27.00 cash.
200 Tons Hard Cold Blast	23.00 cash.
200 Tons Hard Cold Blast	24.00 cash.
100 Tons Cold Blast	25.50 cash.
100 Tons Warm Blast	21.00 cash.
100 Tons No. 3 Foundry	20.00 cash.

Steel Slabs and Billets.

20,000 Tons Steel Billets, deliverable 2,500 tons per month at maker's mill, from May to Dec. inclusive	23.37½ cash.
3,000 Tons Billets April, May, June	23.25 cash.
3,000 Tons Billets April, May, June	23.15 cash.
2,500 Tons Billets and Slabs	23.00 cash.

1,000 Tons Neutral	25.50 cash.
1,000 Tons Neutral, April, May	25.25 cash.
500 Tons Neutral, April, May	25.40 cash.

180 Tons 80% foreign delivery	62.50 cash.
100 Tons 80% foreign delivery	62.40 cash.

400 Tons Narrow Grooved	1.50 4m.
300 Tons Wide Grooved	1.57½ 4m.
200 Tons Sheared Iron	1.80 4m.

650 Tons American Fives, at Mill	32.20 cash.
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1,200 Tons Bloom and Rail Ends	17.00 cash.
600 Tons Bloom and Rail Ends	17.00 cash.

1,000 Tons Old Iron Rails	22.00 cash.
1,000 Tons Steel Mixed Lengths	16.25 cash.
750 Tons Old Iron Rails	21.85 cash.
500 Tons Old Iron Rails	22.00 cash.
400 Tons Old Iron Rails	21.75 cash.

250 Tons No. 1 R. R. W. Scrap, net	19.10 cash.
200 Tons Leaf Steel, gross	21.50 cash.
150 Tons Cast Scrap, gross	12.25 cash.

NEW YORK MINING STOCKS QUOTATIONS.

Table with columns: NAME AND LOCATION OF COMPANY, March 19, March 21, March 22, March 23, March 24, March 25, SALES. Lists various mining stocks like Adams, Alice, Amador, etc.

NON-DIVIDEND-PAYING MINES.

Table with columns: NAME AND LOCATION OF COMPANY, March 19, March 21, March 22, March 23, March 24, March 25, SALES. Lists non-dividend-paying mines like Alpha, Afta, American Flag, etc.

*Ex-dividend. †Dealt at in the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 19,774. Non-dividend shares sold 36,240. Total shares sold, 56,014.

BOSTON MINING STOCK QUOTATIONS.

Table with columns: NAME OF COMPANY, Mar. 18, Mar. 19, Mar. 21, Mar. 22, Mar. 23, Mar. 24, SALES. Lists Boston mining stocks like Atlantic, Bodie, Bonanza Development, etc.

Table with columns: NAME OF COMPANY, Mar. 18, Mar. 19, Mar. 21, Mar. 22, Mar. 23, Mar. 24, SALES. Lists Boston mining stocks like Allouez, Arnold, Axtec, etc.

Dividend shares sold, 37,785. Non-dividend shares sold, 32,894. Total shares sold, 70,179.

COAL STOCKS.

Table with columns: NAME OF COMPANY, Mar. 19, Mar. 21, Mar. 22, Mar. 23, Mar. 24, Mar. 25, Sales. Lists coal stocks like Cambria Iron, Cameron Coal, Ches. & O. R. R., etc.

San Francisco Mining Stock Quotations.

Table with columns: NAMES OF STOCKS, Mar. 18, Mar. 19, Mar. 21, Mar. 22, Mar. 23, Mar. 24. Lists San Francisco mining stocks like Alpha, Afta, Belcher, etc.

Total shares sold, 644,670.

DIVIDEND-PAYING MINES.

NON-DIVIDEND PAYING MINES.

Main table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS, DIVIDENDS, and NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS. Lists 153 dividend-paying mines and 153 non-dividend-paying mines.

Gold, Silver, Lead, Copper. * Non-assessable. + This company as the Western, up to December 10th, 1881, paid \$1,400,000. # Non-assessable for three years. The Deadwood previously paid \$275,000 in dividends and the Terra \$75,000. Previous to the consolidation in August, 1884, the California had paid \$31,200 in dividends, and the Con. Virginia 40,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. 1 This company paid \$190,000 before reorganization in 1890. ** This company acquired the property of the Raymond & Ely Company which had paid \$3,075,000 in dividends.

STOCK MARKET QUOTATIONS.

Aspen. March 21. The closing quotations were as follows:

Table listing Aspen stock prices for various companies like Agnes C., Argentinum Juniors, Aspen Deep Shaft, etc.

Baltimore, Md. March 24. Bid. Asked.

Table listing Baltimore stock prices for companies like Atlantic Coal, Balt. & N. C., Big Vein Coal, etc.

Pittsburg, Pa. Prices highest and lowest for the week ending March 24:

Table listing Pittsburg stock prices for companies like Allegheny Gas Co., Bridgewater Gas Co., Charytians Val. Gas, etc.

St. Louis. March 23. CLOSING PRICES.

Table listing St. Louis stock prices for companies like Adams, Colo., American & Nettie, Bi-Metallic, etc.

Deadwood. March 19. Bid. Asked.

Table listing Deadwood stock prices for companies like Bullion, Caledonia, Calumet, etc.

Helena, Mont. (Special report by SAMUEL K. DAVIS.)

Prices highest and lowest for week ending March 19, 1892:

Table listing Helena stock prices for companies like Bald Butte (Mont.), California (Castle), Mont., Castle Crescent, etc.

Trust Stocks.

Special report by C. I. Hudson & Co., members New York Stock Exchange. The following are the closing quotations March 25:

Table listing Trust Stock prices for companies like Am. Cotton Oil, Am. Sugar Refineries, Distillers' & Cattle Feeders, etc.

Trust Receipts.

Sales at the New York Stock Exchange for week ending March 25. Price Sales. H. L.

Table listing Trust Receipt sales for American Cotton Oil, National Lead, etc.

Foreign Quotations.

London. March 16. Highest. Lowest.

Table listing Foreign Quotations for companies like Alaska Treadwell, Amador, Cal., American Belle, etc.

Paris. March 10. Francs.

Table listing Paris stock prices for companies like East Oregon, Forest Hill Divide, Gold'n River, etc.

CURRENT PRICES.

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

Table listing Current Prices for various commodities like Acid-Acetic, Commercial, Carbonic, Chromic, Hydrobromic, etc.

Powdered, # b. 94

Table listing Powdered and other commodity prices like Marble Dust, Metallic Paint, Mineral Wool, etc.

THE RARE METALS.

Table listing prices for rare metals like Arsenic, Barium, Bismuth, Cadmium, Calcium, etc.