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THE SCIENTIFIC PUBLISHING CO., Publishers.

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CONTENTS.

PROF. JOSEPH VON EHRENWERTH, of Leoben, one of the leading metallurgical authorities of Austria, comes forward with a proposal that seems worthy of attention under certain circumstances. He notes the fact that the gas from blast-furnaces is lower in nitrogen than producer gas, the former ranging from 54 to 56 per cent, and the latter from 65 to 66. But as the ratio of carbonic acid to carbonic oxide is rarely greater than 0·3 with coal-gas producers, while with charcoal furnace gas it is 0·8 and with coke furnaces usually 0·7, rarely dropping as low as 0·5, their calorific value is much less than producer gas. He proposes to utilize them more fully by reducing a part of their contents of carbonic acid to carbonic oxide by conducting them through glowing carbon in some form, and thus regenerating them and making a gas more valuable than ordinary producer gas, on account of its lower contents of nitrogen. He computes that theoretically it would take 7·12 kilograms of carbon to regenerate 100 kilograms of producer gas, using fair coke, and that the regenerated gas would be suitable for the high temperatures needed for the open-hearth steel process. On the basis of blast-furnace practice in Styria, he estimates that, using the entire blast-furnace gas made, it would suffice for making one and a half times the quantity of open steel, as compared with the tonnage of pig-iron made. When the blast-furnace gas is used for roasting ores and for heating the blast, from one third to one half of the output of pig could be converted into steel without any further consumption of fuel. Professor VON EHRENWERTH'S proposal is regarded by European metallurgists as particularly applicable where conditions are similar to those of the iron industry of the Alps.

THE CHICAGO MEETING.

One to whom we have vowed obedience demands an account of the Chicago Meeting of the American Institute of Mining Engineers, "which will make her feel as if she had been there." Let us be thankful that the day of fighting wild beasts in the arena is over. This person would be just the person to throw a glove to the raging lion, and bid us lightly go and fetch it. But being restrained by the customs of a more refined civilization, she requires of us not the perilous, but merely the impossible. Very well; we shall, with a profound salute, toss our failure in her face!

It is not enthusiasm, or matter for enthusiasm, that fails; it is language. In earlier days, when youth was audacious and the dictionary was comparatively virgin ground, we did indeed essay this task; and many a meeting of the Institute have we portrayed in our best colors, with adjectives and exclamation-points not yet outworn; and you, Madam, have said more than once that the picture was truly saccharine—or, to quote *verbatim*, "real sweet." We trust that we have grown in knowledge since; and we would fain hope that we have not lost "sweetness" in gaining "light." Yet the effect of light on sugar is a queer thing, Madam, as the polariscopists will inform you—— But we are forgetting the emphatic provision of your command, that we "leave the science out."

Moreover, there are other difficulties. How can we tell the truth, and yet make you feel as if you had been there? When one of "the fellows' wives" (as our dear HOLLEY used to call them) deliberately absents herself from a meeting of the Institute, that fellow must console himself. And if he should afterward tell her all about it (as he will not), she would very forcibly realize that she had *not* been there! It is best to be frank, and inform you in advance that the following brief account of our doings in and about Chicago is inadequate and incomplete.

As to the science, which we are commanded to omit, we will say a word or two, just to show our manly independence. The papers and discussions of the Chicago meeting were abundant in number, and certainly not below the usual standard in interest and value. Undoubtedly the most novel and important was the paper of Mr. STETEFELDT on Russell's Lixiviation Process. The author contributed to the discussion a supplementary paper which will be published in pamphlet form for the members, and the two will be combined in Vol. XII. of the *Transactions*. Taken together, they form the most thorough essay on this subject with which we are acquainted, either in American or foreign literature—a monograph amounting to a text-book, only that it suggests even more than it communicates. It promises to inaugurate a revolution in metallurgical practice—a revolution, not the fruit of fanciful "invention," but the result of innumerable patient experiments and sure induction therefrom.

Professor CHRISTY'S admirable paper on the Miners' Fund of New Almaden worthily continued the discussion of one of the leading topics of the Cincinnati meeting. The paper of Mr. GJERS (member of the British Iron and Steel Institute, and present as a guest of the Institute) on the Rolling of Steel Ingots with their own Initial Heat, brought freshly before the Institute one of the latest improvements in the economy of the Bessemer process. The debate on Mr. SALOM'S Cincinnati paper on Chemical and Physical Tests of Steel renewed in a lively form the old conflict between the chemists and the mechanical engineers. We need scarcely say that the result is still undecided. President BAYLES, in his excellent opening address on the Study of Iron and Steel, brought forward the microscope as a "dark horse;" but the convention did not unite on him, and the "boom" failed. In fact, the chemists and the physicists don't want to agree in this matter. They are like the Indian tribes of the last century. What they want is not peace, but an agreeably varied and not too gory warfare. One scalp is trophy enough for a campaign. At Chicago, it seemed for a time as if not even that moderate glory was to be won by either party. But WEEKS, at the very end of the battle, neatly detached the coveted war-lock from the head of SALOM—more than scalped him; in fact, clove him with a hatchet of Hadfield steel. Metaphor aside, Mr. WEEKS disproved a single hasty generalization of Mr. SALOM'S paper, as to the effect of manganese in steel, by exhibiting numerous samples of extra-manganiferous steel, in which not that effect, but an illustriously different one, was demonstrated. Mr. KENT clinched the matter by citing the compounds of tin and copper to prove that nothing can be judged as to the properties of an alloy from the properties of its constituents taken separately. But in truth this was an accepted doctrine long ago. Moreover

the overthrow of this one incidental passage in Mr. SALOM's paper leaves its main structure untouched. Yet the physicists were fairly entitled to their little war-whoop and dance; and so the battle closed.

The report of the Pocahontas committee failed to arrive in time; but Mr. BUCK, of that committee, gave an interesting account of the explosion at the Pocahontas mine in March last, illustrated upon the blackboard. The committee's report will be published later. As President BAYLES made plain by his statement to the meeting, it is merely a joint paper, contributed like any other paper, and differing from any other only in the circumstance that the authors were officially requested to undertake it.

Of the numerous other papers, read in full or by title at the meeting, we can not here speak. We must say something about the social features of the meeting. In this particular, it was conspicuously delightful, though our Chicago friends, in their unbounded ambition, were not content with their own overflowing hospitality.

It is true that the simultaneous occurrence of the May Festival of Music, and the imminence of a great political convention, made the work of the Local Committee doubly difficult; but these circumstances also made their triumph doubly great. It can not be said that, among these counter-excitements, the Institute occupied the entire attention of Chicago. On the contrary, it was but the one quiet drop in a turbulent bucket. But it is hard to see how the members could have been more extensively or completely entertained—and got out of it alive! Personally, we have but two grievances. The first is, that a lovely being (No, Madam, I will not tell you her name!), after deeply engaging our admiration, preferred THEODORE THOMAS'S orchestra to our society; the second is, that we were obliged to leave Chicago too early to call upon her, because our bed at the hotel was wanted for four Republican delegates.

Concerning the excursions, particularly the visit to South Chicago—no, the visit to Pullman—no, the visit to La Salle—well, particularly all of them—they were "just perfect." The most impressive spectacle, we think, which metallurgy could offer used to be a rolling-mill; and next to that, a blast-furnace. Then the Bessemer converter came, with its mysterious hydraulic motors and its dazzling splendors of flame. When all these grand displays are united in one magnificent establishment, so complete and beautiful as at South Chicago, the total effect is indeed overwhelming. If *laborare est orare*, then such stately cathedrals of labor are worthy to stand by the side of the elder cathedrals of silent worship.

The town of Pullman is unique. From the great Corliss Centennial engine, which drives the myriad wheels of its shops, to the quiet library and tasteful theater, which provide intellectual entertainment for its inhabitants, every thing in it is charming. Some cynics in our company muttered that so much comfort and beauty bestowed on workmen could not possibly "pay," and that the public, traveling in Pullman cars, was probably unconsciously supporting this urban paradise. We do not believe that; but if we did, we should pay for our Pullman drawing-room henceforward with increased satisfaction.

There was much groaning over the early start required for Thursday's excursion. Getting up at six o'clock is, in these modern days, a hardship—until one *is* up. Then, if it be "a perfect day in June," one is heartily glad of it. The excursion to La Salle, leaving Chicago at 7.15 A.M., and returning at 10.30 P.M., turned out to be a delightful and varied series of pleasures, so excellently arranged and interspersed with rest and refreshment that fatigue was not thought of, until all was over. The Utica Company's cement quarries (underground workings, just like coal mines, only clean!) the vast zinc-works of the Illinois Zinc Company, and of Matthiessen & Hegeler; the glass-works (turning out bottles, 120 gross a day, from a Siemens tank furnace containing 225 tons of molten charge); the coal mines upon which all the other industries are based; these were enough to absorb the attention both of the studious and of the merely curious, while the elegant hospitality of Messrs. MATTHIESSEN & HEGELER, whose handsome residences received the party, crowned the enjoyment of all. But the afternoon's drive to Deer Park, with its lovely gorge and cascade, and to Starve Rock, with its fair, wide prospect and its thrilling Indian legend, was the greatest surprise and pleasure of the day. Even the Chicago members of our company were astonished to find that such wild and romantic scenery existed in the "Prairie State." We suspect that our friends at La Salle will witness hereafter a series of Chicago picnics, amounting to a "run" on the banks of the Illinois River.

It is a pity that the lake excursion to the water-works crib could not be shared by all the visiting members. But at such a meeting it is necessary to give a little time now and then to the reading of papers, and at the time of the water party the exercises in the session of the Institute were more than formal. It was the battle-royal over SALOM's paper which was in progress, and not a man would leave the room to swell the excursion set for that hour. The ladies, who abhor war, and a score or so of members, who either knew all or cared nothing about the chemical and physical tests of steel, had "cut" the session, and were already on board when the final invitation was sounded by telephone to the Institute. So they went off and had a very pleasant sail and saw the crib, and returned as wise as they would have become by staying.

The banquet—it is forbidden to say much outside about the banquets of the Institute. Their wit, wisdom, eloquence, and beauty are incommunicable. This one was one of the good old kind, noticeable, perhaps, most of all, for a novelty in the shape of a toast responded to by four gentlemen at once—to wit, an excellent quartet, who sang "The Bill of Fare" and other four-part songs in a most effective way. For our part, we had the honor of escorting ——

That is all, Madam; neither now nor hereafter will you hear the rest.

*

THE CHICAGO MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.—II.

On Wednesday, the party took a special train to visit the

SOUTH CHICAGO WORKS OF THE NORTH CHICAGO ROLLING-MILL COMPANY,

one of the most modern of our American steel plants, and therefore representing in many respects the accumulated experience of American Bessemer practice. The plant consists of four blast-furnaces, each 75 feet high and with 21-foot bosh, blowing through seven tuyeres. The plant is equipped with fourteen Whitwell stoves, 60 feet high and 21 feet in diameter, with a chimney 12·5 feet in diameter and 190 feet high. The average temperature of the blast is 1200 degrees Fahrenheit. The casting-houses are 138 by 59 5 feet, the pig being tapped into car ladles running on a track along one side of the casting-house for the direct process. Blast is furnished by eight vertical blowing-engines, built by the Cuyahoga Steam Forge Company, of Cleveland, the steam-cylinder being 36-inch bore, the air-cylinder 84 inches, and the stroke 4·5 feet, running at a speed of about 35 revolutions. They are provided with four air-pumps, one for each two engines, with 15-inch cylinders, 15-inch stroke and 28-inch stroke, running at a speed of 75 revolutions. These, and we may say almost all the machinery of the works, were designed by Mr. H. C. Kriete. Steam is supplied to the furnace plant by 72 boilers, 4 feet in diameter and 36 feet long, gas fired. The production of the furnaces ranges from 1000 to 1300 tons a week. The molten pig is carried in bogies to the Bessemer plant. The latter has been so fully and so recently described by Mr. Robert Forsyth, now of Pittsburg, at the Troy meeting of the Institute, that we must refer to it. The rail mill is provided with four Siemens ingot reheating furnaces, 24 feet long, the ingots being taken out by the usual mechanical means. The furnaces are worked by 32 producers, of which, generally, only 24 are in use, the others being in reserve. The blooming-train is a three-high 40-inch train, provided with Fritz table. It is driven by a horizontal engine with 42-inch cylinder and 48-inch stroke, and a 55-ton fly wheel, running at a speed of 60 revolutions. The ingots are cogged and the blooms delivered to the rail mill, which rolls four rails, in 21 passes in all, from the ingot. The four-rail mill is reversing, has 26-inch rolls, driven by a compound horizontal engine, with 42-inch high-pressure cylinders, 72-inch low-pressure cylinders, and 42-inch stroke, and averages 120 revolutions a minute, with an hydraulic reversing gear. The output of the mill has reached from 3600 to 3850 tons of rails, but thus far there has not been material enough to supply the steel-works and the rail mill to reach full capacity.

After partaking of lunch, the members visited the works of the Pullman Palace Car Company, a part of which fully occupied the attention of the members for many hours. To attempt to describe this monster establishment from a walk through miles of shops would be useless. They have been very fully dwelt upon recently by railroad journals.

THE SECOND SESSION.

Mr. John Gjers, of Middlesborough, England, at the invitation of the Council, presented a paper on

ROLLING STEEL INGOTS WITH THEIR OWN INITIAL HEAT.

We have in the past described Mr. Gjers's soaking-pit process. He stated that Mr. Stead, the well-known metallurgical chemist, of Middlesborough, thinks the margin of heat is ample; that is, if the heat units in an ingot brought in a furnace to the highest heat for rolling are represented by 100, then the heat in fluid steel is 150, so that one third of the total heat in the fluid steel as it is poured into the ingot-mold may be lost, and yet there would be sufficient left for rolling purposes. Mr. Gjers stated that numerous experiments have been made by actual weighing of the ingot after it left the mold and the bloom after it left the blooming-rolls, and it has proved that the loss with the pit is 0·5 per cent, or a saving of about two per cent in yield of blooms. This may not hold good in all cases in this country, where the ingots are always of large size; but the saving will be an important one, and arises from the fact that the ingot when in the pit is entirely secluded from free oxygen. Not only do the covers exclude the atmosphere; but during the soaking operation, a considerable quantity of the gas exudes from the steel and fills the pits, completely protecting the ingot. In cases where rails have been rolled off directly from the soaking-pit, the loss has been something less than one per cent, under favorable circumstances as low as 0·75 per cent; and in England, it has been shown that the loss of rolling off in one heat from the furnace is often 3 per cent, and never less than 2¼ per cent. The process is now in continuous operation in four Bessemer works in England, two of which roll off directly without any furnacing whatever; and it is to be started at the largest open-hearth steel-works in Scotland. On the continent, two Bessemer works are using the soaking-pit, a third one is just starting, and one open-hearth plant is also employing it.

This paper was briefly discussed by Messrs. Durfee, Kent, and Dr. Raymond. The lining of the soaking-pits with steel casing to prevent wear was referred to, but was not considered a matter of much importance or value.

Mr. Henry C. Freeman, of Alto Pass, Ill., read a paper on the Hydraulic Cement-Works of the Utica Cement Company, of La Salle, Ill.,

followed by the reading of a description of a gas assaying plant, by Mr. Walter Lee Brown, of Chicago.

The Secretary, in the absence of the complete report of the Committee on the Pocahontas Disaster, read its conclusions on the Pocahontas fire-damp explosion. Mr. Stuart M. Buck, the only member of the Committee present at the meeting, gave a general account of the facts gathered by it, which we shall present at length in a future issue.

On Thursday morning, the members took a special train by the Chicago, Rock Island & Pacific Railroad, provided by the local committee of members residing at La Salle and vicinity, to La Salle and Peru. On the way, the train stopped to give the members an opportunity to inspect the cement quarries of the Utica Cement Company. These works are so fully described in a paper by Mr. Henry C. Freeman, of Alto Pass, Ill., which we shall publish in a future issue, that any attempt to give details from the observations of a very brief visit would be unsatisfactory. Again taking the train, the party sped on to Peru, where the works of the Illinois Zinc Company were inspected, and then to La Salle, where a visit, too brief to do any thing like justice to the magnitude of the plant, was paid to the zinc-works of Messrs. Matthiessen & Hegeler. We trust that in a future issue we may be able to submit some details of these two works. Suffice it to say now, that they give evidence of a vigilant, never-ceasing effort to improve, not alone general administration and management, but matters of minute detail.

The party was then handsomely entertained at the residences of Mr. Matthiessen and Mr. Hegeler, and proceeded by train over the Illinois Central Bridge across the Illinois River, when they took carriages to Deer Park and Starve Rock. Your correspondent, feeling his inability to do justice to scenery by pen-pictures, joined a small number of gentlemen on a visit to the Union shaft of the Union Coal Company, to view the operation of the Harrison coal-cutter. The shaft is a vertical one, 8 by 18 feet, three compartments, reaching No. 2 vein at a depth of about 300 feet. The seam, which averages 5½ feet, is nearly flat, and is opened out in good shape. The mine is very dry. Vein 2 is worked by the pillar system, while No. 3, a better coal, 3 feet thick, is worked by the long-wall system. The upper seam is now extracted entirely by means of the Harrison machines, of which seven are in use undercutting the coal in the clay. Two men are employed with every machine, one doing the cutting proper, while the other removes the *débris* from the cutter. The price paid for labor is 2 cents a square foot undercut, to the man working the machine, and $1.60 to his helper. The compressed air is furnished by a Norwalk compressor. The coal is taken down by shots, the holes being drilled by a Rand rock-drill, specially designed for the work, and which appears to be admirably adapted for it, drilling two 4½-foot holes in nine minutes, including time for changing the position of the drill. The entire plant seems to give satisfaction.

After partaking of refreshments served at Starve Rock, an occasion which President Bayles seized to make some appropriate remarks in a humorous strain, the engineers returned to Utica, and after taking leave of their generous hosts, resumed their homeward trip, reaching Chicago at eleven o'clock.

THE THIRD SESSION

was held on Friday morning, the opening paper being entitled

NOTE ON PATCHING PLATINUM CRUCIBLES,

by H. J. Seaman, Catasauqua, Pa., who gave his method of avoiding the losses incident to keeping platinum work in repair in laboratories where much fusion work is done. He rubs the crucible and the patch, which should be of stout foil, bright with silica, or rotten-stone, welds a light platinum wire to the corner of the patch, and treats the whole for several hours with hot concentrated hydrochloric acid, washing it then with distilled water, and drying. The head of an ordinary iron rivet is rounded off by hammering, and, after being sunk in a block of hard wood, is used as an anvil. The anvil is then heated to the highest point with a gas blow-pipe, fixed in a horizontal position, and when hot, the crucible is dropped on it. The patch is held over the point of operation by means of the thin platinum wire, and a few taps of a light hammer serve to fix it to the crucible. The wire is then nipped off, and the patch firmly united to the crucible by continued tapping, the metal being kept at as nearly a white heat as possible. Mr. Seaman has now three such patched crucibles, one of which has served for at least two hundred fusions, and is still in good order.

The secretary then read a paper by Mr. J. B. Mackintosh, of New York City, on*

This was followed by a paper by Mr. William Kent on a Water-Tube Steam-Boiler at the Lucy Furnaces.

Prof. B. W. Cheever, of Ann Arbor, Mich., then presented a paper on the Estimation of Phosphorus in Iron and Steel, which was followed by the discussion, made a special order for this meeting, of Mr. P. G. Salom's paper on Physical and Chemical Tests of Steel for Boiler and Ship Plate for the United States Government Cruisers. The discussion, which was very animated, was participated in by Messrs. Kent, A. F. Hill, A. C. Marshall, of Johnstown, W. F. Durfee, and others. We shall return to the subject in an early issue.

Mr. J. D. Weeks, of Pittsburg, then presented a valuable paper on Hadfield's Patent Steel.

THE FOURTH SESSION,

which was not very well attended, began with the reading of a summary by Mr. C. A. Stetefeldt, of New York, of his paper, "Russell's Improved Process for the Lixiviation of Silver Ores," now in course of publication in our columns. Being as it is a record chiefly of elaborate experiments, its facts can only be controverted, as Mr. Stetefeldt remarks, by chemists with scales in hand. After some remarks on the importance of the subject, from a practical point of view, by Messrs. C. Kirchhoff, Jr., and H. O. Hofmann, and a few questions by other members, the Secretary read the following papers by title:

J. H. Hammond, Notes of a Visit to the Cauca Mining District, U. S. of Colombia.

J. H. Hammond, Treatment of Rebellious Ores in Mexico with Hyposulphite of Lime.

H. C. Freeman, The History of the Beginning of the Coal Trade of La Salle, Ill.

E. B. Wilson, The Wolfe Safety-Lamp.

A. F. Wendt, A Blast-Furnace with Bosh Water-Jackets and Iron Top.

A. F. Wendt, Concentration of Iron Ores.

Prof. C. A. Schaffer, Tantalite and other Minerals Associated with the Tin Ores of the Black Hills.

F. H. McDowell, Recent Improvements in Copper Smelting.

F. A. Blake, The Blake System of Fine Crushing.

E. S. Hutchinson, Coal-Dust in Colliery Explosions.

W. L. Austin, Mexican Cupellation Furnace.

Profs. B. W. Cheever and W. J. Olcott, The Segregation of Impurities of Bessemer Steel Ingots on Cooling.

A. C. Rand, A New Rock-Drill.

In adjourning the meeting, the President announced that the fall meeting would be held in Philadelphia on the first week of September.

In the evening, there was a subscription-dinner at the Grand Pacific Hotel.

* Influence of Organic Matter and Iron on the Volumetric Determination of Manganese.

THE PITTSBURG MEETING OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—III.

The first point of interest visited during the excursion on Thursday, by rail, was

THE ISABELLA FURNACES,

of which Mr. Hugh Kennedy is superintendent. One of the two furnaces was found to be in blast, the other being out. Both have a twenty-foot bosh and are 75 feet high, and are equipped with six Whitwell hot-blast stoves, each 21 feet in diameter and 70 feet high, which heat the blast to an average of 1300 degrees Fahr. The down-comer, before conducting the furnace gases to the stoves, enters a dust-catcher 8 feet in diameter. These dust-catchers, designed by Mr. Julian Kennedy, the well-known blast-furnace engineer of Carnegie Brothers & Co., appear to be gaining in favor in the vicinity of Pittsburg. The stock hoists are of the crane type. The furnaces are blown through seven tuyeres with 7-inch nozzles, at a pressure of 7½ pounds. The blast is furnished by 6 Mackintosh, Hemphill & Co. vertical engines, with 35-inch steam-cylinder, 84-inch blowing-cylinder and 4-foot stroke, worked with 90 pounds pressure. Steam is furnished by 24 gas-fired boilers, twelve of them plain cylinder boilers, 42 inches in diameter and 64 feet long; and twelve flue boilers, 47 inches in diameter and 34 feet long. The cinder is tapped into slag cars lined with fire-brick and having a capacity of 9 tons. The average daily product per furnace is 200 tons. No. 1 has, however, reached a weekly record of 1552 tons and 464 pounds, and No. 2, 1473 tons 1196 pounds.

Again taking the cars, the party were taken to the Creighton Station Glass-Works, where, with a fairly well-equipped plant, plate-glass is made, the only fuel being natural gas.

After a short run, the mechanical engineers reached the works of the Pennsylvania Salt Manufacturing Company at Natrona, which was particularly interesting, since the raw material is cryolite, a fluoride of sodium and aluminium, which is imported from Greenland. The cryolite is mixed with limestone finely crushed, is then calcined in furnaces heated with natural gas, and leached, the product being aluminate of soda, in solution, and a residue of fluoride of calcium, the latter being a waste product, of which large quantities have accumulated at the works, and for which little use has thus far been found. The aluminate of soda solution is decomposed by passing through it carbonic acid, producing monocarbonate of soda and alumina, the latter being utilized for the manufacture of alum by treatment with sulphuric acid. For the manufacture of the latter, there are two plants, the older one using brimstone, and a second, only recently completed, using Spanish pyrites, burnt in about 16 kilns. A small appliance has been put up to roast the small quantity of smalls made in crushing the lump pyrites. The works, we understood, are about to build a plant for extracting the copper from the residues by the Henderson process, so generally used in Great Britain.

After partaking of an elaborate lunch, the party took the train, and at Freeport crossed the river to the Alleghany Valley tracks, along which line the return trip was made. The first point visited was the

WATER-WORKS AT BRILLIANT STATION,

famous for the enormous sums wasted in building the water-works engines according to the designs of Mr. Lowry. The suggestive scrap-pile in front of the works was the subject of considerable interest, testifying eloquently to the many break-downs, which we understand have practically led to the reconstruction of the engines piece for piece, with the exception, possibly, of the high-pressure cylinders and the low-pressure cylinders, the latter having never, however, run for more than a few days. The boilers are run with natural gas as fuel, the city having made a contract, since contested by the Fuel Gas Company, with the Penn Fuel Company for supplying the works for one year for $44,800.

Again boarding the train, the engineers were carried to

THE LUCY FURNACES,

where the principal points of interest were an inclined stock plane, dumping the charge automatically, and a plant of Babcock & Wilcox boilers heated with blast-furnace gas. The automatic stock plane was, we believe, designed by the Brown Hoisting and Conveying Company, of Cleveland, well and favorably known in connection with wire rope conveying machinery. The stock, limestone and different grades of ore, is dumped into a car, which, reaching the top of the furnace, is automatically discharged. The saving in labor alone due to the introduction of this contrivance is said to be $7 a day; we are inclined to believe, however, that the lessened cost of labor does not by any means express its real value over the usual way of hoisting the cars, because the automatic dumping secures the important advantage of a thorough mixture of the stock. The capacity of the car, of course, is regulated by the volume of the fuel charge. Its weight is counterbalanced by a counter-weight running in a track alongside of it.

On the other side of the track, not far from the Lucy Furnaces, were

THE KEYSTONE BRIDGE-WORKS,

of which Mr. A. Gottlieb is President; Mr. C. A. Strobel, President's Assistant; Mr. Edward Thatcher, Engineer; and Mr. J. H. Springer, Super-

intendent. The shops, which cover together an area of eight acres, consist of a finishing and shearing-shop, two fitting-shops, a machine-shop, smith-shop, foundry, and carpenter and pattern-shop. The iron and steel used by the works are delivered to them in shapes. For riveting, Allan and cam power riveters are exclusively used, the former being preferred because they avoid the disadvantage of the latter, with which the pressure can not be held on the rivet for any length of time. Iron eyebars are pile welded, cheek-pieces being put on, and covered with the top and bottom plates. They are then taken to a hammer die, forged to approximate shape and thickness, and are finished on a flat anvil. The works have the largest hammers for bridge-work in the country, one being a 3-ton and the other a 5-ton hammer. Steel eyebars are generally made by upsetting and hammering. The present capacity of the works is 1500 tons a month; but when the new improvements are completed, it will reach 2000 tons a month, and will then be as large as that of any two other works in the country put together. Much of the new machinery is to be designed with special reference to the working of steel bridge work.

The next establishment visited was

THE CRESCENT STEEL-WORKS

of Messrs. Miller, Metcalf & Co., whose admirably equipped works it was unfortunately impossible to do justice to in so short a visit. The Crescent Steel-Works make all kinds of fine tool steel, helical springs, sheet-steel, etc., and have a total annual capacity of 10,000 tons. Their plant consists of 180 crucible holes, a 12-inch bar mill, two 9-inch, one 8-inch, and one 14-inch bar mill, a 14-inch muck bill, one 8-inch cold-rolling mill, two 16-inch sheet trains, twelve steam-hammers, and a cold-hammered drill-rod shop. The helical car-spring works attracted particular attention and most of the engineers lingered there. Many of them brought with them as a souvenir pieces of extremely thin sheet steel, which furnished ample proof of the high quality of the material turned out by the works.

A short run brought the party to the works of Messrs. Park, Brother and Co., where the great steam-hammers monopolized the attention of the visitors in such a manner that the warning locomotive whistle called them back to the train before they had any opportunity even to glance at the other departments of these great works.

In the evening, the banquet was held in the Monongahela House. Unfortunately, the facilities at that establishment proved so meager that it was nine o'clock when the engineers sat down to table—an hour and a half after the appointed time. This, and slow service, delayed the dinner beyond the usual hour, and had the effect of thinning the ranks. In spite of these drawbacks, a series of bright and humorous responses to toasts kept up the good humor, and made the affair a success.

On Friday morning, the party boarded the steamer Elizabeth, which one of the ladies dubbed a "wheelbarrow"—an appellation less euphonious but not less striking than the term more generally used. A brief stop was made at the

AMERICAN IRON-WORKS

of Messrs. Jones & Laughlins, where naturally the manufacture of cold-rolled shafting, in ten trains, attracted the greatest attention. We noticed that in the same department they were making cold-rolled angles, producing a beautiful product in polish. These angles, we understand, are principally used for machinery. In the same shop, a larger number of engineers clustered about the men who, with the aid of a simple machine, were giving pulleys a true running balance. The other departments of this, the largest iron mill in Pittsburg, were rushed through at a rate that left little time for noting any thing but general features.

To rolling-mill men, the new mill presented a special feature of interest in its floor, which, though expensive, possesses such striking advantages that it certainly deserves general introduction. Instead of the usual floor, paved with brick or iron plates, this floor consists of iron grating very similar to that covering the cellar openings in our cities. Below it is a pit three feet deep. Into this pit all dust, water, etc., drop through the grating, and the floor is cool at all times.

Sailing along the wooded banks of the Monongahela, the party finally landed at Braddock's, and at once proceeded to visit

THE BLAST-FURNACE PLANT OF THE EDGAR THOMSON STEEL COMPANY.

Four of the five furnaces, A, B, C, and D, were found to be in blast, E being out. Furnace A has a diameter of bosh of 13 feet, and is 65 feet high, B, C, D, and E being 20-foot bosh and 80 feet high. They have a common stock-house, 930 feet long by 62·5 by 37 feet, being an iron structure, built by the Keystone Bridge Company. A has one Whitwell and three Cowper hot-blast stoves, as modified by Mr. Julian Kennedy, and fully described in the Transactions of the American Institute of Mining Engineers. The furnace A stoves are 15 feet in diameter and 50 feet high; B and C have both one Whitwell and three Cowper-Kennedy stoves 20 feet in diameter and 55 feet high; while D and E have three 21-foot Cowper-Kennedy furnaces, 77 feet high. The average temperature of the blast is 1150 degrees Fahrenheit, blown through eight tuyeres, at an average pressure of 6 pounds. Blast is furnished by 15 blowing-engines, made by Messrs. Mackintosh, Hemphill & Co. and Messrs. Robinson, Rea & Co., of the Mackintosh, Hemphill & Co. type. The engines have 32-inch steam cylinders, with 4-foot stroke, and 84-inch blowing-cylinders. Steam is furnished by 52 boilers, 36, 42, and 50 inches in diameter, 55 and 65 feet long. All the furnaces are provided with dutch catchers, which have proved successful. All of them are now arranged for the direct process. The average capacity of furnace A is 70 tons, and that of the others, 180 tons per day. The best day's record has been 303 tons 1630 pounds; the best week's, 1804 tons; and the best month's record, 6799 tons 1030 pounds.

The pig is tapped directly into ladles mounted on a car, and taken by locomotives to

THE EDGAR THOMSON BESSEMER STEEL-WORKS,

Using three 10-inch converters, plant of the usual American type, blast of 25 pounds pressure being furnished by E. P. Allis & Co., and Mackintosh, Hemphill & Co. It has a 36-inch steam-cylinder with 4-foot stroke, and 54-inch blowing-cylinder. The Edgar Thomson Steel Company has put up a Gjers soaking-pit plant of 44 pits, 8 feet deep and 20 inches square, served by two cranes. The pits were not in use, and showed some evidence of having been cold for some time. It seems that the distance from the converters to the soaking-pits is a little too great, and that the ends showed a tendency to get cold. Jets of natural gas have been used for heating up the pits, but do not appear to have done well.

At present, therefore, the old plant of six reheating furnaces is used. The reheated ingot is put through the 36-inch three-high blooming mill, with ordinary Fritz tables. It is driven by a horizontal engine, built by Messrs. Robinson, Rea & Co., with a 36-inch cylinder and 6-foot stroke.

The average daily capacity of the Edgar Thomson converter plant is 750 tons of ingots, the best record for that period being 873 tons. The highest product per week has been 4652 tons, and 189,634 tons in a year.

The blooming-mill has a record of 803 tons in one day, and 4559 tons in one week; and the three-high rail train 714 tons in twenty-four hours, 4110 tons in one week, and 16,065 tons in one month.

The total number of men employed at the Edgar Thomson Works is 2400, and its annual capacity 180,000 tons of rails.

The most striking fact to visitors who have not for some time gone through the Edgar Thomson Works is, to note the wonderful change brought about in the character of the place by the substitution of natural gas for producer gas and for direct firing under boilers. Not one of the many stacks of the works belches forth volumes of smoke. The boiler-house is clean and neat, without any dust or smoke, and the absence of any coal or clinker makes it even trimmer than the best kept anthracite boiler-house. The works, of course, keep their plant of 32 producers in reserve.

After paying a visit to the well-appointed and commodious laboratory, to the well-lighted drawing-rooms and the elegant offices of the company, the party returned to the Elizabeth, where ample justice was done to a lunch.

Proceeding down the river, on the homeward trip, the steamer stopped at the Duquesne Forge of Messrs. Miller & Co., which some of the engineers visited, while the remainder assembled in the cabin to listen to a paper by Mr. George H. Barrus, of Boston, on a Comparison of Three Types of Modern Indicators, the Tabor, the Crosby, and the Thompson. After a general discussion, the session was closed by the adoption of a series of resolutions of thanks to those to whom the members were indebted for many courtesies extended and facilities offered.

The last stop made was at

THE HOMESTEAD STEEL-WORKS,

which some time since was purchased by Messrs. Carnegie Brothers & Co. for one million dollars. The works were originally built by a number of Pittsburg parties, many of them crucible steel-makers, and were planned by the late Mr. A. Kloman and a German engineer, now connected with a steel-works at Wheeling, West Va. The refusal of the Bessemer Steel Company, Limited, that aggregation of American Bessemer works, to allow them to use the Holley and other patents, forced them to put up a plant which, in many material points, differs from the typical American plant. The two converters are placed only a few feet above the general level, at the two long sides of the building, blowing out into the air, the cupolas being located at the one short side. Between them is the central ladle crane commanding the deep pit. The iron is tapped into a ladle, which is poured with the aid of a second crane. The bottoms are put on from above by turning the converter up. Ten ingot cranes deliver the ingots on cars on a central track, which runs them on a straight line through the short side of the building opposite the cupola to the mill immediately adjoining. To the left is the three-high blooming train, driven by a horizontal engine. To the right are two sets of Hainsworth soaking-pits, heated by producer-gas, served by two cranes. The Hainsworth pits appear to do the work of heating quite well, but the loss by oxidation, judging from the heavy crusts of scale, must be excessive. Beyond the pits are a reheating furnace and a hammer.

AN APPARATUS FOR THE MANUFACTURE OF VAPOR FUEL FOR HEATING PURPOSES.—A new improvement was introduced on the second of June at the rolling-mills of the Joliet Iron and Steel Company, says the Chicago *Inter-Ocean*, which is pronounced by mill men the most important since the introduction of the Bessemer process of steel-making. In the saving of labor and fuel, as well as other incidental expenses, it is fully as important as the direct process lately introduced at this plant which revolutionized the entire process of making rails. The invention consists of an apparatus for the manufacture of what is called vapor fuel for heating purposes, and takes the place of the present expensive system of heating the furnaces by means of coal-gas. It is called a "thermogen." Its cost is merely nominal, and it does away with a heating plant that cost $50,000, including the gas-house, and the tremendous daily consumption of coal. It is a small cylindrical concern about four feet long and eighteen inches in diameter, with a shell four inches thick. This is placed on a small furnace about seven feet long and four feet wide, and is kept when in use at a cherry-red heat, and is connected with a crude petroleum oil tank by a small pipe, and also by a steam-pipe from a twenty-five horse-power boiler. This boiler generates the hydrogen gas, and the thermogen makes the oil gas, and the two are combined by pipes that bring the two in contact, making the vapor fuel and causing the necessary combustion. Three furnaces are now heated by this vapor fuel, and the results are far more satisfactory than those obtained by means of the coal-gas system. It throws about fifty men out of employment, and saves a very cumbersome and disagreeable system of machinery. These thermogens will be introduced into all the departments of the plants where boilers are required, and will take the place of the expensive system at present in vogue for heating the boilers in the blast-furnaces, converting mill, steel mill, and machinery department. They will also be introduced into the works of the Lumbert & Bishop Wire Fence Company, and are doubtless destined to revolutionize the present system of heating in factories and mills everywhere. The aggregate amount of coal and expenses thus saved annually can not be computed, but will be very great. The inventor is a Washington mechanic. The Chicago Vapor Fuel Company is placing the thermogens in its plant.

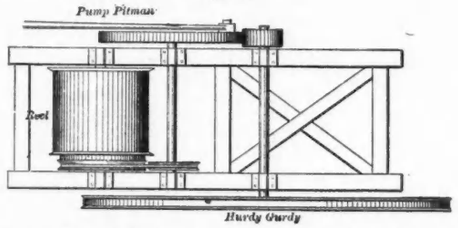
WATER-POWER WITH HIGH PRESSURES AND WROUGHT-IRON WATER-PIPE.—II.*

By Hamilton Smith, Jr., M. Am. Soc. C.E.

METHODS OF CONDUCTING WATER AND TRANSMITTING POWER.

A description of the mode of using water-power for driving the North Bloomfield tunnel in California, some years since, will give a good illustration of some of the advantages of the hurdy-gurdy. This tunnel was originally about 8000 feet long, through a slate highly metamorphosed, with its general line passing under a good-sized stream, at a depth of about 190 feet. There were eight working-shafts, each about 200 feet deep, which, with the lower entrance or portal, gave sixteen working faces. Diamond drills were used at the lower heading requiring power; the other fifteen headings were driven by hand-work. It was uncertain how much water would be encountered; but from the location, it was evident

Fig. 13.



that a large quantity might be struck in any shaft, and hence it became necessary to have ample power at hand at each opening, in readiness for such an emergency. A pipe main was laid along the general line of the tunnel, with its pen-stock 285 feet vertical above the surface at the upper shaft, and 549 feet above the lowest shaft. It was made of single riveted sheet-iron, of No. 14 (Birmingham) gauge, in lengths of 20 feet, put together stove-pipe fashion, with the joints made tight by cloth tarred strips and pine wedges. This pipe had a diameter of 15 inches at the pen-stock, diminishing from this to 13, 11, and 7 inches at its lower end. From it, short branches, 7 inches in diameter, were extended to the several shafts. It was in one place carried across the stream by a light suspension bridge, some 150 feet long, the trunk of a tree on each side forming a convenient tower. The aggregate length of the main and branches was 9960 feet, with some 2500 feet additional, for the branch to the diamond drills. The pipe was laid on the surface of the ground, its only protection being in places a couple of 1½-inch planks, tacked together, and placed over it; the range of temperature was from 10 degrees to 107 degrees Fahr. (in the shade). It was inspected by the foreman of the tunnel-work as he daily walked over the line; besides the occasional driving of a few wedges and putting on a band or two, it gave no trouble from leakage, which probably for its entire length did not amount to more than an average of 3 or 4 cubic feet a minute; from time to time, a little sawdust was put into the pen-stock. Three stop-gates were placed on the main, and a separate stop-gate at each shaft, operated by a fine-threaded screw, so that the water could be cut off when desired.

Fig. 13 shows the arrangement of the machinery for hoisting and pumping, which was identical at the several shafts, except that the hurdy-gurdies varied from 16½ feet in diameter at the upper shaft to 21 feet at the lowest shaft. The water-wheel moved only in one direction; the pinion on the wheel-shaft drove the spur-wheel, to which the pitman of the pump-bob was attached. On the spur-wheel shaft, was a friction gear, driving the hoisting-reel; this reel was mounted on sliding blocks, so that hoisting was done by putting it in gear, the empty load being dropped by a friction-band. Changing the size of the water-wheel as the pressure increased permitted the use of the same pattern of machinery at the different shafts. The water was brought to the wheel by a discharge-pipe, some 9 feet long, having a vertical movement by ball-and-socket joint, so that at pleasure, by dropping the pipe, the machinery could be run at various speeds, or entirely stopped. At the end of this discharge-pipe, was a cast tapered nozzle, about 3½ inches in diameter, in which was inserted a ring of saw-plate steel having the desired diameter, and which was held in place by an annular screw-cap. By changing the ring, which only required a few moments' time, any desired amount of water, up to 3 or 4 cubic feet a second, could be discharged against the wheel. The stop-gate was left wide open while the machinery was running. The pumping was done by eighteen pumps, of Cornish pattern; the largest amount of water pumped from any one shaft was something over 30 cubic feet a minute; the power at hand, however, was ample to pump more than twice that quantity. It was rather curious at this shaft to see more water coming from the pumps than was used on the wheel. The two diamond drills were driven by a small hurdy-gurdy set on the rear of the drill carriage. This, but at another tunnel, was afterward modified by placing a separate hurdy-gurdy on a sleeve on each drill-rod; the advance movement of the drill being given by hydrostatic pressure on an annular piston, thus doing away with all gearing. These eight sets of machinery were run for nearly 2½ years' time; the only break being that of a spur-wheel, doubtless caused by the careless dropping of a steel bar between it and its pinion. Aside from this accident, practically not a dollar was spent for repairs, and the machinery, including the pipe, was in about as good order when the tunnel was finished as when it was first erected. One man, on a twelve-hour shift, operated the machinery at each shaft, besides dumping the cars; two men kept the 18 pumps on the line in order, the principal work being in keeping the suction-pipes for the down-grade headings tight; thus a force of 18 men was only required for the 8 shafts. The cost of the pipe, gates, etc., when put in place, was $14,631, and of the machinery about $60,000.

At the Idaho gold quartz mine, situate near Grass Valley, California, water-power has been introduced during the past year (1883), taking the place of steam. The supply main is of wrought-iron, 22 inches in diameter, 8764 feet long, buried in the ground below frost-line. The joints, as a rule, are riveted together, with occasional lead joints to admit of slight movements in the pipe.* The pipe was coated by placing each joint in a bath of boiling tar and asphaltum; to insure the most thorough coating, it is necessary to keep the pipe for ten or fifteen minutes in the boiling mixture. A cast-iron stop-gate is placed at the lower end of the main, and also one at each of the branches. Cast-iron manholes are attached to the main, which, although they have given no trouble in this particular case, are very objectionable for high pressures, as it is difficult to avoid ruptures with cast and wrought-iron combined, owing to the great difference in the elasticity of the two metals. The long seams of this pipe are double-riveted, and the round seams single-riveted; at the lower end, iron of No. 6 gauge is used. From the end of the main, the water is led to the several wheels by branches of smaller diameter.

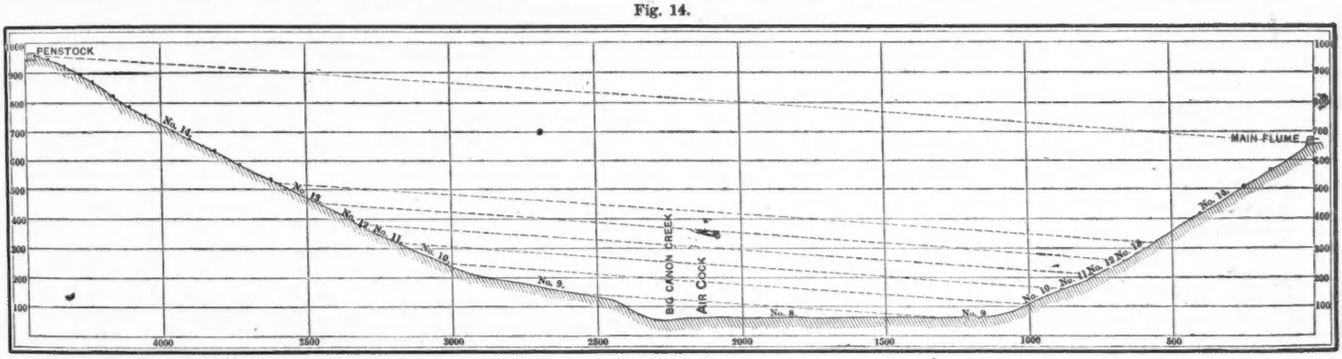
The water is delivered at the hoisting-wheel with a total head of 542·6 feet. For power and for mill uses, etc., the required supply is about 8 cubic feet a second; this draught reduces the effective head to say 523 feet.

The work done consists in driving the following described machinery:

A large air-compressor—2 cylinders, double acting, air compressed to 75 pounds—requiring about 140 horse-power.

A line of Cornish pumps, forcing the water from a depth of 1450 feet vertical; 12-inch plungers for upper 800 feet, 6-inch plungers for lower 650 feet, with 6-foot stroke, requiring from 55 to 70 horse-power.

Fig. 14.



Hoisting from a double-compartment shaft—two connected winding reels, moving separate cages—requiring 35 horse-power, or more.

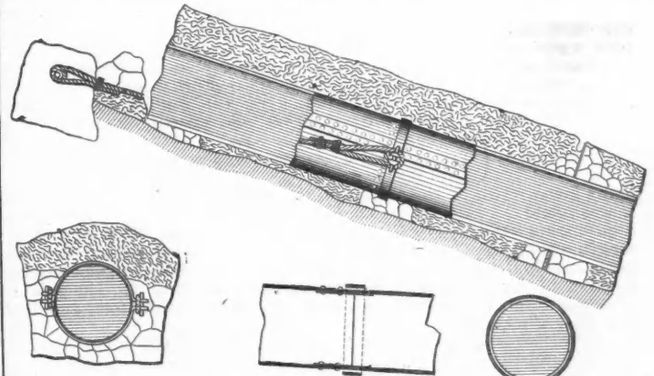
A few small machine tools and smithy forges, requiring 3 or 4 horse-power.

A 35-stamp mill, with concentrating apparatus, etc., requiring about 70 horse-power.

The total amount of power required, being say 320 horse-power, for which seven Pelton hurdy-gurdy wheels are employed.

The power in all cases is transmitted by systems of manilla rope belting; the rope is 2 inches in diameter; the grooves in the sheaves or

Fig. 15.



pulleys are slightly oval, so that the rope does not go quite to the bottom; the ropes are horizontal, and run very slack (no tighteners), with no appreciable slip; the splices are made very long, to obtain uniformity in diameter.

This method of transmitting power appears to work most perfectly,

* Read before the American Society of Civil Engineers.

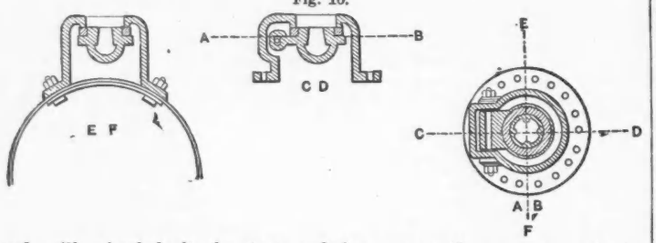
* With buried wrought-iron pipe this precaution is unnecessary, as the elasticity of the iron will admit of the movement due to changes of temperature, without injury to the rivets.

and has given excellent satisfaction. It is thought, at the Idaho, to be greatly preferable to the gearing formerly in use when the works were driven by steam (for such work as pumping or hoisting, leather or rubber belting is never used), besides being much cheaper in first cost.

The wheel driving the air-compressor is 6 feet in diameter, running 300 turns* per minute, with a $1\frac{1}{8}$-inch nozzle; three ropes are used from the wheel-shaft to the counter-shaft, and six ropes from the latter to the fly-wheel shaft.

For driving the pumps, there are two water-wheels, set on the same shaft, one 5 feet and the other 7 feet in diameter, either of which can be used at will, thus permitting different rates of speed; two nozzles are placed on each wheel, so that if necessary the power can at any time be doubled. The smaller wheel has a $1\frac{1}{4}$-inch nozzle, and runs 360 turns a minute; the larger has $1\frac{1}{8}$-inch nozzle, and makes 270 turns a minute. There are two ropes from the wheel-shaft to a counter-shaft, and four ropes to the fly-wheel shaft, on which is the pinion driving the spur-wheel attached to the pitman of the pump-bob. Hoisting is done by two wheels placed side by side on the same shaft, the buckets and nozzle of each wheel being placed in opposite directions. Both wheels are 8 feet in diameter, with $\frac{5}{8}$-inch nozzles, and make at full speed about 225 turns a minute. Reversing the movement of the shaft is done by shutting off water from one wheel, and turning water on the other wheel; the two water-gates for these nozzles are quickly opened or closed by hydrostatic pressure, afforded from the water main. In addition to the usual brakes on the winding-reels, a brake is placed on the wheel-shaft, so that it can be stopped in a very short period of time. The shock to the pipe by the almost instantaneous cutting off the water at these hoisting-wheels (nearly one cubic foot per second) has not apparently had any injurious effect. To lessen this shock, a compensating balance was designed, but which is not now in use. A wheel, of small diameter, is used for the smithy, etc., running at a very high velocity. The wheel driving the stamp-mill is 6 feet in diameter, makes 300 revolutions a minute, and is supplied through a $1\frac{3}{16}$-inch nozzle. The head of water at this point is a few feet greater than at the other wheels. Power is transmitted from the hoisting

Fig. 16.



and mill wheel-shafts by two and four ropes, the same as with the pumping rig. The amount of work done, or of water used, has not been carefully determined; judging from the indicator cards taken from the old steam-engines, the managers of the Idaho believe that an efficiency of fully 80 per cent of the theoretic power of the water is obtained, on the main driving-shafts of the machinery. The substitution of water for steam-power has resulted in a large saving of expense. Although the hills near by are covered with fine forests, thus making wood cheap, and although a round price is charged for water by the company furnishing it, the cost of water is considerably less than that of the wood formerly used as fuel. The cost of attendance is altogether in favor of the water-wheels, which hardly require any attention. The cost of the change from steam to water-power was $46,496.32.

TEXAS CREEK PIPE AND AQUEDUCT.

A description of this work will be of interest, in showing the general practice followed in California for carrying water across deep mountain gorges. In order to augment its water supply, the North Bloomfield Gravel Mining Company desired to conduct water from a stream known as Texas Creek, in Nevada County, California, across the Big Cañon branch of the South Yuba River into the main Bloomfield flume or aqueduct, which was located on the side of Big Cañon Creek, at a vertical elevation of 620 feet above the bed of the latter stream. The quantity of water to be carried was about 32 cubic feet a second (1250 miner's inches), which could be diverted from Texas Creek at a point 480 feet vertical above the Bloomfield flume. An aqueduct about 4000 feet long, partly of ditch and partly of flume, was needed to bring the water from the catchment dam on the creek to the brow of the gorge. The vertical head for the pipe could therefore be from a maximum of 460 feet down to any lesser head; with a head of 460 feet, the pipe would be 4790 feet long; and with a head of 220 feet, the length would be 4290 feet. Assuming a maximum tensile strain upon the iron of 16,500 pounds per square inch, with the formula for the greatest head of about

$$d = \left(\cdot 359 \frac{l}{h} \right)^{\frac{1}{2}}, \quad [\text{or, } v = 68 \left(\frac{d\ h}{l} \right)^{\frac{1}{2}} \text{ and } Q = 32],$$

and a lower value of the coefficient in the last equation for lesser heads, it was found, by calculation, that the least cost could be obtained with a head from 300 to 350 feet. The head fixed upon was 303·6 feet, with a length of 4438·7 feet. A profile of the pipe, with nearly the same horizontal and vertical scales (the horizontal scale showing slope lengths), is given in Fig. 14; details are given in Figures 15 and 16. The pipe was of double-riveted sheet-iron, made in lengths of about 20 feet, and of the following thicknesses:

1349	linear feet,	·083	inch thick.
220	"	·095	"
240	"	·109	"
250	"	·120	"
320	"	·134	"
610	"	·148	"
1450	"	·165	"

Some of the iron was of the very poorest quality; the pipe was made by contract in San Francisco, without the supervision of an inspector, as the contractors were a firm of good reputation; the bad quality of the iron was not detected until too late to have it corrected. Since then, the writer has always had such pipes—the mines of which he has been the manager using large quantities—made directly on the ground where they are to be used; the pipe-makers, in the latter case, always reject such sheets as are too much below in thickness the standard gauge, and those which show in passing through the rolls a bad quality of iron; tests of each joint by hydrostatic pressure would add too much to the cost.

The maximum tensile strain upon each of the seven thicknesses of iron used was intended to be 16,500 pounds per square inch. Some of the sheets were below the standard gauge, so that, in reality, the tensile strain is sometimes as high as 18,000 pounds. The mean diameter of the pipe was 1·416 feet. The entrance into the pen-stock was tapered, so that the coefficient of contraction was about ·92. For pressures not exceeding say 380 feet, the joints were put together stove-pipe fashion. For greater pressures, the joints were made by an inner sleeve riveted on one end of the joint, with an outer lap-welded band, as shown by Fig. 15; lead was run into the space between the outer band and the pipe, and then tightly driven up by calking-irons. The pipe was laid under the bed of the Big Cañon Creek, a large stream when in freshet, where the head below the hydraulic grade line was 760 feet. Some of the lead joints leaked slightly at first, but this was soon remedied by more careful calking. No man-holes or escape-gates were used. The pipe for the larger part of the year is not filled at its upper end; when such is the case, the water at the inlet carries down the pipe a great quantity of air, for which escapes must be provided to prevent a jarring or throbbing, which would soon destroy the pipe. The escape air-valves used are shown by Fig. 16. They consist simply of a heavy flap valve of cast-iron, with recess for lead filling to give greater weight, set on top the pipe, seating on a vulcanized rubber cushion, and swinging on a loose hinge. When the pipe is only partly filled with water, the valves drop down by their own weight, allowing the air to freely escape; when the water rises above the level of a valve, it is tightly closed by the resulting pressure. There are 14 of these valves, those on the lower end being designed to allow air to freely enter the pipe in case it should burst in the deeper portion, and thus prevent any collapse from atmospheric pressure. The valves have answered the desired purposes most effectually. The pipe was hauled over a road built to the inlet end, and shot down the mountain side by means of a V-shaped trough of wood. For the lower end, the joints were hauled up the cliff side into place by a crab worked by horse-power. On steep inclinations, the pipe was held firmly in place by wire ropes fastened to iron pins in the solid rock, as shown by the sketch. The covering of earth and stone was 1 foot to 2 feet in depth; with steep slopes, the earth was kept from sliding by rough dry walls, or by cedar plank placed crosswise. The pipe was laid in 1878; the first year it broke twice, owing to the wretched quality of the iron; since then, it has given no trouble, and has required practically no attention. The cost of this work—ditch and flume 4000 feet, and pipe 4440 feet—was $23,779.53.

A comparison of the relative values of n, in the formula $v = n\ (r\ s)^{\frac{1}{2}}$, for the foregoing ditch, flume, and pipe, will be instructive. The ditch has a width on the bottom of 3 feet, on the top of 6 feet, with a depth of 3 feet, and an inclination of 20 feet per mile; its sides are rough, being in part cut through the rock and with sharp curves, although fairly regular; with a flow of about 1300 miner's inches (32·8 cubic feet per second), the ditch runs about full.

Therefore:

$$a = \frac{6+3}{2} \times 3 = 13{\cdot}5;$$

$$r = \frac{a}{3{\cdot}3 + 3 + 3{\cdot}3} = 1{\cdot}41;$$

$$s = \frac{20}{5280} = \frac{1}{264};$$

$$Q = 32{\cdot}8, \text{ hence } v = \frac{Q}{a} = 2{\cdot}43; \text{ and}$$

$$n \quad \left(\text{in } v = n\ (r\ s)^{\frac{1}{2}} \right) = 33.$$

The flume is of unplaned boards, rectangular, 2·67 wide × 2·83 deep, with an inclination of 32 feet per mile. There are sharp curves, although these were made as regular as practicable; the boiling action of the water passing around these curves brought the flow line ($Q = 32{\cdot}8$) nearly up to the top of the sides; with a straight flume of the same size, the water would have doubtless stood several inches lower.

Therefore,

$$a = 2{\cdot}67 \times 2{\cdot}83 = 7{\cdot}56;$$

$$r = \frac{a}{2{\cdot}83 + 2{\cdot}67 + 2{\cdot}83} = {\cdot}908;$$

$$s = \frac{32}{5280} = \frac{1}{165};$$

$$Q = 32{\cdot}8, \text{ hence } v = \frac{Q}{a} = 4{\cdot}34; \text{ and}$$

$$n = 59.$$

With the pipe,* 1·416 diameter,

$$r = \frac{d}{4} = {\cdot}354;\ Q = 31{\cdot}69;\ v = 20{\cdot}13.$$

Allowing for loss of head due to imparting velocity to water, and for contraction,

$$s = \frac{296{\cdot}1}{4438{\cdot}7}; \text{ and } n = 131.$$

We hence have the following values of n, in $v = n\ (r\ s)^{\frac{1}{2}}$, Q being constant:

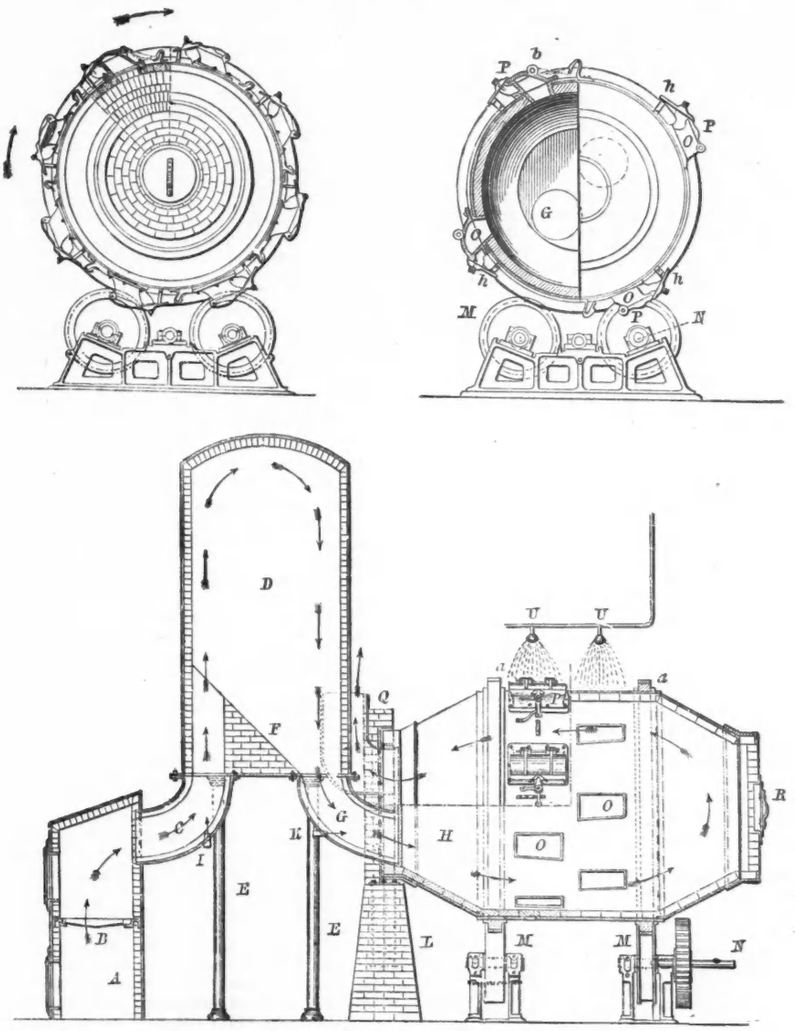
Rough ditch, with sharp curves	33
Rectangular flume, with sharp curves	59
Wrought-iron pipe, with easy curves, coated with asphalt, but with rivet-heads forming noteworthy obstructions ($m = 65{\cdot}5$, and $2\ m = n$)	131

* The revolutions per minute of these wheels, as here given, are only approximate; the design was to have the bucket speed $= \frac{1}{6}\ (2\ g\ h)^{\frac{1}{2}}$.

* *Vide* pages 120-122, Transactions American Society of Civil Engineers for 1883.

THE BRUECKNER ROASTING-FURNACE.

Mr. William Brueckner, who is well known to those interested in metallurgy in this country as the one who first introduced rotary cylinders with success for roasting sulpheret ores, has recently brought out a new design, differing in many of its features from similar appliances. The cylinder *H* has end bearings in the wall *L*, and on the rollers *M* and *N*, the latter being driven in any suitable way. It is a shell lined with brick, and is provided with a series of openings *O*, forming pockets, which are closed by the hinged door *P*, which may be closed by a catch *h*, or may be held open by a spring *b*. The object of these pockets is to provide means for the discharge of the ore, and expose it when it falls from above to the action of the current of air, doing away with any rabbling arrangements. All the buckets of one series, nearest the feeding cylinder, are formed at an incline to the cylinder, so that the ore elevated thereby is thrown toward the opposite end of the cylinder, while the second series is placed at an opposite incline to throw back the ore to be elevated by the first series. Thus the ore is continually being carried in the buckets upward until it reaches a point where the buckets begin to drop it back through the cylinder. The ore is blown into the furnace through the nozzle *I*, dropping down in the chamber *D* and sliding from the incline *F* through the neck *G* into the cylinder, where it is turned over and over in the manner already described. Its transit from the neck *G* to the cylinder *H* is facilitated by the blast issuing from the nozzle *K*. *B* is the grate, and the gases of combustion partly impelled by the blast entering the nozzles *I* and *K* take the direction indicated by the arrows, issuing through the flue *Q*, from which, of course, they pass into suitable dust-chambers.



THE BRUECKNER ROASTING-FURNACE.

PETROLEUM—ITS PROBABLE ORIGIN.

In a highly interesting article by the Right Hon. Sir Lyon Playfair, K.C.B., F.R.S., on petroleum, the light of the poor, he deals to a slight extent with the question of its origin. It is held by geologists that it is due to the charring action of heat on the pre-existing organic *débris*, on the bodies of trilobites, and remains like these are usually supposed to be the sources of it. But he asks, Is then petroleum cosmic? Perhaps the question is not so absurd as it appears, he replies. Recent observations on the tail of the great comet that adorned the heavens not long since showed that it contained hydrocarbons very similar to petroleum. "I do not mean to indicate," he adds, "that the comet was a huge petroleum lamp rushing through space; still the detection of hydrocarbon in it is a significant fact. It lends considerable support to the idea that petroleum is continually formed anew in the deeper parts of the earth. In all petroleum wells, water is also found. In the depths of the earth, there is probably a large abundance of compounds of the metals with carbon, for we find them in basaltic and other rocks. When the crust of the earth becomes fissured, water would reach them at a high temperature, and be decomposed, its oxygen passing over to the metals, while the carbon and hydrogen would unite to produce hydrocarbon, the most common form of which is petroleum. The gaseous hydrocarbons, formed by the same action, are pent up in these cavities, and, when a boring is made for a well, force up the petroleum frequently as high fountains. Wells of this substance are generally found at the base of mountain ranges, as of the Alleghanies in America or of the Caucasus in Russia. These elevations indicate cavities, fissures, or crevices below, and in these, as in a receiver, the hydrocarbons may have been distilled and become condensed. This is only a theory, but it is the one which is the most satisfactory to my mind, and, if it be true, it is a comforting one; for while we find forests disappearing from the earth, and coal exhausted without being formed afresh, petroleum—which as fuel has about twice the value of coal—is constantly formed and deposited in nature's reservoirs. I have admitted, he says, that this is nothing more than a theory, and as such the practical mind is accustomed to look upon it with contempt. But theories are the leaves of the tree of knowledge, nourishing it while they survive, and even when they fall, they give new nutriment to the parent stem. We probably may soon have a better theory, and when it comes, we shall embrace it."

Thus writes Sir Lyon Playfair in 1884. Now let us see, says the *Engineer*, what a Russian chemist said on the same subject several years ago. M. Dimitri Ivanovitch Mendelejeff, on whom in 1882 was conferred the Davy medal by the Royal Society, is principally known for the calculations by which he certainly has in one case foretold the atomic weight of a new element—the metal gallium, which he made out to be ekaaluminium. He had, at an earlier period, visited the source of the petroleum in the Caucasus, and in the summer of 1876 the spots of like import in Pennsylvania, and he has been led to form a new hypothesis regarding the source of this mineral oil. It has been supposed by many in various countries that petroleum is a product of the decomposition of organic remains. This he combats, because the occurrence of the petroleum on the earth's surface shows that it has a desire to rise, which is no doubt due to the fact that oil is lighter than water; and because, in the sandstones, in which much petroleum is contained, there are no charred organic remains found, which must be where the organic remains are, if in this way the oil had its origin. Moreover, it is impossible to conclude that this and this only is the product of the charring. As, however, in the Caucasus it is found in the Tertiary, and in Pennsylvania in the Devonian and Silurian beds, the spot where it is produced must lie at a greater depth. But in the older beds than the Silurian there can have lived but very few organisms, and therefore the theory that it is produced by the charring of organic remains is a very improbable one. Considering the hypothesis of La Place regarding the development of the earth at the outset, the law of Dalton respecting the original condition of vapor, of the constituents of the globe, and the density of the globe, taking into consideration the density of the vapor of the elements, it appeared to Mendelejeff necessary to assume the existence of a collection of metals in the interior of our globe. If now we suppose that among the metals iron prevails—this view was propounded long since, chiefly from the increased density of the interior—which does not appear to be improbable, since it is found in considerable quantity in meteorites, and in the constitution of the sun; and if, moreover, the existence of carbon compounds of these metals be allowed, it will serve not only to explain the mode of formation of the petroleum, but to make conceivable all those peculiarities under which it is found in certain localities where the earth-beds, in consequence of the upheaval of the mountain ranges, must have suffered a break on the interior face. Through a fracture produced in such a manner, the water passed down to the carbon compounds of the metals, and, acting upon them at high temperatures and pressures, metallic oxides and saturated hydrocarbons are the result. The latter rise in the form of vapor to those layers of the earth's surface where they can condense, and the porous sandstones, where many oil products can be taken up, are saturated with them. With such an explanation of the genesis of petroleum, many other natural phenomena may be explained: The prevalence of elements of low atomic weight on the earth's surface; the distribution of petroleum in straight lines or in large circles; the connection which has been traced with vulcanism, which has been noticed by several scientific men, and especially by Abich;

the magnetic phenomena of the globe, and many other natural phenomena. The further metamorphosis of petroleum, the formation of mine gas and saturated hydrocarbons out of it, the chemical composition of petroleum from various regions, and of salt water, which invariably accompanies it—all these points only require a continuous study, which, in connection with future geological investigation of facts, will tell for or against this hypothesis.

Curiously enough, up to the year 1870, there had not been found anything that by its composition favored this view, either in the earth's crust or among the meteorites which have fallen on the earth's surface, and have reached our hands. But in that year, Baron Nordenskjöld, who was at the time in Greenland, found some remarkable masses of what was at the time supposed to be meteoric iron. Some weighed from eighteen to twenty tons, and a Swedish gun-boat was sent the following year to bring them home. Unlike meteoric iron, it was found that they were insoluble in acid; they consist largely of carbide of iron and oxide of iron; when heated, they evolve 100 times their volume of gas, which chiefly consists of carbonic oxide and a little carbonic acid; the iron now becomes brighter in appearance, and soluble in acid. The composition of the supposed "iron" was found by Wöhler to be:

Iron	80·64	Sulphur	2·82
Nickel	1·19	Carbon	3·69
Cobalt	0·49	Oxygen	11·09
Phosphorus	0·15		
			100·07

Iron carbide is not found in meteoric iron. These blocks had been inclosed in the basaltic cliffs of Ovifak, which by weathering had set them free; and they fell down the face of the cliff to between high and low water-mark, where they were found. These more or less metallic blocks must have been erupted from the interior with the basalt in which they were inclosed, and after the investigations carried on by chemists, who are especially experts at meteorites at most centers of cultivation, have been pronounced to be terrestrial rather than meteoric. In them, then, we have the material which the theory propounded by these chemists has sought for.

RUSSELL'S IMPROVED PROCESS FOR THE LIXIVIATION OF SILVER ORES.—VI.*

With Critical Remarks on other Methods of Copper, Silver, and Gold Extraction.

By C. A. Stetefeldt, New York City.

The choice of method will depend on local circumstances, namely, cost of chemicals, freight, etc. As the most simple in execution, the third method recommends itself, and where freights are high, it will also be the most economical. Regarding such a solution, it becomes a question of importance to have it so constituted that it produces a maximum effect with the smallest quantity of reagents consumed in its preparation. Mr. Russell has investigated the subject, and his results are very interesting and surprising.

If one of the heavy metals is precipitated by an alkaline polysulphide, RS_x, one equivalent of the latter precipitates not more than one equivalent of the former $(x-1)$, S being liberated as free sulphur. It seems, however, that there are exceptions to this rule, if the heavy metal exists in the form of a hyposulphite salt, and the alkaline polysulphide has been prepared in a certain way, and is of a peculiar molecular constitution.

If sodium polysulphide is obtained by boiling caustic soda with sulphur, the equation:

$$6NaHO + 2(x+1)S = Na_2S_2O_3 + 2Na_2S_x + 3H_2O$$

shows that for 100 parts of caustic soda used, the sodium polysulphide solution can not precipitate more than 180 parts of silver as Ag_2S, according to the theory stated first above. Hence 100 parts of commercial caustic soda, containing say 87 per cent NaHO, the remainder being sodium carbonate and sulphate, would have a maximum precipitating energy of 156·6 parts of silver only. In preparing sodium sulphide from caustic soda of such quality, Mr. Russell found that its precipitating energy for silver out of a hyposulphite solution was in many cases far in excess of the theoretical limit, depending upon the original concentration of the solution in caustic soda. I will illustrate this by selecting a few examples from numerous experiments:

Solutions prepared by heating 1000 c.c water and			Silver precipitated per	
	Caustic soda.	Sulphur.	100 Caustic soda.	100 Sulphur.
No. 1	400 gm.	400 gm.	95 gm.	95 gm.
" 2	150 "	150 "	108 "	108 "
" 3	100 "	100 "	151 "	151 "
" 4	50 "	100 "	174 "	87 "
" 5	25 "	30 "	245 "	204 "
" 6	20 "	15 "	250 "	333 "
" 7	20 "	20 "	282 "	282 "
" 8	20 "	30 "	282 "	188 "

The commercial caustic soda here used contains 87 per cent NaHO.

For a better understanding regarding consumption and effect of sulphur, I will state that, for the formation of different polysulphides, the following quantities of sulphur would be required:

100 caustic soda of 87 per cent require	46·4	sulphur to form	Na_2S
" " " "	69·6	" "	Na_2S_2
" " " "	92·8	" "	Na_2S_3
" " " "	116·0	" "	Na_2S_4
" " " "	139·2	" "	Na_2S_5

The results of experiments No. 4 to No. 8 show that a great deal more silver has been precipitated than the generally accepted theory demands. This fact can only be explained by assuming the following reaction to take place:

$$x\,Ag_2S_2O_3 + Na_2S_x = x\,Ag_2S + Na_2S_2O_3 + (x-1)\,SO_2 + (x-1)\,S.$$

The free sulphuric acid formed produces a secondary effect, which may be:

1st. To neutralize sodium carbonate, or free caustic soda, if such be present.

2d. To decompose sodium polysulphide with formation of H_2S and Na_2SO_4.

The former would precipitate more silver from $Ag_2S_2O_3$, and set S_2O_2 free, which again may combine with carbonate or caustic soda. Free S_2O_2, however, does not exist, and if it does not combine in *statu nascendi* with caustic soda, if such be present, it will decompose into $SO_2 + S$. The following equation will illustrate this for $x = 3$:

$$5Ag_2S_2O_3 + 3Na_2S_2 = 5Ag_2S + Na_2S_2O_3 + 2Na_2SO_4 + 2SO_2 + 8S.$$

In such cases, the effect would be 261 silver precipitated per 100 caustic soda of 87 per cent. If, however, we assume that a part of the free sulphuric acid was consumed in neutralizing sodium carbonate or caustic soda, then the precipitating coefficient of the solution would be very much increased.

The question presents itself: Is there any economy in using a sodium sulphide solution of this character?

A considerable loss in hyposulphite is indicated by the reaction, which, in this case, decomposes more hyposulphite than it regenerates. If this loss had to be made good by adding fresh quantities of the salt to the lixiviation solution, then there would be no economy at all in using such a precipitant. Even by allowing hyposulphite to be formed, purposely, by oxidation of the sodium sulphide solution, no advantage would be gained. The new reaction could be utilized in part, with a profit, only in cases where the character of the ore is such that the lixiviation solution gains considerably in hyposulphite with an ordinary precipitant.

Mr. Russell preserved a number of sodium sulphide solutions, obtained in his experiments, for five weeks in glass bottles, excluded from contact with air. Upon testing their precipitating capacity again, he found that a decided change had taken place. Some of the solutions had increased in strength, others had decreased in a more or less marked degree. The increase was noted with the concentrated solutions, the decrease with the more diluted ones. This shows that a molecular change must have taken place in the composition of the sodium polysulphides.

Solutions of calcium polysulphides of different concentration, and prepared in different ways, kept five weeks as noted above, had degenerated in every instance to such an extent that the old solutions precipitated only ½ to ¼ as much silver as they did originally when fresh. Here again we meet with another proof of the superiority of the sodium sulphide solution.

The question how the best sodium sulphide solution is to be prepared is not yet completely solved. The function which determines the result is a very complicated one. Mr. Russell will give to the Institute a monograph on the subject at some future time.

B. Calcium and Sodium Sulphides compared as Precipitants for Silver.

G. Kuestel states—and this has been copied by others—that in using calcium polysulphide, the sulphides precipitate quicker and settle better than with a sodium polysulphide. This statement is not confirmed but contradicted by Russell's experiments. In working on a large scale, the sulphides precipitated by sodium monosulphide or polysulphide settled without difficulty and in a short time, and the effect of calcium sulphide did not show itself to be superior in any respect. On the contrary, sodium monosulphide proved to be infinitely better than calcium pentasulphide. Indeed, it is not possible to advance theoretical reasons to support the superiority of calcium polysulphide. Using the pentasulphide, which is mostly obtained, four equivalents of sulphur are wasted, and appear as free sulphur in precipitating the lixiviation solution. To regain this free sulphur either by distilling the sulphides in an iron retort, or by boiling them with caustic lime, as has been proposed, seems to me objectionable, and not profitable. The distilling process would leave the sulphides in a condition requiring pulverizing for subsequent treatment, and the operation needs an expensive plant, and is costly. In boiling the sulphides with caustic lime, we run the risk of having impurities of the lime, and insoluble calcium monosulphide, and sulphate, with the sulphides, whereby their treatment becomes more difficult. A much better method would be to boil the sulphides with an excess of caustic soda. The solution so obtained could be treated with more sulphur, and converted into a normal solution for precipitating.

Another point against the use of calcium sulphide is the fact that gypsum is precipitated with the sulphides, whereby their subsequent treatment becomes more troublesome.

Mr. Russell found that calcium sulphate is practically "insoluble in a solution of calcium sulphide." (And also in sodium sulphide.) Hence no gypsum can enter the lixiviation solution from this source directly. If to a calcium sulphide solution a soluble sulphate is added, for instance, that of sodium, a precipitate of gypsum appears immediately; and if to a sodium hyposulphite solution, containing sodium sulphate, or any other sulphate, calcium sulphide is added, gypsum is formed which in part remains in solution, and in part is thrown down with the sulphides.

The fact that calcium sulphate is insoluble in a sodium sulphide solution can be turned to a practical account in removing from the latter any sodium sulphate it may contain. It is only necessary to add gradually a solution of calcium sulphide as long as a precipitate appears. In preparing sodium sulphide from caustic soda, the amount of sulphate formed is trifling; but the commercial caustic soda may contain an appreciable percentage of sulphate beforehand.

I now turn to the question: In what respect, if in any, differ the calcium and sodium hyposulphite solutions regarding their efficiency in lixiviation? The points to be considered are: *a.* The deterioration of the solutions after prolonged use. *b.* Their dissolving energy for extracting silver. *c.* Their dissolving energy for extracting gold, in case gold-bearing silver ores are lixiviated.

The last subject has already been treated in a former paragraph on gold extraction especially.

(TO BE CONTINUED.)

* Read at the Cincinnati Meeting of the American Institute of Mining Engineers.

MINING IN CHINA.—The Empress of China has ordered the Viceroy of Yunnan to start public companies to open mines in Yunnan to procure gold, silver, and copper ores.

NATURAL GAS AT PITTSBURG.—The gas-well recently struck on the Westinghouse premises, Pittsburg, Pa., is beleved to be the largest in the country. Gas was found at a depth of 1660 feet, and two feet lower the flow was the heaviest ever encountered. This opens a new region, and being in the city limits, the benefits resulting to the industries of the place will be great.

FURNACE, MILL, AND FACTORY.

J. H. Hillman, manufacturer of charcoal pig, at Hematite, Ky., has made an assignment. The liabilities are reported at $60,000, and the assets are valued at from $25,000 to $30,000.

The Bessemer Steel Company, Wheatland, Pa., four stacks, capacity, 30,000 tons, has been out of blast for many months, and is to be torn down and rebuilt. These furnaces were built nine years ago.

The Hydraulic Power Company has purchased a third pair of Rand compressors for its works at Iron Mountain, Mich.

The rolling-mill of the Reading Iron Works resumed operations June 2d, after being idle several weeks. The lap-weld furnace No. 2 and a turn-up furnace in the pipe mill also started. About 200 men are given employment by the resumption.

The Vulcan furnace at Newberry, Mich., has begun shipping pig metal.

The Lane & Bodley Company, Cincinnati, Ohio, recently erected a new shop building which it has equipped with new and first-class tools for the manufacture of a high grade automatic cut-off engine.

A pocket-knife has been patented by Mr. George Freund, of Durango, Colo. It is designed for miners' use, to facilitate the cutting and capping of a fuse. The knife has a notch in the handle-case and one in the blade, the latter having a screw-thread formed on its bottom to press a screw-thread on the end of a fuse placed in the notch of the handle.

The Granite Iron Rolling-Mills of the St. Louis Stamping Company have put in an additional blower of large size to drive the charcoal and hollow fires. The "hollow fire" furnace, which has recently been built and put in operation, is a novelty in this country.

Through the unskillful tapping of a blast at the Cleveland Rolling-Mill Company's new furnace on the morning of June 2d, fifty tons of melted metal rushed out, overspreading every thing in the vicinity, and fatally burning two men.

The Virginia Nail and Iron-Works, Lynchburg, have been incorporated with a capital of $100,000

The Lukens rolling-mills at Coatesville, Pa., have put their puddling and stock mill down to single turn, owing to an increasing output of steel plates in their finishing mill, which makes less demand for iron stock.

The jury in the suit of the New England Iron Steamship Company to recover some $6,000,000 for breach of contract from the old Gilbert (now Metropolitan) Elevated Railroad Company, disagreed May 29th, after a trial of weeks in the Superior Court before Judge O'Gorman. The iron company alleged that it had made a contract in 1873 to construct the rail for $735,000 a mile and $23,000 additional for curves. This agreement was not carried out, and subsequently a contract was made with the New York Loan and Improvement Company, at $2,000,000 a mile, and then this company made a sub-contract with the Edge Moor Iron Company for a part of the work, leaving the Loan Company, it is alleged, a profit of $305,000 a mile. The defense was, that the New England Company was insolvent in 1873, and unable to fulfill its agreement.

All the furnaces of the Brier Hill Iron and Coal Company, Youngstown, Ohio, are in blast.

The new furnace erected by the Youngstown Steel Company, Ohio, is producing thirty tons a day of pure dephosphorized metal.

The reorganization of Brown, Bonnell & Co., Youngstown, Ohio, will be soon effected.

Sir Titus Salt and Messrs. Sleath and Donaldson, of the Dayton Iron and Coal Company, Saltaire, England, have concluded a contract with Mr. J. P. Witherow, of Pittsburg, for the erection of an iron plant in Eastern Tennessee, to consist of two large blast-furnaces, the counterparts of the Isabella, of Etna. The cost will be between $350,000 and $400,000.

The Lidgerwood Manufacturing Company, of New York, has recently shipped to the Atlanta Hill Gold Mining and Milling Company, of Atlanta, Idaho, one of its improved patent friction-drum and brake and reversible link motion combined hoisting-engines complete. This engine has double cylinders, 10 inches bore and 12 inches stroke, with hoisting-drum 54 inches diameter, and is of sufficient capacity to run a double-compartment shaft 600 feet deep. These combination engines are claimed by the makers to be superior to any engine yet designed for mining purposes.

Laviolette & Co.'s foundry and machine shop, at St. Jerome, Quebec, was destroyed by fire June 4th, causing a loss of $12,000.

The Hendy & Meyer Engineering Company has been incorporated at Denver, Colo., with a capital stock of $200,000. The directors are Arthur Hendy, Herman H. Meyer, Henry R. Wolcott, James H. Man, and Edward O. Wolcott. The object of the company is the carrying on of a general machinery and foundry business.

A charter has been issued at the State Department at Harrisburg, Pa., to the Lackawanna Iron and Steel Company, of Scranton. The capital is $100,000.

The Osceola Mining Company, of Michigan, is receiving bids for the building of a one thousand horse-power hoisting-engine, 20-inch cylinders, five-foot stroke, with latest improved valve motion, which will be used for hoisting at No. 3 shaft.

RAILROAD NEWS.

The Rich Hill, Appleton & Brownington Company has been organized to build a railroad from Rich Hill, Mo., east by north through Appleton to Brownington, in Henry County, a distance of about forty miles.

A company has been formed at Rochester, New York, to build a coal road from the branch of the Erie south of that city to Charlotte, on Lake Ontario. This will give the Erie and Delaware, Lackawanna & Western roads another coal outlet. The capital stock is $1,000,000. Rochester, Buffalo, and Warsaw people are the incorporators. The name of the road will be the Erie, Rochester & Lake Ontario Terminal.

The Board of Directors of the Northern Pacific Railroad Company have authorized the letting of the work of construction for the second section of twenty-five miles east from Tacoma, in the direction of the Green River and Stampede Pass, Washington Territory.

The monthly statement of the Norfolk & Western Railroad for April shows gross earnings, $211,522; expenses, $132,922; net earnings $78,599. The regular shipments of coal and coke from Pocahontas, interrupted by the mine explosion of March 13th, were partially resumed in the latter part of April, but not in time for a marked effect upon the earnings. The increase of gross earnings is mainly due to other business, and the restoration of tariff rates on through freight. The increase of expenses is due to the increased volume of freight business, and to the expenses of the New River Division.

A decision was rendered June 2d continuing the injunction of the Pottsville & Mahanoy Railroad Company against the Philadelphia & Reading Railroad Company. This is the last of the pending injunction cases between the rival railroad interests, and the result is regarded as a final decision in favor of the Pottsville & Mahanoy Company.

The receivers of the Wabash Railroad will apply to the United States Court for power to abrogate the present leases of the branch lines, and make new ones on lower interest rates.

Advices from Spokane Falls, Idaho, say that the railroad from that city to the Cœur d'Alène mines will be commenced as soon as it receives the charter from Washington. Most of the right of way and depot grounds have been secured. The first thirty miles will be up the Spokane Valley.

The annual meeting of the Pennsylvania Railroad Company was held at Pittsburg, June 3d. The annual report submitted showed the net profits of the company to be as follows: Total revenue, $2,175,837. Deduct expenses, interest on bonds, etc., $303,008, and there is left $872,829, out of which was paid a four per cent dividend on the capital stock of $800,000, leaving a surplus for the year 1883 of $72,829. The election of directors resulted as follows: G. B. Roberts, H. H. Houston, Wistar Morris, Henry M. Phillips, Edmund Smith, J. R. Dubarry, J. P. Wetherill, A. J. Cassatt, John P. Green, W. H. Barnas, Philadelphia; J. N. McCullough, William Shaw, and Thomas D. Messler, Pittsburg. The organization of the board was postponed until June 6th, at Philadelphia.

The Philadelphia & Reading Railroad and Coal and Iron companies have gone into the hands of receivers for the second time. The United States Circuit Court, at Philadelphia, on June 2d, appointed Messrs. Edwin M. Lewis, President of the Farmers and Mechanics' Bank; Stephen A. Caldwell, President of the Fidelity Trust Company; and George De B. Keim, President of the Reading Railroad Company, receivers, and ordered them to file their individual bond for $500,000, which they did. President Keim issued the following official announcement from the company's main office June 2d: To the Share and Bondholders of the Philadelphia & Reading Railroad Company: I think it due to all interested in the securities of the company to say that no apprehension should be felt in consequence of the appointment of receivers, the company having cheerfully acquiesced in the application for a receivership, believing it a wise and prudent measure for the protection of every one owning either the stock or bonds of the company. The same day, the receivers issued a circular, making the formal announcement that the employés of the two companies would be retained. The circular says that the wages certificates issued by the railroad company, and the obligations for supplies, materials, and labor issued in May by both companies, will be redeemed at maturity by the receivers out of the income of the properties. All overdue wages of both companies not yet settled for by wages certificates will be paid in cash, due notice being given of the times and places of payment. George M. Dallas has been appointed by the United States Circuit Court as master under the receivership of the Philadelphia & Reading Railroad Company.

The case of the Commonwealth against the New York, Lake Erie & Western Coal and Railroad Company to show cause why the charter of the latter should not be annulled was argued before Judge Mayer, of Elk County, in Philadelphia, June 4th. The suit is based on a charge made by the Commonwealth that the company has issued bonds for $3,000,000, which is $1,500,000 in excess of the amount authorized by the charter of the company. The matter was held under advisement by Judge Mayer. Another suit is pending between the same parties growing out of the same matter, by which the Commonwealth seeks to escheat the 30,000 acres of land in Elk County granted to the company.

LABOR AND WAGES.

The representatives of nine State Bureaus of Labor Statistics are about to meet at St. Louis, in order to simplify investigations. The States now having such bureaus are Massachusetts, New York, New Jersey, Pennsylvania, California, Illinois, Ohio, Michigan, and Missouri.

The conference committee of iron manufacturers and the Amalgamated Association met at Pittsburg, Pa., May 31st, and signed last year's scale of wages, with the addition of 20 per cent on steel nails and sheets, as demanded by the employés. The conference, which was in session only a short time, was very harmonious. Its action averts a strike and insures steady work to the 100,000 employés of the iron mills of the country for one year. The iron-workers and all concerned are jubilant over the amicable settlement of the threatened trouble.

Reports from Monongahela City, Pa., state that the delegate convention of the coal miners of the third pool unanimously decided, May 31st, to strike against the ¼ cent reduction in the mining rate. Fifteen hundred men will be affected.

Five hundred laborers employed by Collins Brothers, contractors for the South Pennsylvania Railroad, struck at Somerset, Pa., June 5th. The contractors will pay the strikers off, when trouble is expected, as about 200 Italians, who are among the most turbulent, will be discharged.

COAL TRADE NOTES.

ALABAMA.

At the Peterton mines, Briarfield, Bibb County, owned by the Briarfield Iron and Coal Company, only one mine is worked, but more are to be opened. The coal ranges from 2 feet 6 inches to 5 feet. The miners receive 60 cents a ton for all over three feet. Any thing under a yard, 70 and 75 cents.

The Belmont coal mines, in the northern part of the State, suspended May 29th, on account of the failure of Grant & Ward of this city. U. S. Grant, Jr., was the principal stockholder.

COLORADO.

On the property of the Colorado Coal and Iron Company, at Crested Butte, a shaft will be sunk or an open cut run, for the purpose of locating the coal on the hill back of the mesa, at a sufficient elevation to run the chutes. As soon as the coal is located, an entry will be driven twelve feet wide, with an air-course of ten feet. The entry to be driven will be double-tracked. As soon as the matter of rates can be settled with the Rio Grande, the company will put up additional coke-ovens. The old Skinner bank will be reopened at once, for the purpose of supplying coal for domestic use throughout the State. The company will also build a large number of houses for the miners, and erect a large office in the immediate vicinity of the works.

MARYLAND.

The Consolidated Coal Company, at Cumberland, working five mines, turned out, June 2d, 3833 tons of coal, the largest output of one company in a single day in the history of this region, with, perhaps, one exception.

The reports for the week ended May 27th from Frostburg show that mining at the different works of the Consolidation Coal Company was a little better last week than the week previous. One of the main headings in the New Hope mine took a set yesterday morning, necessitating the immediate suspension of all work in that section of the mine. A number of men were put to work immediately putting timber up, and in a short time the heading was made secure. The Alleghany mine, which supplies the Cumberland rolling-mill and all the Cumberland & Pennsylvania Railroad engines running east of Frostburg with coal, made five full days last week. The miners at this mine average about one car one day and two the other on full-time. The Border Drift continues to work half-time. Eckart & Huffman mines are running nearly full-time. All the mines are crowded with men. The Borden shaft has been a little slack the past few days. Scarcity of orders is said to be the cause. Nearly all the miners in this mine are working on the double-shift system. Blaen Avon mine is working considerably better the past week or so. The Midlothian mine, which is nearly worked out, takes the lead of any mine. In this immediate vicinity, they continue to work steadily, and the miners make very fair wages. The Ocean mines are moving along quietly, running about full-time. The Miller mine makes a run for ten or twelve days, sometimes more, each month, and gives their men all they can do.

OHIO.

The miners in the various works at Nelsonville are averaging about half-time. The indications are, that the dullness will prevail in the coal trade until the lake trade opens up.

At Chapman, the Youngstown Coal Company's switch from the Pittsburg, Fort Wayne & Chicago Railroad is being put down. Mountain, steady and wil

be finished in three weeks. Coal trade here seems dull. Willow No. 5, which was preparing to resume operations, has orders to suspend. Burton, Ridgeway & Co. will begin opening a new shaft soon between Chapman and North Lawrence.

The State Line and Prospect Hill mines at East Palestine are both working.

PENNSYLVANIA.

The question of the prices paid for coal in Philadelphia, Pa., was brought before councils June 2d, and provisions were instituted for an official investigation of the charges that have been made of discriminations against the city. A special committee of five members has been appointed to examine the charges that have been made against the coal-carrying and coal-producing companies of so discriminating against the city that citizens are compelled to pay higher prices for the coal they consume than is charged for the same article in New York, Boston, and other points.

ANTHRACITE.

A new coal stripping is to be commenced shortly to uncover the flat portion of the Mammoth vein, lying on the flat between No. 3 slope and the Tresckow swamp. It is expected that the work will be done by contract, and that from 75 to 100 men will be employed.

The gangway of the Tunnel colliery, at Ashland, fell in May 30th, and buried George Story, a miner. Fifty other miners had a narrow escape from instant death.

The Delaware & Hudson Coal Company will erect a large breaker at its Baltimore Red Ash Slope colliery, near Wilkes-Barre, shortly after the new shaft there sinking is completed.

A new shaft is to be sunk near No. 8 colliery, Coal Dale.

The order suspending work at Preston, No. 2, has been countermanded for the present.

A party of Allentown capitalists has leased 1000 acres of land one mile east of Beaver Meadow, and will shaft for coal.

At Lawrence colliery, a slope is sinking on the Buck Mountain vein from the surface to the fourth lift. Tunnels are also driving from the Mammoth to the smaller veins.

It is rumored that the tunnel to the Buck Mountain vein, at Swatara, will be stopped if it is not reached soon: it is feared that the vein has basined before attaining the depth at which the tunnel is driving.

BITUMINOUS.

At Sewickley, No. 4 mine is doing quite well, employing about 250 men. Three cents a bushel over an inch and a half screen is the price paid for mining. Amieville mine is also doing well, and the same price is paid here.

At Scott Haven, Ocean mines Nos. 1 and 2 are working very well since April 1st, and are likely to continue so all summer. No. 1 employs about 250 men, and No. 2 about 125. Three cents a bushel over an inch and a half screen is the price paid for mining.

The mines along the Low Grade Division are reported as running slowly. The Hard Scrabble miners are still out on strike. The Falls Creek and Dagus mines, each employing a large number of men, are closed; the former on account of some trouble about the size of the screens in use. At Dagus, the miners want an increase in wages.

The prospects at Osceola seem very fair for a good trade from the Clearfield mountains this year. For the week ended May 24th, the largest shipment ever made was recorded, being 79,175 tons. This is an increase of 40,307 tons over the corresponding week last year.

The mines at West Newton have been doing well for a couple of months. They employ upward of a hundred men, with a good prospect of steady work during the summer. Three cents a bushel is the price paid for mining over an inch and a half screen.

The mines in the neighborhood of Walker's Mills, are not doing as well as might be expected this time of year. At Fort Pitt, there are from 75 to 100 men employed, but they are only making about two-thirds time. P. U. mines are hardly making half-time. Ewing & Gordon's mines are doing very well, employing fifty men. Morris & McCue's Cherry mines have also done well since April 1st, with good prospects. They employ about eighty men. All of these mines are paying three cents a bushel over an inch and a half screen.

The Essen mine, recently opened on the new Pittsburg, Chartiers & Youghiogheny Railroad, on Tom's Run, is now employing about one hundred men. This company has very ingenious arrangement for hoisting and tippling its coal. When the cars come out of the mouth of the drift, they are run into iron cages, and with steam machinery hoisted up about thirty feet to the tipple, the cages tippling the coal on to the screens, thus economizing both time and labor. By this arrangement, they are enabled to load rapidly. They are putting out a fine quality of coal. The miners receive 75 cents a ton for coal run over an inch and a half screen.

COKE.

The coke trade continues even and tranquil, says the Connellsville *Courier*. Of the 9820 ovens now in the Connellsville region, exclusive of the Pleasant Unity District, there are 1544 idle and 8276 active. The active and the idle ovens are divided as follows: Of the 6859 ovens in the coke pool, fifteen per cent, or 1027 ovens, are idle in accordance with the restriction agreement. This leaves 5832 active ovens in the pool. Of the 1648 furnace ovens, 52 are idle, being a portion of the Lemont works, and 1596 are active. Of the 944 independent ovens, 96 are idle and 848 active. The idle ovens are 80 at Redstone and 16 at Emma works. Then there are 369 idle ovens. These comprise the Mount Braddock, Mahoning, Pennsville, and Fountain mines. They have been idle for the past six months or more, and with the exception of the Mahoning works, recently purchased at judicial sale by Judge Ewing, there is no immediate prospect of any of them starting up. In addition to the idle ovens enumerated, all the pool ovens close down one day in the week, thus restricting the output one sixth.

The price of coke remains stationary at $1.20 per ton on board cars at the ovens. The daily shipments average, in round numbers, 700 cars, a slight falling off since our last report. Labor is plenty, and wages are becoming more and more uniform.

The H. C. Frick Coke Company is preparing to build a big slope on the east side of the Mount Pleasant branch, between Broad Ford and Morgan's, in order to open out the coal on that side of the valley, in anticipation of the early exhaustion of the coal on the other side.

The Gallitzin Coal and Coke Company is now putting up the machinery necessary to operate its works. It is also building one hundred coke-ovens, workmen being engaged in excavating for them. One hundred and fifty men are employed.

VIRGINIA.

At the Pocahontas coal mines, says *The Virginias*, operations were resumed May 8th, in the East mine, which has been closed and undergoing repairs since the fatal explosion of March 13th. Mining has been going on in the West mine, and by the middle of this month the daily output from both mines at Pocahontas was about 800 tons a day; by June 1st, it is expected to have a daily output of from 1200 to 1500 tons. The East mine was not very greatly damaged by the explosion. It has been put in thorough order again with some, but not many, changes in the mode of ventilation, and is now in successful operation.

On the 1st of May, Mr. H. Wickham, Vice-President of the South-West Virginia Improvement Company, assumed the duties that had been discharged by Mr. J. P. Ilsley, the retiring president of that company. It is stated that Mr. Wickham will have his office at Roanoke. Mr. W. A. Lathrop, who has been superintendent of the mines from the beginning of mining operations there, has resigned.

GENERAL MINING NEWS.

ARIZONA.

MOHAVE COUNTY.

ARIZONA NORTHERN.—The company's five-stamp mill at Cerbat has been leased for one year. The lessees have begun putting it in running order. They propose to work custom ore at reasonable rates.

INDIAN QUEEN.—This mine is in bonanza, and is yielding large quantities of high-grade ore. The mill has been working steadily for the past four months.

PINAL COUNTY.

SAN CARLOS COPPER COMPANY.—The machinery for the mines is now at Picacho Station, and will be put up within the next three weeks. The general manager for the company is James Douglas, Jr.

CALIFORNIA.

INYO COUNTY—DEEP SPRINGS DISTRICT.

Prospects in this region are said to be encouraging. The Greely mill is about ready to start up. The Montezuma furnace material is all on its new site at Antelope Springs, where it is to be re-erected immediately.

MONO COUNTY—BODIE DISTRICT.

Reports for the week ended May 26th:

BODIE CONSOLIDATED.—There were crushed at the Bodie Consolidated mill 150 tons of ore and at the Bodie Tunnel mill 325 tons; the average assay of the pulp was $20.46, and of the tailings $2.56. In and about the mine, all is running well. On the 200-foot level, there is an uprise on the Gildea ledge that has gained a hight of 40 feet. From this they have stoped most of the ore taken out this week, which has paid better than expected.

STANDARD CONSOLIDATED.—There is not much change to note in the flow of water since last report, but it has so decreased as to enable them to start mining and milling ore on June 1st.

NEVADA COUNTY.

DERBEC.—Reports state that the channel has again been struck in the old mine, and that it is very rich.

MAGENTA.—At the annual meeting, the old board of directors was re-elected. The report showed the affairs of the company to be in a satisfactory condition.

NORTH STAR.—Work at the mine will begin soon. At a meeting held in San Francisco, W. B. Bourn was elected president; D. A. Jennings, secretary; and the Bank of California was selected as treasurer.

PEABODY.—The ore taken out is rich. The shaft is down 250 feet. The ledge worked is the regular Peabody ledge, and not the Rhode Island Ravine ledge, the latter having been lately run on by the company. The shaft is 80 feet below the present level, and there is a drift of 400 feet underground.

SIERRA COUNTY.

ALASKA.—Operations have been resumed. The twenty-stamp mill will soon start up. The fire, which a year ago destroyed the shaft-works with a loss of $40,000, caused the stoppage of work for a year.

RAINBOW.—The company is pushing ahead a new tunnel that will give several hundred feet of stoping ground.

SIERRA BUTTES.—Grading has begun for the erection of another twenty stamps in the mill at No. 9 tunnel. This will make sixty stamps. In another year, it is likely that the capacity of the mill will be increased. The ore in the Sierra Buttes is of low grade, and therefore it is necessary to crush a large amount of it in order to realize a profit.

CANADA.

PROVINCE OF ONTARIO.

It is said the smelting-works at Kingston will resume work. The works have been acquired by a Montreal company. The lead ore is to be brought from mines located near Arnprior.

COLORADO.

CHAFFEE COUNTY.

Some capitalists are now in Alpine with a view of starting up the smelter, if satisfactory arrangements can be made with the owners.

CLEAR CREEK COUNTY.

HUKILL.—This mine and water-power property was sold under the hammer recently for $14,500 to L. C. Ellsworth, the receiver of the First National Bank of Georgetown.

CUSTER COUNTY.

A gentleman interested in the Duryee furnace has stated to the Leadville *Herald* that the recent test of this furnace, at Silver Cliff, proved a success, and that one of the furnaces is now erecting at Durango. Other furnaces are also building in other portions of Colorado and New Mexico. The only fuel used at the late test was ordinary lignite coal from the Cañon City coal mines, and one ton of that proved sufficient to reduce five tons of ore. The slags contained an average of about one ounce of silver a ton and the matte between three and four ounces. It was apparent that ores containing a very high percentage of silica and very low in lead could be treated without difficulty and at moderate cost.

BULL DOMINGO.—The mine is sending daily a fair quality of ore to the concentrator, preparatory to starting up.

GILPIN COUNTY.

AURORA.—The company has discontinued working its property, and has given notice that the appointment of Charles W. Price as manager of said company has been revoked, and that the company will not be responsible (nor will its directors and officers) for debts incurred by said Charles W. Price.

CALIFORNIA.—The additional twenty-five new stamps making to the Hidden Treasure mill, the property of the California Company, have been started up. This gives 75 stamps capacity at that mill.

REPUBLIC.—The company has resumed work on the easterly portion of its Pewabic mine, which has lain idle since last December. The smelting ore taken out nets $70 per ton, the mill-dirt being above the average per cord obtained heretofore.

LAKE COUNTY.

The Leadville *Herald* has the following:

AMERICAN SMELTER.—All the furnaces are in blast. A number of improvements have lately been made, calculated to reduce the handling of ore from the time of its final consignment to the furnaces. The establishment is turning out nearly two car-loads of bullion a day. Mr. Brotherton, late superintendent of the Arkansas Valley smelter, is in charge of the American works.

ARKANSAS VALLEY SMELTER.—The establishment is equipping with electric lights and fire-alarms.

CATALPA.—The ore treated at the Estey & Hill concentration mill contains from six to twelve ounces in silver to the ton, and from one to six per cent in lead.

COLORADO NO. 2.—The ore produced during the past month it is expected will average forty-five per cent in lead, from ten to fifteen ounces in silver, and two tenths of an ounce in gold to the ton.

ESTEY & HILL.—The concentrating mill, situated in Big Evans Gulch, is running very successfully.

EVENING STAR.—At the upper shaft of this mine, a pocket of ore has lately been opened, which promises to lead to the development of a new piece of ground. The discovery was made in a drift running eastward from the shaft, at a depth of 340 feet. The drift is a few feet above the water-level, and can be worked very easily.

IRON HILL CONSOLIDATED.—The water has all disappeared from the mines, and the ore-shipments have again reached fifty tons a day.

LA PLATA.—The mine has been cleared of water, and operations have been resumed.

OPULENT.—The mine has increased its daily shipments to thirty tons of ore, which is reported to average from $26 to $24 per ton.

PINNACLE.—The ore-body recently opened shows a thickness of from ten to twenty feet, and nets from thirty to fifty dollars a ton. This ore runs fairly well in gold, in addition to its contents in silver and lead.

SILVER CORD.—A few miners are still employed in the mine on exploration-work. No hoisting is done.

SMALL HOPES.—The company has now about $50,000 in the treasury.

LA PLATA COUNTY.

The Duryee furnace, which will be erected at Durango, will have a capacity of sixty tons a day.

SAN JUAN COUNTY.

NIAGARA CONSOLIDATED.—The company will soon resume work on the Cuba vein, at Eureka. The drift is completed 500 feet, exposing some ore in its course, besides cutting two cross-veins, one of which has been worked by a short branch drift. The present heading of the main drift is on the vein and not very far from a point beneath the discovery-shaft, where rich bismuth ore occurs. The drift taps the vein from 600 to 2000 feet below the surface outcrop along its course.

NORTH STAR.—Mr. T. C. Wilson has purchased of Julius Johnson, for $25,000, half of the two years' lease on this mine on King Solomon.

SILVER CROWN.—An important strike has been made in the tunnel that has been run to cut the valley lode. This vein was cut at a distance of about 200 feet from the mouth of the tunnel.

DAKOTA.

CALEDONIA.—An extensive cave occurred in the north chamber of this mine May 23d. The damage occasioned has not yet been reported.

CLIMAX.—The total output in less than six months has been 2500 pounds of mica, at an average value of $5 a pound.

ESTRELLA DEL NORTE.—The work of piping and ground sluicing has been commenced. The motion to show cause why the judgment of G. W. Chadwick against the Estrella for $1,000,589 should not be set aside or opened up has been denied by Judge Barnard, of the Supreme Court of Kings County, New York.

ETTA.—Work is prosecuted vigorously.

FATHER DE SMET.—The superintendent writes under date May 19th as follows: I herewith inclose you express company's receipt for bar No. 183, containing 1370·90 ounces of gold, the result of the run of mill for first half of May. This is a very good showing for the first run, and insures a large yield this month. The mine is looking extremely well at nearly every point, and in very good shape for working. On the 3d level, we are opening out in the Golden Gate ledge, and will soon have quite a chamber in it. Tramway header is driving in ledge-matter, but not prospecting much yet, though we expect better results before long.

GEORGIA.

Reports from the mines in Lumpkin County show that the usual amount of development-work continues, showing satisfactory prospects. At the Barlow, a ten-stamp mill is to be erected. The ore from the Calhoun is of good quality, and the mill is to start up soon. Operations at the Columbia are to be resumed. Preparations are making for the erection of a new twenty-stamp mill on the Gordon property.

The Auraria mine is to resume operations. The tunnel for conveying the water to the Fish Trap mine is about completed, and a full force of men will be put to work.

ILLINOIS.

LAMB SMELTING-WORKS.—These works, at the corner of Clark and Forty-first streets, Chicago, are prepared to purchase and treat ores. This is the first smelter erected at Chicago to treat raw ores.

MICHIGAN.

COPPER MINES.

From the opening of navigation to May 31st, the total amount of refined copper shipped from the smelting-works for the various lake companies is 2838 tons.

ALLOUEZ.—Work on the new head of stamps is progressing satisfactorily, and a material increase of production may be expected when the work begins.

ATLANTIC.—The lode appears to be growing richer as depth is obtained.

BELT.—Mr. Rathbone, of London, England, one of the consulting engineers of this mining company, is at the mine making a thorough examination of the work done on the surface and in the mine, and will make a report to the company on his return. The underground appearance of the mine continues promising both on the Champion and the Knowlton veins. The work of erecting the second head of Ball's stamps is progressing slowly, but it will be ready by the time they are ready to deliver rock from the mine.

CALUMET & HECLA.—No. 5 shaft is about ready for hoisting purposes. It has a double track, and will be expected to do double duty as soon as the extra heads at the mills are in running order. It is some 1100 feet from No. 4 shaft, and is down about 3000 feet.

HURON.—This copper mining company has levied an assessment of $1 a share, payable June 14th.

PEWABIC.—Mr. M. H. Maynard, of Marquette, has been appointed by Judge Withey special master in chancery in the Pewabic mine injunction suit. The chief duty of Mr. Maynard will be to take account of assets of the company, in order to arrive at the value of the property.

WOLVERINE.—A second head of Ball's stamps have been ordered, and they will double the air-compressing power at the same time.

IRON MINES.

Lake shipments of iron ore from the ports of the Marquette District up to and including the 28th of May have been:

	Tons.
Escanaba, Marquette District	111,864
" Menominee "	167,837
Marquette, Marquette "	66,663
L'Anse, " "	4,583
St. Ignace, " "	6,033
Total	356,980

HEWITT.—As soon as the Hydraulic Power Company is in shape to furnish power, it will employ power-drills and open up the mine more extensively.

ISABELLE.—This iron company, which has been exploring on property adjoining the Vulcan mine, has a shaft down 230 feet, and has begun a cross-cut to intercept the ore that was found by the diamond drill some months since, and which is coming in on such an angle that the management judges it will be encountered at about 40 feet from the shaft. Rapid progress has been made in the work of sinking, the shaft having been commenced in January last.

METROPOLITAN.—The first shipment will be made in two or three weeks. A large deposit of red ore, non-Bessemer in quality, has been found

NANAIMO.—The mine has been cleared of water, and mining work is again under way in the lower levels.

PORTAGE LAKE CANAL COMPANY.—The company has decided to reduce its royalties from 50 to 25 cents a ton on all undeveloped iron lands.

SWANSEA.—This property, located east of the Colusa, has been bonded to Dewey & Co., of San Francisco, for four months, for $30,000. The shaft is 100 feet deep, and shows in the bottom good copper ore.

MONTANA.

JEFFERSON COUNTY.

GREGORY.—The water-jacket smelter is running and turning out about 125 bars of bullion a day, with enough ore on hand for forty days' run. Ten electric lamps illuminate the works by night, and the concentrators close by are having their capacity doubled. The mine is down 500 feet. Two contracts, each of 50,000 bushels of charcoal, were lately let at 14 cents a bushel delivered, and there are large supplies on hand.

HELENA MINING AND REDUCTION COMPANY.—The Comet and the Alta mines are the only mines of the company that are worked. The Comet produces eighty-five tons of concentrating ore a day, which makes from fifteen to twenty tons of first-class concentrates, and about ten tons of second-class concentrates. The first-class concentrates average 68 per cent lead, 50 ounces silver, with a small quantity of gold. Part of this is smelted and the remainder shipped East. The second-class concentrates are smelted in the blast-furnace at Wickes. They contain an average of 40 per cent lead, 35 ounces in silver, and some gold. Besides this, about six tons daily of first-class ore that does not require concentrating and is shipped without treatment are produced. The ore runs from 72 to 74 per cent lead and from 62 to 65 ounces of silver a ton. The Alta is producing about 70 tons a day working one shift. The mine is opened by tunnels only, the deepest of which struck the ledge 800 feet vertically from the surface, or over 1000 on the incline. There is a series of seven tunnels and levels, from six of which ore is extracted at the rate above mentioned. The product can be doubled as soon as the necessary roasting-furnaces are erected for roasting the concentrates. The concentrates run about 20 per cent lead, and have an average value in silver and gold of from $70 to $80. These concentrates, being low in lead and high in precious metals as compared with the Comet product, are more profitably smelted at home. A very important feature in the Alta is the gold, which, on a run of nearly 900 tons smelted, averaged $14 to the ton. Additional roasting-furnaces are in course of construction, and the mill has been thoroughly remodeled, and has twenty-five stamps. The aggregate expense of operating the mines and works, etc., is about $1000 a day.

LEWIS & CLARKE COUNTY.

MONTANA (LIMITED).—Grading has begun at Marysville for the new 30-stamp addition on the Cruse mill, and the contract calls for its completion in four months.

SILVER BOW COUNTY.

ALICE.—The company employs 280 men, with wages ranging from $3.50 to $5 a day. William E. Hall, manager and superintendent, is reported to have said to the local press that the mines never looked so prosperous as at the present time. There is in sight plenty of ore of an average value of $50 per ton. They are taking out 100 tons of ore a day.

NEVADA.

ESMERALDA COUNTY.

CANDELARIA.—The superintendent, under date of May 20th, reports that the work of putting up machinery for running the Howland pulverizer is progressing as fast as possible. The building in of the boiler will be completed to-morrow, and they hope to get the steam-drum connected the following day. They propose to connect the White Mountain water-pipe with Trail Cañon waters, which will be an ample supply for a large mill and all that may be required for the hoisting machinery around Candelaria. The proposed addition to the pipe line is over very favorable ground.

KENTUCK.—The men employed in this mine on royalty are doing well, and are taking out some fine ore. The mill will start soon, either on tailings or on ore from the mine.

ORIENTAL & MILLER.—The New York *Stockholder* states that the management has completed arrangements for the purchase of the twenty-stamp mill from the State Line Company.

SILVERADO.—The mill to run on ore from this mine will be ready for operation by early July. The mine is getting into shape for taking out ore.

LANDER COUNTY.

BULLION.—The company is adding five stamps to the mill. Work at the different mines progresses.

NYE COUNTY.

BELMONT.—The company has decided to enlarge the leaching-works to double the present capacity, and the additional tanks have been purchased.

STOREY COUNTY—COMSTOCK LODE.

At the north end, active prospecting is in progress at several points, and discoveries of value are likely to be made at any time. In Union Consolidated and Sierra Nevada, along the line of the main north and south drift, some 10 or 12 cross-cuts have been started and run out a certain distance east and west. In several of these, the diamond drill has been sent ahead for long distances. Presently a start will be made in some of these beginnings of cross-cuts, some of which show very favorable material. West cross-cut No. 4, in Union Consolidated ground, now out 20 feet, is showing a lively mixture of quartz, clay, and porphyry.

At the Hale & Norcross, work has not yet been resumed on the 2800 level. Much ore is extracted from the newly discovered body on the 200 level, and there are now on the dumps over 800 tons. This deposit lies under South C.

Good progress is making with the bulkhead on the 2600 level of the Savage, which will soon be completed. It will pay for itself in the saving it will effect in the cost of the pumping.

At Gold Hill, the leading mines are still finding a good deal of low-grade ore, keeping all the mills on the Carson River running to their full capacity.

At the Alta, the main west drift on the 2150 level is again pushed ahead. The diamond drill showed a very favorable formation of soft porphyry after it passed through the belt of hard rock in which it was so long at work. The diamond drill is in position at the face of the east drift on the 2150 level, and will be started up as soon as the diamonds arrive that were telegraphed for to New York.

NEW MEXICO.

GRANT COUNTY.

Representatives of smelting and refining-works from Socorro, Kansas City, Denver, and other points have been looking over the mines at Kingston and making bids for ore.

GRAY EAGLE.—Work has shown up a fine body of carbonates, running 50 ounces in silver and 28 per cent lead, and free from zinc, or other refractory minerals.

IRON KING.—The Eclipse mine, recently bonded by this company, has been steadily worked, and is daily improving. They have opened up a fine body of carbonate ore, running very high in lead and smelting ore.

UTAH.

PARK COUNTY.

ONTARIO.—The mill has started up after its annual clean-up.

It is stated that an Eastern company intends to take hold of the Castle Valley coal mines, Emery County, and develop them.

FINANCIAL.

Gold and Silver Stocks.

NEW YORK, Friday Evening, June 6.

There was a marked falling off in the amount of business transacted in the mining market this week, although the dealings were more generally scattered over the whole list. The principal item of interest in the market was the Comstock shares which showed the low-priced stocks at stronger prices, while the high-priced stocks were growing weaker. Some of the Bodie stocks were quite strong, especially Bulwer. Horn-Silver ruled stronger, and was moderately active. The low-priced stocks came in for a good share of the business, but record no material change in price. A complete summary of the market is given below. The total number of shares sold aggregates 58,730, as against 82,795 last week.

The Comstock shares were fairly dealt in, and while the low-priced shares were inclined to strength, the high-priced shares were generally inclined to weakness. California was quite strong, under a fair business, selling from 6@15c. Consolidated Virginia records an active business and was stronger; it sold from 15@20c. Sierra Nevada was weak, and was moderately dealt in; it sold from $1.70@$1.55 assessment paid, and from 80@70c. assessment unpaid. Union Consolidated was quiet and irregular, selling from $1.30@$1.80@$1.40. Mexican was weak, selling from $1.55@$1.45@$1.40, with a small business. Ophir sold at $1.10. Gould & Curry declined from $1.30@$1 under small sales. Hale & Norcross was quiet and weak, selling from $2.50@$1.65. Best & Belcher sold at steady prices, with a small business; it was quoted from $1.50@$2. Sutro Tunnel was fairly dealt in at steady prices, selling from 11@12c.

The Leadville stocks were very quiet, and ruled at steady prices. Amie sold from 5@6c. under a small business. Chrysolite was quiet and steady, selling at 90c. Iron Silver was fairly dealt in, at steady prices; it sold from 85@80c. Leadville sold at 25c. Little Chief was quiet and steady at 32@30c.

The Bodie stocks record but a small business, and sold, with the exception of Standard, at strong prices. Bodie Consolidated was quiet and steady, selling from $4.50@$4. Standard ruled dull, and records but one transaction, selling at $1.25. Bulwer was quite strong under a fair business; it sold from 63@81c. Consolidated Pacific was also strong, selling from 20@30c., with an active business.

The Tuscarora stocks were quiet and steady. Belle Isle sold from 50@51c. Navajo was irregular under a fair business; it sold from $3.45@$3.20. North Belle Isle was quiet and steady at 25c. Independence sold at 20c.

In the miscellaneous list, Alice was quiet and steady at $2.75. Eureka Consolidated records a small business at strong prices; it sold from $2.80@$3.10. Green Mountain was quiet and steady, selling from $2@$2.10. Horn-Silver continues strong, selling from $5.63@$6; it was moderately dealt in.

Barcelona was quiet and steady, selling from 14@16c. Caledonia sold at 55c. under a small business. Harlem was moderately dealt in at steady prices, selling from 4@5c. Lacrosse records a fair business at steady prices; it sold from 11@12c. Oriental & Miller was quiet and steady at 10@9c. Sonora Consolidated sold from 3@4c., with a small business.

The Moulton Silver Mining Company, of Butte Montana, has declared its first dividend, amounting to $20,000. The mines of this company have been worked for some time with very satisfactory results, and the present condition of the property seems to warrant the continuation of dividends. The company gives notice that the new certificates of stock issued under the Montana incorporation are now ready for delivery in exchange for old certificates. Holders are requested to forward their stock to the transfer-agents, Messrs. John M. Moore & Co., No. 78 Broadway, to be exchanged and registered before the payment of dividends.

MEETINGS.

The following companies will hold their annual meeting for the election of trustees and the transaction of other business, at the times mentioned:

Carbonate Hill Consolidated Mining Company, Office of D. J. Haynes, Opera House Block, Denver, Colo., June 30th, at one o'clock P.M.

Coalburg Land and Mining Company, No. 69 Wall street, Room 62, New York City, June 9th, from three to four o'clock P.M.

Consumers' Coal Company, No. 1245 Broadway, New York City, June 14th. Meeting for the purpose of considering the reduction of the capital stock to $135,000.

La Crosse Gold Mining Company, No. 59 William street, New York City, June 11th, from three to four o'clock P.M.

Lake Superior Iron Company, No. 37 Franklin street, Boston, Mass., June 18th, at half-past twelve o'clock P.M.

Quicksilver Mining Company, No. 19 Nassau street, New York City, June 18th, at one o'clock P.M.

Silver Islet Consolidated Mining and Land Company, No. 52 Broadway, New York City, June 12th, at twelve o'clock A.M. Special meeting for the purpose of considering what disposition shall be made of the interest in the company formerly represented by the 13,451·76 shares of its stock on which the assessment due May 1st was not paid. Proxies will be sent to all shareholders of record, in which the only action to be submitted to the meeting will be specified, by means of which the conclusion of each shareholder may be recorded without personal attendance. Holders of untransferred certificates are requested to send their post-office addresses to the secretary immediately.

Teal Lake Iron Mining Company, No. 111 Broadway, New York City, June 18th, at ten o'clock A.M.

United Coal and Coke Company, No. 333 Walnut street, Philadelphia, Pa., June 26th, at eleven o'clock A.M. Special meeting for the purpose of passing upon the question of an amendment and alteration of the charter of the comp ny by providing for the change of location of the principal office of said corporation from the city of Philadelphia to the city of Pittsburg.

Wood River Smelting Company, Mills Building, Room 7, New York City, June 9th, at three o'clock P.M.

DIVIDENDS.

Moulton Mining Company, of Montana, has declared its first dividend, being $20,000, or five cents a share, payable on and after June 30th, at the office of the transfer-agent, Mr. John M. Moore, 78 Broadway, New York City.

Syndicate Mining Company, of California, has declared a dividend of ten cents a share, payable at San Francisco.

PIPE LINE CERTIFICATES.

The petroleum market this week was rather dull, and was inclined to weakness. Opening on Saturday last at 77⅞c., the market rose to 79c., and then gradually declined until it touched 76⅜c., rallying again and closing at 77⅛c. Monday, the market was active at unsettled prices. Opening at 77c., the market dropped to 75½c., then rallying, the price rose to 78⅛c., but closed unsettled at 77¾c. Tuesday, the market was inclined to dullness. In the morning, it showed considerable strength, but a decline set in in the afternoon, and the market closed weak. Wednesday, the market was very dull, and there were but small sales and small fluctuations. On Thursday, the market was more active, but prices ruled weak and closed unsettled. To-day, the market opened at its lowest figure, 74⅞c., rallied and was strong at 76¼c., but a decline set in, and the market closed weak at 75c.

The monthly report of field-work in May, received at the New York Petroleum Exchange, is disappointing to the "bulls." A decided decrease in new work (wells drilling and rigs up and building) is shown, but there was a heavy increase in new production and also in the average per well. The new production in May was the largest yet shown in any month this year, but the average per well is under that of February. Compared with April, the report for last month shows an increase of 12 in the number of wells completed, a decrease of 47 and 45 in the number of wells drilling and rigs up and building respectively, an increase of 1199 barrels in new production, and of 3·4 barrels in the average per well.

The following table gives the quotations and sales at the New York Mining Stock and National Petroleum Exchange:

		Opening.	Highest.	Lowest.	Closing.	Sales.
May	31	$0.77⅞	$0.79	$0.76⅞	$0.77⅛	6,161,000
June	2	.77	.78⅛	.75⅛	.77¾	6,079,000
	3	.78	.79	.76¾	.76¾	5,912,000
	4	.76⅛	.77⅛	.75¾	.76	4,624,000
	5	.75¾	.76⅛	.74⅛	.74⅞	5,196,000
	6	.74⅞	.76¼	.74⅜	.75	4,883,000
Total sales						32,855,000

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS. May 30.	May 31.	June 2.	June 3.	June 4.	June 5.
Albion						
Alpha						
Alta			1¾	1⅞	1⅞	1¼
Argenta						
Bechtel						
Belcher			1			
Belle Isle						
Best & Belcher			1⅞	1⅞	1⅞	1¾
Bodie			3⅞	3⅜	3⅞	3½
Bullion						
Bulwer						
California			.15	.15	.15	.15
Challar			1⅜	1⅜	1½	1⅜
Con. Pacific			.25		.25	.25
Con. Virginia			.15	.15	.20	.15
Crown Point			1⅛	1⅛	1¼	1¼
Day						
Elko Cons						
Eureka Cons				2½	2⅝	2⅞
Exchequer						
Gould & Curry			1	1⅛	1⅛	1⅛
Grand Prize						
Hale & Norcross			2	1⅞	1¾	1⅝
Independence						
Martin White						35.
Mexican			1½	1½	1½	1½
Mono						
Mount Diablo			2¼	2¼		
Navajo			3	3¼	3¼	3¼
Northern Belle						
North Belle Isle						
Ophir			1	1	1⅛	1⅛
Overman						
Potosi			.35	.40	.40	.35
Savage			.75	.75	.70	.70
Scorpion						
Sierra Nevada			.85	.80	.85	.80
Silver King						
Tip Top						
Union Cons			1½	1⅜	1⅜	1⅜
Utah			.70	.50	.75	.75
Wales Cons						
Yellow Jacket			1¾		1¾	1¾

Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

BOSTON, June 5.

The market for mining stocks has lapsed into a chronic state of summer dullness and inactivity. The sales for the past week have been almost wholly confined to Calumet & Hecla, which has continued to steadily decline, touching $155 a share, as compared with $165, the closing price last week. The stock comes out in small lots, showing that the weak holders are liquidating, and that lower prices may be expected before they get through. The question of a dividend in August is mooted in the street, and the general opinion is, that it will be passed, although there are some who are inclined to believe that a reduced amount, say $3, will be paid; but it is all conjecture at present, as the directors have not considered the matter yet, and there is another month to come before the question will be settled. Meanwhile, the mine is steadily increasing its production and making vigorous efforts to sustain the price of ingot copper in the market. The only sales of copper stocks outside of Calumet & Hecla were made in Huron, which declined to 15 cents on the announcement of another assessment of $1 a share. Quincy, Franklin, Atlantic, Osceola, and Pewabic, formerly all active stocks, are now neglected—not a sale of either reported for the week. This condition of the market is hard on the brokers, who have heretofore reaped liberal commissions on buying and selling mining stocks.

In silver stocks, sales of 100 shares of Bonanza at $1⅛ and 100 Catalpa at 27½c., ex-dividend, comprise all the recorded transactions at the Boston Stock Exchange.

At the Mining Board, there is no improvement to note, either in the volume of transactions or prices. Bowman Silver declined to 12c., but recovered again to 14c. Dunkin, 18@19c. Empire, 16@18c., assessment, 10 cents, paid. Sullivan has nearly faded out of existence. The stock was offered down to 4c. for 1000-share lots, without takers, and no one wants it. A meeting of the stockholders is to be held to-morrow

to see what course is to be pursued in regard to further mining operations and paying the debt of the company. It is doubtful whether another assessment could be collected in the present condition of the market.

3 P.M.—Calumet & Hecla sold this afternoon at $156@$155, and closed $152 bid, $155 asked. Franklin, $7½ bid. Osceola, $10 bid. Quincy, $37 bid, $40 asked. Atlantic, $7½ bid. Pewabic offered at $1.

BULLION MARKET.

NEW YORK, Friday Evening, June 6.

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
May 31	50 13-16	110⅞	June 4	50 13-16	110⅞
June 2	50 13-16	110⅞	5	50⅞	110¾
3	50 13-16	110⅞	6	50⅞	110¾

BULLION PRODUCTION FOR 1884.

MINES.	States.	Month of April.	Year from Jan. 1st, 1884.
		$	$
*Alice, G. S.	Mont.	†	298,761
*Belmont	Mont.	.....	8,081
Bodie, G.	Cal.	120,499	209,475
*Bonanza King, S.	Cal.	56,730	191,891
*Boston & Montana, G.	Mont.	37,483	170,296
*Chrysolite, S. L.	Colo.	20,095	52,373
*Consolidated Bobtail, G.	Colo.	7,507	31,833
*Contention, S. G.	Ariz.	65,010	260,174
*Deadwood-Terra, G.	Dak.	.....	128,703
*Derbec Blue Gravel, G. S.	Colo.	12,732	42,028
*Father de Smet, G.	Dak.	40,986	137,061
Grand Prize, S.	Nev.	.....	25,000
*Hecla Cons., G. S. L.	Mont.	‡	162,178
*Homestake, G.	Dak.	.....	301,053
*Hope, S.	Mont.	.....	17,980
Horn-Silver, S. L.	Utah.	168,000	750,087
*Iron Silver, S. L.	Colo.	67,963	252,132
*Kentuck, G. S.	Nev.	3,508	15,147
*Lexington, G. S.	Mont.	98,477	398,373
*Little Pittsburg, S.	Colo.	12,000	37,134
Moulton, S.	Mont.	.....	122,000
*Mount Diablo, S.	Nev.	.....	24,820
*Navajo, G. S.	Nev.	29,268	115,018
*Ontario, S. L.	Utah.	.....	536,205
*Original, S. C.	Mont.	.....	11,135
*Oxford, G.	N. S.	4,090	14,352
*Paradise Valley, S. G.	Nev.	.....	45,164
*Plymouth Consolidated, G.	Cal.	88,399	364,177
*Rooks, G.	Vt.	3,443	11,376
*South Yuba, G.	Cal.	2,637	8,456
*Syndicate, G. S.	Cal.	12,419	48,260
*Tombstone, S. L.	Ariz.	88,094	302,692
United Gregory, G.	Colo.	.....	7,174
Total amount of shipments to date			$5,092,656

* Official. † Assay value. ‡ Not including value of lead. G. Gold; S. Silver; L. Lead; C. Copper.

United States Assay-Office at New York.—Statement of business for the month ended May 31st, 1884:

Deposits of gold:		
Foreign coin	$98,000	
Foreign bullion	50,000	
United States bullion	371,000	
United States bullion (re-deposits)	123,000	
Jewelers' bars	90,000	
Refined gold	127,000—	$859,000
Deposits of silver:		
Jewelers' bars	15,600	
United States coin	600	
Foreign coin	4,800	
Foreign bullion	42,000	
United States bullion (contained in gold)	6,000	
United States bullion (re-deposits)	4,500	
Arizona	4,100	
Colorado	4,500	
Lake Superior	400	
Montana	106,000	
New Mexico	4,000	
Utah	112,500	
Refined silver	47,000—	352,000
Total deposits		$1,211,000
Gold bars stamped	$8,658,457	
Silver bars stamped	499,942—	$9,158,400

H. G. Torrey, United States Assayer at New York, made an argument before the Committee on Coinage, Weights, and Measures at Washington, June 4th, in favor of rebuilding the assay-office in New York City. An appropriation of $500,000 was asked for. Mr. Burchard, Director of the Mint, also appeared before the committee and favored either the improvement of the present building or the erection of a new structure. He was inclined to adopt the views of the architect of the New York post-office, who believes a new building should be constructed.

United States Mint at Philadelphia.—During May, the mint executed the following coinage: Eagles, $661,600; half-eagles, $355,000; total value, $1,016,600; total number of gold pieces, 137,600; 1,310,000 pieces of silver were coined; total value, $1,121,000. Of this total, $1,100,000 were dollars and $21,000 dimes; 7,278,000 pieces of base coin were stamped, aggregating a value of $123,500; $63,400 of this was in five-cent pieces and $60,100 in cents.

Foreign Bank Statements.—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate of discount, and it remains at 2½ per cent. During the week, the bank lost £1,600,000 bullion, but the proportion of its reserve to its liabilities was reduced from 48 1/16 per cent to 46¾, against 35¾ per cent at this date last year. The weekly statement of the Bank of France shows an increase of 1,822,000 francs gold and 2,562,000 francs silver.

METALS.

NEW YORK, Friday Evening, June 6.

Copper.—Our market has remained excessively dull during the week, manufacturers still being well stocked, and there being no speculative demand, however low copper may appear to be. Sales have been restricted to some 150,000 pounds Lake Superior at 14⅛@14¼c., other brands at the same time bringing 13¾@13⅞c. London cables Best Selected £61 10s.@£62 10s., and Chili Bars £56@£56 10s.

Messrs. Matheson & Co., London, and the Paris General Society invite subscriptions to the £1,200,000 second mortgage bonds of the Rio Tinto Company. These 5 per cent bonds are placed on the market at 95, the sinking fund providing for semi-annual drawings during thirty-three consecutive years. All this bond issue necessitates is the annual amount of £74,625, to pay the interest and the bonds canceled, while the net income of the company last year was £729,855, out of which £455,000 were distributed for dividends declared. The *Commercio do Porto* of May 23d states that the profits of the Portuguese Copper Company at Hulloa are also very large, and that for the last fiscal year a 40 per cent divide nd is to be declared, after setting aside for the mining funds 48,880 milreis, and for the reserve fund 23,627, together 72,507, and this in spite of the decline in the price of its ore to 11s. 11d. in 1883 from 13s. 6d. in 1882. In 1878, the company produced only 500 tons of copper; in 1879, 1540; in 1880, 2002; in 1881, 2820; in 1882, 3401; and in 1883, 4533. There were set aside for the mining fund 22,661 milreis in 1879, 20,641 in 1880, 20,294 in 1881, 38,502 in 1882, and 44,880 in 1883.

Tin.—Both the London and our own market are slightly better and firmer, the former, Straits tin, £83 10s., and the latter 18⅝c. spot, and 18¾c. thirty days. Mail advices from the Straits speak of the disappointment resulting from receipts much lighter than had been expected they would be; still the May shipments to England and the United States aggregated 1700 tons, the cable informs us, while from Australia they were 600 tons. The position of the metal remains healthy and strong; if times were not so dull, it would be higher, especially in view of the present and prospective extreme ease in money matters in London.

Mr. Charles Nordhaus, East India agent, No. 13 Cedar street, New York, furnishes us the statistics below:

	Tons.	
May 1.—Stock in New York and Boston		800
Arrivals in May		650
Total supply		1,450
Consumption in May		750
June 1.—Stock		700
Afloat from the Straits	980	
" " Australia	200	
" " Europe	100	1,280
June 1.—Visible supply		1,980

Lead.—Sales during the week sum up 500 tons, the Common selling at $3.62½, and the Corroding at $3.65. These are the closing figures, although some purchasers would probably not feel inclined to go beyond $3.60, with common lead. For the moment, the market is devoid of all features, the tendency apparently being neither upward nor downward; if any thing, it would be the latter, from extreme dullness. The latest cable dispatch from London quotes Common English Pig £11@£11 10s.

Messrs. John Wahl & Co., of St. Louis, telegraph us as follows to-day:

Only a moderate demand can be reported. Our market continues very dull, and since the last report prices have further declined. Sales have been made as low as 3·42½c. for 80 tons Chemical lead, and 130 tons of Common lead were sold at 3·40c. Refined is not wanted at over 3·40c.

Messrs. Everett & Post, of Chicago, telegraph us as follows to-day:

Sellers are offering above 3·45c., but no buyers are to be found. Demand is only moderate and but very little doing. Absence of buyers is effecting a decline. Sellers are anxious to sell, but do not want to name lower prices than 3·45c.

Spelter.—The market is perhaps a little less firm at the close of the week than it was in the beginning of it, and may now be quoted $4.55@$4.60, Common Domestic, with a moderate trade. London cables an unaltered market; at shipping ports, Ordinary was worth £14 2s. 6d.

Antimony.—A limited consumptive demand prevails at 10½c. for Hallett's, and 11¼c. for Cookson's.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 6.

American Pig.—There is nothing new to report in this trade. Business continues very dull, although there is some little inquiry for small lots. Prices remain firm for the best brands, notably of No. 1 and Gray Forge, while No. 2 Foundry is in more ample supply.

We quote No. 1 Foundry at $20@$21; No. 2, $19@$19.50; and Gray Forge, $17.50@$18.50. There have been no sales of domestic Bessemer pig. Foreign remains quiet at $20 ex ship. Twenty per cent Spiegel is quoted in round lots at $28@$28.50 ex ship, some sales having been made at the lower figure. Ferro-manganese, 45 per cent, is worth $45.

Scotch Pig.—Very little business has been done in this trade. In fact, it has been almost stagnant, with occasional sales of small lots. Prices remain firm, and are generally without any change from our last.

We quote ex ship and to arrive: Coltness, $21.50@$22; Langloan, $22@$22.50; Summerlee, $21; Dalmellington, $20; Gartsherrie, $21.25@$22; Eglinton, $19.50@$20: and Glengarnock, $21.50@$22.

At the Metal Exchange, the following cable quotations have been received: Coltness, 56s.; Langloan, 52s. 6d.; Summerlee, 50s. 6d.; Gartsherrie, 50s. 9d.; Glengarnock, at Ardrossan, 50s.; Dalmellington, 47s. 6d.; and Eglinton, 44s. Warrants, 41s. 1d.

Steel Rails.—There has been no business of any importance. We hear of a sale of 1200 tons by a Western Pennsylvania mill for delivery in Ohio on private terms; but outside of this, there is absolutely nothing to report. We quote $32@$32.50 at mill, but no doubt favorable concessions could be obtained from these prices for large lots.

Old Rails.—We hear of one small sale of 150 tons at $19 to be delivered at Bridgeport, Conn. We quote at $18.50@$19.

Philadelphia. June 6.

[From our Special Correspondent.]

Pig-Iron.—Political agitations and financial troubles have had but little effect upon this market. Every thing is quiet. The business done is not of large proportions, but a fair amount of iron is changing hands, and for good brands fair prices are paid. The most important transaction of the week has been a sale of 500 tons of Chickies at $21.50. Other special and standard brands are selling in small lots at from $19.50@$21, although comparatively little iron will bring the latter figure. A good deal of No. 1 has sold under $20, and some as low as $19; but the preference is still for the better makes. Stocks, except in inferior makes, are very light. Sales of No. 2 iron are hard to make. Very little is wanted, and prices range from $18@$19, according to quality. The various qualities of Forge iron range in price all the way from $16@$18. Prices are rather firm for good brands, but the large offerings of inferior irons have a very bad effect on the market. Very few sales of the low-priced irons are reported. There is a moderate demand for small lots of standard brands.

Foreign Irons.—There is nothing doing in foreign irons, excepting a few small transactions in Stee Slabs at $37@$40. Bessemer is quoted nominally at $19.50@$20. Spiegeleisen, $28 for 20 per cent.

Muck-Bars.—The demand is very light, and prices are weak at $31@$32 at mill.

Merchant Bar.—The tone of the market has improved during the past few days, and the demand,

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.			Dividends. Total paid to date.	Dividends. Date and amount per share of last.			Highest and Lowest Prices per Share at which Sales were Made. May 31. H.	May 31. L.	June 2. H.	June 2. L.	June 3. H.	June 3. L.	June 4. H.	June 4. L.	June 5. H.	June 5. L.	June 6. H.	June 6. L.	Sales.	
1	Alice, s. c.	Mont	$10 000,000	400,000	$25	*				$450,000	Jun.	1884	.12½	1										2.75		100	
2	Amie Con., s. L.	Colo.	5,000,000	500,000	10	*				330,000	Oct.	1883	.05	2	.05		.06				.06						3,000	
3	Atlantic, c.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	280,000	Feb.	1884	$1.00	3													B.
4	Argenta, s	Nev.	10,000,000	100,000	100	285,000	Apl.	1884	.10	40,000	Feb.	1880	.20	4												100	
5	Barbee & Walker, s.	Utah	1,000,000	100,000	10	*				60,000	No	1880	.10	5													
6	Bassick, G. S.	Colo.	10,000,000	100,000	100	*				400,000	Mar.	1884	1.00	6													
7	Belle Isle, s.	Nev.	10,000,000	100,000	100	120,000	Mar.	1884	.20	300,000	Dec.	1879	.25	7	.50		.50				.51					2,000	
8	Belcher, G. S.	Nev.	10,400,000	104,000	100	2,588,000	Apl	1883	.25	15,397,000	Apl	1876	1.00	8													
9	Birdseye, G.	Cal.		15,000							Dec.	1882		9													S.F
10	Black Bear, G.	Cal.	3,000,000	30,000	100	15,000	Sept	1879	.50	885,000	May	1883	.20	10													
11	Bodie Con., G.	Cal.	10,000,000	100,000	100	275,000	Dec.	1883	.50	1,495,000	Jun.	1884	.50	11	4.50	4.45	4.50				4.25				4.00		750	S.F
12	Bonanza Developm't	C & M	3,000,000	300,000	10					135,000	Oct.	1882	.15	12													
13	Bonanza King, Cons.	Cal.	1,000,000	100,000	10	*				150,000	May	1884	.25	13													
14	Boston & Mont. G.	Mont	2, 00,000	200,000	10	*				310,000	Jan.	1883	.05	14													P.
15	Breece, s.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1880	.01	15													
16	Bulwer, G.	Cal	1,000,000	100,000	100	30,000	Dec.	1877	.50	175,000	Jan.	1884	.10	16	.60		.63								.81	.65	1,300	B.
17	California, G. S.	Nev.	54,000,0 0	540,000	100	1,283,000	May	1884	.20	31,920,000	Dec.	1879	.50	17	.07		.06				.14	.08	.12				4,100	
18	Calumet & Hecla, c.	Mich	2,500, 00	100,000	25					24,850,0 00	Jan	1884	5.00	18													
19	Carbonate Hill, s. L.	Colo.	2,000,000	200,000	10	*				80,000	Apl.	1884	.05	19													
20	Caribou Con., s.	Colo.	1,000,000	100,000	10	*				50,000	Mch	1880	.10	20													
21	Carolina Queen, c.	N. C.	200,000	100,000	2					8,000	Oct.	1882	.02	21													B.
22	Castle Creek, G.	Idah.	100 000	100,000	1					51,000	Oct.	1883	.03	22													
23	Catalpa, s L	Colo.	3,000,000	300,000	10	*				270,000	May	1884	.10	23													
24	Central, c.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,710,000	Feb.	1884	2.00	24													B.
25	Choilar													25							1.20					10	
26	Christy, s.	Utah	6,000,000	60,000	100	24,000	Dec.	1883	.20	90,000	Jan.	1883	.10	26													
27	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*				1 600,000	Dec.	1881	.50	27	.90				.90							300	
28	Con. Bobtail, G.	Colo.	1,136,630	227,326	5	*				147,762	Mch	1883	.10	28													S.F
29	Con. Gold Mining, G.	Ga.	500,000	100,000	5	*				108,000	Nov	1883	.02	29													
30	Con. Virginia, G. S.	Nev.	54,000,0 0	540,000	100	1,118,000	Mar.	1884	.20	42,930,000	Aug.	1880	.50	30	.16	.15	.16	.15	.16	.15	.16	.15	.20				7,200	
31	Contention, s.	Ariz.	12,500,000	250,000	50					2,462,500	Dec.	1883	.25	31													S.F
32	Copper Queen, c.	Ariz.	2,500,000	250,000	10	*				1,425,000	Apl.	1884	.40	32													
33	Crescent, s. L. G.	Utah	15,000,000	600,000	25	**				150,000	Oct.	1883	.05	33													
34	Crown Point, G. S.	Nev.	10,000,000	100,000	100	2,673,000	Feb.	1882	.25	11,588,000	Jan.	1875	2.00	34													B.
35	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*				4900,000	Jan.	1883	.10	35													
36	Dunkin, s. L.	Colo.	5,000,000	200,000	25	*				210,000	Oct.	1882	05	36													S.F.
37	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	350,000	Jan.	1884	1.00	4,767,500	July	1882	.25	37			3.00		2.80		3.00		3 10				650	
38	Evening Star, s. L.	Colo.	500,000	50,000	10	*				1,300,000	Nov	1883	.50	38													
39	Excelsior, G.	Cal.	10,000,000	100,000	100	410,000	Jan.	1884	.50	875,000	Oct.	1880	.25	39													
40	Father de Smet, G.	Dak.	10,000,000	100,000	100					710,000	May	1884	.20	40													
41	Franklin, c.	Mich	1,000,000	40,000	25	360,000	Jun	1877		348,000	Jan.	1884	2.00	41													
42	Freeland, G.	Colo.	5,000,000	200,000	25	*				50,000	May	1880	.25	42													S.F.
43	Fresno Enterprise, G.	Cal.	5,000,000	100,000	50		Mch	1883	.10	110,000	July	1882	.10	43													S F.
44	Gem s	Colo.	125,000	125,000	1					23,750	May	1883	.02	44													
45	Glass-Pendery, s. L.	Colo.	5,000,000	250,000	20	*				25,000	May	1881	.10	45													
46	Glen, s.	Colo.	100,000	100,000	1					7 000	May	1883	.01	46													S.F.
47	Gould & Curry, G. S.	Nev.	10,000,000	100,000	100	3,638,000	Mar.	1884	.50	8,826,000	Oct.	1870	10.00	47	1.30						1.10				1.00		500	
48	Grand Central, s.	Ariz.	1,000,000	100,000	10	*				625,000	Dec.	1882	.25	48													
49	Grand Prize, s.	Nev.	10,000,000	100,000	100	520,000	May	1884	.35	495,000	Mar.	1884	.25	49													
50	Granite, s.	Colo.	125,000	125,000	1					6,250	May	1883	.01	50													
51	Great Eastern, G.	Dak.	3 0,000	300,000	1	*				16,000	July	1880	.01	51													
52	Great Western, Q.	'al.	5,000,000	50,000	100	35,500	Aug	1873	.15	262,500	Oct.	1882	.25	52													
53	Green Mountain, G.	Cal.	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½	53	2.00								2.10			1,400	
54	Hale & Norcross, G. S.	Nev.	11,2 0,000	112,000	100	4,370,0	May	1884	75	1,598,000	Apl	1871	5.00	54			2.50				1.65						200	S.F
55	Hall-Anderson, G.	N. S.	150,000	150,000	1					7,000	Jan.	1882	.05	55													B
56	Hecla Con., s.	Mont	1,530,000	30,000	50					627,500	Jun.	1884	.50	56													
57	Henriett, L.	Colo.		270,000						27,000	Feb.	1883	.10	57													
58	Hibernia, s. L.	Colo.	7,500,000	300,000	25	*				180,000	July	1881	.40	58													
59	Holyoke, G.	Idah.	200,000	200,000	1					52,000	Nov	1883	.02	59													
60	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	2,412,500	May	1884	.20	60													
61	Hope, s.	Mont	400,000	8,000	50	*				136,340	Mar.	1884	1.50	61													
62	Horn-Silver, s. L.	Utah	10,000,000	400,000	25	*				3,400,000	May	1884	.50	62	4.00		5.88		6.00		6.0		6.00		6.00	5.63	2,150	
63	Howell S. & M. Co	Ariz.	375,000	187,500	½	*				3,750	Aug.	1883	.01	63													
64	Hukill, G. S.	Colo.	1,000,000	200,0 0	5	*				210,000	Dec.	1878	.10	64													
65	Idaho, G.	Cal.	310,000	3,100	100					3,492,150	Jun.	1884	5.00	65													B.
66	Independence, s.	Nev.	1 ,000,000	100,000	100	285,000	Mar.	1884	.20	225,000	Sept	1879	.25	66									.20			200	
67	Indian Queen, s.	Nev.	250,000	125,000	2					368,750	July	1883	03	67													S.F.
68	Inyo, G.	Cal.	500,000	100,000	5	*				45,000	Apl.	1882	.05	68													
69	Iron-Silver, s. L.	Colo.	10,000,000	500,000	20	*				1,300,000	Apl.	1884	.20	69	.85	.83	.82	.80					.82	.80			3,6 0	
70	Jackson, G. S.	Nev.	5,000,000	50,000	100	10,000	Nov.	1880	.20	10,000	Jan.	1884	.10	70													E.
71	Jocuistita, s.	Mex.	10,000,000	100,000	100					1,050,000	May.	1884	.50	71													
72	Kentuck	Nev.	3,000,000	30,000	100	342,000	Nov	1881	.30	1,285,000	May.	1884	.10	72													
73	La Plata, s. L.	Colo.	2,000,000	200,000	10	*				610,000	Sept	1882	.30	73													S.F.
74	Leadville, s. L.	Colo	4,000,000	400,000	10	*				330,000	Dec.,	1883	.05	74			.25										1,000	
75	Leeds, s.	Utah	6,000, 00	60,000	100	87,000	July	1882	.50	78,000	Oct.,	1878	.15	75													
76	Little Chief, s.	Colo.	10,000,000	2 0,000	50	*				780,000	May	1884	.10	76	.30								.32		.30		900	S.F
77	Little Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*				1,050,000	Mch	1880	.50	77													B.
78	Marguerite, G.	Cal.	500, 00	25,000	20					18,750	Oct.,	1882	.25	78													
79	Martin White, s.	Nev.	10,000,000	100,000	100	1,050,000	Dec.	1883	.25	90,000	July	1879	.30	79													
80	Minas Nuevas, s.	Mex.	300,000	100,000	3	*				20,000	July	1882	.10	80													
81	Morning Star, s. L.	Colo.	1,000,000	100,000	10					615,000	Oct.	1883	.25	81													
82	Moulton, s. C.	Mont	10,000,000	400,000	25	*				20,000	Jun.	1884	.05	82													
83	Mount Pleasant, G.	Calf.	150,000	150,000	1	*				105,000	Mar.	1884	.10	83													
84	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	Jun.	1880	2.00	50,000	Nov.	1883	.25	84													
85	Napa, Q.	Cal.	700,000	100,000	7					290,000	Jan.	1883	.10	85													
86	Navajo, G. S.	Nev.	10,000,000	100,000	100	235,000	Mch	1882	.20	225,000	May	1883	.25	86	3.40	3.35	3.45		3.25		3.40				3.20		2,300	
87	New York Hill, G.	Cal.	5,000,000	50,000	100	55,000	Mch	1878	.20	215,000	Aug.	1882	.10	87													
88	New York & Colo., G.	Colo.	1,25 ,000	50,0 0	25					25,000	July	1879	.10	88													B.
89	Northern Belle, s.	Nev.	5,0 0,000	50,000	100	425,000	Jan.	1884	8.30	2,400,000	Apl.	1883	.50	89													
90	North Belle Isle, s.	Nev.	10,000,000	100,000	100	105,000	Jan	1884	.10	3 0,000	Aug.	1881	.15	90					.25				.35				700	B.
91	Ontario, s. L.	Utah	15,000,000	150,000	100					5,325,000	May	1881	.50	91	20.00		19.00										60	
92	Ophir, G. S.	Nev.	10,000,000	100,000	100	3,795,000	Apl	1884	1.00	1,595,000	July	1882	1.00	92					1.10								100	
93	Original, s. C.	Mont	1,500,000	60,000	25	*				96 000	Apl.	1884	.05	93													
94	Osceola, c.	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,335,000	Mar.	1884	50	94													S.F.
95	Oxford, G.	N. S.	100,000	100,000	1	*				39,000	Apl	1884	.05	95													
96	Paradise Valley, s. G.	Nev.	10,000,000	100,000	100	47,000	Mar.	1882	.47	30,000	Apl.	1884	.10	96													
97	Pleasant Valley, G. s.	Cal.	10,000,000	100,000	100	40,000	Mar.	1884	.10	30,000	Dec.	1882	.03	97													
98	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*				600,000	May	1884	.50	98													
99	Polonia, s.	Colo.	200,000	8,000	25					12,000		1882	1.50	99													
100	Prussian, s. L.	Colo	1,500,000	150,000	10					132,000	Jan	1883	.10	100													P.
101	Quicksilver, pref., Q.	Cal.	4,300,000	43,000	100					666,900	Feb.	1884	.30	101													
102	" com., Q.	Cal.	5,700,000	57,000	100					151,000	July	1882	.40	102													S.F.
103	Quincy, c.	Mich	1,200,000	40,000	25	200,000	Dec.	1862	5.00	3,764,900	Jan.	1884	4.50	103													
104	Renfrew, G.	N. S.	60,000	30,000	2					4,80	July	1882	.02	104													E.
105	Richmond, s. L.	Nev.	1,350,000	54,000	25	*				4,042,500	May	1884	1.25	105													
106	Rising Sun, s.	Dak.	750,000	150,000	5	*				52,000	May	1881	.07½	106													
107	Robinson Bar, G.	Idah.	100,000	100,000	1	*				9,000	Dec.	1882	.03	107													
108	Robinson Con, s. L.	Colo.	10,000,000	200,000	50					575,000	Nov	1881	.50	108													E.
109	Robert E. Lee, s. L.	Colo.	250,000,000	500,000	500					100,000	Dec	18 2	.10	109													
110	Rooks, G.	Vert.	500,000	50,000	10	*				8,500	Apl.	1884	.17	110													
111	San Francisco, c.	Cal.	5,000,000	50,000	100	45,000	Sept	1880	.50	20,000	Feb.	1883	.05	111													B.
112	Savage, L.	Nev.	11,200,000	112,000	100	5,708,000	Apl.	1884	.50	4,490,000	Jul	1880	3.00	112													
113	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*				25,000	Apl.	1884	.25	113													
114	Shoshone, G.	Idah	150,000	150,000	1					7,500	Apl.	1883	.01	114													E.
115	Sierra Buttes, G.	Cal.	225,000	22,500	10					1,450,933	Oct	1884	.25	115													
116	Sierra Bella, s.	N. M.	5,000,000	200,000	25					30,000	May	1884	.15	116													
117	Sierra Grande, s.	N. M.	10,000,000	400,000	25					700,000	Oct.	1883	.25	117													P.
118	Sierra Nevada, G. S.	Nev.	10,000,000	100,000	100	5,550,000	May	1884	1.00	102,000	Jan.	1871	1.00	118			.80				75		1.70		1.55		700	B.
119	Sta Paula Eureka, G.	Cal.									Apl.	1881		119													S.F.
120	Silver Cord, G. S. L.	Colo	4,500,00	4 5000	10					225,000	Nov	1883	.25	120													
121	Silver King, s.	Ariz.	1,000,000	100,000	100					1,300,000	Dec.	1883	.25	121													
122	Silver King, s.	Colo.	1,000,000	500,000	2					50,000	Aug.	1881	10	122													
124	Small Hopes, Cons.	Colo.	5,000,000	250,000	20	*				100,000	May	1884	.20	123													
124	Smuggler, s. L.	Colo.	600,000	6 ,000	10					66,700	Aug.	1883	25	124													B.
125	Socorro, c.	N. M.	250,000	2,500	100					4,000	Mch	1882	.00¾	125													
126	South Yuba, G.	Cal.	2,000,000	40,000	50	*				150,000	Oct.	1881	.75	126													
127	Spring Valley, G.	Cal.	200,000	200,000	1	*				50,0 0	Jan.	1881	.25	127													
128	Standard, G. S.	Cal.	10 000,00	100,0 0	100					4,4 0,000	Mar.	1884	.25	128						1.25						100	
129	Stormont, s.	Utah	200,000	200,0 0	1	*				155,000	Nov.	1881	.05	129													
130	St. Joseph, L.	Mo.	1,000,00	100,000	10	*				390,000	Dec.	1882	.20	130													
131	Tip Top, s.	Ariz.	10,000,000	100,0 0	100	250,000	Sept	1883	.25	100,00	Nov.	1881	.20	131													B.
132	Tombstone, G. S.	Ariz	12,500,000	500,000	25	*				1,250,000	Apl.	1882	.10	132													
133	True Fissure, G. S. L.	Utah	1,500,000	150,000	10	*				75,000	Jun.	1883	.15	133													
134	United Gregory, G.	Colo.	300,000	300,000	1					42,000	Apl.	1884	.25	134													E.
135	United Gold Min. Co.	Colo.									Oct.,	1883	.05	135													B.
136	Vizina, s.	Ariz.	5,000,000	200,000	25	*				140,000	Apl.	1882	.10	136													
136	Yellow Jacket, G. S.	Nev.	12,000,000	12,0000	100	5,358,000	Feb.	1882	1 00	2,194,000	Aug.	1871	1 50														

* Non-assessable. † The Deadwood has previously paid $275,000 in eleven dividends, and the Terra $75,000. ‡This company, as the Western, up to December 10th, 1881, paid $1,400,000. Quotations of these stocks will be found in S. F., San Francisco; B., Bostou; and P., Philadelphia, tables. E are British companies. ‖ Total number of shares, 500,000; 50,000 shares have never been issued, and are still held by the company. Dividend shares sold, 33,410. ** Non-assessable for 3 years.

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. Number.	Par Value.	Assessments. Total levied to date.	Date and amount per share of last.			Highest and Lowest Prices per Share at which Sales were Made. May 31. H.	L.	June 2. H.	L.	June 3. H.	L.	June 4. H.	L.	June 5. H.	L.	June 6. H.	L.	Sales.	
1	Advance M & M. Co.																						
2	Albion, s. L.	Nevada	$15,000,000	150,000	$100	$622,500	July	1882	.50														S. F.
3	Allouez, c.	Michigan	2,000,000	80,000	25	240,000	February	1884	.50														B.
4	Alpha Con., G. S.	Nevada	3,000,000	30,000	100	450,000	January	1884	.50														S. F.
5	Alta, s.	Nevada	10,080,000	100,800	100	2,338,090	March	1884	.50														S. F.
6	Alta-Montana, G.S.L.	Montana	5,000,000	500,000	10																		
7	American Flag, S.L.	Colorado	1,250,000	125,000	10	300,000	June	1877	.25														
8	Barcelona, G.	Nevada	5,000,000	200,000	25	*										.15	.14	.16				4,800	
9	Battle Creek																						
10	Bear Creek	California	300,000	300,000	1																		
11	Beauce																						
12	Bechtel Con., G.	California	10,000,000	100,000	100	185,000	January	1883	.10														S. F.
13	Belvidere																						S. F.
14	Best & Belcher, G. S.	Nevada	10,080,000	1 0,800	100	1,547,390	April	1884	.50			1.50						2.00				110	
15	Big Pittsburg, S. L.	Colorado	20,000,000	200,000	100	*																	
16	Black Jack, G.	California	250,000	100,000	2½	*																	
17	Bonanza Chief	Montana	1,000,000	1,000,000	1	*																	
18	Bondholder	Colorado	500,000	200,000	2½																		
19	Boston Con., G.	California	10,000,000	100,000	100	120,000	November	1883	.25														
20	Boulder Con.	Colorado																					
21	Bradshaw, S.	Arizona	2,25 0,000	225,000	10																		
22	Buckeye	Colorado	2,000,000	400,000	5	*																	
23	" preferred	Colorado																					
24	Bull Domingo, S. L.	Colorado	10,000,000	200,000	50	*																	
25	Bullion, G. S.	Nevada	10,000,000	100,000	100	3,812,000	May	1884	.25														S. F.
26	Bye and Bye	Arizona	1,000,000	100,000	10	*																	
27	Calaveras, G.	California	500,000	500,000	1	*																	
28	Cal. W'r & M. Co., G.	California																					
29	Caledonia, S. H., G.	Dakota	10,000,000	100,000	100	490,000	October	1883	.10									.55				100	
30	Castle Creek																						
31	Catskill, S.	Nevada	1,500,000	300,000	5																		
32	Central Arizona, S.	Arizona	10,000,000	100,000	100																		B.
33	Chapparal	California																					
34	Cherokee, G.	California	1,500,000	150,000	10																		
35	Chollar, S.	Nevada	11,200,000	112,000	100	689,000	April	1884	.50														S. F.
36	Climax																						
37	Colorado Central																						
38	Con. Imperial, G. S.	Nevada	50,000,000	500,000	100	1,475,000	April	1884	.05														
39	Con. Pacific, G.	California	6,000,000	60,000	100	150,000	March	1883	.15							.25	.20	.25		.30	.26	1,300	
40	Crescent, S. L.	Colorado	3,000,000	300,000	10	*																	
41	Crowell, G.	North Car.	500,000	500,000	1																		B.
42	Dahlonega, G.	Georgia	250,000	250,000	1	*																	
43	Dardanelles, G.	California	1,000,000	100,000	10	*																	
44	Decatur																						
45	Dunderberg, S.	Colorado	1,500,000	150,000	10	*																	
46	Durango, G.	Colorado	500,000	500,000	1	*																	
47	Eastern Oregon																						
48	Elko Con., S.	Nevada					March	1884	.15														
49	Empire, S.	Utah	10,000,000	100,000	100																		
50	Enterprise	Colorado																					B.
51	Exchequer	Nevada	10,000,000	100,000	100	670,000	May	1884	.20														
52	Fannie Barret, S.	Colorado																					
53	Globe Copper	Arizona																					
54	Gold Placer, G.	Colorado	5,000,000	200,000	25	*																	
55	Goodshaw, G.	California	10,000,000	100,000	100	220,000	January	1884	.10														
56	Granite Mountain, S	Mont.	10,000,000	400,000	25	*																	
57	Granville, G.	North Car.	300,000	300,000	1	*																	
58	Harlem M. & M. Co, G.	California																					
59	Harshaw, S.	Arizona	10,000,000	100,000	100																		B.
60	Head Center, S.	Arizona	5,000,000	200,000	25	180,000	January	1884	.10														
61	Hortense, S.	Colorado	2,000,000	200,000	10																		
62	Julia, G. S.	Nevada	11,000,000	110,000	100	1,416,000	January	1884	.10														
63	Kossuth, S.	Nevada	10,800,000	108,000	100	421,200	August	1877	.15														
64	Lacrosse, G.	Colorado	1,000,000	100,000	10					.12	.11	.12						.12		.12		4,800	
65	Leviathan, S.	Nevada	10,000,000	100,000	100	380,000	September	1882	.25														
66	Lucerne, S.	Colorado	5,000,000	500,000	10	*																	
67	Mariposa pref., G.	California	5,000,000	50,000	100	1,687,500	December	1881															
68	" common, G.	California	10,000,000	100,000	100	1,975,000	February	1883	.25														
69	May Belle, G.	California	10,000,000	100,000	100	84,000	December	1881	.20														
70	Maybower, S.	Nevada	1,000,000	100,000	100	60,000	March	1884	.15														
71	Mexican, G. S.	Nevada	10,000,000	100,800	100	2,521,000	April	1884	.50	1.55	1.45			1.35				1.40				800	
72	Michoacan Synd.	Mexico																					S. F.
73	Miner Boy, G. S. L.	Colorado	5,000,000	500,000	10	*																	
74	Miller	Nevada	5,000,000	200,000	25																		
75	Mono, G.	California	5,000,000	50,000	100	585,000	January	1883	.20														
76	Moose Silver, S.	Colorado	3,000,000	300,000	10	*																	S. F.
77	Nevada Syndicate																						
78	New Pittsburg																						
79	North Standard, G	California	10,000,000	100,000	100	20,000	November																
80	Noonday	California	600,000	60,000	10	208,000	December	1881	.10														
81	Old Dominion, C.	Arizona	3,000,000	300,000	10	*		1882	1.00														S. F
82	Oriental	Nevada	2,000,000	200,000	10																		
83	Oriental & Miller, S.	Nevada	10,000,000	400,000	25					.10	.09											3,000	
84	Overman, G. S.	Nevada	11,520,000	115,200	100	3,892,700	December	1883	.25														
85	Potosi	Nevada	10,200,000	112,000	100	696,640	January	1884	.50														S. F
86	Quartz Creek				100																		
87	Rappahannock, G.	Virginia		250,000		*															.17	1,800	S. F.
88	Red Elephant, S.	Colorado	500,000	500,000	1	*																	
89	Retort M. & M. Co.	Colorado			10																		
90	San Pedro, G. S. L.	New Mex.		400,000																			
91	Silver Cliff, S.	Colorado	5,000,000	200,000	25	*																	
92	Silver Islet	Canada	1,.00,0.0 0	40,000	25																		
93	Sonora Con.	Mexico										.04		.04				.04	.03	.04		1,800	E., P
94	South Bodie, G.	California		100,000		100,000	March	1882	.15														
95	South Bulwer, G.	California	10,0 0,000	100,000	100	195,000	May	1881	.25														
96	South Hite	California	10,000,000	100,000	100		January	1883	.05														
97	South Pacific	California			5																		
98	State Line, No. 1, S.	Nevada	200,000	200,000	1																		
99	" No. 2, S.	Nevada	5,000,000	200,000	25																		
100	" No. 3, S.	Nevada	5,000,000	200,000	25																		B
101	" No. 4, S.	Nevada	5,000,000	200,000	25																		
102	" Nos. 1 and 4, S.	Nevada			25																		
103	" Nos. 2 and 3, S.	Nevada																					
104	Sullivan, G. S. L.	Maine	500,000	100,000	5	125,000	December	1882	.25														
105	Sutro Tunnel	Nevada		2,000,000		*				.11		.11					.11		.12			6,500	
106	Taylor-Plumas	California			10																		
107	Tioga, G.	California	10,000,000	100,000	100	285,000	October	1882	.10														B.
108	Tuscarora, S.	Nevada	10,000,000	100,000	1 0	110,000	October	1881	.15														B., P.
109	Unadilla, S.	Colorado	50,000,000	500,000	100	*																	
110	Union Con., G. S.	Nevada	10,000,000	100,000	100	1,870,000	March	1884	1.10			1.30						1.80		1.40		410	
111	Utah, S.	Nevada	2,000,000	20,000	100	1,480,000	March	1884	1.00														
112	Vandewater	Nevada	20,000,000	200,000	100	*																	
113	Washington	Arizona	2,000,000	200,000	10																		S. F.
114	Whalen Copper	Nevada	2,500,000	100,000	25																		
115	Wide West																						
116	Willshire	California	250,000	50,000	5	*																	

G. Gold. S. Silver. L. Lead. C. Copper. *Non-assessable. †Stocks quoted on S. F. San Francisco; B., Boston; P., Philadelphia. Non-Dividend shares sold, 25,320. Total shares sold at all the Exchanges, 58,780.

while almost exclusively for small lots, is quite active, compared with what it has been. The settlement of the scale question in the West has had a favorable effect, and buyers are showing more confidence and more willingness to provide for current requirements, although the market conditions are not such as to encourage any buying ahead. Prices for best Refined Bars are very firm at 1·90@2c., and mills making this class of iron have in some cases all they want to do for the present. Prices on the lower grades are, however, weak.

Plate and Tank-Iron.—A few sales of moderate size have been made at very little more than 2c. for Common Plates, and more could be made at the same figures. Manufacturers are very much dissatisfied with these prices, as they leave next to nothing in the way of profit, but no more can be obtained at present. Quotations for other kinds are unchanged. The

depression in the boiler establishments has caused a decided falling off in the demand for boiler plate.

Structural Iron.—Only a moderate amount of business is coming in, though there is a good deal of inquiry on the market; prices offered are so low, however, that makers are unwilling to take orders at the best rates obtainable, excepting for immediate delivery.

Sheet-Iron.—There is a fair demand for small lots, but the business done is far below what was expected. Prices are nominally unchanged, but are rather weak.

Wrought Pipes and Tubes.—Orders are coming in fairly well, but are for small amounts. Prices are maintained at the usual limits.

Nails.—Quotations are $2.40@$2.50, and business has been done at $2 35. The demand is mostly of a retail character.

Old Rails.—It is reported that sales have been closed at $19.50; $20 is the asking price, but buyers are very scarce. Most holders prefer to keep their stocks rather than drop prices below $20. The sale rumored at a lower figure was probably of inferior rails.

Steel Rails.—A few mill-owners who are short of orders have been accepting orders at low rates, but stronger companies are holding firmly to $33 for small lots. There are rumors of orders being placed at about $30, but these can not be authenticated. There is a feeling among buyers that prices are destined to decline a good deal further, and so, though there is some inquiry in the market, no heavy transactions can be reported. Probably $32 would buy large lots at any of the mills.

Scrap-Iron.—There is very little demand for any kind of scrap, and prices are hard to quote. The tendency is to lower figures.

Pittsburg. June 5.

[From our Special Correspondent.]

Pig-Iron.—I can report a dull market, with prices very unsatisfactory, at least to sellers who have been waiting for a favorable turn of the market for some time past. Sales have been confined, as heretofore, to limited amounts merely for current wants. Low-priced irons are plenty, but consumers are doubtful of its quality, and it is difficult to effect sales. The reported sales the past week were 762 tons. Prices run as follows: Lake ores, Foundry: $18.50, 4 months; Bessemer, $20, 4 months. Native ores: Gray Forge, $17.25, 4 months; Extra Foundry, $19, 4 months; Gray Forge, $17, 4 months; White D, mottled, $16.50, 4 months. Charcoal: No. 1 Foundry, $21, cash. The possibility of a lock-out in the iron mills has been prevented by the signing of the scales in force during the year ended last Sunday, with a few additions regarding steel nails, cutting and rolling steel-nail plate, demanded by the men. However, the number of idle mills in this vicinity has increased, the shut-downs being for repairs, and the outlook does not indicate that there is to be any immediate improvement in the pig-iron market. Consumers say there will first have to be an improvement in the market for finished iron before they can be induced to take much stock in the raw article. It is thus probable the trade will continue as at present for some time to come. The production is light. During the five months just ended, six furnaces about Pittsburg have been producing. The stock of iron now at the furnaces in blast will probably go a little more than 4000 tons.

Manufactured Iron.—Trade in almost all branches continues very dull; there are few orders coming in, and prices are close for those that are filled. Sales have been made of bars as low as $1.65 and $1.60.

Nails.—The trade continues unusually dull for the season. Some of the factories are closed, stock in first hands has increased, owing to the expected closing of the mills, which did not come. Prices are easy but unchanged at $2.25, 60 days, 2 per cent off for cash.

Muck-Bar.—Quite a number of melts are stocked up and the market is dull. Prices are $30.50 cash and $31, 4 months.

Wrought-Iron Pipe.—Trade is slightly improved, but is backward for the season.

Steel.—Dull trade is reported and prices are unchanged.

Steel Rails.—The price is still quoted at $35, but no sales are made at that figure. The employés of the Edgar Thomson accepted the reduction. The capacity of the works has been limited to 500 tons daily.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 6.

Anthracite.

The most interesting item in the anthracite trade is the turn taken in the Reading Company's affairs. As is well known, and a full report of which is given elsewhere, the company has been placed in the hands of a receiver. The effect upon the trade has not been to weaken the market, as many supposed it would do, but has placed the company in a position where it is relieved from the great pressure that has been upon it for a long time past, to make fixed charges. So that to-day it is in a better position to protect the market than ever before. There is a growing feeling that coal will not go any lower, and many dealers have been in the market within the past few days, and have picked up such bargains as they could find to replenish stocks. Some orders have also been taken against a possible advance, which seems to be set down for July 1st. While the market is no worse than it has been, and a stiffening tendency has developed, there is not by any means a boom in sight, and we can not believe that an advance on July 1st will cause one.

Bituminous.

Continued dullness characterize the bituminous trade. But little new business is done, and from appearances there will be no relief from the present stagnation until after midsummer. Very low quotations have been made where cargo lots have been upon the market unplaced, though the low figures thus made can not be taken as fair prices for business. The Chesapeake & Ohio Canal Company has postponed its annual election for six months and ordered a general reduction of salaries and the displacement of unnecessary political employés. There is no doubt that efficient reorganization of the company upon a business basis would enable it to reduce its tolls and compete effectively with the railroads, and the step now taken is one in that healthy direction. The vessel supply has been more favorable, owing to the diminished calls for the movement of anthracite, and freights on the whole incline to lower figures.

Philadelphia. June 6.

[From our Special Correspondent.]

The large consumers of anthracite coal in Eastern and Western markets say that most of the whistling that the anthracite people are doing, as they are going by the graveyard of low prices, is to keep their courage up, and that all the talk of high prices grows out of a vivid imagination, and has no reference to any immediate probabilities in that direction. They say the stoppage of the anthracite mines this week will have very little effect upon the market. Stocks at Port Richmond to-day are 26,739 tons. Stocks in largest supply to-day are hard broken and hard egg. Our dealers here report large quantities in New York, for shipment, and say that stocks here and along the lines are comparatively light. Your correspondent has heard it intimated in several responsible quarters that an advance is probable, but is unable to express any opinion on the question, and therefore gives the statements of those who are in a position to know. It is believed that the Reading will be first to make the advance, should any be attempted. No very good reasons are given for this belief, and all the elements seem to be at work in favor of the continuance of the active competition that has been demoralizing prices all along. It is very true that some small quantities of coals sold within a week have brought good prices. The West has been in the market for considerable amounts of coal, but not all the requirements are placed. Buyers there are given to understand that now is the best time to buy, and some few are acting on the intimation, but there are a good many who will have to pay more if the advice is sound. There has been considerable shipment from Port Richmond Freights are easier, and it is likely that some heavy transactions will be reported within a week for Eastern delivery. The coal companies will certainly follow out their policy of restriction to any lengths necessary. A good deal of coal has been shipped South, as the markets there are rather bare. Dealers here expect to ship a good deal of coal inland this summer, and figure out a considerable market area along the Atlantic coast, when it is properly worked. The line trade has begun to do a little better. The manufacturing demand in Eastern Pennsylvania is at a very low ebb. As the market report on iron shows a little improvement, it is likely to be attended with a little improvement in the demand for coal for manufacturing purposes.

Considerable business is done in a small way, but the bituminous coal operators have become so accustomed to long faces that they have nothing encouraging to say this week. There is a great deal of talk about turning the Clearfield region into a coke-producing region, in which Osceola mills will be a second Connellsville, according to the predictions made. It is very natural to suppose that this course will be taken, since the demand for Clearfield coal will not be sufficient to engage all of the enormous producing capacity of that region, to say nothing of the prospective openings of mines. It would be a wise thing to turn the coal into coke, and ship it, if it can be done profitably. The matter is talked over, and will very likely take shape some time during the summer or fall.

Pittsburg. June 5.

[From our Special Correspondent.]

As to the coal trade here, the river is harassed by labor issues and business is dull. The railroad trade is duller than a week ago; lake is unchanged.

River coal production might have been progressing satisfactorily had the miners cared to work at a low price through the summer. As it is, they prefer to go without work in preference to taking wages they were anxious to get a few years ago. There is no business to be sure, the low water preventing any movement of coal whatever. The local landings have got a fair stock and are getting fair prices for it, but the trade is unusually slack. The stocks down the rivers are gradually diminishing, but the dealers manage to keep prices at 8 cents at Cincinnati, and 7½ cents at Louisville. The yards there are fairly supplied, as well as first hands. As no coal will go down the river for some time to come—a month, perhaps—your readers can see that there are no special inducements for operators to continue mining. The third pool miners are generally idle, refusing to work for 2¾ cents. Their efforts have been unavailing, however, to bring the other pools out for a "uniform" price, which means higher wages in each pool. The men of the first pool are working right along at 3 cents, and most of those in the second pool are doing likewise. The fourth pool men are also working at 2¼ cents—some of them, I understand, at 2¼. The miners were generally idle on Tuesday, however, on both the rivers and railroads to attend the miners' picnic, at which 4000 people, it is said, were present. It was a very orderly assemblage. There was no whisky sold on the ground, and during the morning dancing and games were indulged in. In the afternoon, several orators addressed them on the rights of labor. But very few operators refused to shut down to let the men enjoy themselves. The strike will stiffen prices, as the stock will not be on hand when the run comes, as it would otherwise be, if trouble did not exist. Next week, the miners propose to make an effort to bring out the other pools, but I am under the impression they will fail. Miltenberger & Co.'s, New Orleans, report of June 1st, shows 177 boats and 5 barges of Pittsburg coal at that port. Consumed in May, 24 boats and 6 barges; arrivals, 36 boats and 5 barges.

The railroad trade has been steadily growing duller lately. This is partly due to the difficulty of securing cars and to iron mills shutting down for repairs. The week ending to-day has seen one or more idle days at most of the railroad pits for want of cars. Trade is slack generally, possibly because it is presidential week. There is nothing doing locally along the Allegheny Valley and Pennsylvania Railroad, the pits are working half-time, three days a week. The iron scale, as your readers are doubtless aware, is signed, which warrants the expectation of steady coal trade to this source through the fall and winter. Many puddling-furnaces, however, are idle, and will remain so for a few weeks, some of them months, as the stocks of muck iron at a number of mills are large. Three or four mills in this vicinity are idle for repairs, so you see the signing of the iron scale has not immediately benefited coal producers. The railroad coal operators will meet shortly if there is a meeting called of the River Coal Exchange in regard to asking Congress to assume ownership of the Monongahela River lockage.

The railroad coal men will oppose this, as they say it means river coal at local points at rates cheaper than the railroad men can meet. There is little prospect, however, of the river men asking for congressional intervention to give them free lockage, as they are not unanimous in the matter. Coal is still selling at 5¾ cents a bushel on the wall, except for very heavy orders. Tonnage is light for the reason mentioned above.

The coke trade continues in its recently acquired smooth course. There are no troubles at all between the Producers' Association and the syndicate, and the latter are disposing of all the coke made under the restricted production rule. The independent operators are conforming with the rules of the Producers' Association if they do not belong to it. A very fine quality of coke is turned out. Shipments average 720 cars a day. Prices are unchanged.

Buffalo. June 5.

[From our Special Correspondent.]

The condition of the anthracite and bituminous coal market at this place remains *in statu quo*. The only feature talked of is the continued harmony existing between dealers, and their steadfastness in maintaining the schedule rates.

Several anthracite coal contracts have been advertised for; but what is the use of doing so when no concessions will be made? In future specifications, as in the past this season, when bids are opened, a delightful similarity of figures will be presented to view.

The coke trade is without change.

Lake freights have been and are very firm; vessels scarce. It is expected that higher rates will prevail this week, for the reason that a general advance is observable for ore and heavy freight. This morning, the vessel brokers report the market very strong and 80c. freely paid. The *Courier* of yesterday says: Coal freights can not well be otherwise than strong, when tonnage is in good demand and vessels are very scarce. As has before been noted, our shippers would be in a bad predicament if they did not get vessels from other Lake Erie ports. The shipments thus far this season aggregate 226,620 tons, an increase of only 16,240 tons over last year for the same period. It is conceded that much more coal is to go forward by lake this year than was shipped last season, and it now looks as if inducements must continue to be made to bring light vessels here to move the stock. We must pay higher freights than Erie, Ashtabula, or Cleveland.

Receipts of coal by Lake Shore & Michigan Southern Railroad for week, 924 tons. For month of May, 2996 tons; 1920 tons for Buffalo, and 1076 tons to other points.

Shipments by lake from May 28th to June 4th inclusive, 55,340 tons, namely, 23,840 tons to Chicago, 15,640 to Milwaukee, 3360 to Toledo, 400 to Detroit, 9780 to Duluth, 150 to Bay City, 600 to Manitowoc, 920 to Sandusky, and 650 to Kenosha.

The total shipments by lake from opening of navigation to June 1st were 226,620 tons; corresponding period last year, 194,210 tons; and in 1882, 219,510 tons.

The total shipments by canal from opening of navigation to June 1st were 5396 tons, against 2398 in 1883.

Receipts by canal this season to June 1st were 1563 tons.

The shipments by canal have been as follows for the past eight days:

One load to Palmyra at 60c. net ton, captain to pay unloading; 5 loads to Syracuse at 70c. gross ton, captain to pay unloading; 1 load to Schenectady at 90c. net ton, captain to pay unloading; 1 load to Oriskany at 80c. net ton, captain to pay unloading. The nominal figures to New York are $1.37½, and to Albany, $1 per gross ton, captain to pay for unloading. These rates are very low; boatmen firm.

Freight engagements by lake were at the following rates: 80c. to Chicago, Milwaukee, and Duluth; 90c. to Cheboygan, Kenosha, Racine, and Manitowoc; 40c. to Toledo and Sandusky.

The estimated cost for enlarging the lock on the Erie Canal, as ordered by the last Legislature, as stated by Engineer Richmond, will be $30,000. The plans have been sent to Albany for the approval of the State Engineer and the Canal Board.

Messrs. J. Langdon & Co. were awarded the contract of the Michigan Central Railroad for 150,000 tons of bituminous coal at the reported price of $1.80 per ton delivered at Buffalo. This is the rate at which the New York Central is supplied. This is deemed a great achievement for the Buffalo firm, as the order has hitherto gone to Detroit or Cleveland shippers, and has invariably been Ohio coal. It is understood that the Buffalo, New York & Philadelphia Railroad will do the hauling.

Much of the tonnage chartered late last week and early this week came here light, owners refusing the low rates ruling for grain from upper Lake ports to Buffalo. Many propeller owners especially will not accept 1¾c. for wheat and 1½c. for corn from Chicago to this port; therefore their vessels come light and take coal for return cargoes. It pays better to do this, as more trips can be made when the time taken for loading is considered.

A newspaper item says: The Buffalo, New York & Philadelphia has already begun putting coal from its cars into canal-boats at Rochester. Six boats there at present go to the Gas-Light Company at Albany.

Another item is as follows: It is very poor picking among the coal shippers. The Erie is still working on its $1.05, and the others are maintaining rates, but are doing little or no business. There seems to be a general impression that the Rochester & Pittsburg has knocked all the chestnuts into the fire. So far as can be seen, there are no convenient cats'-paws to pull them out.

A press dispatch from Rochester, New York, says: A company has been formed here to build a coal road from the branch of the Erie south of the city to Charlotte, on Lake Ontario. This will make another coal out-let for the Erie and the Lackawanna. Capital stock, $1,000,000. Buffalo, Rochester, and Warsaw parties are the incorporators. The name of the road will be the Erie, Rochester & Lake Ontario Terminal.

From my Northwestern papers, I glean the following interesting items:

The receipts of coal at Duluth for the week ended Saturday last were 7640 tons; for the season, to same time, 44,630 tons.

Vessels taking coal to Port Arthur have been seriously delayed there on account of the poor facilities for handling coal. At present, there is but one dock at which to unload, and that can take out but 800 or so tons a day. Private advices from there say that in a few days this trouble will be entirely obviated, and hereafter vessels will meet with as much dispatch at that port as any place on the lakes. A number of patent hoisters are in course of construction, with capacity for handling from 3000 to 4000 tons daily.

At Ashland, Lake Superior, a Mr. Thomas B. Dickens showed a fine specimen of lignite coal, taken from a vein of considerable width, which he had discovered in a deep ravine where a land-slide had occurred. He thinks the vein or bed quite extensive. The location is about twelve miles from Bayfield. The coal burns freely.

About 5000 tons of coal have been unloaded upon the new dock of the St. P. & P. Coal and Iron Company at Superior this season. The quantity expected this year will aggregate 180,000 tons.

Boston. June 5.

[From our Special Correspondent.]

The retail trade and consumers generally continue to distrust the coal market. In this we do not consider Boston trade, because, owing to the continuance of its retail warfare, it is not to be considered as a barometer for any but Boston trade. And so, following out the disposition to buy sparingly of the anthracite, the wholesale trade is as quiet as last noted. Any talk of advanced prices for June had but little effect. Every one knows that anthracite coal pays a profit to the companies at present prices, and, as this is a year for hard-pan prices on all kinds of merchandise, the trade did not take kindly to any talk of advance for June, particularly when suspension was still necessary.

Before the Reading went into receiver's hands, such action was considered probable by the trade, and its effect discussed. While some expected demoralization in some degree to follow, the general belief, based upon the course of the market on a similar occasion, was, that the receivers would stop the production of unprofitable mines, and that the market would be strengthened rather than the reverse. Still there is a feeling of distrust on the part of consumers as to the future of the market, for which they give no definite reasons, but which makes them small buyers.

The cargo prices are unchanged, based on f. o. b. prices at New York of $4 for Stove, $3.65 for Broken and Egg, with individual coal selling fairly at $3.90@$3.95 for Stove and $3.50 for Broken and Egg. Philadelphia f. o. b. prices are $3.75@$3.85 for Stove; $3.40@$3.50 for Broken and Egg. Special coals are worth $5.50 for Stove and $4.90 Egg. The cargo demand and pocket trade also is small description.

Only a few sales of bituminous coal are reported but these are said to be at bottom prices, in the close vicinity of $3.80@$3.90 delivered. As high as $4 might be had for small lots. There are no contracts in the market. It is reported that 10,000 tons pea coal have lately been purchased by a manufacturing concern in close competition with bituminous and at slightly below bituminous prices. The consumers are said to prefer hard coal and bought the kind which they have used for some years. Such a contract could hardly be said to indicate the market.

The larger part of the gas-coal tonnage has been placed, though more than usual has been left for purchase later in the season. Good Pennsylvania gas-coal has sold at $4.75 delivered. Some lots of cheaper coal have sold at $4.50.

Freights continue low. A few barges are running from New York at about 90 cents, and so long as they can get present low insurance rates, they are likely to run on about that basis. We quote:

New York, 90c.@$1.15 per ton; Philadelphia, $1.25@$1.30; Baltimore, $1.40; Newport News, $1.25; Richmond, $1.30; Bay of Fundy, $1.50; Cape Breton, $1.90@$2.

There is a quiet retail trade, with dealers moderately busy where they will meet the low figures. Unless coal can be bought on some such basis as is reported for the pea coal contract above, it is difficult to see how stove coal can be sold at $4.75 on the wharf. Retail contracts are taken in a small way. Delivered prices for ton lots are as follows:

White ash, furnace, and egg	$5.50@
" " stove and nut	5.75@
Red ash, egg	6.00@
" " stove	6.00@
Lorberry, egg and stove	6.50@
Franklin, egg and stove	7.25@
Lehigh, furnace, egg, and stove	5.50@5.75
" nut	5.50@5.75

Cincinnati. June 2.

[Reported by the CONSOLIDATED COAL AND MINING COMPANY.]

The feature of the coal trade for May was an advance of a clean cent per bushel in the price of river coal. This was made in the face of a reduction in the price of mining on the Monongahela, and upon a run of over six millions of bushels of coal from Pittsburg, more than one half of which came to the Cincinnati market. The Pittsburg shippers assumed a solid front, and simply said they must have 8 cents for their coal or it should go into the coal harbors. A large portion of the run had been sold before it started out, and the shipment was a large one for this market. They only had to hold a stiff backbone and their coal soon began to melt away. Dealers bought only as they were compelled to, but trade had become active at low prices, and many of the dealers had to pay the prices asked. The month may be recorded as a fairly good one, both for the shippers and the dealers.

The effect of cornering the market, however, when coal is plenty, is likely to operate against the large shippers, who are the only ones who can successfully accomplish a corner. The immediate effect is to compel such dealers as can do it to run their own coal. They can send barges to Pittsburg, and get them loaded at the smaller works, which can not run their own coal to the lower markets. The coal shipped in this way would cost the dealers from one to two cents a bushel less than they would have to pay if they bought in the Cincinnati market. The conditions of the trade are not favorable for high prices, and any producers will make a mistake who force consumers to pay temporarily more than their commodity is worth. There are other available sources of supply, and consumers are simply compelled to resort to them. When a good new coal has once obtained a foothold in a large manufacturing market like this, it becomes very hard to dislodge it.

The month of May went out with second pool coal steady at 8 cents per bushel. Kanawha, 7 cents.

Anthracite coal has not begun to move much as yet. Dealers are not willing to submit to the conditions agreed upon by the Western Anthracite Association, which has been able, as yet, to maintain the ground it assumed at the opening of the season.

The consequence of this action is to reduce the early summer shipments to very small proportions, so far as this section is concerned.

What will be the effect of throwing the bulk of the anthracite trade over till fall, it is hard to tell. If transportation in the fall should be plenty, it will make but little difference in the quantity consumed. If transportation should be scarce and an advance asked on the coal, it will reduce the consumption very largely. Already consumers are experimenting with coke, and if anthracite should be any higher, the coke will be substituted to a very great extent.

Anthracite in this section is a luxury, and will feel the effect of retrenchment very quickly.

If the anthracite associations take a course that will not leave the dealers a fair margin for dealing in anthracite, they will turn against it, and do what they can to substitute something else in its place. This would reduce the consumption of it to very small proportions where soft coal is so good and so cheap as it is here, and where coke can be had in any quantity.

We quote as follows :

	In barges.	Delivered to consumers.
Youghiogheny	8 cents	11@12 cents per bush.
Kanawha	7 "	10@11 " " "
Ohio River	6 "	9@10 " " "

Anthracite, $7@$7.50 per ton delivered.

Louisville. May 29.

[Reported by BYRNES & SPEED.]

The delivery of coal has been very light here for the past two months. The prospect for June is good. Our prices are as follows :

Wholesale.

Pittsburg, 7½c. per bushel.	Kanawha, 7c. per bushel.
Laurel, 7c. "	Kentucky, 6c. "
Coke 7c. "	Anthracite, $6.75 per ton.

Retail.

Pittsburg, 12c. per bushel.	Kanawha, 11c. per bushel.
Laurel, 10c. "	Anthracite, $8 per ton.

Milwaukee. May 28.

[Specially reported by R. P. ELMORE & Co.]

Sales of anthracite are light and confined to city retail trade. Dealers are busy getting in stocks by lake, and yards are filling up about as fast as usual.

City retail prices delivered to consumers on sidewalk are :

Stove and chestnut ..... $6.75 per ton, net.
Grate and small egg ..... 6.50 " "

Prices delivered on cars and to dealers and manufacturers in yard here are :

Grate ..... $5.94 net ton.	Stove ..... $6.25 net ton.
Egg ..... 6.03 "	Chestnut ..... 6.25 "

Bituminous coal is in fair supply, and selling at all sorts of prices.

Montreal. May 29.

[Reported by KINGMAN, BROWN & Co.]

Retail.

Anthracite.—Stove and Chestnut $6 00
Egg and Furnace 5.75
(*Per 2000 pounds, delivered.*)

Soft.—Welsh $5.50
Lower ports 5.00
(*Per 2240 pounds, delivered.*)

Wholesale.

Quotations merely nominal.

New Orleans. May 30.

[Specially reported by C. A. MILTENBERGER & Co.]

The month of May has proved to be a dull one in the coal trade, the demand falling considerably behind that of the corresponding month of 1883. The sugar-planters have not entered fully into the purchasing of their coal supply, owing to the continued high stage of the river, the water in many places being over their coal landings. The river is now on the decline, and some activity will be soon developed in the trade, although the consumption will fall considerably short of that of last year, owing to the large number of plantations that were overflowed, and the crops ruined. The demand for the river trade is also on the decline. We quote :

Pittsburg coal.		Anthracite coal.	
	Per bbl.		Per ton.
By boat-load, 29c. @ 31c.		At wholesale, $7.50 @ $8.50	
To steamboats	40c.	At retail	9.00 @ 9.50
To manufact., 42½c @ 45c.			
To families	50c.	Alabama coal.	
	Per hhd.		Per bbl.
In hhds	$5.00	At retail	40c. @ 50c.

Richmond. May 28.

[Reported by S. H. HAWES.]

Every thing indicates low prices for coal this season. Three of the railroads entering this city tap the coal regions and bring in steam coals, which causes sharp competition.

There is not a large stock of anthracite in the market.

Dealers seem to be "resting on their oars," waiting for lower prices and freights.

Toledo. June 4.

[Reported by GOSLINE & BARBOUR.]

We quote prices on coal as follows, f. o. b. cars at Toledo, net tons.

ANTHRACITE.

Grate	$5.04	No. 4	$5.58
Egg	5.13	Chestnut	5.36
Stove	5.36		

Retail (net tons).

Stove	$6.25	Egg	$6.00
Chestnut	6.25	Grate	6.00
No. 4	6.25		

BITUMINOUS.

Lump	$2.35
Nut (best grade Ohio coal)	1.95

Retail.

Massillon lump	$4.50	Massillon nut	$4.00
Jackson "	4.25	Jackson "	4.00
Straitsville "	4.00	Straitsville "	3.75

The trade generally is very dull, more especially in the anthracite for domestic purposes, as it does not put in their supply until late in the season.

STATISTICS OF COAL PRODUCTION.

Comparative statement of the production of anthracite coal for the week ended May 31st, and year from January 1st :

TONS OF 2240 LBS.	1884.		1883.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co.	134,751	1,404,442	102,985	1,457,732
D. L. & W. RR. Co.	126,605	1,886,155	114,223	1,833,829
Penna. Coal Co.	42,059	462,011	36,066	507,325
L. V. RR. Co.	47,970	539,516	25,616	430,586
P. & N. Y. RR. Co.	6,660	81,665	5,430	80,346
C. RR. of N. J.	*	*	45,556	971,766
Penn. Canal Co.	12,343	95,951	12,572	105,709
North & West Br. RR.	14,254	326,184	6,574	194,595
	384,642	4,795,924	349,022	5,581,888
Lehigh Region.				
L. V. RR. Co.	118,693	1,721,122	120,154	1,902,551
C. RR. of N. J.	*	*	35,554	884,582
S. H. & W. B. RR.	4,461	83,082	451	19,086
	123,154	1,804,204	156,159	2,806,219
Schuylkill Region.				
P. & R. RR. Co.	328,685	4,112,383	177,333	2,659,716
Shamokin & Lykens Val.	*	*	26,731	533,568
	328,685	4,112,383	204,064	3,193,284
Sullivan Region.				
St Line & Sul. RR. Co.	2,566	34,352	1,316	25,062
Total	839,047	10,746,863	710,561	11,606,453
Increase				
Decrease		859,590		

* Included in tonnage of the Philadelphia & Reading Railroad.

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

Total same time in 1879 ..... 5,325,681 tons.
" " " " 1880 ..... 9,299,850 "
" " " " 1881 ..... 9,693,057 "
" " " " 1882 ..... 9,520,085 "

The increase in shipments of Cumberland Coal over the Cumberland Branch and Cumberland & Pennsylvania railroads amounts to 94,246 tons, as compared with the corresponding period in 1883.

Belvidere-Delaware Railroad Report for the week ended May 31st :

	Week.	Year. 1884.	Year. 1883.
Coal for shipment at Coal Port (Trenton)	3,513	22,898	31,182
Coal for shipment at South Amboy	17,342	274,262	342,869
Coal for distribution	15,657	324,187	327,836
Coal for company's use	3,882	76,350	61,657
Total	40,394	697,697	763,545
Increase			
Decrease		65,848	

Comparative Statement of the Production of Bituminous Coal for the week ended May 31st and year from January 1st :

Tons of 2000 pounds, unless otherwise designated.

	1884.		1883.	
	Week.	Year.	Week.	Year.
Cumberland Region, Md.				
Tons of 2240 lbs.	64,305	1,027,514	52,700	890,124
Barclay Region, Pa.				
Barclay RR., tons of 2240 lbs.	4,115	143,944	4,878	139,920
Broad Top Region, Pa.				
Huntington & Broad Top RR., of 2240 lbs.	4,217	81,238	.....	82,617
East Broad Top	.....	.....	.....	.....
Clearfield Region, Pa.				
Snow Shoe	2,962	80,366	4,096	104,805
Karthaus (Keating)	1,050	7,207	.....	.....
Tyrone & Clearfield	62,969	1,261,136	46,037	1,152,756
Alleghany Region, Pa				
Gallitzin & Mountain	5,693	154,668	7,869	199,705
Pittsburg Region, Pa.				
West Penn RR.	4,143	121,418	7,321	201,206
Southwest Penn. RR.	2,789	68,835	1,428	49,321
Pennsylvania RR.	6,058	119,588	9,421	203,107
Westmoreland Region, Pa.				
Pennsylvania RR.	34,088	485,381	30,696	587,874
Monongahela Region, Pa.				
Pennsylvania RR.	1,789	65,489	.....	.....
Total	194,178	3,616,784	164,446	3,611,435
Increase	.....	5,349	.....	.....

Comparative Statement of the Transportation of Coke over the Pennsylvania Railroad for the week ended May 31st, and year from January 1st :

Tons of 2000 pounds.

	1884.		1883.	
	Week.	Year.	Week.	Year.
Gallitzin & Mountain (Alleghany Region)	2,288	55,254	503	47,693
West Penn. RR.	40	24,504	2,619	45,639
Southwest Penn. RR.	46,696	930,625	43,186	843,023
Penn. & Westmoreland Region, Pa. RR.	4,435	74,485	3,023	99,763
Monongahela, Penn. RR.	1,827	34,187	.....	.....
Pittsburg Region, Pa. RR.	.....	136	18	331
Snow Shoe (Clearfield Region)	425	8,732	336	8,408
Total	55,711	1,127,923	49,685	1,044,857
Increase	.....	83,066	.....	.....