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RICHARD P. ROTHWELL, C. E., M. E.
ROSSITER W. RAYMOND, Ph. D., } Editors.

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NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

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The Social Aspects of the Cleveland Meeting.

THE Cleveland meeting of the Institute of Mining Engineers, like all its predecessors, was characterized by a delightfully cordial good-fellowship among the numerous members in attendance. It seems simple enough, that the primary object of a *meeting* is to *meet* somebody; yet in too many societies the original significance of the purpose is lost, and the meeting is an abstract sort of performance, to be "attended" as one would attend a show or an experiment. Now the meetings of the Institute are of the old and genuine sort. They begin all over the country, on steamboats, railways—wherever the streams of members begin to flow together toward the common rendez-vous. These preliminary meetings are called to order with a slap on the back, a hearty shake of the hand, and a "Hallo! old fellow; you going too?" Along the route to Cleveland, and in the office of the Kennard House, there was a perpetual *feu de joie* of such greetings, which reached its culmination when HEINRICH, arriving late, dusty with the long journey from his Virginia colliery, registered his name at the hotel, and was embraced with many a hurrah by the eager crowd who had been asking after him for hours. "The Cleveland meeting," indeed! When one considers that on such an occasion every one of fifty members has a separate meeting with every other, it is evident that there are at least twelve hundred and twenty-five meetings to be accounted for.

The gathering for certain sessions in a hall does not represent adequately either the social or the professional profit of the occasion. The discussions held in public are interesting and important; but the knots into which a car-full of excursionists breaks up, and the eager discussions which they carry on, are the most fruitful. We have often pointed out this fact; and we repeat our allusion to it, in order to enforce upon members a sense of the great advantage of personal attendance upon the meetings.

The dullest mind could not fail to be impressed with this truth, on contemplation of the brilliant banquet with which the Cleveland people crowned their hospitality. Everybody united to pronounce that occasion an extraordinary one. The capital dinner seemed to inspire a series of capital speeches; and the members and their hosts evidently produced upon each other a mutually charming impression.

Not less enjoyable were the excursions to the coal and iron districts of Ohio, and to the immense industrial establishments upon which so much of the greatness of Cleveland is built. The imposing exhibition of the power and natural resources of a State and of the growth of a wonderful industry was studied with intense interest by many a representative of Eastern or Southern enterprise; and the admission of Ohio's favorable opportunity, in the competition that must come, was freely made.

We have not space enough to describe in detail the many delightful features of the Cleveland excursions and social festivities. In the retrospect of so much innocent and unalloyed pleasure, we feel sure that, with reference to this occasion at least, no member who participated in it will be forced to acknowledge the cynical maximum with which ASMUS set the company in a roar :—"Whoever has a good conscience, must have a bad memory!" *

Arbitration and Co-operation.

PRESIDENT SINEY'S ADDRESS BEFORE THE MINERS' NATIONAL ASSOCIATION.

THE *Miners' National Record* publishes in full Mr. JOHN SINEY'S address before the Miners' National Association; it is marked by the plain, sound common sense which characterizes its author. He devotes a large part of his attention to an explanation of the cause of the failure of all the strikes undertaken by the men during the past year. It has appeared on various occasions that Mr. SINEY encouraged, by his presence and acts, the strikes going on in several of the coal regions, yet in this address he throws the entire blame for failure on the men who commenced and carried them on, without having followed the course prescribed by the National Association. We strongly suspect that, had the men been successful, Mr. SINEY would have been ready to claim for his Association a large part of the credit, and we would have heard less about strikes being inaugurated without the approval or sanction of the Union.

The following brief extracts from the address will indicate the general policy advocated. Speaking of the causes of the decline in wages, Mr. SINEY says:

"No man in our movement has better opportunity to observe the spirit which moves employers than that afforded me by the position you have placed me in. Whilst many are cold, unfeeling, and some even malicious, among them, and ever ready to take advantage of workmen's needs, I know there are also many who desire to do strict justice to them, as far as that can be done under the prevailing system. To me it is impossible to class all mine employers in the category of thieves, robbers, and bad men, for it is not true. Like as it is among ourselves, I suspect the good among them are largely under the powerful sway of the reckless and unscrupulous. To live, that is, do business and maintain a position to compete, the minority must adopt the rules of the majority. This is the rule, and while it has been the fate of our members, and trade generally, to suffer for the common necessaries of life, it has also been the misfortune of many of them to go into bankruptcy, and *all* to submit to a terrible contraction in the estimated values of their property. As with us, so is it with them, in the matter of organization. Except in the anthracite regions, and I might add, Pittsburgh, I do not know that a real, genuine combination exists that at any important point can hold the prices of our product up in the markets. In the course of my official term I have met lots of them who prayed that such a union could be organized and sustained. Those men I have met in Indiana, Illinois and Ohio, and at this hour they would give a good deal if such a controlling power could be built up for their protection. With them, all divided, and each man cutting his neighbor's figures, and trying to get a paying trade out of a languid and inactive market; with us, all divided—for this has really been our condition, taking our trade as a whole—and thus holding no perceptible control over their actions as the producers; nothing else but reductions in prices could be the result, and the semi-organized resistance on our part fail of its purpose. The consequence was that coal fell in the markets, by the 'cutting under' plan of the dealers, and this largely at the expense of the working miner." . . .

"I am aware of the objections raised by our own men to such an overshadowing monopoly as the coal combination, with its almost illimitable power to not only control the man who consumes, but him also who produces. But while I appreciate the arguments used on general principles, I cannot, as a trade unionist, be consistent and condemn its members, because what they now are doing, we, in a large measure, aim to do for the purpose of maintaining 'a fair day's wages for a fair day's work.' When our miners will put themselves in a position such as those companies have done, in the management of their supply to the demand, then shall they have attained to such a standard of perfection in organization as will be of real practical benefit to them, and which all comprehensive unionists have striven to reach.

"You understand, to keep wages up is the leading object of a trade union. The means to be employed to accomplish this is to put ourselves in a position whereby we can intelligently regulate our labor to the demand there is for it in the markets." . . . "As union men, we claim the right to so manage our own affairs as to bring us the greatest returns. This is what employers very often refuse, and this refusal makes turmoil and trouble. Our labor is our own, and if we can make the better bargain by combining together, the right to do so ought to be as readily conceded as that which allows any number of capitalists to associate together, such as the anthracite combination, for this purpose." . . .

"The great want among us is perfect organization." . . . "Another point of the greatest importance to the Association, is the matter of too many men getting on a strike at one time. When a given number are out—all that can be supported and not tax the society beyond a decent point—any more coming out only add assistance to the enemy and make the success of their fellowmen an impossibility."

In advocating the principle of arbitration for the settlement of disputes, the address says:

"No man who has taught himself to think and has studied the relations existing between capital and labor, and the rights of individuals, hesitates one second to pronounce in favor of arbitration and conciliation in the settlement of trade disputes." . . . . "What is claimed by the best advocates of this method is that it will determine what is right in more cases than the old brute force plan of striking, as is our practice, and by so doing prevent the suffering, the hard feelings, the excitement, and the sometimes lawlessness that grow out of strikes." . . . . "In the light of this truth, let us, of this body, give some adequate expression to our appreciation of arbitration and conciliation in the settlement of all our difficulties over the system of striking, as is and has been the custom. My sincere wish is that not only the miners but the employers will show a desire to cultivate this principle. There can be no well-founded doubt in the mind of the fair man, whether of the one class or the other, as to its desirability. Our members are really more concerned in this than any other set of men, and it appears to me they cannot be good members of the Miners' National Association, who are not prepared to make as great sacrifices to *win* by its adoption as they are and have been in fighting by strikes. As I view it, the true interests of both parties are to be faithfully served in this way, and they have not been so in the other."

Mr. SINEY'S panacea for all labor troubles, and for all the ills the class is heir to, is in co-operation; he says:

"In co-operation I see the revolution of the entire social fabric in the generation to come. All members of a co-operative institution, whether of a productive or distributive nature, receive their just dues, and this is genuine republican doctrine. Trades unions are the stepping-stones to this higher principle. Out of them, I expect, will spring the development of this idea till the condition of their members has attained to the highest standard. The wages system keeps us slaves, and to perpetuate it with all our remedies, which only touch effects, is to make our children heirs to an inheritance *men* should be ashamed of. It is a blot on our age—the fact that we keep running in the same old ruts as did our forefathers. They adopted combinations and strikes to defend themselves against a certain set of circumstances. These did bring them a wider sphere of action. They did, by this means, obtain greater liberties. But must we stand still where they left off? Must we live on what they gave us? Is it not as incumbent upon us to free ourselves from ills we know we labor under, as it was for them? Have we no tax upon tea and other obnoxious duty to throw off? Do we owe nothing to posterity? If so, then is our boasted civilization and boasted age of progress a farce, and life has no object. I claim we have wrongs we can right. I claim we have a higher end in life than simply to live and enjoy the fruit of others' toil. I claim there are thousands in our ranks who are ripe to adopt the scheme of co-operation and look to this body to make the start." . . .

"When we consider the amount of money that has been subscribed by our members this year to support strikes, it is something astonishing; it must have been no less than $75,000. To what purpose was it paid? The object was de-

cidedly to keep the prices of the employed labor up higher than it would otherwise be if all were employed. The object was to deplete the markets, to an extent, and bring better prices. This being the purpose, if some plan could have taken the surplus men out of the field of production, and have them in some way profitably employed by that money, it would surely be of the very highest consideration and benefit." . . . "A well-matured co-operative coal mining company engaged during the present dull season in developing new fields and making ready to enter into the arena as a competitor for a full share of the coal trade as soon as the business of the country will improve, promises this."

A proposition was made to the Association to organize a co-operative colliery in Tennessee, and Messrs. JOHN SINEY and ANDREW ROY, State Inspector of Mines of Ohio, were appointed a Committee to examine the property, and on the receipt of a favorable report measures are to be taken to organize and issue stock in a co-operative company.

The general recommendations of Mr. SINEY to the organization over which he presides indicate that the National Association is by no means powerful at present, but that was to be expected after the series of defeats the miners have suffered during the past year, even though the responsibility for these is disowned by the Association.

We cordially approve the adoption of the principle of conciliation and arbitration; it is one for which we have always contended. Some legislation is, however, required that will make the award of an arbitrator, or the conclusions of a board of conciliation, binding in law on the parties submitting the question to such a court.

There can also be little question of the *theoretical* advantages of co-operation in mining enterprises, but, unfortunately, experience has shown such undertakings have been almost invariably miserable failures. We strongly suspect that a similar fate will befall the Tennessee Co-operative Coal Mining Co., which it is proposed to organize. The reason for this non-success, probably, is that the limited experience working miners have of general business and of the various conditions which go to make up successful management of a colliery, is insufficient to carry on such an enterprise. This, and the dissensions and bickerings which have generally arisen among the members themselves, have caused the failure of all previous attempts in this country. Nevertheless, we are, on general principles, advocates of co-operative enterprise, but in reducing the principle to successful practice, a much greater amount of thought and ability is necessary than is generally supposed.

It has always appeared to us that one of the first duties of trades unions should be the promotion of education among workingmen. There is no possibility of "enslaving" intelligent men who have that enlightened education which gives them a better appreciation of the causes that affect wages, and of the rights due to employers as well as employés. Yet the subject of education seems to be ignored, or at best to receive but little attention, by any of the workmen's associations.

This duty of elevating the laboring classes, while most binding on the leaders of labor associations, is no less the duty of the educated classes. Ignorance is the bane of industry. The more intelligent the workman the better for himself, his employer, for industry, and the world at large. Employers and the Government, as well as the labor associations, should move in this matter and wipe out this blot upon our modern civilization.

Assuredly it is to the interest of every employer, of every capitalist, to have the laboring classes educated and improved, and if a tithe of the money now wasted in the periodical strikes and conflicts between employers and their workmen was devoted to the improvement of the latter class it would not be many years before we would have that degree of intelligence governing their counsels as would effectually prevent strikes, and make so disgraceful a picture as that of Sub-Inspector BREWER, given in another column, no longer applicable, even in the workshops of the "Black Country" of England. Fortunately, we believe, no such facts at present exist in this country.

No better preparation for the adoption of the great principles of conciliation and co-operation can possibly be devised than the better education of the laboring classes.

American Society of Civil Engineers.

THE twenty-third annual meeting of this Association was held on Wednesday last.

The annual report of the Board of Directors upon the affairs of the Society was read, from which it appears that the increase in membership during the year was 48, and the present number is 492. By donation and purchase, there were added to the library about 850 books and pamphlets, many photographs, and other illustrations of engineering structures.

The Treasurer's report shows the finances of the Society to be in satisfactory condition, the increase in receipts keeping pace with increased expenditures during the year, incident to change in location of the society-rooms.

Officers were elected as follows:

GEORGE S. GREENE, President.
THEODORE G. ELLIS, W. MILNOR ROBERTS, } Vice-Presidents.
GABRIEL LEVERICH, Secretary.
JOHN BOGART, Treasurer.
OCTAVE CHANUTE, ALEXANDER L. HOLLEY, FRANCIS COLLINGWOOD, QUINCY A. GILLMORE, JULIUS W. ADAMS, } Directors.

Subsequently the Standing Committees were appointed as follows:

On Finance—Messrs. ROBERTS, GILLMORE and COLLINGWOOD.
On Library—Messrs. HOLLEY, BOGART and ELLIS.

The Norman Medal was awarded for a paper, "Description and Results of Hydraulic Experiments with large apertures, at Holyoke, Mass., in 1874," by Gen. THEODORE G. ELLIS.

Reports of Committees on "Tests of American Iron and Steel," "Time and Place of the Eighth Annual Convention," "Mutual Benefit Society," and on "Policy of the Society," were accepted. It was determined to hold the next annual Convention at Philadelphia, June 13–15, 1876. The matter of presenting American engineering at the Centennial was referred to a committee. A proposition that action be taken towards adopting the metric system of weights and measures was discussed, and amendments to the by-laws relating to the appointment of committees to report on professional topics, or perform expert services; annual conventions being declared business meetings; making Past-Presidents of the Society members of the Board of Directors; holding social meetings at the Society's rooms during the winter, and other matters, were considered and duly referred.

The annual dinner was held at DELMONICO's. Gen. THEODORE G. ELLIS presided, and informal speeches were made by Messrs. ROBERTS, BRIGGS, HOLLEY, BLOOR, WESTERN, THURSTON and others.

Some Pressing Needs of our Iron and Steel Manufactures.

[ADDRESS of President A. L. HOLLEY at the opening of the Cleveland Meeting of the American Institute of Mining Engineers, October 26, 1875.]

CONTINUED FROM PAGE 451.

III.—*Refractory Materials.* Improvements in this direction are probably the most important that can be considered, and they increase in importance as iron and steel processes become cheapened, and as products become more refined. A better blast-furnace lining would be desirable; better heating furnace walls would be very valuable; better Bessemer vessel linings would lead to great economy; better open-hearth furnace roofs are absolutely essential to cheap Martin-steel manufacture, and better refractory materials generally must be provided before the Siemens direct process, high-pressure furnaces, the cheap compounding of various metals with iron, and many other promising processes, can be carried on at all with commercial success. It is not too much to say that a better and cheaper fire-brick will be the key to the situation.

The cost of maintaining refractory linings and fixtures in the Bessemer process averages nearly $1 per ton of ingots, of which the cost of vessel-bottoms is about one-third. Merely doubling the life of bottoms would save some $6,000 per year, in a single works. As the life of a bottom frequently exceeds double the average life, it should not seem impossible to raise the average in this proportion. The cost of refractory materials and maintenance in the American Siemens-Martin manufacture is not far from $5 per ton of ingots, while in Wales and in France it is about $1. This difference lies largely between bricks which cost $50 to $60 per 1,000 and stand 50 to 70 heats, here, and those which cost $18 to $20, and endure 200 to 250 heats. abroad. Merely equaling the foreign practice would of itself make a good business profit.

Our metal manufacturers seem less serious and methodical in their attempts at this, than at any other improvement. They can copy the steam-engine results of others, but the refractory material problem is all their own. That it is difficult cannot be denied; but the average attempts to solve it, which consist largely in traveling round in a circle, are wholly inadequate, and unworthy of the profession. Bricks, tuyeres and fire-clay mixtures generally, have not been notably improved for a decade, except here and there, accidentally, by the discovery of better clays, or empirically, by trying all sorts of mixtures hap-hazard. There have of course been some attempts at scientific improvement. Mr. SNELUS gives the following facts in his late valuable paper before the Iron and Steel Institute: The presence of 2 or 3 per cent. of oxide of iron renders bricks unfit for open-hearth furnace roofs, and 1 per cent. of alkalies makes them fusible at high temperatures. There are some apparent anomalies: lime fluxes ordinary fire-bricks, but 1 per cent. of it used to bind together pure silica sand makes the most durable furnace roofs known. Alumina by itself, and in the proportion with silica of 30 to 38 per cent., as in some of the best clays, is extremely refractory, but 3 per cent. of it in a silica brick will flux it at high temperatures. These facts explain the bewilderment and discouragement that usually attend experimenting on a limited scale; they also show the necessity of combining the results of a vast number of experiments and analyses; and they especially show that the direction of these experiments should be in accordance with chemical probabilities. Merely varying mixtures, even with a knowledge of their constituent parts, might never lead to improvement, if the laws of chemical affinity were misunderstood or ignored.

The same conclusions may be drawn from another group of facts, viz.: the very different behaviour of refractory linings in contact with different metals, slags and ores, such as the cutting of sand bottom in the pig-and-ore open-hearth process. The best furnace-roof brick we know of—as nearly pure silica as possible—is the worst brick to stand the manganese reactions in a spiegel cupola. In the first case, it might endure 250 charges at an excessively high temperature; in the second, it would hardly stand 25 heats at a low temperature.

In view of these complications and of the obvious necessity for prolonged and searching chemical work of the highest class, and for a systematic series of experiments—also, in view of the extremely limited progress which has been made by present methods, it really seems that the time has come for a new departure. No individual works can, nor should, afford the cost of such an investigation, which would be for the general benefit. A clay-bank owner, or a brick-maker, can hardly be expected to do more than develop his own products, since complete experiments might prove them inferior. Why should not the iron and steel makers of the country unite in carrying out a series of investigations which, if properly managed, would inevitably lead to important savings

in the old processes, and to revolutionary economies in the new and developing ones? It has been objected to this kind of effort, that "what is everybody's business is nobody's," and that valuable results rarely follow mixing up the interests of independent companies. If these remarks are ever true, they do not apply to this case. In general, the history of associated effort is the history of civilization; and in particular, the association of individuals, through governmental and private organizations, to test the strength of metals, to inspect boilers, to analyse ores, to collect facts, and to do numerous things of general and of special interest, is often the foundation of success in commerce and the arts. The proposed investigation would be entirely relieved from those uncertainties which embarrass combinations to sell products under certain limitations of price and quantity. It would be simply a search after physical facts, by a corps of experts in whose ability and integrity all parties would have confidence. However difficult the problem may be, the manner of its solution is plain, and the means of experiment are numerous.

Not to anticipate the proceedings of such a commission, but merely to observe how large and hopeful is the field for investigation, let us for a moment consider the situation and probabilities.

I. The comparative failure of previous attempts to improve refractory materials has been due to the varying presence of unknown elements. Three materials each make a good fire-brick; mixing the first with the second makes a better one, but mixing the first with the third makes an inferior one—and the experimenter is all adrift. The more alumina, between 40 and 60 per cent., we mix with silica, the better the result, but the more alumina, between 3 and 10 per cent., we mix with silica, the worse the result. Repeating apparently the same mixture sometimes gives different results. But there are no anomalies in nature; apparent contradictions are merely want of knowledge. Therefore one important step in this inquiry would be to variously compound pure silica, alumina and other substances, to imitate nature in their mixing, and then to try their refractory qualities, rather than to confine experiments to variable natural mixtures. Even if we must use materials as we find them compounded in nature, it is better to know, first, exactly what we want, by means of artificial mixtures of pure materials, and then to come as near it as we can.

It is not certain, however, that we shall be confined to natural mixtures just as we find them. The chief ingredients of that remarkable refractory material bauxite (which is somewhat rare and expensive), alumina and oxide of iron, can be obtained more free from other substances than bauxite is. Why cannot artificial bauxite be made? The intimacy of mixture, indeed, has much to do with the character of the product. We know that five per cent. of alumina, incorporated by nature with siliceous sand, give more adhesiveness, both wet and glazed, than three times that amount as ordinarily mixed by hand. The artificial distribution of manganese ore with iron ore in a furnace makes iron pigs and manganiferous slag, while, if the manganese ore had been rubbed into the iron ore by nature, the result would have been spiegeleisen. More than intimacy of mixture may be necessary in some cases. Dr. STERRY HUNT has suggested that the difference in the behavior of silica in furnaces may be somewhat due to the manner of its formation—either as an animal secretion, or as found in igneous rocks, or in rocks stratified from their debris. The shape of sand-grains has also much to do with their binding qualities, angular fragments being better than rounded ones. There is, however, a strong probability that refractory materials may be artificially compounded out of pure, or nearly pure, substances, more uniformly than they are compounded by nature. So that the synthetical method we are considering should be useful, not only in showing what we want, but in enabling us to produce it.

II.—Other substances than silica and alumina are extremely refractory, indeed indestructible, by mere heat; such as lime, magnesia and carbon. The great difficulty has been to form them into compact bricks without adding such binding substances as will flux them, and so impair their refractory qualities. But as pulverized silica—a rope of sand—is sufficiently held together by 1½ per cent. of lime, to make the best heat-resisting brick we know of, the other incoherent refractories should offer a promising field for experiment.

We may learn much on this subject from the experience with crucibles. The two required qualities to be chiefly considered are—1st, resistance to softening, or to melting by contact with neutral flame—by mere heat; 2d, resistance to the chemical action of metallic oxides, slags and free oxide. Both these qualities are attained by lining a crucible that will resist fire well, with one that will resist chemical action well. For instance, a carbon crucible wastes more rapidly than an earthen one, in the fire; but by lining an earthen crucible with carbon, it perfectly resists the action of manganese oxide, which would soon destroy any vessel containing much silica. Carbon mixtures, however, are affected by oxygen in a surprisingly small degree. The endurance of graphite crucibles in a fire of coke driven by a powerful blast, and graphite Bessemer tuyeres in contact with air blast and oxide under intense heat, are examples. The use of carbon, even in the form of wood, is already on trial by Mr. SIEMENS, and, in another form, by one of our members.

Lime is extremely refractory, never having been fused by mere heat. Crucibles cut from blocks of well-burned, slightly hydrated lime are used to melt platinum. Magnesia is also infusible at the highest attainable temperatures. Mr. TESSIÉ DU MOTAY, of Paris, has made some remarkable magnesia bricks, of which I have specimens. They are, certainly, expensive, but they are said to resist not only heat, but the dissolving effect of manganese oxide and various corroding slags. There is a prospect of this manufacture being started in this country. Dr. PERCY says of this material, in his new *Metallurgy*: "Reverberatory furnaces for melting steel may be lined with a paste formed of the prepared magnesia and water, which will undergo the necessary drying and firing after the furnace is lighted, without any special precautions being required." He also gives directions for preparing magnesia for use in crucibles and bricks. This material is also used at Creusot in Bessemer vessel linings. The only difficulty is to make it sufficiently coherent.

Still another requirement of Bessemer vessel lining and revolving open-hearth linings is hardness, to resist the mechanical erosion of the contained metal. All the foregoing considerations, indeed, point to the importance of making refractory materials hard and dense, without running into the other extreme of increasing their liability to crack and crumble on the exposed surfaces. But even this tendency may be prevented by proper treatment. Silica bricks require slow heating. In some Bessemer vessel linings, made of natural siliceous stones, trimmed like bricks to make a wall, which are now in successful use, the "spalling off" was permanently stopped by glazing the wall at its first heat, by blowing a charge of metal within it.

III.—It is, further, possible that refractory linings must, in many cases, be made where they are used. This is already the case with the silica bricks we have mentioned, as at Landore and Terrenoire. They are too tender to bear transportation, but are remarkably refractory when once set in a wall. The apparatus for making them is not very costly, nor elaborate. The quartz is crushed to fine sand, wetted down with lime-cream (1½ to 2 per cent. of lime), and moulded by hand into bricks. These are dried and burned in kilns, containing 32,000 each, for seven days. Bessemer vessel linings are also necessarily made where they are used, and it seems reasonable to believe that the use of monolithic linings will become more general in all kinds of furnaces. It is very obvious that the cost of a furnace roof and sides, rammed up like a Bessemer vessel, dried out and glazed, would be much less than that of bricks individually moulded, pressed, dried, burned, trimmed and set. And if the material is equally good, the continuous wall should stand much longer, because it has no joints, which are always the first parts to fail. We know that such linings in Bessemer vessels will outlast a dozen linings made of any fire-bricks yet tried. The vessel-lining is, indeed, a continuous arch of small radius, while the furnace roof is nearly flat, and, consequently, more liable to fall by shrinkage, due to variation of temperature. But could not a flat arch be sustained by a lathing of water-pipes, either in tension or in compression, which would also cool it, and thus increase its endurance? This subject will be further considered under the following head.

IV.—It has been a matter of surprise to me, that the cooling of refractory linings by means of water-jackets has not been developed in heating and open-hearth furnaces, when it has been so remarkably successful in blast furnaces, puddling furnaces, and, especially, in SELLER'S and in CRAMPTON'S revolving puddlers. I have seen the fettling of the Crampton furnace purposely knocked off for more than a square foot of the shell and front ring, during the boiling of the metal. The naked iron plates were thus exposed to the molten iron and slag on one side, and to water on the other; in a very few moments the lining was completely renewed by the chilling action of the jacket. Some jacketed cupolas are running with success, but where increased durability is most needed, as in Bessemer cupolas, the attempt has not been carried out, although it has been frequently planned.

If a firebox sheet of naked iron, in immediate contact with a white-hot anthracite fire, will remain sound for years, it is probable that it would be nearly indestructible under a four-inch coating of fire-brick. Of course, the cooler the bricks are kept, the more heat will go into the water; but, as we can melt down a gas furnace roof in an hour or two, there is, evidently, reserved power enough to furnish the necessary units of heat to the bath, while passing as many other units, at the same temperature, through the roof. Nor would water-jacketing, say, an open hearth furnace, be comparatively wasteful. Even if a quarter more fuel were thus required, half a dollar per ton of ingots (at average rates of fuel) would pay for it, while even doubling the endurance of furnace bricks would save four or five times this sum.

Water-jacketing should protect the bricks not only from destruction by mere heat, but from chemical dissolution, as this is generally a question of temperature.

The effects of heat are notably lessened as walls become thinner, so as to conduct heat more rapidly to the atmosphere. The thickness at which a lining will remain, in the Crampton revolving furnace for instance, is exactly regulated by the amount of cooling. Where the lining is knocked off, the fluid slag quickly sets, up to a certain thickness, but beyond this thickness the water cannot chill it, and it cannot, therefore, accumulate. The amount of cooling by water can be perfectly regulated. The two features requiring experiment are—1st, Decreasing the water supply in such a regular manner, when the furnace has to be stopped, that the lining shall be neither overheated nor rapidly cooled; 2d, How to sustain very thin linings. Water-jacketing a furnace roof a foot thick would not do the maximum good until it was nearly burned out—and then it would fall in. As before mentioned, I believe that a roof composed of groups of wrought iron water pipes, either in tension for a drooping one, or in arch-form for a convex one, each group having its separate water connections, the whole to be filled in and rammed with a ganister mixture, like that of a Bessemer vessel, or with a natural or artifical bauxite, would be very durable. Certainly, there might be some very promising experimenting in this direction.

In concluding these observations on refractory linings, I must again call at-

tention to the importance—the necessity, I believe—of putting this whole subject into the hands of a Commission of Chemists, who are familiar with the requirements of metallurgical processes. It really ranks in importance with government tests of metals and boilers; but as governments can with difficulty be got to sustain experiments which seem to be of greater public interest, the expenses of refractory material tests would have to be borne chiefly by iron and steel makers. They can well afford to do it, and some important results can, doubtless, be determined without a very large expenditure. But such a commission should be nothing, if not thorough. Immature conclusions would do more harm than good, as they have done heretofore in iron and steel tests.

TO BE CONCLUDED.

The Mahoning Valley Coal Region.*

BY ANDREW ROY.

THE Mahoning Valley coal region lies on the extreme northern outcrop of the Ohio coal field, and all the mines, with one exception, are opened on the lower coal of the series—No. 1 of the Ohio Geological Survey. The coal ranges from an inch to five, six, and sometimes seven feet of thickness, the workable height being between two and a half and six feet.

There are two varieties of coal, known in market as "Briar Hill coal" and "Mineral Ridge coal;" both varieties are drawn from the same seam. The Briar Hill coal is generally called block coal, and is the kind so largely used in smelting iron in a raw state. It possesses a laminated structure, easily splitting into horizontal sheets, but is very difficult to break in the opposite direction. The faces of the layers are often covered with a soft, dead, carbonaceous material, like charcoal, and the white seam throughout is marked by alternate layers of dead and bright-looking coal. In the act of combustion the coal neither swells nor changes form, the masses retaining their shapes until they fall to ashes in the furnace.

The Mineral Ridge variety is much softer, and is also shorter in the grain than the Briar Hill kind, and it contains a good deal of sulphur and pyrites of iron, which forbid its use in the furnace. It, however, makes an excellent fuel for household purposes, for rolling mill purposes, and for the generation of steam.

The Briar Hill coal is invariably found in a solid bench, while the Mineral Ridge variety is almost always found in two layers, forming a double seam. Between the two layers there are, generally, a layer of black band ore from 3 to 10 inches thick, and also a stratum of gray shale, called "wide-awake" by the miners. The black band is mined and sent to the surface, and after being calcined at the pit's mouth, is used in connection with the rich ores of Lake Superior, the resulting product being a very superior brand of pig metal, known in the market as "American Scotch."

Unlike other coal seams, where the strata have not been subjected to upheaval and erosion by mechanical agencies, this bed, instead of extending in a continuous, unbroken sheet, in a level plane, or with a natural dip, lies in a series of hollows and ridges, and the coal is frequently wanting altogether where the mining engineer, unacquainted with the peculiar structure of the troughs in which it reposes, would confidently pronounce its existence.

The upper surface of the Waverly Sandstone, upon which the coal rests—for the foundation stone of the Coal Measures, the Conglomerate, is wanting in this part of the coal field—is very wavy and uneven forming long, narrow and serpentine troughs, which the miners call "swamps." These troughs are of varying widths, and in one part of their line of direction may not be more than 50 or 60 yards wide, while in another part they may widen out to 200 and 300 yards. Sometimes a number of them lie alongside of each other. In such cases the basin, in an unbroken chain, may be a mile in width, the coal stretching across in a series of hills and hollows, like synclinal and anticlinal arches. The coal is always thickest in the bottom of the trough, growing gradually thinner as it ascends the hill sides, till it disappears altogether, or is suddenly cut out by a fault—a "horseback," as the miners term it. The approach of a horseback is first indicated by a change in the roof, the gray slate being supplanted by a stratum of fireclay or sandstone; then the place of the coal itself is usurped by this foreign matter.

These faults very frequently occur on the sides of the hills in mines where there is but a single swamp, suddenly cutting away the coal while it is yet of good workable height. Such faults are also found in the bottom of the troughs, as well as on the hills. They appear to have been formed, during the subsidence of the land, by currents of water in rapid motion flowing over the coal marsh and cutting away the coal, the mud and sand finally settling down in its place.

These synclinals and anticlinals on which the coal reposes do not appear to have been formed by internal disturbing forces, upheaving and eroding the coal strata, after the close of the Carboniferous age, as in the case of the anthracite basins of Pennsylvania, but have been caused by erosive agencies, by a scooping of the coal floor anterior to the deposition of the coal vegetation. The coal and its incumbent strata may pitch at an angle of 20° or 25°, but the material underlying the coal does not partake of the inclination; on the contrary, it occupies a horizontal plane.

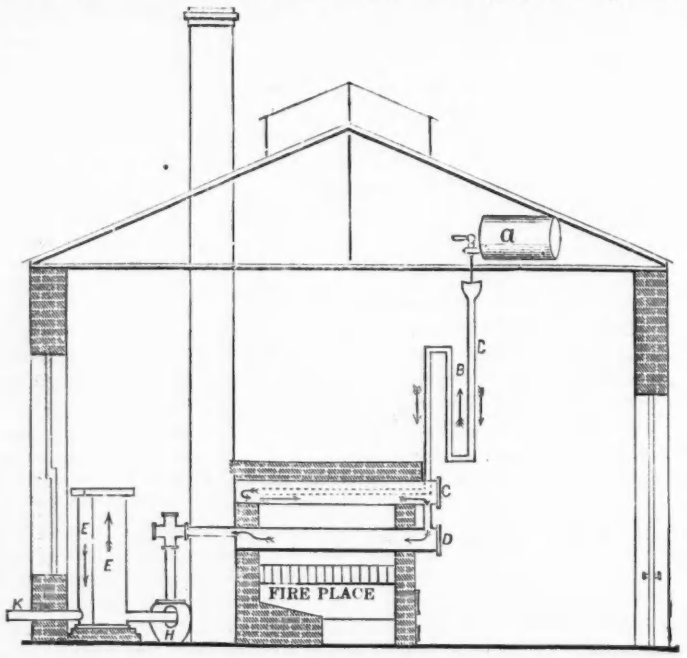
The line of direction of these swamps is generally southwest, but they are very serpentine in their courses, and they sometimes cross each other. How far they extend in line of direction, is matter of much conjecture among practical men. Mines are now opened along their line of direction for ten or twelve miles. Southward, towards the Ohio River, along the dip of the Coal Measures, the increasing thickness of the overlying strata has, till this time, forbidden any vigorous exploration for coal.

Wherever the lower coal of the Ohio series has been opened in the State, the coal has been found resting on an irregular floor, and the coal itself partakes, in a greater or less degree, of the qualities which characterize it in the Mahoning Valley. At Massillon, in Stark County, the mines are opened in No. 1, and the coal, though softer in nature, and shorter in the grain than the Briar Hill coal of the Mahoning Valley, is used in the furnace from several of the mines, as it comes from the workman's pick. In Jackson County, also, where No, 1 is in course of vigorous development, it makes a good furnace coal in a raw condition. In both of these districts, as in the Mahoning Valley, the floor of the coal is wavy and irregular, though in Jackson County the troughs, instead of being long and serpentine, are generally round like a bowl.

* A paper read before the American Institute of Mining Engineers, at the Cleveland Meeting, Oct., 1875.

Patton's Petroleum Gas Apparatus.

THE Philadelphia and Reading Rail Road Company, who for twenty years past have used coal gas for the illumination of their passenger cars, have recently changed to petroleum gas, finding, after repeated tests extending over a period of two years, that it is far better adapted to their purpose. It proves to



be more permanent and less condensible under high pressures and continued exposure to extreme cold, besides containing a much greater volume of light in a given space, and is also more economical than coal gas.

For this purpose more particularly, but also for general use in their extensive shops, depot, and offices at Reading, Pa., they erected last year a very complete gas-works under the patents of Mr. J. D. PATTON of Trevorton, Pa. We give herewith an engraving showing a side elevation of the interior of these works, giving a view of the entire manufacturing apparatus, and showing the course of the oil from the oil tank "A," through the oil feed pipe B. B. B. to the upper retort C, where the oil is vaporized and partly decomposed, and thence to the lower retort "D," where the decomposition of the oil is completed, and whence the gas passes through a hydraulic main "H" and scrubbers E. E., and thence through the pipe K, to the condensers and gas-holders.

From the gas-holder an ordinary outlet conveys the gas to the depot and shops, and a separate outlet leads to the compressing apparatus. If taken from the same outlet the rapid motion of the pumps would impart a vibratory motion to the entire flow of gas that would be plainly perceptible at all the burners. The compressing apparatus consists of an upright pumping engine designed by WM. E. GOOD, of Reading, and made for this purpose in the shops of the company, with one steam cylinder and two gas cylinders or pumps. These pumps are kept surrounded with water to prevent them from heating, as they otherwise would, both from their rapid motion and from the great amount of latent heat evolved by the compression. From the pumps the gas is forced into a series of cylinders, forming a reservoir for the compressed gas *and is kept stored in them under a pressure of three hundred pounds to the square inch.* From this reservoir a special set of pipes carries the gas, still under this high pressure, to cylinders underneath the passenger cars. The filling of the cylinders, through very strong rubber tubes, is done during the regular stops of each train and causes no delay. These cylinders, though only fifteen inches in diameter by seven feet long, contain enough gas to meet the ordinary requirements of a car for several days, or for two full nights. The reduction in pressure necessary between the cylinder and the burner is accomplished by means of a regulator, the invention of A. H. PHILLIPPI, of Reading.

The following further particulars of the manufacture and cost of this gas appeared in our report, last week, of the Gas Association meeting, where Mr. PATTON stated that "his experience with petroleum in gas-making was almost entirely with the grade of oil known as naphtha or benzine. The result of that experience is a yield averaging about seventy feet per gallon of seventy-candle gas, in constant running day after day. He never had been able to exceed 100 feet per gallon, or obtain results below 56 feet per gallon. Amount of fuel for converting 1 bbl., about 7½ bushels coke. The gas thus made stands all tests that coal gas will. Retorts last, on an average, 6 months, and cost $90 per bench to renew. Cost of 70-candle gas, $1.17½ per thousand, exclusive of labor and interest. The labor required is less than half that of coal-gas. 'As far as established companies are concerned, can it be used profitably in connection with coal-gas?' His experience shows that it can, by using 8 or 10 per cent. of oil-gas. By working out all the gas you can, you may, from Westmoreland coal, get 13,000 feet gas, of 16 candles, from one ton of coal and 16 gallons of oil; or 1 ton coal and 32 gallons of oil would give 14,000 feet of 20-candle gas, etc. He stated these as facts, and refrained from advocating any special mode of oil-gas making.

"In reply to numerous questions, Mr. PATTON stated that by a "ton of coal" he meant 2,240 lb. That the oil was brought in contact with the red hot surface, by dropping it into the retorts. That he ascertained the quality of the gas by using a one-foot burner, and applying the photometric test. That the gas thus produced possessed five times the illuminating power of coal-gas. That he was not able to state what effect leakage would have on the result, as he tried to have as little leakage as possible. That he was not able to state the weight of the mixture he referred to in the paper, and that the price charged for the gas, and actually obtained, was $10 per thousand feet."

The burners used are ordinary open burners of very small size, and four of them in each car render reading easy and conductors' lamps unnecessary.

This mode of lighting cars is not only to be recommended for its economy, but also for its entire safety; while, as a matter of illumination, it is the only

real one in use for passenger cars, and, compared to it, the lighting of passenger cars with kerosene lamps or candles is a relic of the dark ages.

The officers of the Philadelphia & Reading Rail Road Company deserve the thanks of the travelling public for this important addition to their safety and comfort; and those rail road managers who persist in subjecting their passengers to the dangers and smell of kerosene lamps, or the profanity-provoking glimmer of candles that only serve to "to make darkness visible," cannot be too strongly censured.

We commend this improvement to the managers of the Great Pennsylvania road, where even the the Pullman palace cars are still run in this uncertain and tantalizing twilight of old-fashioned candles.

Investigations on Iron and Steel Rails made in Europe in the Year 1873.*

BY T. EGLESTON.

DURING the year 1873, my attention was called to the frequent accidents, resulting from the breaking of rails, on the different railroads in this country, and I was requested to investigate the subject. The plan of investigation I proposed was to ascertain, in as many cases as possible, the exact history of broken rails, both in this country and in Europe; to collect information in Europe relating to the tests which rails used there were required to undergo, and to experiment upon the pieces of rails broken on the road, with a view to ascertain whether their fracture was due to their chemical constitution, bad manufacture, to a reduction in strength owing to temperature, or to physical changes in the constitution of the rail. The investigation was commenced by the collection of statistics, and for this purpose I spent several months in Europe, collecting information on the subject of broken rails, as well as the life of iron and steel rails generally, and inquiring into the systems of purchasing and of testing them employed by the railroads there, intending, on my return, to make a series of analyses of rails broken, both in this country and in Europe; to ascertain, if possible, how far great cold had an influence on the fracture; to examine whether the rail broken, either on the road or afterwards, underwent, at or about the fracture, any physical change, and to make a series of experiments on the strength of rails manufactured in the United States or sold in the American market.

Unfortunately, the panic of 1873 came on, just before my return from Europe, and prevented the carrying out of the larger part of the plan proposed; as, however, I had collected, in the meantime, a large number of statistics of different kinds from all parts of Europe, and had made a number of interesting experiments and investigations, I have thought it would be worth while to communicate some of the results to the Institute. These investigations are, unfortunately, not complete in any sense, since they were suddenly brought to a close shortly after they were commenced in Europe, and before anything had been done in this country, so that what I have to communicate will be mostly results obtained in France and Belgium from experiments made on broken rails, and statistics collected with regard to them, and information relating to the purchase of rails and their wear upon some of the principal roads. Some of these results have not, as yet, to my knowledge, been published, and most of them are interesting as they bring together a series of facts collected over a number of years, on some of the longest and most importanf lines in Europe.

The purchase of railway supplies and material in Europe differs entirely from that in vogue in this country. Rails are very rarely purchased in the open market, but are almost invariably made by contract with the manufacturer, after patterns furnished by the railroad companies, and expressly for them. For the purchase of supplies a large number of forms of contract, which are either autographed or printed, are provided. Each railway has from twenty to twenty-five of these documents relating to the road-bed and its supplies alone. They enter into every detail with regard to the ties, chairs, plates, wedges, spikes, bolts, nuts, screws, fish-plates, and every possible material that the railroad company has to buy. These contracts are drawn up by the engineers in charge of each one of the different departments, and are submitted to the engineer-in-chief for approval. They are altered from time to time, as the necessities of the case may require. They bind the contracting parties in such a way as would scarcely be tolerated in this country, but their general result is most careful management on the part not only of the contractors, but of all of the employés of the road. These printed or autographed contracts are furnished, on application, to the manufacturers wishing to bid for the contract for furnishing any of the supplies. All the supplies, of whatever nature, are subjected to the closest inspection, not only when finished, but in all stages of their manufacture, and the contract specifies that during the time of the execution of the contract the engineers of the company shall, both during the day and at night, have free access to the works, and be at liberty to examine every part of the article being manufactured, in every stage, from the crude material up to the time of delivery, in order to verify that the conditions of the contract are being fulfilled. During this time the engineer in charge is always at liberty to reject the whole or any part of the material which is not up to the standard. As the strength of the rail is stipulated in the contract, a certain number of experiments are made in the presence of the engineer of the manufacturer furnishing the rails, but under the direction of the engineer of the railroad company, sent to the works for that purpose. None of the verifications, however, have the effect of in any way diminishing the responsibility of the guarantee of the life of the rail for the time fixed in the contract. No manufacturer is allowed to underlet any part of his contract to another manufacturer without the written consent of the company. The acceptance of the works by the company does not guarantee the whole payment until the article contracted for, whether it is a car, a rail, a water-tank, steam-engine, or any other material about the railroad, has worn well and without repairs during a certain specified time.

Most of the rails manufactured are of the ordinary American pattern, though some companies still use the double-headed rail.

Iron rails are not so generally used as formerly. On all the principal roads their place is being rapidly replaced by steel.

Steel-headed rails are used by some of the companies, but there is no certainty that the weld of the iron to the steel will always be perfectly made. The general experience is that there is a tendency for the two materials to separate. There have been a great many ingenious plans proposed, to make the iron clamp the steel, or the steel clamp the iron, but in view of the experiments made at the Northern R. R. of France, it does not seem worth while to lay any but steel rails, more especially as the old steel rail has a value which no combination of iron and steel could have.

It does not necessarily follow, that what is done in Europe, is better than what is done in this country. On the contrary, European railway companies have a great deal to learn from the practice of this country, as is shown by the repeated reports made by engineers of different countries, sent here for that purpose by their governments; but in the manufacture of rails and the study of their wear and tear, we have something to learn from them. I have taken some pains to compare the contracts for the purchase of rails made by different companies, and give below an abstract of the contracts made for the purchase of both iron and steel rails, including the stipulations of all the roads of France whose contracts I have been able to procure. There is, necessarily, a great deal of sameness in these contracts, and as one of the roads imposes all of the conditions which I give below, I have given the contracts somewhat in detail, at the risk of being tedious, since I do not know that they have heretofore been published in English. They are, certainly, not generally within the reach of our members.

CONTRACTS FOR IRON RAILS.

All of the roads furnish either a drawing or a steel pattern of the form of the rails, and the manufacturer is not allowed to make the rails, until the company is assured that the rolls agree perfectly with the shape furnished. The toleration allowed in the transverse section is only ½ m. more or less. This is done in order to take into consideration the difference which may arise from the wearing of the rolls, and accidental differences in the distance between them. They require a specimen showing the quality of the iron to be used in the rails to be sent to the office in Paris. The iron rails used by the Lyons and Orleans R. R., are several types of the American and of the double-headed rail. For the double-headed rails the length is 5 m. for 9-10th of the order; the last tenth may be composed altogether or in part of rails 4.96 m. To facilitate the manufacture, 1-30th part of the rails may be admitted 3.75 m.

For the American rail, on the Lyons road, the length is 6 m. for 9-10th, and 5.96 m. for the last tenth; 1-30th of the order may be in lengths of 5 m. and 3.75 m. The Northern R. R. contracts for rails of the American pattern of 37 kilo. The normal lengths of this rail are 6 and 7 m. For a part of the contract which may not exceed 1-10th, and which is fixed by the chief engineer, the rails may be 6.96 m. to 5.96 m. long. One rail in twenty may be delivered of a shorter length than these, and may be either 4 or 5 m. It is always understood by all the roads that the short rails are to be manufactured from the long ones which have to be cut on account of defects at their extremities. All the roads stipulate that they may order a certain number of rails of exceptional lengths, providing that the greatest length shall not exceed 10 m. The Lyons road agrees to pay for all rails exceeding 6 m. in length 5 per cent. above the ordinary price. The Northern R. R. agrees to pay only 4 per cent. A toleration of two millimeters, greater or less, is accorded by the Lyons & Orleans R. R. in the length of the rail, provided that on the whole order it shall not exceed 1 per cent. The toleration fixed by the Northern road is never more than 1½ millimeters. All rails which have been manufactured in the trials of the rolls, and all others manufactured after the rails have been accepted, but which are not in accordance with the model furnished, are rejected. The companies are always at liberty to change the shape of the rails, providing always that the special expenses necessary for these changes shall be allowed to the manufacturer. The weight of the rails is determined by the model, and is ascertained by trial of the first rails delivered. In the reception of the rails, a toleration of 2 per cent. above or below is allowed, providing that the weight of the whole contract does not vary more than one per cent. Within this limit of toleration, the rails are paid for at their actual weight. Above it, the iron is not paid for, and any rails outside of the limits, either weighing too little or too much, may be rejected entirely if the company think best. The blast furnaces which produce the cast iron used are required not to use any ore which gives a brittle iron.

If the rail is allowed to be made of different qualities of iron, the head *must* be fine grained, but in general, the manufacture must be so conducted as to produce only fine grained iron. It must be weldable, as hard and compact as the specimen which is furnished to the manufacturer, and not cold-short; in short, of a quality to resist the action of the wheels of the train without breaking, crushing or becoming unwelded. The Northern R. R. classifies the iron to be used into three distinct classes, namely: first, granular iron; second, iron composed partly of grains and partly of fibers, and third, fibrous iron. In the packages for making refined iron, only first class granular iron must be used. The Lyons R. R. prescribes that the foot of the American rail shall be made of fibrous iron. It requires that the piles shall be composed of two-third puddled iron and one-third merchant iron; that the width of the package shall be 20 centimeters at least and its height 22 centimeters, and that its weight shall be 40 kilogrammes heavier, at the least, than that of the rail. All the bars used in making up the different layers must be of rectangular section. Each layer of puddled iron may be made up in width of two or three pieces at the most. The layers of refined iron which form the upper part of the package must all be of a single piece, and must represent one-fifth of the total weight of the package, in order to have in the section of the finished rail, on the surface exposed to the wheels, a thickness of at least one centimeter. Th layers which are next to them should be entirely composed of the best puddled iron. All the pieces composing the package must be of a single length and strength. For the puddled iron, however, a few bars are allowed of two pieces, at the most, the smallest piece of which must be at least 30 centimeters in length. They, however, must be adjusted end to end, with care, in such a way as to leave the least possible space in the interior of the package. No joint in the package should be directly above another joint, and for this reason the bars of puddled iron should not be of the same width. Fibrous iron may be used only in the last third of the package. Between it and the two first layers, granular iron only must be used. The Orleans R. R. allows the rail to be made entirely of puddled bar, or with such a proportion of old rails as the manufacturers think best. The packages, of which the covering for the head is made, must be made exclusively of rectangular bars placed together on the flat side, in regular layers, with cross joints, and each bar should be 54 m. m. in width at the least. The packages for the head of the rail should be rolled flat, and not on the edges, so that the width of the covering will be parallel to the direction of the layers. The cover must be made of puddled iron of the best quality. It must be of a single piece, and represent one-third of the total weight of the package.

The Lyons R. R. requires that the puddled iron used, either in the body of the packages for rails, or in the manufacture of the merchant iron for covers, should be of good quality, carefully worked, and the edges of the bars should be smooth. When they are shorter than the package, they must be placed together carefully end to end, in such a way as to leave the least possible space between them. In the works where the rails are rolled in a single heat, the packages must be turned in the furnace, end for end, when the heat is three-quarter finished.

In the works where there are two heats, it must be turned at the commence-

* A paper read at the St. Louis meeting of the American Institute of Mining Engineers, May, 1874.

ment of the second heat. All the companies reserve the right to prescribe in what direction the packages shall be rolled, and all require that the name of the manufacturer must be engraved in the last curve of the rolls, so as to be distinctly seen in each rail. The dimensions, form, and composition of the packages, as well as the drawings of the successive curves in the rolls, must be submitted to the company, without, however, this diminishing in any respect the responsibility of the manufacturer. All the roads require that the rails shall be as carefully manufactured as possible, and that all those badly welded, laminated, cracked, or broken in any way, must be rejected. They require that they must be perfectly flat, both on the foot and head, and if they are not so, must be straightened or rejected. That they must be straightened on their four faces with the greatest care. This straightening is invariably required to be done, as far as possible, hot, immediately after the rails leave the rolls. If they, afterwards, when cold, require to be straightened, it must never be done by percussion, but by gradual and slow pressure produced by means of a screw. All the surfaces of the rails must be clean and uniform. All the roads require that the ends of the rails must be cut off at a sufficient distance to be sure that the rail end is perfectly sound. All projecting iron must be removed either with a file or a graver, and the ends of the rail must be square with its axis. They all require that the final length should be made by cutting one of the ends in a lathe, planing machine, or with a milling tool, in such a way that there shall be no tearing or any other alteration of the surface at the end, and that all excess of matter shall be removed with a file or graver, but on no account with a hammer. Reheating any part of the rail, either to cut off the ends, or for any other reason, is positively forbidden, except in case of temporary accidents to the machine used for cutting them, and then, if absolutely necessary, only during the time that is strictly necessary to repair it. Every kind of repair done to cracks or other inequalities in the rail, whether done cold or hot, is forbidden. Each extremity of the rail is pierced with two round holes, to receive the bolts of the fish-plates, the dimensions and position of which are fixed by a drawing furnished by the engineer. The Lyons road provides that in some cases one of these holes may be half round. Two cuts of a rectangular form must be made at the extremity of the American rail to receive the wedges which prevent its motion forward, the position and size of which are also given. These holes and cuts may be made by any process which shall suit the engineer of the company, but in any case the edges of the holes and of the cuts must be filed smooth and not left rough.

If the positions of the holes and cuts are not conform to the drawing, the rails may be rejected. The rails must be classified in series, according to the manufacture of different days.

The Northern & Orleans R. R. require the rails to undergo the following tests. Each one of the rails selected for trial is placed on supports 1.10 m. apart, and must support, in the middle between the two supports, a pressure of 12,000 k. for five minutes, without preserving any sensible set after the test. The same rail, in the same position, must support during five minutes, without breaking, a charge of 30,000 k. The Orleans R. R. requires 25,000 k.

At the Lyon R. R., the rails are placed on supports 1 m. apart, and should support a pressure of 13,000 k. for five minutes, without showing any perceptible set, and then for another five minutes, without breaking, a charge of 27,500 k.

After these tests, all the companies require that the rail should be broken by an increase of the weight. The Northern & Orleans R. R. require, that each one of the two pieces of the rail broken should be placed between supports 1.10 m. apart, (the Lyons R. R. makes the distance 1 m.) and should then support, without breaking, the shock of a weight of 200 k. (the Orleans R. R. requires 300 k.) falling in the middle between the supports from a height of 2 m. for the Orleans R R., and for the Lyons & Northern R. R., from a height varying, according to the temperature, from

0° C., and below, of.....	1.30 m.
From 0° C. to 20, of.....	1.50 "
From +20° C. and above, of.....	1.70 "

This variation is made as the rails are not considered as capable of resisting as great a strain in cold weather as in warm. All the roads require that for this test the two supports should rest upon a block of cast iron, weighing at least 10,000 k., placed upon masonry at least 2.30 m. in diameter and 1 m. thick. The Orleans R. R. allows the foundation to be of oak or masonry. If one of the rails tested does not resist the tests are continued upon a greater number. If more than 1-10 of the rails do not resist, all the roads reserve the right to reject the entire series.

Provisional receptions are being made at the works, as the rails are manufactured, for the object of sorting, weighing, and marking them. Up to the time of their being sent to the company, the rails must be preserved in a dry place, and kept from oxidation as far as possible. Those accepted must be marked at their end, and in case the name of the works, made by a cutting in the last curve of the rolls, should not have come out in rolling, it must be marked cold in such a way that it shall be visible. The rails which have been rejected must either be broken, or marked in such a way that the mark cannot be effaced.

All the roads provide that the tools for making the tests, as also all the labor of accepting and testing the rails, must be made at the expense of the manufacturer. The report of the tests and receptions are made every day. Every rail marked, and comprised within the report of acceptance made at the works, becomes, by the act of reception at the works, the property of the company.

TO BE CONTINUED.

Cushion Pressure.

By J. F. FLAGG.

THE writer's attention has been called to a criticism in the ENGINEERING AND MINING JOURNAL, for September 25th, upon the report of Mr. JOHN W. HILL, contained in the "Fifth Annual Report of the Cincinnati Industrial Exposition," by Mr. RICHARD H. BUEL.

Being a fellow-member, with Mr. HILL, of a Board appointed by the Commissioners of the Exposition for the present year, for making similar tests, the writer takes the liberty of criticising, in turn, one of Mr. BUEL's paragraphs, viz.: that marked VIII., relative to cushion pressure.

It appears to me that the proper solution of this point is far from being reached in this criticism. In the first place, in the formula given for the "pressure in pounds per square inch required to give reciprocating parts the velocity of the piston when at half stroke," the numerical factor in the denominator should be 32.16 instead of 16.08, making the resulting pressure only 6.54 lb.

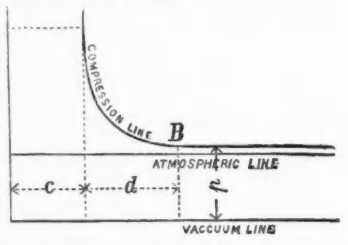
By referring to page 193, of the 3d edition of "PORTER'S *Treatise on the Steam Engine Indicator*," and substituting the same values in the formula there given, this pressure will be found to be only 5.48 lb.

One of these formulas is directly deducible from the other, and they should therefore give the same results.

The trouble is that Mr. BUEL, in his formula, has apparently acted on the theory that the motion of the piston is a *uniformly* accelerated or retarded one, which is very far from being the case. (*Vide* Table XII., column *C*, of PORTER'S *Treatise*.)

According to the theory of uniformly accelerated motion, s= half length of cylinder $=\frac{vt}{2}$, v being the velocity at the mid-point of the cylinder, and t the time consumed in traversing the half length; or $v=\frac{2s}{t}$; substituting the values for the Harris engine, $v=\frac{2\times 2}{.25}=16$ ft. per second, instead of 12.56, which is the true velocity at this point (neglecting angular motion of connecting rod); another proof of the errors arising from the assumption of uniformly accelerated motion. If 16 ft. were used as the velocity, the pressures obtained from the formulas of Mr. BUEL and of PORTER'S *Treatise* would be identical.

The following is submitted as, in the writer's opinion, a more correct solution of the question, *but* with the supposition that during the period of compression the connecting rod is disconnected from the crank pin; in other words, that the entire *vis viva* of the reciprocating parts is taken up by the cushion.



Let W= weight of reciprocating parts,
" g = acceleration of gravity,
" v = velocity of piston at *point* of *compression*, (B in figure.)

Then $\frac{Wv^2}{2g}$ = mechanical effect, or units of work in reciprocating parts which are to be overcome in the distance d, of compression by the cushion.

Let d = distance of compression.
" c = increase of length of cylinder equivalent to clearance.
" A = area of piston in sq. inches.
" p_s = mean pressure per sq. inch on steam side of the cylinder for distance d.
" p = counter pressure.
" p_c = mean cushion pressure for distance d.
" f = friction of *reciprocating parts*.

Then, in order that the cushion may exactly overcome the *vis viva* of reciprocating parts,

(1) $\frac{Wv^2}{2g}+A\ p_s\ d = A\ p_c\ d + f\ d$;

substituting for g its value and transposing

(2) $p_c=\frac{Wv^2}{64.33\ Ad}+p_s-\frac{f}{A}$

also we have, by the usual formula, for mean pressure in the expansive curve

(3) $p_c = p\frac{c+d}{d}$ hyp. log. $\frac{c+d}{c}$

substituting the values for Harris-Corliss engine in equations (2) and (3), viz.:

W=900 lb. $\frac{f}{A}$ (assumed for reciprocating parts alone)=1.00 lb.
c = .029×4=.116 ft. A=202.6 sq. inches,
d = .044×4=.176 ft. p (for forward stroke)=14.95 lb.
ps (taken from indicator diagrams for forward stroke)=3.60 lb.
v (for forward stroke, *including* angular motion of connecting rod)=4.726 ft. per second, connecting rod being 5½ times the length of crank.

From equation (2) p_c = 8.76+18.03—1.00=25.79, or above atmosphere=11.36
" " (3) p_c =22.89 " " " = 8.46

Mr. BUEL gives this average pressure p_c as approximately 20.52 lb.; but this would be more than the arithmetical mean of initial and terminal pressures; in other words, in order to be correct, the compression line would have to be concave instead of convex to the atmospheric line.

If steam is admitted before the end of the stroke, the average cushion pressure would have to be obtained from the indicator diagram, which would doubtless give the *actual* average pressure in any case more accurately than the *theoretical* mean obtained from equation (3).

As before stated, this argument is predicated upon the hypothesis of disconnection of the crank pin. In point of fact, although the acceleration of motion of the piston is greatest at the very end of the stroke, when the resistance of the cushion is also greatest, yet this acceleration does not diminish towards the point B with anything like the rapidity of diminution of the cushion pressure; (in the Harris-Corliss engine the value of piston acceleration at the instant of termination of stroke is but ½ of a lb. more than given by expression $\frac{W\ v^2}{64.33\ A\ d}$, whilst the compression pressure by card mounts up to 33 lb.); consequently, the cushion pressure at commencement of compression cannot be sufficient to absorb entirely the *vis viva* which is given out by diminution of velocity of piston, part of the *vis viva* is still transferred through the crank pin, and the average cushion pressure required is somewhat less than demanded by formula (2), not more, certainly, than is given by formula (3).

MEADVILLE, PENN., November 1, 1875.

The Hocking Valley Strike.—COLUMBUS, Ohio, Nov. 8.—The coal-miners' strike in Hocking Valley continues. The operator, who last week acceded to the demands of the miners has withdrawn his agreement because other operators refuse the advance to sixty cents per ton. The miners at the Tunnel mines, Perry County, who have been paid sixty-two cents, are on a strike for sixty-eight cents. Five coal trains on the Hocking Valley road have been withdrawn.

Nickelisation.—In Plazanet's process a bath is used of 87·5 grammes of sulphate of nickle, 20 sulphate of ammonia, 17·5 citric acid and two litres of water. A bath much used in France is formed of a solution of four parts of nitrate of nickle in four of liquid ammonia, and 150 water, in which fifty parts of sulphate of soda have been dissolved. Using a moderately weak current the operation is at an end in a few minutes. There is no need to interrupt it by taking the objects out and brushing them. When the film of nickel is of sufficient thickness the objects are withdrawn from the bath and dried with sawdust.

Gallium.

WE gave lately an abstract of the memoir presented by the discoverer of the new metal, gallium, to the Academy of Sciences. M. LECOQ's note in full is as follows: (1) The oxide, or, perhaps, a subsalt, is precipitated after some time by metallic zinc from solutions of the chloride and sulphate. It does not appear to be the metal itself which is reduced by zinc. (2) The chloride is precipitated by a small quantity of ammonia. In a mixture containing an excess of chloride of zinc, the new body is precipitated before the zinc when the liquid is thus treated by ammonia. After the second precipitation the proportion is small, nearly all being found on the first fractionation. (3) Even in conditions which ought to correspond to a state of preoxidation the oxide is soluble in an excess of ammonia. (4) The salts are precipitable by hydrosulphide of ammonium, an excess of which does not appear to redissolve the precipitate to any great extent. (5) The salts are precipitated by hydrosulphuric acid in presence of acetate of ammonium and much free acetic acid. In the presence of zinc the new body is concentrated in the first-formed sulphides. Yet six successive precipitations have been required to separate it, within a trace, from the sulphide of zinc. (6) The salts are not precipitated by hydrosulphuric acid in a solution slightly acidulated with hydrochloric acid. (7) The oxide is redissolved in an excess of carbonate of ammonium, at the same time with the zinc. (8) The extremely small amount of the substance at my disposal has not allowed me to isolate the new body from the excess of zinc which accompanies it. The few drops of chloride of zinc in which I have concentrated the new substance give, under the action of the electric spark, a spectrum composed principally of a line in the violet, narrow, easily visible, having a place close to the number 417 of the scale of wave-lengths. I also perceived a very faint streak near No. 404. (9) The sulphide is really insoluble in an excess of hydrosulphide of ammonium. (10) Although the quantity at my disposal is very small, I have obtained the chloride in such a state of concentration that the ray No. 417 is already very distinct under the action of the induction spark. (11) The chloride gives the ray 417 in the gas flame, but it is feebler than with the spark passed over the solution. (12) The salts are easily precipitated in the cold by carbonate of barium (13) In a mixture with a large excess of chloride of zinc the new body is precipitated by the hydrosulphide of ammonium with the earliest portions of the sulphide of zinc. (14) Repeated evaporations with a large excess of *aqua regia* do not appear to occasion any loss by volatilisation of the chloride. (15) The sulphide, it seems to me, will be white, like that of zinc. This point will be cleared up after a complete purification of the substance. (16) When hydrated chloride of zinc containing traces of the new body is heated so as to form a small quantity of oxychloride of zinc, the whole amount of the gallium remains in an insoluble condition, under the form, as I suppose, of an oxychloride. (17) The spectrum is more brilliant with a spark of medium length than with a very short spark.—*Iron.*

The Construction of Gasworks.*

BY HARRY EDWARD JONES, Assoc. Inst. C. E.

CONTINUED FROM PAGE 429.

MR. H. GORE remarked that in the case of a large retort house, capable of manufacturing 1,000,000 cubic feet of gas per day, a certain quantity of coals was required, and, in order that it might be properly carbonized, a sufficient amount of fuel was needed to heat the retorts. Common sense would suggest that the less the volume of cooled air admitted into the furnace the better, and also, that the deeper the fire, commensurate with the construction and solidity of the furnace itself, the better for the purposes in view. Every time an ordinary furnace was opened a cooling effect would be produced, and when fuel was put on, the combustion would be comparatively incomplete until a fresh supply was required. This was sufficient to demonstrate one advantage in connection with a stage house. Another advantage was the facility for rapidly drawing and charging the retorts. When he had the control of a retort house connected with the Chartered Gas Company in Horseferry Road, he was in the habit of timing the charging of the retorts as compared with a ground-floor house, and he found that he could charge five, seven, or eight retorts in a stage house in a third less time than in one built on the other plan. Much, also, was favorable in the stage system to the comfort of the men employed. So confident was he of the advantage of the stage house, that in reconstructing a gasworks in South America he made a pit in front of the retorts, for the purpose of gaining the advantage of a deep fire, less frequent opening of the furnace door, and facilities for drawing and charging. The cost of coal at Valparaiso was £2 15s. 6d. per ton delivered in the retort house, and the saving effected by the use of deep fires was 33 per cent. of fuel. The system of setting a large number of retorts to a single fire was, he believed, to a certain extent wrong. If the terminal retorts in any large setting were to be of a temperature sufficient to carbonize the coal perfectly, the retorts immediately above the furnace must be at such a temperature as would more or less destroy the illuminating power of the gas, unless these retorts were charged with cannel coal. It was essential to the carbonization of cannel coal that it should be effected as quickly as possible; therefore, high heats were absolutely necessary. In Aberdeen, in order to obtain rapid carbonization, it was now the practice to set three retorts to two furnaces; they were worked at three-hours' charges, and the illuminating power of the gas produced was from 26 to 30 candles. With regard to condensation, he wished to ask what was really meant by it. If it was desired to make good gas, the method of procedure of the manufacturers was extraordinary. He always thought it an object to keep as much as possible of the light-giving material in contact with the conveyance employed to transmit it to the burners, especially where coals of a different chemical constitution were used in the process of manufacture, such as a mixture of ordinary bituminous coal and cannel. It was well known that the gases resulting from such a mixture were simply in mechanical contact, and anything which impaired this contact must cause the partial precipitation of the light-forming constituents. He had noticed curious illustrations of the effect of this condensation in gasworks in South America, the result of mixed gases passing through small apertures. The company with which he was connected were bound by the terms of their concession to supply gas of 19-candle illuminating power. In order to produce this, he used from 20 per cent. to 25 per cent. of Boghead or other rich Scotch cannel, 20 per cent. of English or Australian bituminous coal, and the residue of Chile coal. This mixture gave about 10,000 cubic feet per ton of 21-candle gas, measured at the works. The temperature of the gas was never below 60°, generally from 68° to 70°. So long as the gas was conveyed through ordinary-sized mains, or service pipes of tolerably large diameter, no inconvenience was experienced from reduced illuminating power; but whenever it entered small service pipes or fittings, condensation of the hydro-carbons took place. In order to test this accurately, he placed several screens of wire gauze in a condenser, similar to a plan he had seen at Geneva, which was, he believed, a suggestion made by the late Mr. GEORGE LOWE. Three screens removed the greater portion of the naphtha and hydrocarbon oils. This principle was in effect the same as that recently patented in England by MM. PÉLOUZE and AUDOUIN, of Paris. It formed an admirable condenser for gas from ordinary bituminous coal, which was of low illuminating power, and comparatively homogeneous; but when gas was manufactured from mixed coal, it was very injurious, as it caused the light-giving constituents to be precipitated by the concussion of the particles of gas against the sides of the appertures through which it was forced. To some extent he indorsed the opinions of Mr. LIVESEY, believing as he did that the facility with which capital was raised in this country had placed gas engineers in their present position. If a paper had been read from twenty to twenty-five years ago, describing the processes then in vogue, it would have been a duplicate of that now brought forward. In other branches of the engineering profession there had been vast improvemements; gas engineering was at a standstill; and simply because the incentives to improvement—that of setting brains to work instead of bank-notes—had been wanting. Let those incentives be brought into action, and the day would not be far distant when gas engineering would advance as other branches of the profession had done.

Mr. A. F. WILSON expressed surprise that the author had omitted to mention almost anything that had not been known for the last twenty years, and had given so little indication of his ideas of possible improvements. He could not but conclude that the reticence was intentional. No paper, with such a title, was complete, that did not include an exhaustive consideration of the principles of gas-making. Works should be subordinate to the method, not the method to the works. He agreed that one of the main points to be considered was the retort house; but the retorts themselves, not the mere shell of the building, should be principally studied. Upon the manipulation of the retorts, and the use of the exhauster, most gas companies depended for their dividends, and improvements in this direction were the chief means of cheapening production. What was greatly needed was to overcome the inability to control the temperature in the retort. Dr. LETHEBY's suggestions only related to the starting points from which distillation began. Nothing was really known of the temperature at which coal was, or should be, distilled, and the sooner that fact was acknowledged the better. A profound ignorance existed as to the effect of temperature on the various combinations formed during the distillation. Coal was put into a glowing retort, and immediately the heat fell. The absorption of caloric by the coal was in excess of the conductibility of the retort; and for a considerable time the heat was low and irregular, only the outer crust of the coal encountering it; and carbonic acid and carbonic oxide were formed in the filtration of gases from the interior, which, under other circumstances, would probably be avoided. The remedy lay in smaller charges, and, if possible, in continuous charging; not in ingenious mechanical stokers, but simple mechanical stoking, with the retorts built to suit the working. Retorts set diagonally, instead of horizontally, would suit, and the coke would be improved by cooling gradually of itself in air-tight vaults, instead of being disintegrated by the present 'drowning-out' process. It did not seem impossible to design such a bed of retorts or such a system of stoking. Want of control over the temperature was felt as an evil by all who really thought of the matter; and there was no doubt gas-making would never be an exact science so long as the present method was pursued. The pioneers in bringing about a change ought to be the metropolitan gas companies, who, although no doubt they must be credited with a certain desire of improvement, were really not earnestly seeking it; and it was to be hoped the law would be altered, so as, without harshly bearing on the shareholders, to stir them up in the matter. He trusted his suggestion would not be lost sight of, as to obtaining some useful data, from those persons in a position to give it, of the comparative advantages of very large works, such as that at Beckton, with its facility of position for the receipt of coal, and its concentrated apparatus and superintendence, but with the attendant disadvantages of distance from the field of supply of gas and coke, entailing the necessity of large trunk-mains, and loss in the wholesale removal of the coke, as against smaller works more centrally situated for the supply of both. He inclined to the former, although conversant with both sides of the question.

Mr. H. E. JONES, in replying upon the discussion, said he felt that the principal points raised in the paper were such as called for discussion. Believing as he did that the construction of gasworks in the metropolis had lately been drifting in a direction that was needlessly expensive, he had addressed himself to the task before him; and if the paper failed to carry conviction, it would at least have served the purpose of eliciting the views of those who differed from him. With regard to Dr. LETHEBY's remarks on the temperature best suited for carbonizing, he believed every engineer would agree that low temperature failed to secure the best results from coal, having regard both to quantity and quality. What was wanted was the greatest number of candles that a ton of coal could be made to equal in illumination; and that could not be obtained by a low temperature, the employment of which was an imitation of the process of the mineral oil maker, who endeavored to get all the liquid product of distillation he could, to the exclusion of the gaseous product. The gas-maker, on the other hand, used a high heat to obtain permanent gas with as little liquid or tar as possible, robbing the latter of its light hydrocarbons, and leaving it poor in secondary products, not rich, as was suggested. Dr. LETHEBY cast a stigma upon the London Engineers for truckling to the board-room in using a high heat to make much poor gas. That was quite beside the question. The illuminating power was fixed by an independent authority, and that must be obtained, whether the directors liked it or not. The object of the engineers was no other than to obtain the best possible results. In reference to the remarks as to the efficacy of washing gas with strong ammoniacal liquor for removing bisulphide of carbon, he might mention that at the Ratcliff works 36,000 cubic feet of gas per hour were washed by 900 gallons of ammoniacal liquor (from 14 ounces to 18 ounces). According to Dr. LETHEBY's calculation, the bisulphide of carbon normally due to that quantity of gas ought to be combined with the sulphuretted hydrogen in the ammoniacal liquor 133 times over; and if it was said that the liquor would in time get charged and there was an end of its action, the reply was that the liquor was changed every twenty-four hours. Nevertheless, without using lime he altogether failed to modify the bisulphide of carbon. That being so, the sooner the pernicious notion that had been propounded was abandoned the better. The gas was cooled because in winter it had to be distributed through mains, some of them not far from the surface of the ground, which were liable to great fluctuations of temperature; and it was useless to send out a body like gas, containing condensable illuminating vapor, at a temperature of 60°, when, before it reached the burner, it had to pass through a temperature of 30°. It only resulted in filling the syphons with liquid, while the naphthaline, con-

*A paper read before the Institution of Civil Engineers of London, January 12, 1875.

densed out of it, gave the consumer endless annoyance by causing stoppages in the pipes. Mr. LIVESEY's only objection to a ground-floor house was that it did not admit of mechanical stoking. But he knew of no patent of any value which sought to imitate exactly by machinery the manœuvres of a human agent. What was wanted was mechanical carbonizing; and to effect that the whole retort house must be swept away. It was obvious that a system having the coals at the top, the gas passing away in the middle, the coke going out at the bottom, and the tar running off elsewhere, would be all that could be desired; but if Mr. WILSON would realise his beau-ideal, he would find serious mechanical difficulties in the way. With regard to the distribution of the liquor at the top of the scrubber, however well it might be arranged, there would always be a gummy oil that would choke up the pores of the material and divert the liquor. Mr. HODGSON JONES referred to some retorts on a ground-floor that had settled; but they would have equally settled with a bad foundation, if built on a stage. Objections had been made to his comparison of the manufacturing wages in a stage and a ground-floor house, and to his taking the figures from the Home Secretary's returns, which included wages foreign to the stoking house. He had preferred to go to the most authoritative source for his information, rather than travel into the region of speculation, and fall into such serious error as he would show Mr. KIRKHAM and other speakers had done. It was true that the figures he had quoted included a few insignificant charges not due to stoking; but he contended that the comparison was a fair one and substantially correct, inasmuch as in his own case 78 'per cent. of the entire sum was for stoking wages, including foremen, scurfers, &c., and all the other companies returned their accounts on the same system. Mr. KIRKHAM's estimate for wages was quite wrong. A gang of men to carbonize 26 tons, in the Ratcliff ground-floor houses, was only nine, viz., two scoop-drivers, four stokers, two-barrow-men, one fireman, and half a coke-trimmer, one coke-trimmer doing the work for two gangs. The cost came out at 2s. a ton, not 2s. 6d., as Mr. KIRKHAM said, estimating for twelve and a half men, or three more than were actually employed. He had been informed by Mr. HARRIS, of the Chartered Gas Company, who worked both systems, that there was no saving whatever in the wages by the use of a stage house as compared with a ground-floor house. Mr. KIRKHAM put the cost of a stage house for 1,000,000 cubic feet at £22,190; and he was glad to hear that statement, because Mr. MORTON and Mr. WOODALL seemed to doubt that they cost so much, and stated that they made houses for little more than half the money. In allotting only £3,500 as the extra cost of the stage, he thought Mr. KIRKHAM had overlooked the foundations required for the extra height of the walls, and the additional thickness of the walls of the whole building, rendered necessary by the expanding and contracting of the iron stage, which was subject to extreme variations of temperature; indeed in no other way could he account for so high a figure of total cost as that given. Mr. KIRKHAM's remarks on gasholders, of which he had constructed a large number, were entitled to great respect; nevertheless, such holders as he disapproved were found to work well, and not to be subject to the difficulties suggested. His plan of tying down the sheets to the truss obviously threw unequal strain upon them, and prevented their taking that form in which they bore equally over their area the strain due to the entire weight of gasholder.

The Lackawanna Steel Mill, Scranton, Pa.

On the 23 ult., the Lackawanna Iron & Coal Co. made the first cast in its new steel mill, at Scranton. This magnificent establishment is admirably situated, as far as the supply of fuel is concerned, and is also so located as to command a variety of ores at moderate prices. The following description of the works we take from the *Scranton Republican*:

"The building consists of a cupola room, 44 feet span, 71 feet long, and 49 feet high to eaves; a converting room, 84 feet span, 124 feet long, and 31 feet high; an engine room, 54 feet span, 77 feet long, and 26 feet high; a boiler room, 46 feet span, 73 feet long, and 16 feet high to eaves, all arranged so as to form a rectangle of 124x120 feet.

"In the cupola room are located four cupolas of seven and a half feet in diameter, four feet in depth of tuyeres, and fifteen feet high to charging doors, each capable of smelting five tons in thirty minutes; also, two six-ton ladles mounted on scales for receiving the molten pig-iron from the cupolas, and in which it is weighed before being converted into steel; also, two reverberatory furnaces for smelting the franklinite, the office of which is to impart to the converted product its requisite hardness and to remove impurities.

"In each end of the cupola room is located a hoisting tower, furnished with a hydraulic elevator of six tons capacity and fifty feet travel.

"The converting room contains two five-ton converters of eight feet external diameter and fifteen feet high. These are lined with refractory material, ten inches thick at the bottom of the vessel, and are provided with trunnions eighteen inches in diameter, and with a hydraulic gear for rotating, mounted on massive beams and columns.

"The center of the converters are ten feet nine inches above general level.

"The casting-pit is situated immediately in front of the converters, and is 38 feet in diameter, two and a half feet deep, and commanded by a central hydraulic ladle-crane of twelve tons capacity.

"The crane is swung over the several ingot-moulds in rotation, when the liquid metal is tapped by a system of machinery, allowing it to flow from the bottom of the casting ladle to avoid the slag becoming mixed with the steel. The slag forms in a solid crust upon the surface.

"The first casting, made on Saturday evening, proved eminently satisfactory, and yielded some excellent ingots, but the second was not so happy, and completely demolished the moulds, by reason, doubtless, of the sudden expansion.

"The size of the ingots will depend on the weight of the rail to be produced, but will average twelve inches square and forty-five inches long, and for thirty-two-foot rails sixty-five pounds per yard.

"The hydraulic machinery seems very perfect, and is actuated by a hydraulic duplex force pump having two steam cylinders, 30 inches in diameter, two water cylinders of nine inches in diameter and twenty-four inch stroke.

"The water is forced from these pumps under a pressure of 300 pounds per square inch into a system of pipes which communicates with the various hydraulic motors throughout the works.

"In the engine room are located two independent horizontal and condensing blowing engines, fifty inches in diameter, and a blowing cylinder 54 inches in diameter and five-feet stroke. These furnish the blast for the conversion to the converters at the rate of 9,500 cubic feet per minute and under a pressure of twenty pounds per square inch, making a loud roaring noise, fairly deafening to hear.

"The boiler house is occupied by a battery of six boilers of the locomotive type, having each 34 square feet grate surface, 1,504 square feet heating surface, and 112 tubes 16 feet long and three inches diameter."

Cost of Lake Superior Charcoal.—The Depere furnaces pay from $1.35 to $1.75 per cord for hard wood delivered at kilns. At this rate their charcoal ought not to cost them over six cents a bushel—at which rate of fuel expense every charcoal furnace on Lake Superior could be made to pay at even the present low prices offered for charcoal iron. We are not surprised, therefore, to learn that the furnaces there will continue blowing through the winter.—Marquette *Mining Journal*.

The Condition of Certain Classes of Laborers in England.

WE are reminded, from time to time, of the fact that wages have largely increased in England, and this is undoubtedly, true in nearly every branch of industry; but something more than high wages is necessary to make a satisfactory change in the condition of the working classes. They are ignorant to the last degree, and addicted to all the low vices that are the natural outgrowth of ignorance, so that in many cases the very receipt of high wages only affords a more abundant means for indulging the most degrading instincts.

What could be more sad and humiliating than the condition of things described by Sub-Inspector BREWER, as existing in the workshops of the "Black Country" of England?

Writing his half-yearly report to the Home Secretary, Mr. BREWER, the Sub-Inspector of Factories, says:—"The root of all evil in the Black Country appears to be drunkenness, no matter whether the drinker be puddler, collier, chain or nail maker. The outcry against the colliers and puddlers' wives working is very great; not, perhaps, so much from their influx into the trade, but from the fact that they work night and day, and toil and slave; and for what? Not for the price that straightforward masters would give, but for any price any crafty knave of a master chooses to offer. These people work, and do not stand out for 'tommy' or 'beer' so long as they can get something to satisfy their half-starving families, whilst the ought-to-be bread-winner is luxuriating in some public-house at his ease, in 'training his wippet,' for some future running, on beef steaks and the best of good fare. Day by day I am more and more convinced that this woman's labor is the bane of this place. Nor do I confine this remark to the nail and chain trade alone. It was only the other day that a young woman, addressing me, said: 'I say, master, I wish you would make my man do a little more work and me less! I married a swell, I did.' On my inquiring what she meant by a swell, she replied: 'Why, when I married him in the morning he had a smart gold watch and chain, and a smart dickey; but when we came to go to bed at night, I'm blessed if he had e'er a shirt on; and ever since I've had to keep him by working in the brickyard, and not only keep him, but find him money to drink.' Nor is this state of things confined to the Black Country. I went one day over to Bromsgrove, and in conversation with a nailer, to whom I preached my usual sermon on women's labor, and the growing custom of idle, lazy young lads looking out for skilled industrious wives, in order to obtain 'an easy life,' he said: 'That is true! There is my wive's brother, who got a decent girl into trouble and then wouldn't marry her, though we all did what we could to persuade him; for he said he weren't agoing to marry a lass as couldn't work; and he should look out for a nailer, and has found one.' The evil of this is, that in marrying a girl that can work they both marry young, but neither has anything put by, and they must needs run into debt for the little furniture and tools they require. Things go on smoothly for a short time, perhaps, and the skillful wife keeps not only the house going, and her lord and master in drink, but, in addition, pays off the debt. But the day of reckoning comes in the shape of one baby, and then another; then sickness, and other troubles, and the once skillful wife is now a haggard untidy woman, no longer able to earn much. Starvation is in the house, and where, then, is the legitimate bread-winner? If he has ever attempted to work, his career of idleness has caused his hand to lose its craft, or a course of drunkenness has so debilitated him that he can no longer stand the fatigue and heat. Nor is this the whole of the mischief. Whilst the mother toils and slaves, the children are left uncared for, to wander shoeless and in rags, till they are old enough to blow the bellows for their father at a miserable pittance per week—to be kicked and cuffed, hear filthy, indecent, and blasphemous language, and are then sent into the shop amidst men degraded by drink and gambling, in time to follow the same course. Take, again, the instance of a collier's wife in the Black Country, who works at chain-making about ten hours a day, for which she is paid 8*d*, though, if she had taken her work to an honest master, she might have had 12*d*. Out of this, before she can take any for herself, she has, probably, to pay 1/6 for a child hired to nurse her baby, whilst she works; 2/ a week for her breezes (*i.e.*, firing for her nail-making), and 1/ for the hire of her stall, leaving her half-a-crown for her subsistence. It is true, this may not be the same in every case; but in far too many it is. My experience is, that the chief encouragers of such labor as this are the 'middlemen,' the 'foggers,' and the 'drunkards.' Intelligent chain-makers suggest that all females commence work not earlier than eight A. M., and do not work later than seven P.M.; that every occupier or owner of a chain-shop should be served with a copy of the rules of the trade, which it should be compulsory by law to have hung up in the shop; that the factory act holidays be applied to chain shops. The 'middlemen' are a great curse to the trade, for to such the poor drunkard flies who cannot carry on from week's end to week's end, to receive the wages of a few hours' labor, and, of course, at reduced prices. The woman with a drunken husband is much in the same plight. Lots of these 'middlemen' keep public-houses and 'tommy' shops, and carry on a system of 'truck.' Thus, if a workman would decline to spend his money at his employer's house, he gets no more work, and cannot, therefore, refuse. Drink they must have, and drink they will have, whether they starve their families or not. The sanitary condition of the shops is often bad. Women, certainly, work often in an advanced state of pregnancy; but then, in the chain shops most of it is handwork and no oliver. Not many days since a tale was related to me, by an ironmaster, of what happened in a brickyard, near Bilston, a short time back. The manager noted a girl, carrying clay, looking exceedingly ill. Thinking she had been drinking over night, he exclaimed: 'Why, Clara, you don't look up to much this morning?' 'No more would you,' was the retort, 'if you had had a child during the night.' On another occasion I called in at Mrs. COOLIS' school, close to which was a chain shop. After the visit to the school I called in at this chain shop, and found a tall, lanky boy 'blowing.' I said, 'I supposed he was 13?' This he indignantly denied. To my question if he went to school, I got the reply that 'his mother said he was not to go.' 'Where is your father?' 'In jail' 'What for?' 'For deserting mother and us.' The following is the truth of the story:—Her husband, an anchor smith, could earn £3 a week. For eight months he had not given her a penny. She had a large family, which she supported as best she could. The poor woman, at last getting wearied out, threw herself on the parish, who prosecuted her husband, and the justices sent the man to jail, though he offered to pay all expenses."

Lake Superior Iron Ore Shipments.—It will be seen by our tabular statement that the lake shipments of ore for the season about to close, were, up to November 3rd, 743,103 tons, against 747,161 tons up to the 5th of the same month last year—a falling off of only 4,058 tons. The total shipments last year were 880,147 tons up to the close of navigation. A comparison of figures at the close of the present season will show a decreased production by at least 100,000 tons.—Marquette *Mining Journal*.

Arrangements for the Centennial.

THE Exhibition will be opened on May 10th, 1876, and remain open every day, except Sunday, until November 10th. There will be a fixed price of 50 cents for admission to all the buildings and grounds.

The Centennial grounds are situated on the western bank of the Schuylkill River, and within Fairmount Park, the largest public park in proximity to a great city in the world, and one of the most beautiful in the country. The park contains 3160 acres, 450 of which have been enclosed for the Exhibition. Besides this tract, there will be large yards near by for the exhibition of stock, and a farm of 42 acres has already been suitably planted for the tests of ploughs, mowers, reapers, and other agricultural machinery.

The Exhibition buildings are approached by eight lines of street cars, which connect with all the other lines in the city, and by the Pennsylvania and Reading railroads, over the tracks of which trains will also run from the North Pennsylvania and Philadelphia, Wilmington and Baltimore railroads. Thus the Exhibition is in immediate connection with the entire railroad system of the country, and any one within 90 miles of Philadelphia can visit it at no greater cost than that of carriage hire at the Paris or Vienna Exhibition.

The articles to be exhibited have been classified in seven departments, which, for the most part, will be located in appropriate buildings, whose several areas are as follows:

Department.	Buildings.	Acres Covered.
1. Mining and Metallurgy, 2. Manufactures, 3. Education and Science,	Main Building.	21.47
4. Art,	Art Gallery	1.5
5. Ma hinery,	Machinery Building	14.
6. Agricu ture,	Agricultural Building	10.
7. Horticulture,	Horticultural Building	1.5
Total		48.47

This provides nearly ten more acres for exhibiting space than there were at Vienna, the largest International Exhibition yet held. Yet the applications of exhibitors have been so numerous as to exhaust the space, and many important classes of objects must be provided for in special buildings.

An important special exhibition will be made by the United States Government, and is being prepared under the supervision of a Board of Officers representing the several Executive Departments of the Government. A fine building of 4½ acres is provided for the purpose, space in which will be occupied by the War, Treasury, Navy, Interior, Post Office, and Agricultural Departments and the Smithsonian Institution.

The Women's Centennial Executive Committee have raised $30,000 for the erection of a pavillion in which to exhibit every kind of women's work. To this collection, women of all nations are expected to contribute.

The list of special buildings is constantly increasing, and present indications are that their total number will be from 200 to 250. Most of the important foreign nations—England, Germany, Austria, France, Sweden, Egypt, Japan, and others—are putting up one or more structures each, for exhibiting purposes, or for the use of the commissioners, exhibitors and visitors. Offices and headquarters of this kind, usually of considerable architectural beauty, are provided by the States of Pennsylvania, Ohio, Indiana, Illinois, Michigan, New Jersey, New York, Connecticut, Massachusetts, New Hampshire, Missouri, Kansas, Virginia, West Virginia, Nevada, Wisconsin, Iowa, and Delaware; and it is likely that others will follow the example.

A number of Trade and Industrial Associations, which require large amounts of space, will be provided for in special buildings. Among these are the photographers, the carriage builders, the glass makers, the cracker bakers, the boot and shoe manufacturers, besides quite a number of individual exhibitors. The great demands for space will probably render this course necessary to a considerable extent, especially for exhibitors who have been tardy in making their applications. In the Main Exhibition Building, for example, 333,300 square feet of space had been applied for by the beginning of October, by American exhibitors only, whereas the aggregate space which it has been possible to reserve for the United States Department, is only 160,000 square feet, about one-third of which will be consumed by passage ways.

The Machinery Building, like the others, is already fully covered by applications. There are about 1000 American exhibitors in this department, 150 English, and 150 from other European countries—which is about 250 more than entered the Vienna Machinery Exhibition. Extra provision is being made for annexes to accommodate the hydraulic machinery, the steam hammers, forges, hoisting engines, boilers, plumbers, carpenters, etc.

Power in the Machinery Hall will be chiefly supplied by a pair of monster Corliss engines. Each cylinder is 40 inches in diameter, with a stroke of ten feet; the fly-wheel is 31 feet in diameter, and weighs 55 tons; the horse-power is 1400; and the number of boilers is 20. This engine drives about a mile of shafting.

For the Art Exhibition, the most eminent American artists are understood to be at work, and it may be confidently stated that, especially in the department of landscape painting, the United States will present a finer display than the public has been led to expect. Quite aside from the contributions of American artists, applications from abroad call for more than four times the exhibiting space afforded by the great Memorial Hall. Provision for the surplus will be made in temporary fire-proof buildings, though all exhibiting nations will be represented in the Central Art Gallery.

More Good Blast Furnace Work.—HENRY FORD, ESQ., general manager of the Bangor (Mich.) furnace, sends the Marquette *Mining Journal* the following report of the make of that furnace for the two months ending October 31st:

BLAST ENDING SEPT. 30.

Furnace run—4,145 charges, 25 bushels of coal to the charge.
Gross tons iron made—695 No. 1, 189½ No. 2, 36 No. 3, 22 No. 4, 7 No. 5, 8 No. 6—total, 957½. Bushels charcoal per ton of iron made, 108½; yield of ore, 61½ per cent. Stopped six hours, making the actual running time 29¾ days—an average of 32 1-5 tons per day.

BLAST ENDING OCT. 31.

Furnace run—4,494 charges, 25 bushels coal to the charge.
Gross tons iron made—913½ No. 1, 126½ No 2, 23½ No. 3 8½ No. 4, 1¼ No. 5—total, 1073½. Bushels charcoal per ton of iron made, 104½; yield of ore, 61½ per cent. Stopped six hours, making actual running time 30¾ days—an average of 34½ tons per day.

BLAST REPORT FOR TWO MONTHS ENDING OCTOBER 31.

Furnace run—8.639 charges, 25 bushels coal to the charge.
Gross tons iron made—1608½ No. 1, 316 No. 2, 59¼ No. 3, 30½ No. 4, 8½ No 5, 8 No. —total, 2031. Bushels coal per ton of iron made, 106½; yield of ore, 61 3-5 per cent. Stopped 12½ hours, making actual running time 60½ days, with an average of 33 3-5 tons per day.

Mr. FORD informs us that at least one-fifth of the coal used was made from soft wood, but neglects to state the kind of ore used.

SELECTED LIST OF PATENTS.

FOR THE WEEK ENDING NOV. 6, 1875.

RELATING TO MINING, METALLURGY, GAS MAKING, ENGINEERING, &c. REPORTED FOR THE "ENGINEERING AND MINING JOURNAL" BY LOUIS BAGGER & CO., SOLICITORS OF PATENTS, WASHINGTON, D. C.

169,033. Inclined Revolving Puddling Furnaces, Charles Pernot, St. Chamond, France.—In this furnace are combined an inclined rotating and removable hearth, arranged to leave an open joint between the hearth and the body of the furnace, and a regenerator from which heated gases are passed to the furnace under a pressure greater than that of the external atmosphere. The inclined revolving hearth is run into the Siemens furnace on rails, and, by revolving, mechanically puddles the iron. The joint is kept open, the internal pressure of the gases, caused by their expansion in the regenerators, and additional expansion or bursting into flame in the hearth being sufficient to exclude the air.

169,047. Puddling Furnace, C. J. Scofield, Clayton, near Manchester, Great Britain.—The annular chamber contains water in which the annular hearth revolves on friction rollers. Flame and products of combustion enter the annular chamber from the fire at one side, and dividing into two streams, find exit at the other, impinging on the metal in the revolving annular hearth. A mechanical tool puddles the iron, and a slide let down through the top of the chamber dips into the revolving hearth, across which it is obliquely arranged, and diverts the puddled iron upon a shelf leading out of the furnace. The iron is remooved through a door opening in front of the shelf.

169,071. Three-high Rolling-Mills, J. I. Williams, Millvale, Pa.—The middle roll is balanced by weights and levers, to the last named of which is attached a crosshead, connected to and raised and lowered by the piston of a steam cylinder. Attached to the bearing of the middle roll is a small fore-plate, which moves with the roll and its bearings.

168,909. Gas Apparatus, Charles Lord, Shelbyville, Ind.—For crude oils, fats, and resins. The gas material is heated in the feed-pipe, which coils in the furnace, is vaporized in the inner iron retort and the vapors are fixed in the outer clay retort. The liquid gas material cannot touch and penetrate the clay retort, and the iron retort is protected from the severest heat.

169,037. Manufacture of Gas for Burning and Lighting, T. B. Redwood, Fairlawn Finchley, England.—This claims to be an improvement in the manufacture of permanent gas rich in carbon, and consists in bringing hydrocarbon vapor, together with water gas, into contact with a largely-extended and highly-heated surface of copper and alloy of copper.

168,906. Gas Washing Machinery, T. K. Lees, Brooklyn, N. Y.—A revolving vertical shaft, provided with horizontal perforated disks, is mounted centrally in a cylindrical case. Below each disk is a grating of wood. Water enters at the top of the case, and is showered down through it, while the gas passes up from below. The disks are corrugated concentrically, to prevent the water being thrown off at their peripheries by centrifugal action.

Notes.

An Important Decision has just been rendered by the Supreme Court of Iowa, to the effect that railroads are liable for damage caused by fire from sparks from locomotives.

A new Siemens Furnace, of twenty tons capacity, and a new train of rolls, seventy-eight feet by thirty feet in dimensions, are being erected in the Chester, Pa., rolling mills.

Professor Bell, the Canadian Geologist, is at work on the North Shore, in behalf of the Dominion Government, collecting mineral and geological specimens for the Centennial Exposition at Philadelphia.—Portage Lake *Mining Gazette.*

Messrs. Hillard & Holland, of 62 and 64 Gold street, N. Y., are offering railway and machinists' supplies at prices which should attract attention; the facilities and experience of the firm enable them to produce goods of the best quality at the lowest cost, and dealing direct with the consumers, these obtain an important advantage. We note their cast-iron elbows of size from ¼ inch to 8 inches, at from .02 to $5 10; tees of the same sizes from .04 to $7 56; brass globe valves from ¼ inch to 3 inches, at from 31 cents to $7 00; malleable iron fittings, 12 cents per lb., net; water gauges from $1 85; lubricators for steam cylinders from $1 25; gauge cocks from 50 cents; Messrs. H. & H.'s brass straigthening valves, sizes from ½ inch to 3 inches, at from 72 cents to $13 50. The mere mention of these prices is sufficient; they are claimed to be from 25 to 50 per cent. below current market prices of goods of similar quality.

Nederland Mill Report, Colorado.—This mill works the ores from the Caribou mine in Boulder County, Col., and, occasionally, custom ores from the vicinity. Of late the ores of the Caribou have decreased very much in value, and the quantity raised per month is not at all commensurate to the large price paid by Dutch capitalists for the property. By economical management it has, however, been possible to continue running the works. The ore is roasted and chlorinated in Brückner cylinders preparatory to amalgamation.

The following monthly statement of the mill work for September speaks for itself:

DRY ORE TREATED.	Tons.
Caribou ore (mine)	151,808
Caribou ore (dump)	81,312
Custom ore	13,080
Total	246,200 tons.
Average assay of Caribou ore received	43.6 oz. per ton.
" " " " from dump	26.2 " " "
" " Custom ore	87.4 " " "
" " Tailings	4.3 " " "
Average Chlorination	89.1 per cent.
Time for roasting a charge	11 hours.

(A charge contains 3,700 lb. of ore and 175 lb. of salt.)

RESULTS.	
425 pans produced	1450 lb. Amalgam.
25 " scraped produced	1,310 "
Total put in retort	2,760 lb.
Retort of crude bullion produced	675 lb.
Weight after refining (6 bricks)	9,260 oz.
Average fineness	0.8929

WORKING EXPENSES.	
Pay Roll	$2,065 55
Apparent loss of Quicksilver, 0.5 lb. per ton of ore, at $1 00	123 10
Salt, 27,440 lb., at 2½c.	583 10
Wood, 358 cords, at $3 00	1,074 00
Oil, Candles, etc.	100 00
	$3,945 75
Total running time	21 days.

STATISTICS OF COAL PRODUCTION.

Duties.

Anthracite free, *Bituminous*, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c. gold.

Not otherwise provided for, per ton, 40c. gold.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending Nov. 6.

	1875.		1874.	
	Week.	Year.*	Week.	Year.
Wyoming Region.				
D. and H. Canal Co	56,447	2,592,265	44,957	2,036,917
D. L. and W. RR. Co	63,804	2,869,921	59,059	2,134,333
Penn. Coal Co	26,061	1,173,842	29,236	1,140,129
L. V. RR. Co	21,980	796,557	16,236	811,535
P. and N. Y. RR. Co	534	82.932	1,297	54,245
C. RR. of N. J	38,324	1,187,916	28,895	1,269,146
Penn. Canal	13,506	265,415	8,523	295,928
Lack. and B. RR	..	81,493	..	112 529
	220,656	9,043,341	188,213	7,854.762
Lehigh Region.				
L. V. RR. Co	82,838	1,741,858	75 730	2,750,128
C. RR. of N. J	26,810	614,748	23,610	1,009.350
D. H. and W. B. RR	2,594	69,904	878	36,044
	112,242	2,426,510	100,218	3.795,522
Schuylkill Region.				
P. and R. R. RR. Co	102,030	3,902 759	141,472	4,558,584
Shamokin & Lykens Val.	25,248	1,051,584	20,222	827,247
	127,278	4,954.343	161,694	5,385,831
Sullivan Region.				
Sul. and Erie RR. Co	286	8,137	222	30,855
Total	460,462	16 437,331	450,347	17,066,970
Increase	10,115	..	..	..
Decrease	..	629,639	..	..

* Year beginning January 1st.

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

The following Table does not give the entire production of our Bituminous mines, but it is by far the fullest report published.

The Production of Bituminous Coal for the week ending Nov. 6, was as follows:

Tons of 2,000 lb., except where otherwise designated.

	Week, Tons.	Year, Tons.
Cumberland Region, Md.		
Tons of 2,240 lb	39,604	2,002,889
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb	7,707	282,760
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	4,374	183,794
*East Broad Top	1,728	39,708
Clearfield Region, Pa.		
*Snow Shoe	626	52,185
*Tyrone and Clearfield	18,148	732,397
Allegheny Region, Pa.		
*Pennsylvania RR	4,280	185,044
Pittsburgh Region, Pa.		
*West Penn. RR	3,960	181,460
*Southwest Penn. RR	927	19,071
*Penn. & Westmoreland gas coal, Pa. RR.	19,350	586,907
*Pennsylvania RR	8,064	360,156
Kanawha Region, W. Va.		
Chesapeake and Ohio RR	4,882	145,458

* To Oct. 28.

The Production of Coke for the week ending Oct. 28.

Tons of 2000 lb.	Week. Tons.	Year. Tons.
Tyrone and Clearfield	..	285
Alleghany Region	..	58
West Penn. RR	896	41,765
Southwest Penn. RR	11,848	457,746
Penn. & Westmoreland Region, Penn. RR.	936	29,759
Pittsburgh, Penn. RR	3,384	94,362
Total	17,084	620,975

The receipts at Port Richmond for the week were 45,000 tons, shipments 50,000 tons, and balance on hand 195,000 tons.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania Railroads amounts to 80,686 tons.

The Exports of Coal from Baltimore for the week were 782 tons, and for the year, 33,554 tons as compared with 65,366 tons to the corresponding time in 1874.

Receipts of Coal at Boston, for week ending Nov. 5, and years from September 1st, 1874 and 1875.

From	Week. Tons.	Previously. 1875. Tons.	1874. Tons.
Alexandria and Georgetown	1,381	28,380	35,796
Philadelphia	7,936	191,259	158,320
Baltimore	1,530	39,468	45,140
Other places	2,170	80,147	66,355
Great Britain	—	704	1,270
Nova Scotia	1,260	9,294	11.355

‡ *Shipments from Pictou, N. S.*, for the week ending Oct. 23:

	Tons. Week.	Year.
To United States	1,540	22,844
" West Indies	125	3,148
" South America	—	4,772
" Canada	3,770	130.902
" Other Provinces	1,768	57.337
	8,329	219,003

Belvidere Delaware RR. report:	Week.	Year 1875.	Year 1874.
Receipts of coal at Coal Port (Trenton)	8,086	158,586	248,252
" " " South Amboy	8,327	213,052	536,220
Shipments of Coal Port (Trenton)	7,420	154,447	247,860
" South Amboy	7,234	283,828	548,182

Shipments from Block House, Cow Bay, C. B., to the following destinations, from Oct. 15 to Oct. 25, 1875:

	Week.	Year.
Provinces	309	7,039
West Indies	107	1,393
United States	1,743	11,036
	2,159	19,468

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 12, 1875.

Anthracite.

The demand for anthracite coal is much smaller than a week ago. Firms, who last week could not supply the demand for certain sizes, now find it requires an effort to move them. The greatest demand is for chestnut coal, which is followed by stove. Egg and broken sizes are, in most cases, dull, while lump and steamer are exceedingly quiet. Prices remain very much as they have been for several weeks, with probably some underselling being done. Buyers appear to be acting upon the suggestion we offered a few weeks ago, and are observing silence when they are favored with concessions. The Reading Company has partially resumed work at its mines. The other companies are, as a rule, working about three-quarter time. The Port Richmond stock, although the receipts were 35,000 tons less last week than the week previous, was reduced but 5000 tons on the 6th inst., as compared with the 30th ult. The cars were, however, unloaded, which permitted the company to resume work. Stocks at other ports are increasing.

The Philadelphia *Public Record*, of the 6th inst., describes the situation in that city as follows:

"At Port Richmond the wharves and sidings are blocked full, while Smith's Island and other places for storing coal are all full to their utmost capacity. It is, therefore, impossible for coal shipments to continue. Great efforts are making to increase sales, and the charge is freely made that offers are accepted that are below the schedules of the combined companies. The agents of the companies, we believe, adhere to the prices; but they know of men who have over-bought and must sell. The independent dealers are doing better; in the spring they will have the advantage of fresh coal, while the companies will be obliged to sell coal that has been stored during the winter, which is always objectionable."

The Pennsylvania Coal Company has reduced its retail prices, and quotes, per ton at yard, as follows: Grate and egg, $5 70; stove, $6, and chestnut, $5 30. These are reductions of 50 cents per ton on grate and egg; 40 cents on stove; and 30 cents on chestnut.

The Production of anthracite coal for the week ending November 6, was 460,462 tons, and from January 1, 16,437,331 tons. The production for the corresponding week of 1874 was 450,347 tons, and from January 1, 1874, 17,066,970 tons. The production for the week ending October 30, 1875, was 626,960 tons. From the above figures it will be seen that there was a decrease in the production of last week, as compared with the previous week, of 166,498 tons, and an increase of 10,115 tons, as compared with the corresponding week of 1874. There has been a decrease since January 1, as compared with the corresponding period of 1874, of 629,639 tons.

Close of the Legislative Investigation into the Affairs of the Reading Company.—A dispatch from Philadelphia, dated yesterday, says:—The Joint Committee to investigate the affairs of the Philadelphia and Reading Railroad Company and the Philadelphia and Reading Coal and Iron Company held a final meeting to-day and agreed upon the character of a report to be submitted to the Legislature. There was a general unanimity of opinion among the committee. It is understood the committee hold that the constitutionality of the act incorporating the Philadelphia and Reading Coal and Iron Company is only for the decision of the courts, and not for the committee of the Legislature, and they recommend that the evidence taken in the case be submitted to the Attorney General for his examination, he being the proper law officer to institute proceedings against the corporation, should the facts warrant such action. The committee condemns the policy by which such charters have been granted by the Legislature, but thinks, that as all other companies carrying anthracite coal had these great powers granted to them, there was no good reason why they should be withheld from the Reading, and it expresses the hope that a different and more prudent course will be pursued hereafter in this matter. Concerning

THE CHARGE OF CONSPIRACY TO REGULATE THE PRICE OF COAL,

the committee thinks that the combination has not been injurious to the public, and if it should become detrimental hereafter the law can be resorted to to remedy it.

Bituminous.

The output of bituminous coal fell off considerably last week. This was the result of various causes—light demand, election day, and All Saints' Day. Prices are low and somewhat irregular. The Clearfield trade is only fairly maintained, while from several sources we learn that there has been a very much increased demand for Cumberland coal. Many consumers appear to have delayed stocking up for the winter, fearing that their business would not warrant further purchases. There appears, however, to be a revival of business in certain Eastern industries, due, in part at least, to considerable sales to foreign countries. Cotton goods are now being sold at unprecedentedly low prices, and we are informed that in some cases these prices, owing to economies introduced, yield profits; there is no doubt that there is still considerable room for economy, especially in the item of fuel. Thousands of dollars could be saved each year, by many of the large manufacturing companies, if they would carefully study the value of the various fuels, and introduce fuel-saving appliances of known merit. During the year, bituminous coals have been very largely introduced into the Eastern markets, and have, in most instances, given great satisfaction as regards economy. The indications are, that this class of fuel will cost no more during 1876 than during this year; while there are very promising indications that it will be somewhat cheaper. If the latter should be the case, it would, undoubtedly, give a great impulse to manufacturing—one of the greatest needs of which is cheaper fuel. In this connection we commend to the careful consideration of all manufacturers the admirable address of Mr. HOLLEY, in another column. Had there been an active business in manufacturing this year, it is very doubtful if bituminous mines could have supplied the demand.

We are receiving very full reports of coal production throughout the country, for this and past years, and are led to anticipate an increase in the production of bituminous coals this year, as compared with 1874.

By such comparisons as we are now able to make, it appears that the consumption of coke is now about 300,000 tons more than during the corresponding period of last year.

Foreign and Gas Coals—There is an occasional cargo of foreign coal arriving on orders. Small sales of domestic gas coals are being made, but the majority of deliveries are on contracts, Prices remain as they have been for months, with no indication of a change this year.

Freights.

Vessels are very scarce at all the shipping ports, and to many ports rates have advanced—especially around the Cape. There is much anxiety on the part of shippers to fill orders to such ports as are liable to be closed early by ice. Many vessels are preparing to lay up for the winter, and some have done so already.

Wholesale Prices of Anthracite Coal for Nov. f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
*Lackawanna and Scranton at Rondout and Hoboken	5 05	5 15	5 25	5 65	6 10	4 95
‡Pittston at Newburgh	5 05	5 05	5 15	5 40	5 90	4 85
Wilkesbarre at Port Johnston	5 05	5 15	5 25	5 65	6 10	4 95
Plymouth, R. A., Del	....	....	5 25	5 65	6 10	4 95
Susque. Coal Co. at Amboy W.A.	5 05	5 15	5 25	5 65	6 10	4 95
Kingston at Hoboken	5 05	5 15	5 25	5 65	6 10	4 95
Lehigh Coals.						
Old Company at Port Johnston	5 55	....	5 55	5 65	6 10	5 10
Old Company's Room Run "	5 55	....	5 55	5 65	6 10	5 10
§Sugar Loaf, Hobok. &Amb."	5 55	....	5 55	5 65	6 10	5 10
Lehigh Coal Exchange "	5 55	....	5 55	5 65	6 10	5 10
Honey Brook Lehigh	5 55	....	5 55	5 65	6 10	5 10
Spring Mt. C. Co. at Hoboken	....	....	....	....	....	....
Beaver Meadow at South Amboy	5 55	....	5 55	5 65	6 10	5 10
†**Schuylkill Coals at Port Richmond.**						
Schuylkill white ash	4 55	4 65	4 75	5 15	5 60	4 45
Schuylkill red ash	...	....	5 05	5 25	5 65	4 45
Shamokin white and red ash	....	....	....	5 40	5 80	4 50
Lorberry	....	....	5 90	5 90	5 90	4 65
Lykens Valley	....	....	6 50	6 50	6 50	5 50

Per ton.

Freight from Hoboken and Weehawken to New York .... 40c.
" " Elizabethport & Port Johnston to N. York. 45c.
" " South Amboy to New York ..... 50c.

*Freight on Lackawanna coal from Rondout to New York, by boats or barges of the D. and H. Canal Co. 50c. per ton, the expense of towing vessels from New York harbor to Rondout and back will be borne by the Company.

†Freight from Port Richmond to New York (free of discharging) 85c. per ton.

‡ Prices to the Trade.

§ By Canal at New York, Jersey City and Brooklyn, 30c additional alongside.

Schuylkill coal is delivered f.o.b. of boats in New York harbor at 50c. per ton additional to these rates.

Pittston coal is delivered to carts in New York or Brooklyn at 65 cents per ton in addition to the above rates.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$5 20	$6 50
" " at S. Amboy	6 00	6 50
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
" " South Amboy	8 50	....
" Orrel	6 00	6 50
Youghiogheny, Waverly Co., at Balt	5 00	6 50
Despard, West Va.,	5 00	6 50
Murphy Run, West Va., at Baltimore	4 75	6 30
Fairmount, West Va., " "	4 75	6 50
Newburgh Orrel, Md. " "	4 75	6 50
Cannelton Cannel, W. Va., at Richmond.	9 50	11 00
" Splint, " "	5 00	6 50
Peytona Cannel, " "	9 50	11 50
Straitsville " at Sandusky, O	3 25	10 00

Foreign Gas Coals.

	Sterling.	Am. cur'cy,
Newcastle, at Newcastle-on-Tyne	10/6@12/9	6 50@ 7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	47/ 18	00@20 00
" Gas Cannel "	32/ 6d	13@14
Scotch Gas Cannel, at Glasgow, nominal,	25/ Gold.	7 50
Block House, at Cow Bay, N. S	2 00	5 50
Caledonia, at Port Caledonia	1 75	5 25
Glace Bay, at Glace Bay	1 80	5 50
Lingan, at Lingan Bay	75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75

Steam and House Coals.

Broad Top, at the mine, $1 25; at Amboy	4 75@5 00	5 25@5 50
Cumberland, at Georgetown and Alexandria, Va	4 00@4 25	5 25@5 50
Cumberland, at Baltimore	4 25@4 35	5 75@6 00
Clearfield and Allegheny, "Derby," "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, $1 00; at Greenwich, Phil.	4 65	5 65

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$6 20	$6 40	$5 60
Lackawanna coal, delivered	6 75	7 00	6 25
Wilkes-Barre, "	7 00	7 25	6 75
Lehigh & Locust Mountain, del'd	7 00	7 50	6 50
Schuylkill Red Ash, del'd	7 00	7 50	

The Cost of delivering Pittston coal ranges from 40 cts. to $1 per ton, according to distance from the yard.

Williamsburgh, N. Y.

Lackawanna Coal at Yard.

Stove	$6 40
Egg	5 90
Chestnut	5 40

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$23 00
Liverpool House Cannel " " "	25 00
American " " " "	16 00
American Orrel " " " "	11 00
Red Bank Cannel " " "	14 00
Cumberland " " "	7 00

Baltimore, Md. Nov. 10, 1875.

Reported by our Special Correspondent.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$4 80	$4 65
Broken	5 55	5 40
Egg	5 77	5 62
Stove	6 02	5 87
Nut	4 90	4 87
Shamokin, (red or white ash), and "Boston," freeburning white ash,		
Egg	5 95	5 79
Stove	6 15	5 99
Lykens Valley, red ash,		
All sizes	6 55	6 37

From wharf or yard, wholesale, 50@75c. additional.

By retail, all kinds and sizes, per 2240 lb. $7 00@8 00.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point	4 15	4 50
West Virginia f. o. b. at Locust Point		5 50
Youghiogheny Gas, f. o. b. at Locust Point		5 50
Swanton Coal, George's Creek		4 40

Boston. Nov. 6, 1875.

Reported by our Special Correspondent.

CARGO PRICES TO TRADE.

Lingan coal	$ 5 20	Westmoreland and Penn.	6 85
Caledonia	5 00	Waverly Co. Youghiogh'y.	6 80
Pictou	5 60	Cannelton Cannel	11 60
Block House	5 20	Cumberland	5 80@ 6 00
Red Bank Cannel	9 00	Anthracite .6 50@	7 25
Glace Bay	5 00	" retail..7 50@	8 00
Sydney	6 25		

Buffalo, N. Y. Nov. 10, 1875.

Reported by our Special Correspondent.

ANTHRACITE.

	Afloat. f.o.b.	Retail. Deliv'd.
Grate	$6 40	$7 40
Egg	6 40	7 40
Stove	6 85	7 85
Nut	6 60	7 60

	Lump.	Run of Mine.	Nut.	Slack.	Nut & Slack.
Connellsville Coke	$5 50	....	....	....	....
Brookfield Coal	....	....	....	....	....
Briar Hill	4 50	....	....	....	3 00
Youghiogheny	4 75	....	....	....	....
Monterey	3 75	3 50	3 25	2 50	....
Catfish	3 75	3 50	3 25	2 50	....
Stoneboro	....	....	3 25	2 50	....
Sterling Cannel	5 50	....	....	....	....
Buffalo Coal Co.	3 50	3 25	....	2 30	....

Chicago, Ill. Nov. 9, 1875.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

Retail prices per ton of 2000 lb. delivered to buyer.

No change in prices of coal.

		BITUMINOUS.	
Lehigh Lump	$10 0	Briar Hill and Erie	@ 7 00
Lehigh grate and egg	9 50	Walnut Hill, Pa	@ 6 50
Lehigh stove and chest.	10 00	Midway, Pa	@ 6 50
Lackawanna, Wilkes Barre and Pittston*		Cannel	@ 8 00
		Blossburg	7 50
Grate and egg	9 50	Indiana Block	6 00
Stove and chestnut	10 00	Hocking "Brooks"	6 50
		Wilmington and Illinois	5 00

* 50 cents off these prices for car load lots to country dealers and manufacturers.

Cincinnati, O. Nov. 6, 1875.

Reported by our Special Correspondents.

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	10 c.	——
Pomeroy coal	8 c.	——
Kanawha "	10 c.	——
Cannel coal, according to quality	—	——
Semi-Cannel	—	——

The following are the retail prices delivered

Youghiogheny	15@16c. $1 00
Pomeroy	11c. 3 00
Cannel	—c. ....
Kanawha Semi-Cannel	13c. 3 60
Anthracite	9 50@10 5
Foundry coke	10c. ——
Coke, hard and soft	1cc. ....

Cleveland O. Nov. 10, 1875.

Specially reported by Messrs. WARNER, BATES & CO.

WHOLESALE.

Per ton of 2000 lb. f. o. b. vessels.

	For vessels,	On cars.
Youghiogheny Gas Coal	$4 40	$4 15
Cannel	4 50	4 15
Blossburgh	5 00	5 00
Briar Hill Block Coal	3 80	3 60
Hocking Valley	3 25	3 10
Straitsville Coal Co., lower vein	3 25	3 10
Massillon	3 10	3 30
Tuscarawas Valley	2 85	2 70
Columbiana	2 80	2 60

RETAIL DELIVERED.

	Lump.	Nut.
Briar Hill	$5 00	$3 50
Massillon	4 50	4 00
Mineral Ridge	4 50	4 00
Columbiana	3 25	3 00
Straitsville Coal Co., lower vein	4 00	3 00
Tuscarawas Valley	3 25	3 00

ANTHRACITE DELIVERED.

	Grate.	Egg.	Stove.	Chestnut.
Lehigh	$9 00	$9 00	$9 50	$9 25
Wilkes-Barre	8 10	8 10	8 50	8 25
Lackawanna	8 10	8 10	8 50	8 25

Detroit, Mich. Nov. 6, 1875.

Specially reported by Messrs. ROBINSON & KEYS, Dealers in all kinds of coal.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep.sizes.	10 00	Briar Hill	7 50
Wilkes-Barre, Grate and Egg	9 00	Willow Bank	7 00
Wilkes-Barre, Stove and Nut	9 50	Erie	7 50
		Massillon	7 00

Erie, Pa. Nov. 6, 1875.

Reported by our Special Correspondent.

Wholesale, per ton of 2000 lb. Bituminous f. o. b.

Briar Hill lump	$3 75	Beaver lump	$3 50
Midway	3 25	Cat Fish	3 00

Indianapolis, Ind. Nov. 6, 1875.

Specially reported by Messrs. COBB & BRANHAM

Wholesale on board cars, and retail delivered to consumers.

Per ton of 2000 lb., bushel of 70 lb.

BITUMINOUS.

Indian Creek, per ton	$2 75	Peytona cannel, per ton.	7 00
White River, "	2 75	Indiana Cannel	6 50
Brazil Block, "	2 65	Hocking Valley	4 25
Highland, grate, "	2 25	Youghiogheny	4 75
Block coal, nut, per car	18 00	Blossburg (smithing)	6 50
Highland " "	18 00	Piedmont "	6 50
Block Slack "	17 00	Gas coke, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre.)

Broken	$9 95	Nut	9 80
Egg	9 95	Stove	10 25

Owing to the Miner's strike there is no Lehigh coal in this market.

Retail, per bushel, delivered.

Sand Creek	15c.	Block Nut, steam	8
White River	14	" Slack, "	
Brazil Block	14	Peytona Cannel	6
Highland grate	14	Indiana "	24
Block Nut, domestic use.	12	Youghiogheny	20
Highland Nut, " "	12	Blossburg	26
" " steam	8	Piedmont	26

GAS COKE (measured.)

Crushed	15c.	Lump	12c.

ANTHRACITE.

Wilkes-Barre and Lackawanna (all sizes)	$10 per ton.
Lehigh, retail	$11 50 per ton.

Louisville, Ky. Nov. 6, 1875.

Specially reported by Messrs. BYRNE & SPEED.

WHOLESALE.

	per bushel		per bushel
Pittsburgh	10c	Pine Hill	—
Raymond City	9c.	Kentucky	—

RETAIL.

	per bushel		per bushel
Pittsburgh	14c.	Peytona Cannel	20@22c.
Raymond City	13c.	Buckeye "	—
Pine Hill	13c.	City-made Coke	11c.
Kentucky	12c.	Anth., per ton, $10 00 to 10 50	
Screened Pittsburgh per load			$3 00
Screened Raymond City			2 75
Pine Hill (Kentucky)			2 75
Cannel			$5 to 5 50

Milwaukee, Wis. Nov. 6, 1875.

Specially reported by Messrs. R. P. ELMORE & CO.

Retail price per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 00
Lehigh Prepared	11 00	Blossburgh	8 00
Lackawanna (all sizes)	10 00	Cannel	8 00
Pittston	10 00	Pittsburgh	7 00
Scranton	10 00	Steam coal	5 00

New Orleans, La. Nov. 6, 1875.

Specially reported by Messrs. P. & R. DE VERGES, Wholesale and Retail Dealers in Pittsburgh, Anthracite, Cannel and other Coals.

Pittsburgh coal, retail, per bbl	60c.
" wholesale	35c.
" steamboats, per box	50c.
" to manufacturers, per bbl	55c.
" shipments, per hhd	$6 00
Anthracite, wholesale, per ton	9 50
" retail, "	12 50
Virginia Cannel, per bbl	80c.
Scotch " "	....
Mt. Carbon, wholesale, per bbl	...
" " retail, "	....
St. Bernard, wholesale, per bbl	....
" retail, "	....

Pittsburgh, Pa. Nov. 10, 1875.

COAL.—There is a fair degree of activity, as there usually is at this season of the year, but operators generally continue to complain that, in consequence of an active competition, there is little or no margin for profit. Since the date of our last review some 750,000 bushels have been started down the river, the most of it destined for Cincinnati and Louisville, and while this will ease the owners thereof, it will no doubt cause prices to decline in the markets in question. Anthracite coal is still quoted $6 50 per ton on track for Wilkesbarre, and $7 delivered; the demand for anthracite is constantly increasing hereabouts.

COKE.—Trade continues rather dull, in consequence of the continued depression in the pig iron business; and there does not appear to be much prospect just now of any early change for the better. The consumption is light, in consequence of so many pig iron furnaces being out of blast. Prices are nominal at $2 50@2 75 per ton, delivered free on cars in Pittsburgh. It is evident, unless there is a change for the better, that many of our manufacturers will have to curtail their production, if not suspend entirely.—*American Manufacturer.*

Richmond, Va. Nov. 6, 1875.

Specially reported by S. H. HAWES, Dealer in Coal.

Per ton of 2240 lb., f.o.b.

Kanawha Cannel	$12 00	New River Bituminous,	$4 50
" semi-Cannel	4 75	Clover Hill Coal	4 25
Coalburgh Splint	4 90	James River Bitum	3 30
Lewiston "	4 90	" " Carbonite,	5 80
Kanawha Gas coal	4 50		

San Francisco.

From the *Commercial Herald*, Oct. 28, 1875.

Imports from January 1st to Oct. 16:

Anthracite tons	9,047	English, tons	42,718
Australian, tons	104,220	Vancouver Island, tons	50,417
Coos Bay, tons	26,722	Rocky Mountain, tons	53
Cumberland, tons	8,530	Seattle, tons	46,075
Mt. Diablo, tons (8 mos)	100,712	Bellingham Bay, tons	8,545

The receipts during the week have been of considerable importantance, the bulk of which was sold prior to arrival upon terms withheld—spot prices for cargoes not yet placed, more or less nominal. The arrivals for the past few days embrace the following: *City of Calcutta*, from Newcastle, N. S. W., 1,330 tons; *Three Brothers*, 2,514 tons, from Liverpool; *Montana*, 1,070 tons, from Seattle; *Green Jacket*, from Hongkong, 319 tons; *Statesman*, from Liverpool, 197 tons coke. Wallsend cargoes may now be quoted at $8 75@9; Sydney, $8 50@9; Cumberland in bulk, $14@15; in casks, $16@1 80; Bellingham Bay, at $6 50; Coos Bay, $10; California Mt. Diablo Steam, $6 25@8 25 for fine and coarse respectively; Cumberland, $16@18; Nanaimo, $9 50@10; Seattle, $9 25@10; Anthracite, $15@18. The *Wallacetown*, from Newcastle, N. S. W., brings 2,327 tons.

Toronto, Ont. Nov. 6, 1875.

The following are present retail prices for coal:

Per ton all sizes.

Lackawanna and Scranton	$7 00
Lehigh Lump and prepared	8 00
Blossburgh	6 50
Soft lump for grates	6 00
Soft nut	4 50

Toledo, Ohio. Nov. 9, 1875.

Specially reported by Messrs. GOSLINE & BARBOUR.

Per ton of 2000 lb. on cars.

Hocking Valley	$3 40	Massilon	4 20
Straitsville	3 40	Youghiogheny	5 00
Shawnee	3 40	Blossburg	7 00@7 50
" nut	2 90	Cumberland	7 00@7 50
r Hill	5 50	Connellsville coke	7 00

ANTHRACITE.

Grate, screened	$7 50	Stove, screened	$7 75
Egg, "	7 50	Chestnut "	7 50
Lehigh Lump	9 00		

40 cents to $1 per ton additional for delivery at retail.

Halifax, N. S. Nov. 6, 1875.

Prices per ton of 2240 lb. in gold.

Sydney (old mines)	$4 00	Little Glace Bay	3 35
Gowrie	3 35	Blockhouse	3 35
Victoria	——	Albion (at Railroad)	4 00

Montreal. Nov. 6, 1875.

Specially reported by Messrs. ROBERT C. ADAMS & CO.

With the close of our season of importation prices of coal have advanced and are firmly maintained. Anthracite is believed not to be in large stock, and high prices are expected during the winter. The completion of the New York and Canada RR., will, however, probably pre-

vent a recurrence of the famine prices occasionally obtained here in winter, as it is said coal can be laid down by this route at a cost of seven dollars per ton.

Bituminous coal, which has been a drug in the market all the season, is now inquired for, and stocks appear to be light. An advance of one dollar per ton has taken place, and the loss of 1000 tons Pictou coal in the steamer *Normanton* will give increased firmness. Quotations are:

Wholesale per ton of 2240 lb.

Scotch Steam	$6 00	Cape Breton Steam	$5 25
Pictou "	5 75	Newcastle Smiths,	7 00

Anthracite at retail, per 2000 lb., delivered.

Egg	$8 50	Chestnut	8 25
Stove	9 00		

Rates of Transportation on Anthracite Coal to Tide Ports.

Lehigh and Wyoming Coals.

per ton of 2240 lb.

	From Penn Haven.	From Mauch Chunk.	From Hazleton**	From Upper Lehigh.	From Ashley and Sugar Notch.
To ‖ Newark, N. J., via Central Railroad of New Jersey	2 60	2 46	2 93	2 93	3 16
‡ Mauch Chunk, Pa., via Central Railroad of N. J.	14	..	56	47	71
‡ Phillipsburg, N. J.	99	85	1 32	1 32	1 65
Elizabethp't, Port Johnston, Hoboken and South Amboy, N. J., shipping and wharfage 35c. add.	2 24	2 10	2 59	2 57	2 80
High Bridge, N. J.	2 40	1 95	2 80	2 54	2 72
Somerville and Raritan, N. J	2 80	2 35	3 20	2 35	3 12
Elizabeth, Cranford, Westfield & Elizabethport, for consumption,	2 60	2 46	2 95	2 93	3 16
¶ Jersey City, N. J., and New York, via L. V. RR. and Morris Canal.	2 85	2 40	3 17	3 24	3 54
Andover, via Delaware, Lackawanna and Western RR	3 30	3 10	3 70	3 69	3 99
Trenton, Somerset Junction and Greensburg, via P. RR. Belvidere Division	2 65	2 45	3 05	3 04	3 34
Trenton, for shipment, including shipping and wharfage	2 11	1 95	2 45	2 46	2 76

From *Mauch Chunk* to *New York* (towing limits) and Jersey City† via Lehigh Valley RR. and Morris Canal .. $2 37

From *Mauch Chunk* to *Philadelphia* via L. V. RR. and North Penn. RR 1 75

††From *Phillipsburg, N. J.* to *Hoboken* for shipment via Delaware Lackawanna and Western RR., Morris and Essex Division 1 24

From *Lackawanna Junction* to *Auburn, N. Y.*, for shipment, via Southern Central R R. in connection with Pa. and N. Y. R.R. 2 53

From *Lackawanna Junction* to ‖*Weedsport* for *Rochester and Charlotte* 2 59

From *Lackawanna Junction* to *Sterling* for *Oswego, N.Y.*.. 2 02

‖ To this point for all places between Rochester and Buffalo the rate is 2 53

* The rate to this point for Syracuse is 2 05

** Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.

§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

¶ 20 cents per ton additional for transferring coal from boat to boat, and 30 cents per ton for reshipment of same from wharves.

† Transportation on Coal destined for re-shipment from this point is 20c. less than above rate.

†† The rate for consumption to this point is $1 80.

CANAL TOLLS, exclusive of towage, Bordentown to New Brunswick, when towed by the Company's Steam Tugs:

For Anthracite Coal ..... 3½c.

Bituminous and Semi-bituminous Coal... 3½c.

Freight on Nova Scotia Coals.

Pictou, Nova Scotia, to	New York		$1 80
" " "	Portland, Me		2 00
" " "	Montreal, Canada		2 35
" " "	Quebec, "		1 80
" " "	Halifax, N. S.		1 25

Pilotage for vessels of from 80 to 150 tons, $6 inward and $4 outward. From 150 to 1000 tons, 10 to $17 inward and $6 to $12 outward. Vessels of 1000 tons and upwards, 2c. per ton inward and 1½c. per ton outward.

Towage 3c. per ton. Trimming 3 hatch vessels, 6c per ton. Two hatch vessels 7c. per ton.

Delaware and Raritan Canal.

Tolls and Steam Towage.

Per 2240 lb. Cargoes to exceed 110 tons.

From Fairmount to New York, towing limits within 53d st.			74c.
" Greenwich	"	Bituminous	64c.
" "	"	Anthracite	69c.
" Lambertville	"	Anthracite	62c.
" Port Richmond	"		68c.
" " "	"	Semi-bituminous coal,	63c.
" Philadelphia	"	Cumberland "	58c.
" Trenton	"	Anthracite "	37c.

Towing.

From foot of 23d Street, East River, and *return*, *per ton*

	cts.		cts.
Bridgeport, Conn	33⅓	New Haven and Norwalk, Conn	33½
Hartford and Stonington, Conn	75	New London, Conn	60
orwich, Conn	68	*Derby, "	33½
Stamford, Conn., per boat	$75	Harlem, N. Y., per boat.	$18
Whitestone, L. I.	$30	Glen Cove, L. I.	50

	cts.
Manhattanville, via Hudson River, per ton	8
Harverstraw and Peekskill, via Hudson River	16
West Point and Cold Spring " "	17
Rondout " "	23
Yonkers, boats of 100 tons capacity " " per boat.	$5
Sing Sing and Peekskill " " "	20

* $50 per boat extra is charged for towage to this point.

Boats having less than 200 tons will be charged the same to Eastern points as if carrying that quantity.

Freights.

Per ton of 2240 lb.

Representing the latest actual charters up to Nov. 12, 1875.

Ports.	From Philadelphia.	From Baltimore and Georgetown.	From Elizabethport Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	....	2 25	....
Albany	*85	1 70	....
Amesbury, Mass	....	....	....
Bangor, Me	†2 00	2 00	1 30
Bath, Me	1 60	1 70	1 30
Baltimore	....	....	....
Boston, Mass	§1 80	2 20	130
Bridgeport, Ct	*85	1 60	80
Bristol, R. I.	....	....	90
Cambridgeport, Mass	§1 50@1 60	....	1 30
Derby	....	1 60	....
Dighton	....	1 65	....
East Cambridge	1 60§	....	§1 30
Fall River	1 50	1 60	90
Hackensack	....	....	....
Hallowell, Me	....	....	....
Hartford	1 90	2 50	1 30
Hoboken	†85	1 30	40
Hudson	....	1 65	....
Jersey City	....	1 30	40
Lynn, Mass	†2 10	....	†1 30
Middletown	....	....	1 00
Mystic	....	....	....
Newark	....	....	....
New Bedford	1 35	1 65	90
Newburyport	1 65	1 80	1 45
New Haven	*85	1 60	90
New London	1 45	1 65	85
Newport	1 60	1 45	90
New York	85††	‖135@1 40	40
Norfolk, Va	85	60	....
Norwalk	1 45‡	1 60	80
Norwich	1 50‡	1 65	90
Pawtucket	1 72½	1 65	‡100
Philadelphia	....	£0	....
Portland	1 60	1 70	1 30
Portsmouth, N. H.	2 05@2 10	2 ‖	1 55
Providence	1 50	1 65	90
Petersburg, Va	....	90	....
Portsmouth, Va	....	....	....
Poughkeepsie, N. Y.	*85	1 50	....
Richmond, Va	1 c5	70	....
Rockport	....	....	....
Saco	2 00	....	....
Sag Harbor	....	....	1 00
Salem, Mass	1 65	1 70	1 30
Salisbury Pt., Mass	....	....	1 50
Savannah, Ga	....	1 50	....
Stamford	*85	....	90
Stonington	....	....	....
Taunton	.. .	...	1 30
Trenton, N. J	....	....	....
Troy	....	....	....
Warren, R. I.	....	....	90
Washington, D. C.	1 10	....	....
Wareham	....	1 65	....
Weymouth	....	1 80	....
Wilmington, Del	1 50	85	....
Wilmington, N. C.	....	1 50	....

* And discharging and towing. † And discharging.

‡ And towing. § 3c. per bridge extra.

‖ The rate to this point by barge is $1 65.

†† Afloat.

From Philadelphia to all places on the Hudson River the rate is 85c, and discharging and towage according to destination.

THE BRITISH COAL AND IRON TRADES.

LONDON, October 30, 1875.

THE IRON TRADE.

Prices of both pig and manufactured iron have an inclination to decline. Shipments have stopped, for the season, to many ports. In cases where prices are now firm, concessions are offered for forward delivery. The manufactured iron trade is more quiet than that of pig iron. The great decrease in iron shipbuilding is much felt by makers of iron plates, as is also the substitution of steel boiler plates in large quantities for iron. Rail orders are pretty well worked up, and but few new ones are being received, and even those at very low prices. The prospects are very discouraging for the winter. The financial condition of the iron-manufacturers is very bad. Many are now assisted; with the hopes that they will be able to pass through to better times, but, with the prospects ahead it looks as though there may be much trouble in the near future—

The following are the leading quotations of iron:

——	Tees, f.o.b.	Barrow, f.o.b.	Liverpool, on trucks.
No. 1 Pig	54/6	*80/	70/6
No. 2 "	52/	*77/6	..
No. 3 "	49/6	*75/	68/
No. 4 Forge	48	74/	65/
Common Bars	142/6@147/6		162/6
Rails	130/@135/		140/@145/

* Bessemer Pig.

Common bars in South Staffordshire. £8 and marked bars, £10—12/6 for Lord Dudley's. Iron rails in Wales £6 10/@£6 15/, and bars £7 10/; Steel rails, £9@£9 10/. Steel rails at Liverpool and on the East Coast, £9 10/@10 10/.

THE COAL TRADE.

There is a good demand for house coals, but manufacturing coals and coke are very quiet. In Wales the coal trade is fairly active, although, in some cases, prices are very low. Tyne coals are quoted f. o. b. as follows: steam, 10/6d.@14/; households, 11/@15/; and gas coals, 8/6d.@10. Hetton gas coal f. o. b. Sunderland is quoted at 20/6d.; common steam coal f. o. b. Liverpool, 10/; South Wales coals f. o. b. Cardiff, as follows: best double screened coal, 12/9d.; colliery screened, 11/3d.@12/; household, 10/; coke, 14/6d.@16/.

THE LABOR MARKET.

The strike of 13,000 iron ore miners at Cleaton Moor, near Whitehaven, terminated on the 23d. inst.—the masters having compromised with the men.

The North Wales colliers have struck for an advance of 20 per cent. on their wages, and refuse to submit to the 15 per cent. reduction awarded by SERJEANT WHEELER. Public sympathy is against the men because they agreed to abide his decision.

The Forest of Dean coalmasters propose a reduction of wages, to be based upon a sliding scale varying with the selling price of coal.

The South Wales and Monmouthshire Board of Conciliation held its first sitting at Cardiff, on the 27th inst. It is thought that the meeting may last several months.

SALE OF THE PHŒNIX BESSEMER STEEL COMPANY'S WORKS.

This company, which recently failed with £220,000 liabilities, and £84,000 assets, is now at an end, the works having been purchased by Mr. HARRY STEEL, the well-known turf commissioner or betting agent. The price is £37,000, which is considered exceedingly moderate. It is understood that Mr. STEEL has a partner in this undertaking, and that he is entering upon the business on behalf of his son. The results of this sale must be very unsatisfactory to the shareholders, who will now lose all they have invested, besides having to pay off the £10 remaining on each of the shares. Since the liquidation the works have been carried on by Messrs. MACREDIE and BARBER, the liquidators appointed by the creditors, and the result of their operations has been that the concern, under their management, has yielded a fair profit. The works are capable of producing 50,000 tons of steel ingots per annum and 800 tons of rails per week.

SCOTLAND.

THE IRON TRADE.

Under a quiet business warrants have ranged from 60/@60/7½d, and closed yesterday at 60/6d.@60/7½d. The best qualities of makers' brands have commanded more money, but No. 3 has shown a tendency to decline. Stocks in CONNAL & Co's stores showed, yesterday, a decrease of 1252 tons as compared with a week previous, and were 71,885 tons. The number of furnaces in blast remains unchanged.

The shipments for the week ending October 23, were 8108 tons, against 9723 tons for the week ending October 23, 1874. The increase in shipments from December, 25, 1874, as compared with the same period of 1873-4 is 86,466 tons. Makers' brands of No. 1 iron are quoted as follows: Gartsherrie, 71/; Coltness, 77/; Summerlee, 67/6d.; Langloan, 75/; Glengarnock, 68/6d.; and Eglinton, 62/6d. Freights are as follows: To New York, 2/6d.; Boston, 14/; New Orleans, 5/; Baltimore, 8/ Philadelphia, 10/; and San Francisco, 27/6d. There is only a limited demand for ship and boiler plates, and but a moderate inquiry for rods and bars.

THE COAL TRADE.

The advance in house coals is maintained, while in some other descriptions there has been a decrease of 3d. The wholesale prices are as follows: Household coals, 8/6d to 10/6d. per ton; Wishaw main, 7/3d. to 7/9d.; steam, 8/9d. to 10/; splint, 8/3d. to 8/9d.; smithy, 13/9d. At one or two places in Ayrshire the miners have been sending deputations to their employers asking for an advance of from 6d. to 1/a day on their wages. They have in every case met with a refusal, some of the masters telling them that they had more need to get than to give, and others stating that trade was so bad they were contemplating the expediency of closing their pits altogether for a time.

The First Shipment of Coal from Mexico.

We are advised that a cargo of 200 tons of gas coal has been shipped from Tampico, Mexico, consigned to Messrs. J. W. WILSON & Co., of this city, for trial. A sample of three tons was previously sent to the Manhattan Co., and has, we understand, been very favorably reported on. This coal is from mines discovered about a year ago, some distance inland from Tampico, between the mines and which port there is river navigation.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, NOV. 12, 1875.

American Pig.—We are reported sales of 400 tons of No. 1 foundry, 500 tons of No. 2, and 500 tons of forge, all Thomas iron, at $24, $22, and $21, respectively; 1000 tons of No. 2 foundry and 1000 tons of forge, all Port Oram, on private terms; 265 tons No. 1 and No. 2 North River iron, at $23 and $21; and 300 tons of North River mill iron on private terms, but very low. Although the above would indicate more business than usual, yet most of the sales appear to have been forced at considerable concessions. The market is, as a rule, very quiet. It is encouraging to learn that some companies that are making a good grade of iron find a profit in even the very low prices of to-day. If all of our iron makers were to read carefully the address of President A. L. HOLLEY at the opening of the Cleveland Meeting of the American Institute of Mining Engineers, a portion of which is pub-

lished on another page of this Journal, and act upon the suggestions made, there might be more who could report profits.

The Boston *Commercial Bulle'in*, of the 6th inst , in a very sensible editorial, which reiterates the views expressed by this Journal frequently during the past two years, gives a very correct and practical view of the present condition of the iron trade. We regret that our limited space will not permit us to republish the article, as it contains many truths that our iron masters should hasten to realize.

Scotch Pig.—The arrivals of this article are light, and the demand in this market is equally so. Freights from Glasgow are as low as it is possible, ranging from nothing (ballast) to 2/6d. The Glasgow quotations of pig iron remain fairly steady, although this is the result of speculation, as all information would point to a decline. We note sales of 200 tons of Coltness, at $33, and 75 tons of Eglinton, at $29.50 We quote Coltness, $33 Eglinton, $29.50@$30; Glengarnock, $32; and Gartsherrie, $32.50.

Rails.—We are now permitted to report a sale which took place several weeks ago, of 3000 tons English rails on private terms. We quote iron rails at mills at $45, and steel at $70, although we know of offers to shade these quotations.

Old Rails.—We note a sale of 2000 tons f. o. b. Portland, at $25, 4 mos. interest added. We quote at $26.

Scrap.—We are unable to report further business and continue to quote at $31@$32.

Spiegeleisen.—We note a sale of 500 tons on private terms, and quote at $36@$37 gold, here. At European ports £5 10/ is quoted.

Baltimore. Nov 10, 1875.

Specially reported by Messrs. R. C. HOFFMAN & Co.

We have to report continued dullness in the iron market, and no prospect of any improvement for some months to come, as navigation is now drawing to a close. We quote.

Baltimore Charcoal	$32@35	Anthracite No. 3	$21@22
Virginia Charcoal	31@34	Mottled and White	19@20
Anthracite No. 1	24@26	Charcoal C. B Blooms	70@75
" No. 2	23@24	Refined Blooms	60@65

Boston. Nov. 6, 1875

Specially reported by Messrs. E. P. CUTLER & Co.

We have nothing new to report in regard to the iron trade, sales are only in small parcels as required by consumers, and prices for pigs rule somewhat lower than last month. Scotch iron is rarely inquired for and the stock here is quite small, bars are in moderate demand at about former prices from store. Scrap is dull with sales at $30 50 per ton.

PIG remains as last noted, wholly unsettled, with buyers dictating terms rather than holders suggesting values. The quotation on the fancy No 1s does not run above $26, while two or three prominent lots have been offered at $25 at the close, with holders giving the refusal until Monday to take the situation into consideration. No. 2s quote at $23 to $25, and gray forge $20 to $23, with no buyers.

BAR has had a quiet week, with prices just about as irregular as a week ago, running from $55 50 to $57 50 on warranted refined, just according to the whim of seller or cuteness of buyer. The advance of 5c. per hundred on Western freight, now quoting 30c., has had a trifling influence to stay any further downward movement, although the market is not firm.

STEEL is moving along in a small way, this week, showing a call for sleigh shoes and machinery. Prices are a trifle steadier.

We quote American tool, 14@15c.; American machinery, 9@9½c.; Bessemer tires, 7@7½c.; Sweet's Excelsior ire, 8½@1 2c.; English tool, 16@18c., gold.

COPPER remains without improvement. The reports from foreign markets show a full stock and small demand, while hereabouts brass-founders, copper-workers, and the copper manufacturing companies never were doing less. The market shows no noticeable strength on ingot which is quoting at 23c. For manufacturers we quote new sheathing 30c.; bolts and braziers 31c.; yellow metal bolts, 20@29c.

LEAD is very dull, and prices seem to hold nominally at last quotations. We quote pig 5⅛@5⅜c. for domestic, and 6⅜@6⅝c. for foreign; tin-lined pipe 16½c.; bar lead, 9c., less usual trade, or 10 per cent. discount.

ANTIMONY is firm, with inquiry at 13½c.

SPELTER is strong and quiet at $7 45, 30 days, and $7 35, prompt cash, all currency. Silesian is having a trivial business at $7 30.

TIN has had a small jobbing business at somewhat irregular prices, our quotations representing the full measure to holders' expectations. We quote Straits, 19¾c.; Banca, 24c.; Refined English, 19¾@20c., gold. Plates are active; we quote charcoal I. C.. $7 25@7 75; coke. $6 50@$6 75; and Terne at $6 15@6 50, gold.—*Commercial Bulletin.*

Cincinnati. Nov. 9, 1875.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

Below please find the closing quotations of our pig iron market, viz:

CHARCOAL.		
Hanging Rock, No. 1 Foundry	$25 00@26 00	—4 mos
" No 2, "	23 00@24 0.	—4 mos
" Mill	21 00@22 00	—4 mos
Tennessee No. 1, Foundry	24 00@25 00	—4 mos
Tennessee, No. 2, "	23 00@23 50	—4 mos
" Mill	21 00@22 00	—4 mos
Missouri, No. 1, Foundry	@	—4 mos
STONE COAL.		
Ohio, No. 1, Foundry	23 00@24 00	—4 mos
" No. 2, "	22 00@23 00	—4 mos
Ohio Mill	20 00@21 00	—4 mos
Missouri, No. 1 Foundry	27 00@28 00	—4 mos
" No. 2, "	26 00@27 00	—4 mos
" Mill	26 00@27 00	—4 mos
CAR WHEELS.		
Hanging Rock, C. B	40 00@50 00	—4 mos
Tennessee "	30 00@35 00	—4 mos
Missouri "	35 00@40 00	—4 mos
Alabama "	30 00@35 00	—4 mos
BLOOMS.		
Charcoal	60 00@ 80 00	—cash
SCRAP IRON.		
Cast	50c.@ 65	—cash
Wrought	1 00@1 25	—cash

Cleveland, Ohio, Nov. 9, 1875.

Messrs. C. E. BINGHAM & Co., quote as follows:

Per gross ton, on four month's time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.	
No. 1, Lake Superior Charcoal	30 00@....
No. 2, "	29 00@....
No. 1, Anthracite	27 50@....
No 2, "	25 50@....
No. 1, Bituminous foundry	27 0 @ ..
No. 2, " "	25 50@....
American Scotch, No. 1, Cherry Valley	30 00@....
" " B—1, " "	28 00@....
" " No. 2, " "	26 50@....
No. 1, Massilon	29 50@....
B—1, "	27 50@....
No. 2, "	25 00@....
CAR WHEEL AND MALLEABLE IRON.	
No. 3 Lake Superior Charcoal	28 00@....
No. 4 " " "	30 50@....
Nos. 5 and 6 " "	30 00@....
BESSEMER IRON.	
Nos. 1 and 2 Lake Superior Charcoal	30 00@....
FORGE IRON.	
No. 1, Gray	24 00@....
White and Mottled	23 00@ ..

Louisville. Nov. 10, 1875.

Specially reported by Messrs. GEORGE H. HULL & Co.

There is only a moderate demand for metal, and prices are without change. The usual time, four months, is allowed on the quotations below.

HOT BLAST—CHARCOAL.	
No. 1 foundry, from Hanging Rock Ores	$25 00@26 00
No. 2 " " "	23 00@24 00
No. 1, Mill, from " "	—@—
No. 1, foundry, from Alabama, Georgia and Tennessee ores	23 00@24 00
No. 2, foundry, from Ala., Geor'a and Tenn. ores	22 00@23 00
No. 1, Mill, from " " " " "	21 00@22 00
HOT BLAST—STONE COAL AND COKE.	
No. 1, foundry, from Hanging Rock ores	23 00@24 00
No. 2, " " " " "	22 00@23 00
No. 1, Mill, " " " " "	21 00@22 00
No. 1, foundry, from Ala. Ca. and Tenn. ores	23 00@24 00
No. 2, " " " " "	22 00@23 00
No. 1, Mill, " " " " "	21 00@22 00
No. 1 foundry, from Missouri ores	24 00@25 00
No. 2 foundry, from Missouri ores	24 00@25 00
No. 1 Mill, from Missouri ores	25 00@26 00
COLD BLAST—CHARCOAL.	
Car Wheel from Hanging Rock ores	35 00@40 00
" " Tennessee "	28 00@30 00
" " Alabama and Georgia ores	28 00@38 00
" " Kentucky ores	28 00@40 00

Pittsburgh. Nov. 9, 1875.

Specially reported by A. H. CHILDS, Esq.

No 1. foundry	$25 00@26 00	—4 mos
" 2. "	24 00@25 00	—4 mos
Gray forge	23 00@24 00	—4 mos
White and mottled	20 00@22 00	—4 mos
Hot blast charcoal	25 00@30 00	—4 mos
Cold blast charcoal	30 00@35 00	—4 mos

PIG IRON.—Wednesday, Nov. 10, 1875.—The general position of the pig iron trade has not varied much since the date of our last review: there has been no change for the better, and there does not appear to be much prospect for an early improvement. As a rule, the mills have very light stocks, and stocks in the yards of commission men are very much reduced, but the market is weak, nevertheless, and the tendency downward. The mills have no difficulty in getting good brands at $23 4 mos., or $22, cash. We have heard of hot blast charcoal iron having been offered as low as $23@24, 4 mos., and it is worthy of notice in this connection that the depreciation in these irons has been much greater than that in coke or coal, as the stock of the former was much larger than that of the latter, and the consumption considerably less. There has been an increased activity here in charcoal iron within the past few weeks, in consequence of strong inducements held out in the shape of low prices, and some buyers have been anticipating future wants in consequence; we understand the stove manufacturers have been buying pretty freely, and it is not strange in view of the fact that it is about as cheap as anything they can buy.

Cold blast charcoal car wheel iron is quoted at $50@55, 4 mos., and while there are other brands thought to be equally as good, manufacturers of car wheels, as a rule, have a very decided preference for Hanging Rock, and will have no other kind, hence the price is holding up much better than for any other kind.

MANUFACTURED IRON.—Manufacturers continue to report trade in manufactured iron of all kinds as being very dull and unsatisfactory. At the present writing trade is very much depressed; one of our oldest and largest manufacturers remarked the other day that the iron business has not been as dull and unsatisfactory at any time since the panic as just now, that not only is there a scarcity of orders, but prices have been cut so close that there is no margin for profit.

STEEL.—The steel mills are still in operation, some of them working up to their full capacity. So far as we can learn our steel manufacturers generally have had about all they could do all this year, but they complain that they made but little money.

Richmond, Va. Nov. 9, 1875.

Reported by ASA SNYDER, Esq.

The market for charcoal irons is depressed. Although receipts are very light, still they are adequate for present demand. Good wheel irons will command former quotations—but inferior brands are from $3 to $5 under.

Virginia Cold Blast Charcoal Pig Iron						$30 to $35
" Warm " " " "						28 to 32
" " " Coke " "				1 X		26 to 27
" " " " " "				2 X		25 to 26
" " " " " "				3		24 to 25
" Anthracite	1 X					27 to 29
" "	2 X					26 to 27

San Francisco, Cal.

From the *Commercial Herald*, of October 28, 1875.

Supplies of pig iron, tin plates, etc., continue to pour in upon us from all quarters, causing low and nominal prices to prevail. The fact is patent that buyers of pig iron can purchase on better terms from foundry-men (2d hand) than from importers direct, for the reason that the foundries purchased too largely to arrive at low prices, far beyond their own consumptive wants. The ship *Three Brothers*, from Liverpool, brought 500 tons pig iron; *British Statesman*, 300 tons same from same, etc. We quote the range of the market for pig iron, $32 50@35 50. Tin plate is without movement, quotations nominal. The stock is thought to be large. The supply of Sydney tin is liberal, with a limited demand; price, 22½c. Banca pig tin is held at 25@26c. The stock of yellow metal is not large, and when suits are required they are ordered from the East by rail. The market for American cast steel is well supplied, and is fast taking the place of best brands of English.

St. Louis. Nov. 9, 1875.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

We report no change in our market. The demand is comparatively light, and prices getting lower and lower. We quote, on 4 mos.:

Mo. Stone Coal No. 1 Fy.	$26@27	Massillon iron, A No. 1	34@35
" " " 2 "	24½@25	" " B "	1.32@33
" " Gray Mill,	23½@24	" " "	2.30@31
" Charcoal No. 1, Fdy.	26@27	Cold Bl. Car Wheel, Mo.	3·@35
" " " 2, "	23½@24	" " " Tenn.	30@32
" " Gray Mill,	23@24	" " " Ala.	30@32
Tenn. No. 1, Fdy.	25@26	" " " H. R.	35@40
" " " 2, "	23@24	Mo. Charcoal Blooms	60@65
" " Gray Mill,	22@23	" Scrap "	60@65
" Coke, No. 1, Fdy.	25@26	" " hammered Billets	8 @90
" " " 2, "	23@24	Assorted Bar Iron	2 4-1cc.
" " Gray Mill,	23@24	H. R. Char. No. 1, Fdy.	26@27
" " " 2, "	24@25	No. 1 Wrought Scrap	1c.
" " Gray Mill,	24@25	Heavy cast "	¾c.
		Light " "	½c.

METALS.

NEW YORK, FRIDAY EVENING, Nov. 12, 1875.

There is only a fair jobbing business doing in most metals, although there is more inquiry for some in a larger way.

ERNEST W. S. MURRANT, Esq, of London, under date of October 27, says:

"The increased steadiness which has lately been observable in the metal market is a feature of considerable interest. The credit system is almost dead, and transactions limited to genuine business. The return of confidence is believed to be making good progress, and with it may be expected a general improvement."

Gold Coin.—During the week past gold has ranged from 114⅛@115⅜, and closed at 114⅛.

Bullion.—Fine silver bar is quoted at $1 23@1 23½, gold, per ounce, and fine gold bar at par ($20 67 gold, per ounce,) to ¼ per cent. premium.

Copper.—The sales during the week have been about 1,000,000 lb. for future delivery, at 23c.@23¼c. There has not been much available copper offering, so that spot sales have been small at 23⅛@23¼c., which are the asking prices to-day. The latest London quotation is £82 10/ for Chili bars. To-day's cable advices say "copper is easier." Manufacturers have, in most cases no stock, and are constantly coming into the market for current necessities, being unwilling to purchase beyond immediate wants.

Mr. MURRANT says of copper:—"Chili has not been in any great demand, there being no speculation, and the sales which have transpired were chiefly for consumption. In the result, bars are about 10/ cheaper than they were a week since. The position of the article is undoubtedly good, and with another low charter the Birmingham people would have to come in at the higher rates. Furnace stuff has maintained its rates, a cargo of ores being sold on Wednesday at 16/9 per unit. At the Swansea ticketing on the 26th instant, about 260 tons of ore in fine, with an average produce of 14 7-16 per cent., fetched an average price of 16/5½ per unit. The business of the week was 1000 tons g. o. bs. and named brands, at £81 15/ to £83 for cash and arrival."

Tin.—There is only a jobbing business doing in this article. We quote Straits, 19¾@20c.; Refined, 19¾c.; L. & F., 19¼@19½c.; and Banca, 24c., gold, per lb. During the week, Straits declined in London, under a strong bear influence, to £82, but upon receipt of advices from

Penang, of prospects of a religious war in the mining distrsct of Malacca, prices immediately took an upward tendency, and to-day the quotation is £86, although the bear element is st ll a very strong one. L. & F., in London, as per day's cable advices, is quoted at £87 10/. The Penang market is not quoting.

MR. MURRANT says of tin:—"There was scarcely any fluctuation in foreign during the week, the position of the article seeming to be too sound to admit of any attempts to manipulate prices succeeding at present. There have been delivered out of London stock during the present year over 3000 tons for home requirements, and this appears to point to an increased consumption in this country. The late low prices, according to recent advices from Australia, tended greatly to attenuate the production in that part of the world. Whether any of the above circumstances will influence the future course of prices is, perhaps, doubtful, but it is pretty certain that the statistics at the end of this month will be more favorable than of late. The week's sales were 250 tons Straits and 200 tons Australian, a, 82/6 to 85/6, for cash and forward delivery."

Tin Plates.—A fair jobbing business is doing. We quote charcoal tins at $7 25@7 37½, gold, per box, and ternes, $6 87½@$7; coke tins, $6 25@$6 50, and ternes, $6@$6 25.

Messrs. ROBERT CROOKS & Co., of Liverpool, under date of Oct. 28, say of tin plates: "We have little change in price to note, but the tone of the market is decidedly weaker, if it is not actually lower. Where makers have room for orders there would be a chance of obtaining concessions, but most of them are well stocked till well on into December."

Lead.—The sales during the week are estimated at 300 tons, at prices ranging from 5·65c.@5·75c., gold. There is more inquiry, and prices more firm than a week ago.

Spelter and Zinc.—Domestic spelter is very quiet, and we are unable to learn of any sales of importance having taken place at the advanced Combination rate—7·40c., currency. There have been a few ontside lots offering down to 7¼c., currency. Sheet zinc is firm at 9c., gold.

Antimony is in fair request and firm at 14c. gold.

Quicksilver is quoted at 72½c. gold per lb., in this city, and 67½c. in San Francisco. The London price has declined to £11 10/.

The San Francisco *Commercial Herald* of Oct. 28, says: "The price in London is now given at £13 per bottle. This is a serious decline from rates recently ruling in that hitherto "primary" market. It looks now as though the time had about arrived when California is to be the primary market, and her supplies to control the world's market. The *City of Tokio*, unfortunately, is on the berth for Hongkong, to sail the 1st proximo. The difficulty experienced in getting satisfactory insurance upon this steamer will no doubt diminish the shipments, although prices with us have fallen to 70@72½c. within a week. We have now so many productive mines, and so many different parties receiving large and small parcels, all anxious to realize, that it is hard to govern, control, or regulate prices, even for a single day. Some sell for prompt cash, others allow 2 per cent discount, hence it is a difficult matter to give exact prices. Sales for the week, in lots, 1000 flasks at 70@72½c. The exports by sea for the past week, 444 flasks, valued at $26,386.

FINANCIAL.

New York Stocks.

FRIDAY, Nov. 12, 1875.

The tone of the New York Stock Market during the past week has been generally strong, with prices, in the majority of instances, fairly maintained. The dealings for the week exhibit a slight increase, compared with the sales reported in our last. The shares of the Central R. R. of New Jersey have declined one per cent., compared with our last quotations. The coal tonnage of this road for the month of October exhibits an increase of about 38,000 tons, as compared with the amount carried during the same period last year. The gross earnings of the company for the month are reported at over $1,000,000.

At an auction sale on the 10th inst., the following securities were sold at the prices annexed: $20,000 Union Coal Co.'s 1st mtg. 7 per cent. bonds, due 1887, guaranteed by the D. & H. Canal Co., at 102½; 18,000 American Dock and Improvement Co., 7 per cent. Cons. bonds, guaranteed by the N. J. C. R. R. Co., at 99⅞ to 100⅛.

It is announced that the Hoffman Petroleum Co. will hold their annual meeting on Nov. 15th.

Quotations and Sales of Stocks and Bonds,

For the week ending Nov. 12, 1875.

STOCKS.

	Highest	Lowest	Closing	Shares sold.
Pennsylvania Coal Co	—	—	275	—
Consolidation Coal Co	47½	47	47⅛	300
Spring Mt. Coal Co	—	—	65	300
American Coal Co	—	—	50	—
Maryland Coal Co	—	—	17	—
Del., Lack., and West. RR. Co.	118¾	118	118¼	1319
New Jersey Central RR. Co.	105¾	103†	105	1758
Delaware and Hudson Canal Co.	121¼	120⅝	120⅞	425
Quicksilver Mining Co. pref'd	23½	22⅜	23⅛	500
" " " Common	17⅞	17¼	17⅞	350
Mariposa Land & Min. Co. various.	—	—	8	100
St. Louis & Iron Mountain RR.	—	—	14½	200
Lehigh & Wilkes-Barre Coal Co.	—	—	—	—
				—
Total Shares sold				5252
Sales for the week previous				4056
Increase				1196

† Seller 60 days.

BONDS.

	Sales.	Price
Ches. & O. R. R. 6s, 1st. cou. on	3,000	— @ 31⅛
" " " ex coupon	—	— @ 24
Central RR. of N. J. 1st Mtg. N.	6,000	— @111¼
" " " 1st Cons.	7,000	— @107⅜
" " " Convt.	53,000	105 @106⅛
Del. and H. Canal, 1st Mtg. '94	11,000	107 @107½
" " 7s, '84	—	— @111
" " Reg. '91	—	112 @112½
Del., Lack. & W. R. R., 7s, conv.	—	—@†120½
" " " " 2d Mtg.	—	— @112⅛
St. Louis & Iron Mount'n 1st Mtg.	12,000	90½@ 91
St. Louis & Iron M'tn. 2d Mtg.	—	— @ 56†
Lehigh & Wilkes-Barre Cons.	3,000	95¾@ 96
Total Sales	$95,000	

Closing quotations, in the absence of sales, represent the latest prices bid.

† Asked.

Philadelphia Stocks.

PHILADELPHIA, Nov. 12, 1875.

We note an improvement in the quotations of a majority of the stocks dealt in at the Philadelphia Stock Market, with an increase of sales amounting to some 27,000 shares over the volume of business reported in our last. The stock of the Pennsylvania Railroad Co. has been very active during the week, the total sales aggregating over 55,000 shares, were made at figures ranging from ⅛ to ⅞ per cent. in advance of quotations ruling in our last. The Pennsylvania Railroad Company is putting a 6 per cent. loan upon the market, through DREXEL & Co., bankers, for the purpose of paying off the entire floating debt and all the equipment and construction charges for the year 1875.

The Catawissa Railroad Company announces a dividend of 3½ per cent. on the preferred stock, and 2½ per cent. on the second preferred stock, payable on the 15th instant.

At a recent auction sale the following securities were disposed of at the prices annexed: 55 shares Allentown Iron Co. at 50; 50 shares Crane Iron Co. at 48½; and 20 shares of the Huntington and Broad Top R. R. Co. at 6.

Interest and coupons, in addition to those reported in our last, are due and payable during the month of Nov. on the following: On the mortgage bonds of the Camden and Amboy Railroad Company, payable at the office of the Pennsylvania Railroad Company; also on the chattel mortgage 10s of the Catawissa Railroad, and on the second mortgage 7s of the North Pennsylvania Railroad. Interest matures on the sevens of 1892–93 of the Philadelphia and Reading Coal and Iron Company, on the six per cent. improvement loan, six per cent. boat and car loan, and seven per cent. boat and car loan of the Schuylkill Navigation Company.

Quotations and Sales of Stocks and Bonds,

For the week ending Nov. 12, 1875.

STOCKS.

	Highest	Lowest	Closing	Shr's
Lehigh Valley RR. Co.	62⅛	62⅜	62½	552
Pennsylvania RR.	50⅞	50¼†	50¾	55250
Reading RR.	55⅝	55⅜	55⅝	10065
Lehigh Coal and Nav. Co	51⅛	50⅝	51⅛	12306
Penn. Canal	—	—	7	9
Buck Mountain Coal Co.	—	—	—	—
Fulton Coal Co.	—	—	3½	—
Locust Mountain Coal Co	—	—	—	—
Westmoreland Coal Co.	—	—	80	—
St. Nicholas Coal Co.	—	—	1	—
Cambria Iron Co.	—	—	16	20
Crane Iron Co.	—	—	—	—
Emaus Iron Co	—	—	—	—
Pennsylvania Salt Manufact. Co.	78	77⅛	78	401
Total shares sold				78,603
Sales for the week previous				50,985
Increase				27,618

† Ex Dividend.

BONDS.

	Sales.	Price
H. and B. T. RR. 1st mortgage, 7s	—	— @106
" " " 2d "	1,000	— @102
" " " 3d " cons	3,000	— @ 54
Lehigh Valley RR. Con. mtg. 6s, Reg	1,000	— @ 99¾
" " " 7s, 1910	4,000	— @103⅞
" " " con. mtge. 6s reg.	—	— @ —
Pennsylvania RR., 1st mtge. 6s	—	— @104
" " gen. " cou. 1910	12,000	— @102
" " gen. " 6s, reg.	8,000	— @101¼
Phil. & Reading RR. 6s,	—	— @104
" deb. bonds.	43,000	— @ 81
" " " G. M. 7s, cou. 1911,	4,000	— @109¼
" " " " 7s, Reg	1,000	— @109
" " new convertible 7s, '93	9,400	108½@109
Phil. & Reading C. & I. Co. 7s deb. '92	20,000	— @ 83
" " " 6s	—	— @ 91½
Lehigh Coal & Nav. Co., 6s '84	2,000	— @101⅜
" " " RR, '97	—	— @101
" " " '77	—	— @ 98
" " " conv. '82	—	— @—
" " " gold, '97	2,000	— @104
" " " Reg.	—	— @—
Penn. Canal, 6s	—	— @ 70
Penn. and N. Y. Canal, 7s	5,000	— @107½
Ches. and Del. Canal, 6s	3,000	— @ 88
Susquehanna Coal Co. 7s	—	— @ 70
Buck. Mount Coal Co. 6s	—	— @ 97½
Penn. Gas Coal Co	700	— @100¼
Total amount of sales	$119,100	

Closing quotations, in the absence of sales, represent the latest prices bid.

Gold and Silver Stocks.

NEW YORK, Nov. 5, 1875.

We have quotations from the San Francisco Stock Board dated the 10th inst. The market is irregular with but few alterations in quotations worthy of note.

The Directors of the National Gold Bank and Trust Company have decided to put the bank in liquidation and wind up its affairs as speedily as possible. Their liabilities are reduced to $800,000, and they have no doubt of being able to pay depositors and stockholders in full. The bank is not likely to open again, at least with the present executive.

The Comptroller of the Currency says that the proceedings of the British Banks of California in refusing to accept the notes of the gold banks has caused the gold banks to retire their circulation. The gold banks at Stockton, California, has retired eighty thousand dollars of their circulation.

With the November dividend, the Consolidated Virginia Mining Company will have paid to its stockholders $11,880,000; from May 1874 until February 1875, $3 per share per month were paid, and from that time up to the present dividend the stockholders have received $10 per month or an aggregate of $110 per share, during the period from May 1874 to October 1875.

Ten of the mills employed by the Consolidated Virginia Mine, capable of reducing four hundred tons per day, were saved from destruction in the recent fire. It is estimated that the Company has produced $1,300 000 in bullion since the fire.

The Secretary of the Eureka (Grass Valley) Mining Company reports the receipts for the past year as $105.968 13, and the disbursements $127,638, an excess of $21,680 over the receipts. $100,091 of the Company's receipts represents the bullion product for the year. The ore reduced amounted to 4,810 tons, the mining of which cost $9 94 and the milling $3 34 per ton. They have a balance on hand of $76,975. Since the Company went into operation, October 1st, 1865, there has been $4,414,997 produced, and out of this amount $2,054,000 was paid in dividends. No dividends have been paid since December, 1873, and no assessments have ever been required.

There are upwards of 900 tons of ore in sight which will pay a small profit. The Superintendent regrets not being able to give a more favorable report of the last year's workings, and the immense amount of prospecting that has been done, and the large amount of money expended, without making any favorable developments, but there are still three places worthy of a further prospect, viz: the 12th level, the Roannaise from No. 3 shaft, and the Morehouse claim.

Assessments, with dates when delinquent: Young America, 25 cents, Nov. 29th; New Coso, 50 cents, Nov. 30th; New York, 75 cents. Dec 1st; Caledonia, $3, Dec. 4th; Kennedy, $1, Dec. 6th; Table Mountain Alpha, 10 cents, Nov. 30th; Stanislaus, 20 cents, Nov. 30th; Sheba, 10 cents, Nov. 29th; Utah, $2, Nov. 22d; Oceanic Quicksilver, 50 cents, Nov. 23d; Ward Ellis, 10 cents, Nov. 29th; Empire, 50 cents, Nov. 29th; Gould & Curry, $1, Nov. 27th; Troy Cons., 20 cents, Nov. 26th; Maxwell Gold Creek, $10, Nov. 12th.

The mining dividends paid in October, 1875, in San Francisco, amounted to $1,170,000, against $988,800 same time last year.

MINING NOTES.

The gold mines of Southern California are attracting attention. Some of them have been extensively worked during the past season with satisfactory results. The Kernville Mine, belonging to Senator Jones, will, it is said, show a profit of $4,000,000 on the twelve months' run; the Summer Mine, on the Big Blue Lode, has yielded about $650,000, and the Panamint Mine has yielded $100,000 during the past two months. The St. John Mine started its fine new mill on October 27th, and will hereafter make regular returns. The great mines on the Mother Lode of California show an increased yield, and a considerable reduction in the expenses of mining and milling

A new mining company, recently organized in London, has purchased a lease of the silver mines Lenoir and Stanley, Idaho, and the company's engineer and superintendent have arrived in this country to take possession and begin work.

A certificate of the increase of capital stock of the Alta Silver Mining Company from $3,600,000 in 36,000 shares to $10,800,000 divided into 108,000 shares, has been filed in the office of the County Clerk.

An extension of the famous Blue Lead, which has produced millions of gold, has been found in Nevada County, Cal., and preparations are making to work it.

A rich body of ore, assaying $4,000 to the ton, has been struck, in the Mariposa Silver Mine, near Belmont, Nevada.

It is reported that the Julia Mine is lately coming into prominence, the Stock having sold as high as $16 per share in the Stock market. The San Francisco *Stock Report*, with regard to this report, says: "We are credibly informed that important developments have been made in the 1,000 and 1,400 levels, and that the shaft, at a depth of 1500 feet, is in seams of quartz."

The bullion product of all the mines of California during the past ten years amounted to $219,500,000. The treasure shipments from the port of San Francisco during the same period were $365,487,200.

For the week ending, Oct. 30, $1,638, 398 38 in treasure was shipped to New York.

The shipments of gold coin from San Francisco overland by express, from Jan. 1st to Nov. 3d, 1875, amount to $22,898,515.

The coinage of the San Francisco mint, from July 1st, 1874, to Nov. 1st, 1874, amounted to $12,403,000, about 90 per cent. of which was gold coin. The coinage for the same period this year amounts to $12,784,000, $2,650,000 of which was silver coin.

QUOTATIONS :

	No. of shares.	Nov. 2.	Nov. 10.
Sierra Nevada	100,000	13	$13
Union Consolidated	100,000	8	8
Mexican	108,000	17	17
Ophir	108,000	39	41
California	540,000	55	57
Consolidated Virginia	108,000	260	259
Best & Belcher	100,800	39	38
Gould & Curry	108,000	17	16
Savage	16,000	70	75
Hale and Norcross	16,000	36	36
Chollar Potosi	28,000	64	61
Alpha Consolidated	30,000	18	17
Imperial	100,000	10	19
Yellow Jacket	24,000	70	72
Kentuck	30,000	13	14
Crown Point	100,000	30	31
Belcher	104,000	20	21
Overman	38,400	48	46
Caledonia	20,000	17	14
Raymond & Ely	30,000	28	1[illegible]
Meadow Valley	60,000	4	4
Eureka Consolidated	50,000	12	11
Eureka G. V.	20,000	—	—

† Quotation on Nov. 6.

Copper Stocks.

Specially reported by Messrs. WILSON W. FAY & Co., Bankers and Brokers, room 7 Traveller Building, 31 State street, Boston.

BOSTON, Thursday Evening, Nov. 11.

The Copper market still remains in an inactive condition. Al'ouez has sold at 14. Calumet has advanced from 160 to 161, and closes 161¼ bid. Duncan has advanced to 70 bid, and there seems to be a little demand for it at these figures. Quincy steady at 41 bid, but all the sales at this figure. National has advanced to 2¼ bid, and closes firm at that bid. Eastern R. R. has fluctuated between 20½@22, and closes 21¼ to 21½.

The Shamus O'Brien Mining Company of Ishpeming, Mich., has filed its articles of association with the Secretary of State, and shows a paid-up capital of $500,000.

The Wolverine Silver Company, of Negaunee, Mich., has filed its articles of association with the Secretary of State, and shows a paid-in capital of $20,000 out of a maximum of $500,000.

The copper product of the reporting mines for the month of October amounts to nearly 1626 tons.

The Calumet and Hecla Mining Company will have paid to their stockholders, with the November dividend, $9,450,000. The consolidation of the two companies took place in 1871, previous to which the Calumet paid $300,000 and the Hecla Mining Company $650,000, which is included in the above total. The stock was quoted in January, 1872, at 95¾ ex. dividend, being the lowest point of which we have any record. Since that time, with exceptional fluctuations, a gradual improvement has taken place up to the quotation which we record today at $161¼ bid.

DESCRIPTION.	Par Value.	No. of Shares	CLOSING. Bid.	Asked.
Allouez	$50	20 000	$14¼	$14¾
Calumet and Hecla	20	80,000	161¼	161¾
Central	25	20,000	33 00	33 50
Copper Falls	25	20,000	7 00	7 25
Dana	25	20,000	10	15
Duncan Silver	20	60,000	70	75
Franklin	25	20,000	12 25	12 75
Humboldt	25	20,000		
Madisca	25	20,000	25	30
Menard	25	20,000	53	57
Minnesota	25	20,000	2⅛	2⅜
National	15	20,000	2 25	2 50
Petherick	25	20,000	60	65
Pewabic	25	20,000	4½	5
Phenix	25	20,000		
Quincy	25	20,000	41 00	41 50
Ridge	25	20,000	6⅛	6 ⅜
Rockland	25	20,000	45	55
Silver Islet	—	—	16 00	17 00
Star	25	20,000	25	37¼
Superior	25	20,000	17	20
Eastern RR.			21⅜	21½

Gas Stocks.

NEW YORK, Nov. 12, 1875.

A fair demand has prevailed for gas stocks during the week under review, at prices generally within a fraction of quotations ruling on our last. Sales of about 500 shares of the stock of companies located in New York and vicinity are reported to us at prices within the limits of our quotations.

The following were sold at auction on the 10th instant, at prices annexed :—$4,000 Metropolitan Gas Co.'s 7 per cent. coupon bonds, due in 1878, at 104½ ; also 270 shares of the Manhattan Gas Co.'s stock, $50 par, at 310@311½ on the $100 ; also 100 shares of the New York Gas Co., $100 each, at 151½, and $2,000 Metropolitan Gas Co.'s scrip, at 107½.

A rumor is circulated in Middletown, that the Supervisors have passed an illegal claim of the Richmond County (N.Y.) Gas Company, amounting to $9,200. This claim was decided against the Gas Company four years ago by the Court of Appeals.

Sales of stock of various Massachusetts Gas Companies, for the week, are reported us as follows—12 Salem Gas Light Co., 116½ ; 19 Roxbury, 157¾ ; 15 Brookline, 120 ; 2 Boston, 777½@780 ; 17 Lawrence, 130¾ ; 2 Malden and Melrose, 100.

The following list is corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad street, New York.

Quotations "bid" and "asked" of New York City and Vicinity Gas Companies are on the $100 of stock and not on one share.

Companies in New York and Vicinity.	Cap. Stk.	Par.	Bid.	Askd.
Mutual Gas Light Co., N.Y. City	$5,000,000	$ 100	107	107½
" " " " Bonds	900,00	1,000	104	105¾
New York " " " "	4,000,000		148½	150
Metropolitan " " "	2,500,000	100	160	162
" " Certificates	1,000,000	....	106	107
" " " Bonds	500,000	1,000	104	
Harlem " " "	1,850,000	50	138	140
Manhattan " " " .	4,000,000	50	310	311
Brooklyn " " Brooklyn..	2,000,000	25	250	
Nassau " " " " ..	1,200,000	20	135	
" " " Certificates.	700,000	1,000	100	103
People's " " Brooklyn..	1,000,000	10	101½	102½
" " " Certificates.	300,000	1,000	95	97½
" " " Bonds.	325,000	....	97½	100
Metropolitan " " Brooklyn..	1,000,000	10	110	113
Williamsburgh " "	1,000,000	50	145	
" Certificates.	1,000,000	....	102	
Citizen's " " "	1,200,000	20	153	155
" " " Certificates.	320,000	1,000	101½	102½
J. C. and Hob'n. G. L. Co. N.J.	386,000	20	160	170
Westchester Co. " New York.	466,000	50	100	105

Companies out of Town.*	Cap. Stk.	Par	Bid	Askd.
People's " " of J. C.			130	
Citizen's G. L. Co., Newark, N.J.				65
Hempstead " " L. I., N.Y.	40,000	100		100
Jamaica, " " " "	25,000	100		100
Citizens', Rochester, "		100	50	65
People's G. L. Co. Albany,"	1,000,000	100	45	
Mutual " Buffalo "	750,000	100	50	55
Troy G. L. Co., Troy, N. Y.			108	
Brockport, N. Y., G. L. Co.	25,000	100		90
Baltimore G. L. Co., Balt., Md.	2,000,000	100	185	
People's G. L. Co., Balt., Md	2,000,000	25	27¼	27½
Hannibal G. L. Co., Hanni., Mo.	100,000	100	90	
Lewiston G. L. Co., Lewis., Me	400,000	100		80
Chicago G. L. Co., Chicago, Ill.	2,000,000	100	135	
Derby G. L. Co., Derby, Conn.	160,000	100		80
Woonskt G. L. Co. Woonskt, R.I.	150,000	100	100	
Fort Wayne G. L. Co. F. W., Ind		100		105
North. Liberties G. L. Co. Phila.		25	29½	
Wilkes-Barre G. L. Co W. B. Pa.		50	70	
Washington G. L. Co., Phila.			42	43
Portland G. L. Co. Portland, Me	350,000	50	72	75
Hartford G. L. Co., Hartford, Ct	700,000	25	41	43
Boston G. L. Co., Boston, Mass.	2,500,000	500	775	780
Chelsea G. L. Co. Chelsea, "	300,000		139	
Cambridge G. L. Co., Cam., "	700,000		132¾	
Louisville G. L. Co., Louis., Ky.			127	
Cincinnati G. L. Co, Cincin. O.			202	
S. F. G. L. Co. San Francisco, Cal			95	
City G. L. Co. Montreal, Canada	1,440,000	40	127	130
Consumers G. L. (old.) Tor., Ont	600,000	50	129	132½
Halifax G. L. Co., Halifax, N.S.		40	147	

* These quotations represent the latest obtainable prices at which sales were made.

American Mines in London.

DIVIDEND MINES.
CLOSING PRICES—Oct. 30, 4 P. M.

No. of Shares.	MINES.	Par Value of Shares	Bid.	Total Dividends paid.	Last paid.
		£	£	£ s. d.	
10,000	Battle Mountain, c. (6240 sh.) part paid	5	....	0 10 0	Nov. 1872
15,000	Birdseye Creek. g. Cal.	4	1⅜	0 14 0	June, 1874
40,000	Cedar Creek. g. Cal.	5	12/6	0 5 0	June, 1873
15,000	Chicago s. Utah	10	4	1 12 0	May 1875
21,000	ColoradoTerrible.s.-l.Col †	5	1¾	0 13 6	Jan. 1875
23,500	Eberhardt&Aur'a, s. Nev.†	10	7¾	1 0 0	July, 1871
60,000	Emma, g. s. Utah (35,000 shares part paid	20	1⅛	3 12 0	Dec. 1872
15,000	Ferguson, g. Cal	2	....	0 3 0	Ap'l, 1872
30,000	Flagstaff, s. Utah	10	½	4 2 0	July, 1873
30,000	Gold Run, hydr, Cal.	1	⅜	0 2 4	Oct., 1872
20,000	Last Chance, s Utah	5	⅝	0 14 0	July, 1873
65,000	London & California. g.†	2	⅛	0 1 0	July, 1875
15,000	Mammoth Cop.c. s. Utah	10	....	0 5 0	Dec., 1872
5,000	Mountain Chief, s. Utah.	10	...	0 4 0	Jan., 1873
54,000	Richmond Cons. s. Nev.	5	7¾	2 14 0	May, 1875
125,000	Sierra Buttes, g. Cal.†	2	1	1 14 0	July, 1875
60,000	South Aurora, s. Nev.	5	9/	0 14 2	Nov., 1873
15,000	Sweetland Creek, g. Cal. †	4	2¾	3 0 0	Sept. 1875
20,000	Tolima, g. s. (14,000 sh., £4/10 pd)	5	3	0 11 6	May, 1874

c. copper ; g. gold ; s. silver; s.-l. silver-lead ; † Quoted on the London Stock Exchange. All of the above are Limited Liability Companies.