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CONTENTS.

IT is proposed to hold a mining congress in Denver at the opening of the new building of the Colorado Mining Stock Exchange building, which is expected to occur in the last part of the present year or early in 1892. The meeting will be national in character, invitations being extended to every one in the United States interested in mining. A convention of this kind, if well attended and thoroughly representative of the great mining industry of the country, would doubtless do much good. There are many questions of public policy affecting the various branches of the industry upon which the miners of the country are by no means agreed, and a free and full discussion of these subjects would do much to clarify opinions.

THAT the Colorado desert lake will be permanent, there does no longer seem to be any doubt. The latest reports from Salton are that the water is slowly rising at the rate of about ¾ inch per day, the extensive area over which the water has spread and the excessive evaporation preventing a rapid increase in the depth of the water. Parties who have recently explored the country in the vicinity of the lake, report that the water has cut a well-defined channel from the river to the lake, and is so deep that there will be a flow to the latter, even when the former is at its lowest stages. About three miles below the junction of the Colorado and the New rivers, a bar, which is rapidly growing larger, has been formed across the Colorado.

It is said that since the flooding of the desert there have been exceedingly heavy and unprecedented rainfalls in the country adjacent. These are locally attributed to the effect of the new lake. Such conclusions are, however, premature. They are based merely upon the dicta of the "oldest inhabitant," an extremely untrustworthy source of information concerning changes in climate. That some such effect may be experienced from the new lake when it has attained greater volume is, nevertheless, by no means improbable, though, as a general rule, the moisture taken into the atmosphere from a given surface of water is not precipitated in the immediate vicinity.

THE IRON INDUSTRY OF NEW ENGLAND.

The decadence of the important iron industry of the New England States under the operation of the protective tariff system of this country has been a fact patent to all observers. While the McKinley bill was pending last summer, a long list of New England manufacturers, including the largest and most important in these States, without regard to politics, presented a petition to Congress asserting that the tariff was ruining the iron industry in that portion of the country, and asking for a modification of the duties on iron ore, coal and coke, in order that they might compete with the manufacturers of Pennsylvania. This petition was, however, like many others, rejected. Since that time many of the important iron works of Maine, Massachusetts and Rhode Island have given up the struggle which they had been carrying on against such adverse odds, and have removed to other more favored localities. The South Boston Iron Works, one of the most important concerns in Massachusetts, has within the past few months transferred its plant to Middlesborough, Ky., one of the reasons given for the relocation being the reduction in the cost of fuel, as coke of equal quality to that which cost $6 per ton in Boston could be had at Middlesborough at $2. Many other instances of the removal of important iron industries for the same reasons might be mentioned. The New England manufacturers told Congress that without a reduction of duties and consequently cheaper coal, iron ore and coke, they could not maintain their business. Their request being refused, they are moving their establishments from these States for business reasons.

The Bureau of Statistics of Labor of Massachusetts has just issued its fifth annual report on the manufacturing industries of that State, which shows clearly the decrease of the iron industry under the tariff. This report, which is issued under a new law, is not so minute in its returns as the regular censuses, but according, Mr. HORACE G. WADLIN, chief of the Bureau, "fully portrays the condition of the industries of the Commonwealth, and accurately shows the trend of business from year to year." Concerning the iron industries of the State, Mr. WADLIN writes as follows:

"The aggregate product returned by blast furnaces was 9,543 tons in 1880, valued at $300,810, and 7,523 tons in 1889, valued at $197,479. The total product of rolled iron (not including wire rods, the product of which is not shown in either year) was 109,252 tons in 1880, valued at $7,773,058, and 42,847½ tons in 1889, valued at $1,887,062. The product of Bessemer and open-hearth steel aggregated 22,342 tons in 1880, valued at $2,178,860, and 11,887¾ tons in 1889, valued at $461,419. Besides these there were returned in 1889 140 tons of crucible steel, valued at $21,993, and 44 tons of iron blooms, valued at $2,200."

In the nine years from 1880 to 1889 the production of pig iron has, consequently, fallen off more than 21 per cent. as to quantity and 34 per cent. in value; the product of rolled iron (not including wire rods), 51 per cent. in quantity and 88 per cent. in value; and the production of Bessemer and open-hearth steel, 47 per cent. in quantity and nearly 80 per cent. in value. The report furnishes equally striking statistics concerning the number of men employed in iron works at Taunton, the center of southeastern Massachusetts, in which this industry was of greater importance than in any other section of the State.

The maximum number of employees at eight works at this place was 2,942. In 1890 the number employed was but 1,537, a decrease of nearly 50 per cent., corresponding approximately with the decrease in production of pig iron and its manufactured products. No more conclusive evidence in favor of the assertions made by the Massachusetts manufacturers concerning their own business, last summer, is needed.

THE ORE DEPOSITS OF LEADVILLE.

Recent developments in Leadville have been of a most interesting and important nature, and there is every prospect that a new group of lead-carbonate ore producing mines will speedily take the place of the older ones, which are now rapidly working out their reserves of this class of ore. Practically, all of the older mines are located in the area lying east of the Carbonate fault which breaks the formation along the southwestern slopes of Carbonate, Yankee and Fryer hills. Some exploration work was done in the early days, before the geology of the district was well understood, in the area west of this fault, or series of faults; but resulting unsuccessfully, work in this portion of the district was practically discontinued until 1889. It was, nevertheless, the opinion of geologists familiar with these deposits that the continuation of the ore chutes of Carbonate Hill

would be found in the ground to the west of the fault. All evidence was in favor of this theory. Throughout the Leadville ore zone, development work had shown the ore chutes to be of wonderful strength, persistently following the same general direction. Nowhere had the end of any one of them been found, except where the formation had been broken by a fault or the vein scored away at the apex of an anticlinal fold. The North and South Iron chutes had been followed to what was considered to be their northeast termination, but it was subsequently demonstrated that they had simply pitched from the porphyry-blue-limestone contact to a lower plane in the blue limestone and continued in the latter in full strength. South of the iron fault at which the vein cropped, the Houghton Mining Company opened the continuation of these chutes, as well as the Silver Cord Gold ore chute, and followed them southwest to another series of faults cutting the northeast slope of Carbonate Hill. In similar manner the Argentine-Adelaide, undoubtedly the continuation of the famous Evening Star chute of Carbonate Hill, was opened southwest of the Iron fault by the Mikado Mining and Smelting Company.

In 1888 similar prospecting work was begun in the area west of the Carbonate fault. The first shaft to go down, the Pocahontas, was sunk in line with the probable continuation of the Evening Star ore chute. Ore was struck, but the shaft proved to be too near the fault, and the contact pitching to the southwest so that it could not be well commanded, the undertaking was financially a failure. The large amount of water encountered in the workings from this shaft, and the greater volume met with in the mismanaged Sixth Street shaft, which was being sunk at about the same time, deterred mining men from following up the Pocahontas discovery immediately, on account of the great expense anticipated. Attention had been more strongly attracted to this section of the camp, however, and soon other shafts were commenced. In 1889 the Lucy B. Hussey shaft on the property of the Wolcott Mining Company struck the continuation of the second contact ore chute of Carbonate Hill southwest of the fault, but the northern edge of the chute only proved to be within the lines of this company. In the following year the Elk Mining Company, sinking a shaft a little further south, cut the chute in its center, and opened a body of ore which reminded old-timers of the great Evening Star ore bodies of ten years before. Both the Hussey and Elk shafts are within the city limits of Leadville.

Since this time much exploration work has been done on this slope of Carbonate Hill, with most successful and important results, the Evening Star ore chute having been cut in several places by shafts and diamond drills. During the past week, only, it was cut again by a diamond drill, on the property of the St. Louis Smelting and Refining Company, immediately behind the Harrison Reduction Works, at a depth of 571 ft. This point, which is the furthest southwest that this chute has been yet opened, is but a few hundred yards from Harrison avenue, the main street of Leadville.

That the Carbonate Hill ore chutes extend southwestward under the city of Leadville there is, consequently, no longer any doubt whatever. So far as they have been opened, the ore is lead carbonate, assaying high in silver and lead, being very similar in character to the ore which was mined in the early days on the other side of the fault.

With these developments a large production of ore from Leadville may be expected for many years more, although there is no likelihood that it will ever attain again the figures which it did in 1882 and 1883, when the large bodies of rich carbonate ore near the outcrop of the chutes on Fryer, Yankee, Carbonate and Iron hills were being mined. The lead-carbonate ore is now almost entirely gone from these, the base sulphide ores from below the water level only being mined. In view of the exhaustion of the old lead-carbonate ore bodies, the new developments are of particular importance, as promising a further supply of ore of this character to the lead smelters of Colorado, although this is now not so necessary as three years ago, on account of the changes which have been made in the process of lead smelting practiced there during the past three years.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and that of book buyers, give the retail price.—These notices do not supersede review in another page of the Journal.]

A Treatise upon Wire, its Manufacture and Uses, Embracing Comprehensive Descriptions of the Constructions and Applications of Wire Ropes. By J. Bucknall Smith, C. E., author of "Cable Traction as Applied to the Working of Railroad Tramways," "Rope Haulage in Mines," etc. Illustrated, 347 pages. Published by *Engineering*, London, and John Wiley & Sons, New York, 1891.

Catalogue of Minerals and Synonyms. By T. Egleston, Ph. D. 378 pages. Published by John Wiley & Sons, New York, 1891.

Geological Survey of Missouri, Bulletin No. 5. Illustrated, 86 pp. Published by the Geological Survey, Jefferson City, 1891.

Jahrbuch der kaiserlich-königlichen geologischen Reischsanstalt. Vol. XL., 1890. Illustrated, 390 pp. Vienna, 1891.

The History of Tariff Administration in the United States from Colonial Times to the McKinley Administrative Bill. By John Dean Goss, Ph. D. 89 pp. Published in *Studies in History, Economics and Public Law.* New York, 1891. Price, 75 cents.

NEW PUBLICATIONS.

THE RAILWAY PROBLEM. By A. B. Stickney. With many illustrative diagrams. 249 pages. Published by D. D. Merrill Company, St. Paul, Minn. Price, $2.

The author of this work is an expert in railroading, and his views are worthy of attention by all interested in the great problem of the management of railways and their relation to the public. His claims to be heard are thus given in his introduction:

"In his preface to his 'History of the Dutch Republic,' Mr. Motley says: 'When an unknown writer asks the attention of the public upon an important theme he is not only authorized, but required, to show that by industry and earnestness he has entitled himself to a hearing.'

"In obedience to this requirement the writer is led to make the following somewhat personal statements: In 1861 he commenced his business career, when quite a young man, as an attorney at law in Minnesota, one of the so-called Granger States, where he has ever since resided. At that date there was not a mile of railway in the state, the nearest railway station being La Crosse, Wis.

'In 1871 he first became interested in the construction of railways, with which he has been chiefly occupied since that date. His experience has been in the legal, the construction, the operating and the financial departments. He participated in the discussions and events which culminated in the first Granger legislative enactments of Minnesota and Wisconsin, and in all the subsequent enactments of Minnesota and latterly of Iowa. He has been an interested student of the judicial inquiries which have grown out of this class of legislation. At the time of writing, his principal business is the management of a railway, and about one-half of his moderate fortune is invested in railways. On the other hand, while for 20 years his chief occupation has been in connection with railways, yet there has been no time during these years that he has not been financially interested in the ordinary business of the locality in which he has lived, and devoted to it more or less attention."

With admirable clearness and brevity the author treats the history of railway development in this country, the era of construction, the bonding of towns and counties, the beginning of the evil of discrimination and its ruinous effects both upon the prosperity of large sections of the country and upon the railroads themselves, the growth of competition, the cutting of rates and the like. His opinions on the mismanagement of railways are summed up as follows:

"The truth is,—and it is time the investing public should be told the truth,—it is not the so called Granger laws, nor the Interstate Law, nor the acts of commissions, which have reduced the rates of transportation to the present unprofitable level, but the mismanagement of the companies. For more than twenty years the managements of Western railways have been engaged in the prosecution of rate wars, in which it was impossible to decide which was acting on the offensive and which on the defensive. Each manager has surrounded himself with a standing army of freight and passenger agents, contracting agents, soliciting agents, advertising agents, traveling agents, clerks, typewriters, and runners. In every important city, and in many of the unimportant towns, detachments of each of the companies have been permanently quartered, occupying the most expensive offices at the most conspicuous corners of the most important streets. Hardly a day has passed during the twenty years without active engagements in each city, in which all the forces have been under fire. No expense has been spared to equip them with the latest and most expensive arms. The arts of the printer, the lithographer, and the engravers on wood and steel have been exhausted. Theatre tickets, credits at livery stables, and "*et ceteras*," have been supplied without stint, and 'no questions asked.' The expenses of the standing armies have been enormous; but, like all standing armies, they are consumers and not producers. Their mission is to destroy. All of them together have not in twenty years produced a single ton of freight. Their whole duty is to get the freight which others have produced routed over their line, 'honestly if they can, but get it.' After two nations have been at war until the resources of both are exhausted, and a treaty of peace has been concluded, the first step toward making it permanent is to disband their armies, or at any rate withdraw them to the interior. As long as they are on the frontier, face to face and under arms, no continuous peace is expected.

"From time to time during the twenty-years war, the chiefs have made solemn compacts of peace. These treaties have been signed, sealed and delivered with all the necessary solemnities, but not once have they withdrawn or disbanded their forces. For a few days at a time have they slept with their guns loaded, only to renew the contest on the first pretext, with renewed vigor and destructiveness. This has been the true cause of the destruction of revenues, instead of Granger laws or State Commissions."

The causes which led to the enactment of the "Granger Laws" are discussed, and it is shown that bad as some of these laws were, none of them was equal in evil effect to the acts of the railway companies themselves. The Interstate Commerce Law, of course, is treated of at length, and the author seems to regard it as practically a failure, simply because it does not go far enough. It leaves the actual rates of the railways untouched, and they combine to discriminate and to cut each other's throats, so that neither the public nor the railways reap the benefit which the makers of the law intended.

The author boldly asserts the view that the nation should fix by law the rates to be charged for the transportation. He takes the legal ground that the railways are not private corporations, but public servants, and agents of the state, exercising the rights of eminent domain and the making of highways which belong to the state.

He says, "When the subject is looked at from all points, it will have to be admitted that the fault is not with the traffic agents, but in the system. By this process of gradually wearing away the rates, as by friction, they have reached such an unprofitable level that owners now stand on the brink where it is easy to see ruin if these methods are continued. But the companies seem powerless. For a quarter of a century they have been attempting, by agreements between themselves, to make and maintain uniform and stable rates. But as such contracts are not recognized as binding by the law, they have rested entirely on the good faith of each company, and to a great extent upon the capacity as well as good faith of each of the traffic officials and employees. In the past they have not been efficacious, and, judging from experience and from our knowledge of the foibles of human nature, it is too much to hope for any sufficient protection to the rights of owners growing out of such agreements in the future.

"Their alternative protection is the strong arm of the law. Let the law name the rates, and let the law maintain and protect their integrity."

The tone of the book is generally calm and judicial, and the arguments are such as to carry the respect of the reader, although it cannot be expected they will be universally accepted.

The book is illustrated with numerous diagrams from statistics of rates which gives much clearer ideas of the subject than can be gained from tables of figures. No doubt the author will be deemed by many readers too radical in his view that the solution of the railway problem lies in the establishment of rates by law, but it is only one step forward in economic evolution from the regulation or attempted regulation of rates by the interstate commission, to their actual fixation by such a commission acting according to principles to be laid down in law. No student of economic problems should neglect to give this book a careful reading.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

The Precipitation of Gold from Chloride Solution.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: A few months ago there was a question between two of your correspondents as to the precipitation of gold from the terchloride by copper sulphide, and I was, correctly, quoted to the effect that the gold is thus thrown down in the metallic state, which did not accord with the result of an experiment made by one of your correspondents.

When I discovered the method in question I, foolishly, applied for a patent which I, fortunately, did not get, being refused on reference to a voluminous and comprehensive English patent in which it is stated that gold in solution as terchloride is precipitated in the metallic state, the sulphur of the CuS being oxidized to SO_2. Prior to reading this I had improperly taken for granted that the gold combined with the sulphur.

So I must plead guilty to having perpetrated the "parrot" act in extenuation of which I can only plead my "modesty," which prevented me from setting my own idea against that of the other man in the absence of experimental investigation, for which I was not prepared when I read the Briton's patent, and which precluded the supposition that I should be ever elevated to the dignity of an authority on the point. *Peccavi*, and will try to be more cautious in future. C. H. AARON.

SAN FRANCISCO, Cal., July 5, 1891.

Jet Propulsion.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: A couple of months ago I thought I had a chance for fame and fortune. I had invented a jet propeller for vessels. There were two jets parallel to each other and to the ship's keel, and they rotated around an axis "like the tips of a screw propeller." I had an apparatus made which proved defective, and then I saw in a prominent scientific journal a letter, the writer of which stated that he had conceived exactly the same idea a year previously, and had made experiments which proved the principle to be correct. The idea is that the revolving jets, constantly impinging on stationary columns of water, will, with a given expenditure of power, move the ship more, and the resisting water less, than the ordinary jet can do.

I am convinced that the principle is correct, though I clearly discern difficulties in its application. Prof. J. Burkit Webb is right in saying that the *reaction* under constant pressure is the same whether the jet flows into air or water or against a solid body, and he might have included a vacuum. (See ENGINEERING AND MINING JOURNAL, June 27th, page 744.)

That the reaction, and therefore the propulsive force on the ship, is the same under constant pressure regardless of the medium into which the water flows, is to me a self-evident proposition, requiring neither demonstration nor experiment to prove it. But the rate of flow of the jet makes all the difference in the *work which must be done to maintain that constant pressure.* A jet under pressure will flow faster into vacuo than into air, and faster into air than into water; faster into fresh than into sea water, and faster if it remains in one place in the water, than if it constantly and rapidly moves, or changes its direction.

I am not enthusiastic about the proposed new propeller, but the *principle* is correct, and if this hint is not enough to convince Prof. Webb that it is so, I am prepared with more cogent arguments. C. H. AARON.

SAN FRANCISCO, Cal., July 5, 1891.

Little Joker System of Stealing in the Comstock Mills.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: A recapitulation of the quarterly statements of the Consolidated California & Virginia Mining Co., will undoubtedly interest your readers and we hand you with this a tabulated statement of the last three-quarters of the year 1890 and the first quarter of the year 1891.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.

Quarter ending.	Ore extracted, tons.	Gross yield.	Costs and charges.	Profit.	Loss.	Average pulp assay per quarter.	Average yield per ton.	Per cent. of pulp saved.	Profit if ore had been worked to 90% of pulp assay.
Jun. 30,'90	35,485	512,879.27	$492,385.91	$20,943.56	.....	$22.34	14.60	65 34/100	$221,217.44
Sep. 30 '90	22,934	327,712.95	334,151.70	.....	$3,438.75	20.12	14.25	70 76/100	81,183.04
Dec. 31,'90	21,340	275,496	292.261	....	16,765	20.04	12 90	64 36/100	92,712.60
Mch.30,'91	19,215	349,654.43	301,086.38	48,'90	.....	24.69	18.20	73 70/100	126,063.07
Total av.	98,974	1,465,742.65	1,419.884 99	69.033.56	23,203.75	21 79	14.79	68 56/100	521,176 15

An examination of this table shows that the company milled 98,974 tons of ore, averaging 21·79, on which it made a profit of $45,829.81, or 46·30 cents per ton, being just about enough to pay the expenses of the San Francisco office and have a small surplus. The nicety with which the thing is calculated does credit to the shrewd rascals who control and manipulate this property.

The value of the ore as given from battery or pulp assays is $21.79 per ton for the 12 months. Of this they saved, according to their statements, 68·56%, but as the mill ring's battery assay is worthless it is impossible to say what the value of the ore was when taken from the mine.

If there were any battery amalgamation a large percentage of the precious metals would not show in the pulp assay, or if a little sand were added after the pulp was dried out and before it was handed to the assayers, the results would be greatly changed. The ore in the Consolidated California & Virginia mines is free milling. Other companies on the Comstock work similar ore up to nearly 90% of what is given as the pulp assay, and there is no reason why this company should not do as well. If they had saved 90% of the pulp assay instead of making a profit of $45,829.81 for the company they would have made $521,176.15, and could have paid dividends to their stockholders.

There is a reason why the mills that treat this ore retain but a small percentage to the stockholders of the mining company, and it is the following:

The parties who control the Consolidated California & Virginia are John W. MacKay and James L. Flood. The ore taken out of this mine was reduced in the mills of the Comstock Milling Company. The Comstock Milling Company is owned and controlled by John W. MacKay, James L. Flood and Senator John P. Jones.

The difference between 90% and 68·56% is kept by the mill, and how much more than this is taken no one knows except those who are on the inside, for no statement is made of the value of the ore before it is delivered to the mills. The gentlemen who own the Comstock Milling Company may not be thieves, but the practices they tolerate at the mills owned by this company are such as would be followed by thieves, and if these gentlemen do not want such imputations to rest upon them they should take measures to correct the dishonesty of those to whom their business is intrusted.

Let them state the value of the rock before it goes through the battery and give opportunity to verify this statement. Let them see to it that honest amalgamation is done, giving sufficient time for the exposure of the metals in the pulp to the quicksilver, and run their mills so that the company, for which the ore is crushed, gets the profits, instead of running the ore through the "little joker" into the pockets of the mill-owners.

In the case of the Consolidated California & Virginia as given here it can be seen that the property was managed so that the ore paid the expense of milling and transportation, and all the profit was appropriated by the milling company by returning low assays to the mining company.

Can any one imagine anything more iniquitous than this? A mining corporation with shares held all over the country deliberately and systematically robbed by the *trustees* of the stockholders!

J. H. TINGMAN,
Secretary Mining Stock Association.

SAN FRANCISCO, July 9, 1891.

DESULPHURIZING MOLTEN CAST IRON.*

By P. Tunner.

When commercial ferrous sulphide (FeS), containing about 36% of sulphur, is melted together with ferro-manganese, the sulphur separates as a slag in the form of manganous sulphide, leaving the iron free. This reaction is utilized in a process introduced by the Hoerde Steel Works Company in Westphalia, for obtaining pig iron for the basic Bessemer process free from sulphur; experiments having shown that fluid sulphurous metal from the blast furnace might, by the addition of highly heated melted ferro-manganese, be purified to as low as 0·01% of sulphur. The resulting manganese-sulphide slag contains 20% and above of sulphur, and about 50% of manganese; and when subjected to a reducing fusion with lime as a flux, ferro-manganese is recovered and can be applied for desulphurizing further quantities of metal. In order to carry out the operation successfully it is necessary to keep the bath liquid for a sufficient time, either by its own or externally applied heat, so that the slag may separate completely. The most convenient apparatus for the purpose is a Bessemer converter, made up with tuyeres in the bottom, and the operation should be repeated several times before pouring, in order to obtain a large volume of slag, which can then be easily removed, and to promote its separation by the stirring action caused by each new addition of metal.

The results of 15 trials at Hoerde, made in August and September, 1890, showed that the sulphur in metal from the blast furnace, ranging between 0·27% and 1·20%, was reduced to between 0·034% and 0·056% in the purified metal for the converter, the charges being from 10 to 11 tons each The sulphur in the finished steel was 0·018% from a metal originally containing 0·352%, and 0·025% from that with 1·20%. The effect of spiegeleisen and ferro-manganese as ordinarily used for recarburizing blown metal is somewhat similar, but is less advantageous, as being likely to unduly increase the carbon or manganese on the finished steel.

A Reaction of Carbonic Oxide.—Carbonic oxide will reduce silver nitrate in cold ammoniacal solution, according to M. Berthelot, *Bull. Soc. Chim.* 5, 569. Upon boiling, a heavy black precipitate occurs. This reaction will work equally well with an aqueous solution of the gas. It is extremely sensitive, and takes place even in the presence of a great quantity of air. On this account, it will be useful in determining the presence of small traces of carbonic oxide in a gaseous atmosphere, provided it contains no other reducing agent. The reaction is the more worthy of interest on account of the fact that neither the alkaline formates, nor pure hydrogen, after it has been washed with potassium permanganate solution, will reduce ammoniacal silver nitrate.

Serrin's New Balance for Analytical Work.—M. V. Serrin recently read before the Society for the Encouragement of Science, Paris, according to *Moniteur Industriel*, a paper in which he sketches the following new device for rapid precision weighing. The new balance does away with the very small weights of wire and sheet metal now in use, one decigramme being the smallest needed. One of the arms of the balance is connected by means of a fine chain with a runner that slides on a vertical column. This is marked off in 100 divisions, each two millimeters long, each part of the chain corresponding representing one milligramme, and allowing, by means of a sliding rule, of a further division in tenths, and even more if necessary. The chain is easily manipulated from the outside by the aid of a button provided for that purpose, so that the second stage of precision weighing, the slow but accurate operation following the rapid but rough estimate, is accomplished without opening the case by adjusting the runner, reading off the number of decimilligrammes indicated, and adding it to the weights in the scale, which in no case need be smaller than one decigramme. This invention signally diminishes the oscillations of the beam and saves considerable time.

*Oesterreichische Zeitschrift für Berg und Hüttenwesen, Vol. XXXIX., 1891, p. 206.

AN APPARATUS FOR TESTING THE SENSITIVENESS OF SAFETY LAMPS.*

By Frank Clowes, D. Sc., Professor of Chemistry, University College, Nottingham, England.

It is generally acknowledged that the Davy safety lamp cannot with certainty detect less than 3% of firedamp in the air of the mine. Gas indicators of much greater sensitiveness have been invented; among these the electrical apparatus of Liveing and the spirit safety lamp of Pieler take first rank. The objection to these special forms is, however, a serious one. They do not serve for illuminating purposes, and, therefore, it becomes necessary to carry an ordinary safety lamp together with the testing apparatus. Many attempts have been made to obviate this inconvenience by producing a safety lamp which will serve the double purpose of illumination and of detecting minute percentages of firedamp. The invention of such a lamp would be of great value to the miner, in view of the fact that very low percentages of firedamp have been proved to be dangerous in the presence of coal dust.

The following apparatus has been devised to render easy the process of testing the sensitiveness of different forms of safety lamps when used for detecting firedamp. To enable satisfactory tests to be made in the laboratory, it was necessary to insure (1) the easy and rapid production of mixtures of firedamp and air in known proportions; (2) to insure economy of the artificially prepared methane, which represented firedamp; and (3) to examine the flame of the lamp under conditions similar to those existing in the mine.

A wooden cubical box of about 100 litres capacity was constructed so as to be as nearly gas-tight as possible. It was then made absolutely gas-tight by painting it over with melted paraffin wax, which was afterward caused to penetrate more perfectly by passing an ordinary hot flat-iron over the surface. This testing chamber was furnished with a small inlet tube at the top, and with a similar outlet tube below. It had a plate-glass window in front for observing the lamp in the interior, and a flanged opening below for introducing the safety lamp. This opening was closed by a water-seal consisting of a small zinc tray supported by buttons and containing about 2 ins. depth of water, into which the flange dipped. A mixer was arranged, which consisted of a light flat board, nearly equal in dimensions to the section of the chamber and suspended by an axis from the upper corner of the chamber. The mixer was moved rapidly backward and forward from the side to the top of the interior of the chamber by grasping a handle projecting through the front of the chamber.

When a mixture of air with a certain definite percentage of firedamp was required, the methane, prepared and purified by ordinary chemical methods, was introduced into the chamber in the requisite quantity by the top inlet. It displaced an equal volume of air which escaped through the lower outlet, the exit end of which was sealed by being immersed just beneath a water surface. A vigorous use of the mixer secured a uniform mixture of gas and air throughout the interior of the chamber in the course of a few seconds. The lamp was then introduced into the chamber, and placed in position behind the glass window. The simplicity of arrangement of the water-seal rendered the necessary opening of the chamber very brief, and the introduction and removal of the lamp many times in succession were not found to produce any appreciable effect upon the composition of the atmosphere inside the chamber. The appearance and dimensions of the "cap" over the flame were noted as soon as the cap underwent no further change. A lamp was left burning in the chamber for a considerable length of time, and its indications underwent no change owing to the large capacity of the chamber and the very limited amount of air required to support the combustion of the small flame always used in gas-testing. The whole interior of the chamber and mixer were painted dead black, so as to render visible pale and small caps against a black ground.

The methane was introduced from an ordinary gasholder. A volume of water, equal to that of the methane to be displaced, was poured into the top of the gasholder. The gas tap of the holder was then momentarily opened so as to produce equilibrium of pressure between the methane and the atmosphere. The gas tap having then been placed in connection with the upper inlet of the chamber, the water-tap was opened and the measured volume of water was allowed to flow down and drive the methane into the chamber. As soon as bubbles of air ceased to appear through the water at the outlet, the chamber was closed; the mixer was then vigorously worked for a few seconds, and the mixture of gas and air was ready for the introduction of the lamp. Before introducing the methane for a fresh mixture, the atmosphere of the chamber was replaced by fresh air by removing the water-tray from beneath the opening at the bottom of the chamber, and blowing in a powerful stream of air from a bellows to the top of the chamber.

The chamber was supported on legs, which were arranged so as to place it at a convenient height for observations through the window, and also for the introduction and removal of the safety lamp.

The accuracy of this method was tested by introducing the Pieler lamp into the chamber, which was charged successively with a series of mixtures containing proportions of methane varying from 0·5% to 4%. The height and appearance of the cap over the flame absolutely corresponded with a series of standard tests already published and made by a different method in which fire damp was used instead of methane.

The observations were usually made in a darkened room, but the flame caps were easily seen in a lighted room, provided direct light falling on the eye or chamber was avoided.

The capacity of the chamber was 95,220 c. c.; accordingly the following volumes of methane were introduced: for ½% mixture 476 c. c., for 1% 952 c. c., for 2% 1904 c. c., for 3% 2856 c. c., for 4% 3808 c. c., and for 5% 4760 c. c. It will be seen that a series of tests, in which the above mentioned percentage mixtures are employed, involves an expenditure of only 15 litres of methane, a quantity far smaller than that required by any other method of testing as yet described.

Of many forms of safety lamp tested in the above apparatus, the one which most satisfactorily fulfilled the two purposes of efficient illumination and delicacy in gas testing was Ashworth's improved Hepplewhite-Gray lamp (see ENGINEERING AND MINING JOURNAL, March 28). This lamp is of special construction, burns benzoline from a sponge reservoir and its flame is surrounded with a glass cylinder, which is ground rough at the hinder part; this latter device prevents the numerous reflected images of the flame, and the generally diffused reflections which are seen from a smooth glass surface and which render the observation of a small pale flame cap very difficult, if not impossible.

The wick of this lamp, when at a normal height, furnishes a flame of great illuminating power. When lowered by a fine screw adjustment the flame becomes blue and non-luminous, and does not interfere therefore with the easy observation of a pale cap. The following heights of flame cap were observed, which fully bear out the unusual sensitiveness of this flame. With 0.5% of methane 7 m. m.; with 1% 10 m. m.; with 2% 14 m. m.; with 3% 20 m. m.; with 4% 25 m. m.; and with 5% 30 m. m. The cap, which with the lower proportions was somewhat ill-defined, became remarkably sharp and definite when 3% and upwards of methane was present. But even the lowest percentage gave a cap easily seen by an inexperienced observer.

It appears from the above record of tests that the problem of producing a lamp which shall serve both for efficient illuminating and for delicate gas-testing purposes has been solved. The solution is in some measure due to the substitution of benzoline for oil, since an oil flame cannot be altogether deprived of its yellow luminous tip without serious risk of total extinction, and this faint luminosity is sufficient to prevent pale caps from being seen.

From further experiments made in the above testing chamber with flames produced by alcohol and by hydrogen it was found to be true in practice, as might be inferred from theory, that if the flame was pale and practically non-luminous, the size and definition of the flame cap was augmented by increasing either the size or the temperature of the flame. It is quite possible by attending to these conditions to obtain a flame which, although it is very sensitive for low percentages of gas, becomes unsuitable for the measurement of any proportion of gas exceeding 3%. This must, for the general purposes of the miner, be looked upon as a defect, but it is not a fault of the lamp already referred to. It is of interest to note that with the Pieler spirit lamp a flame cap an inch in height was seen in air containing only 0.5% of methane.

* A paper read before the Royal Society, London, June 18, 1891.

PRODUCTION OF INFUSORIAL EARTH IN THE UNITED STATES.*

By E. W. Parker.

Infusorial earth has been found in useful quantity in a number of places in California, Connecticut, Maryland, Nevada, New Hampshire, New Jersey, New Mexico, Oregon and Virginia, but the production in 1889 was limited to five States, namely, New Jersey, New Hampshire, Connecticut, Maryland and California. The bulk of the product was obtained from the Dunkirk district, in Maryland, the ledge at Dunkirk producing 3,000 short tons and all other localities 466 short tons. An excellent deposit of infusorial earth was opened at Pope's Creek, Md., in 1887, and a considerable quantity taken out, but owing to a slack demand only 50 tons were produced at this point in 1889. In Storey County, Nev., there is a mine of a fine quality of infusorial earth, but no work was done upon it in the census year. The following table shows the production of infusorial earth in 1889, by States:

States.	Short tons.	Value.	States.	Short tons.	Value.
California (*a*)	50	$8,000	New Hampshire (*a*)	80	$2,750
Connecticut (*b*)	211	422	New Jersey (*a*)	75	1,500
Maryland (*b*)	3,050	10,700			
			Total	3,466	$23,372

(*a*) Separated and ground. (*b*) Crude at the mines.

The mines at Dunkirk, Maryland, were the only ones which were operated actively during the year. The total number of men employed in the industry was 52. The expenses incurred in mining infusorial earth during 1889 were as follows: Wages, $8,388; paid contractors, $575; paid for supplies, $760; paid for other expenditures (rent, insurance, taxes, etc.), $6,955; total, $16,678. The amount of capital invested was: In land, $61,380; in buildings, machinery, etc., $21,900; in tools, implements, live stock, etc., $16,970; in cash, $10,500; total, $110,750.

The table following shows the analyses of infusorial earths from different localities:

	From Pope's Creek, Md	From Morris County, N. J.	From near Richmond, Va.	From Storey County, Nev.
Moisture	3·47%	.....	8·37%	.....
Silica	81·53	80·66%	75·86	81·08%
Alumina	3·43	3·84	9·88	.....
Protoxide of iron	3·33	.....	.....	.....
Lime	2·61	0·58	0·29	.....
Ferric oxide	.....	.....	2·92	.....
Magnesia, soda, potash, sulphur and organic matter	5 63	.....	1·63	.....
Loss on ignition	.....	14·01	.....	.....
Water at red heat	.....	.....	.....	18·44
Loss	.....	.....	.....	0·48
Total	100·00	99.09	98.95	100·00

Infusorial earth is used to a considerable extent in the manufacture of various cleansing preparations, either in the form of powder or so-called soap. There is but a step between the crude mineral and the merchantable articles used for cleansing purposes. To manufacture a polishing powder it is necessary only to clean and grind the crude mineral, the particles of which are loosely adherent, while in making soap the pulverized mineral is mixed with the other ingredients of soap manufacture. The greater portion of the product of this country is dried in furnaces at the pits and used for making protective coating for boilers. Some infusorial earth has been imported from Germany and used as an absorbent in the manufacture of dynamite from nitro-glycerine. The American product, however, does not possess sufficient absorbent properties for this purpose, and the German product has been supplanted by the use of wood pulp, which answers the purpose excellently and is much cheaper. The first development of infusorial earth properties in California was made in 1889. This was due to the discovery of a valuable ledge by Mrs. Emma Eells on her ranch near Calistoga, Napa County. By practical tests she learned that the mineral was excellently adapted for use as a polishing powder, and, with a number of ladies, organized a stock company for the purpose of mining and manufacturing the mineral.

* From Census Bulletin No. 75.

PROMINENT MEN IN THE MINING INDUSTRY.

J. H. Ernest Waters.

Mr. J. H. Ernest Waters, of Telluride, Colo., at present manager of the Sheridan Mining Company, operating one of the most important mines in the San Juan district of Colorado, is a representative man of the great silver-mining industry of that State. He was born in 1851, at Parsonstown, Ireland, and was educated at Christ's Hospital and Victoria College, England. He was a student at the Royal School of Mines, London, and at Freiberg, Saxony, from 1867 to 1872, and also took an "Apprentice" course at the machine shops of Messrs. John & Henry Gwynne, London. During his student term he visited the principal mining centers in Germany, Hungary, Belgium, France and Sweden, as well as in Wales and Cornwall, and he took the practical courses in mining and smelting at Freiberg and in Cornwall.

The first professional work that Mr. Waters had, was the examination, for a London syndicate, of some mines in Gilpin County, Colo., and of iron lands in Missouri; this was followed by a commission to report on certain lead mines in Wales and in Norway. In 1873 he was appointed Mining Engineer to the Japanese Government, and this post he filled for two years to the full satisfaction of the government employing him. In 1875 Mr. Waters was employed again by a London syndicate to report upon mines in the Lake Superior district, and also in Mexico.

Having had experience in many parts of the world, Mr. Waters determined, in 1877, to locate in Colorado, which then gave promise of becoming one of the most important mining regions in this country, promises which have since been fulfilled. During the four years between 1877 and 1881 he was engaged in various branches of professional work in connection with mines and dressing works in Leadville and the San Juan district in Colorado, and in several parts of New Mexico. Among the mines with which he was connected during this time were the Columbia, Aspen, North Star, Iron Silver, Congress, and Yankee Girl, several of which were then and others of which have since become among the most important producers of the precious metals in the Rocky Mountain region.

J. H. ERNEST WATERS.

In 1882 Mr. Waters was employed by the San Juan & New York Smelting and Mining Company to design and erect smelting works at Durango, Colo., which have been in successful operation during the past ten years. Completing this work, he was engaged in 1882 by the Chinese Government to advise upon the introduction of foreign labor and mining machinery at some of the mines in North China. While fulfilling this commission he organized a syndicate of Englishmen, resident in China, to purchase the Sheridan and Mendota mines, located in Marshall basin, near Telluride, Colo. The property was at that time comparatively undeveloped, but its prospects were of such a nature as to be quickly appreciated by a mining engineer of Mr. Waters' experience. Being successful in enlisting the capital to purchase this property, the Sheridan Mining Company was organized, and Mr. Waters was appointed its manager, resigning his commission under the Chinese Government to accept the new position.

Since September, 1883, Mr. Waters has occupied the post of manager of the Sheridan Mining Company, residing at Telluride. During the eight years which have since past he has developed the mine from a prospect into one of the bonanzas of the San Juan. For his management of the property during this time Mr. Waters deserves much credit. Realizing at once upon taking charge the magnitude of the undertaking to develop properly the great Sheridan-Smuggler vein, he carefully laid his plans to open it in the cheapest, most thorough and systematic manner. The results of his work are the best evidences of the manner in which his plans were carried out. Notwithstanding the high cost of supplies and the high freight on ore shipments from the mine and the fact that during the past eight years but little more than development work has been done in the vein, the mine has been made to pay regular dividends, and some time ago returned the shareholders all the money that had been originally invested. The most important work done by Mr. Waters in the development of the property has been the driving of the long cross-cut tunnel, which was completed last spring. This was regarded by local mining men as a bold and hazardous undertaking, but the result proved the correctness of Mr. Waters' views. Cutting the vein at a depth of 1,000 ft., far below any other workings, the ore was found to be richer and the chutes stronger than above, and the value of the property was multiplied, so that at present it may be classed among the greatest silver mines of this country. While the tunnel was being driven, a long gravity tramway was constructed to connect the mouth of the tunnel with the dressing works at the foot of the mountain. A description of this tramway, which has many novel engineering features, will be given in a subsequent issue of the ENGINEERING AND MINING JOURNAL.

In 1888, Mr. Waters was appointed manager of the Smuggler mine, which adjoins the Sheridan-Mendota property, and this he operated in equally successful manner during the time that he held this position. The development of the Marshall Basin mines, upon which the town of Telluride depends, has consequently been largely due to his industry. Mr. Waters is gradually extending his interests in that region. During the past spring he effected a sale of the Belmont gold mine to a syndicate mainly composed of Sheridan shareholders, and is now engaged in the development of that property.

THE NOBLE GOLD MILLING PROCESS.

A new process which bids fair to be of great importance in gold milling is about to be introduced by the Noble Mining and Milling Company, of New York, a company recently organized for its exploitation. The process, which is the invention of the late Mr. B. G. Noble, ex-Governor of Wisconsin, an experienced chemist, who spent many years upon its development, is designed to save the very fine gold occurring in certain ores, much of which is lost as "float" in the ordinary process of plate amalgamation. This desideratum is accomplished by intermixing the pulp and mercury to a degree hitherto unattainable on account of the danger, and consequent loss, of flouring the mercury, this difficulty being overcome in the Noble process by the addition of a chemical which has the effect of coalescing the almost infinitesimally fine particles of floured mercury. A series of tests with the process, which have been conducted at the company's testing works, near New York, upon a working scale during the past six months, has given extremely successful results.

By the Noble process the auriferous ore is ground so as to pass a 100-mesh sieve, a Fuller mill having been used for this purpose at the experimental works. The pulp, with the necessary amount of mercury for amalgamation of its gold contents, is then run into a tub called the amalgamator, which is equipped with a stirrer suspended near the iron bottom of the vessel. The tub, which is 42 in. in diameter, has a capacity of ½ ton of pulp at a charge. The charge having been run into the amalgamator, the mercury-coalescing chemical, the nature of which is kept a secret, is added, and the stirrer put in motion, rotating at 250 revolutions per minute, the presence of the chemical preventing the flouring of t mercury. During this operation, which lasts 15 minutes, the particles o pulp are brought into contact with those of mercury in the most thorough manner, and the amalgamation is effected. The pulp is then drawn off into a settler, little different from those of the ordinary type, and diluted, whence it is drawn into a second settler, and further diluted, from which the tailings are allowed to run away.

In the tests which have been made, various lots of ore, principally from North Carolina mines, have been run. Ore from one mine which is now being regularly worked by plate amalgamation furnished the best comparative results. It was a free-milling ore, containing a very small amount of pyrite, assaying from $2 to $4 per ton. On the plates but 24% of the gold value was recovered, while by the Noble process as much as 93% was saved. Equally satisfactory results have been obtained from pyritous ores. The loss in mercury in experimental runs has been about ¼ lb. per ton; in continuous runs this would, of course, be considerably smaller. It is claimed that in a 25-ton plant the process can be worked for $1 per ton.

THE MOUNT MORGAN MINE, QUEENSLAND.*

By T. A. Rickard, Melbourne, Australia.

Among the gold deposits discovered in recent years none is more extraordinary in richness or interesting in structure than that of the famous mine at Mount Morgan. At a time when but few Australian mines were known to the world outside the colonies, Mount Morgan was quoted as an occurrence, unusual not only in its origin (for it was said to be due to geyser action) but also in the purity of its gold.

The mine, which is situated just within the tropics, 26 miles southwest of Rockhampton, in central Queensland, produced during the year ending November 30th, 1889,† 75,415 tons of ore, yielding 323,542 ozs. 13 dwts. 13 grs., worth £1,331,484 18s. 5d. (about $6,657,424), while the expenditure was £227,769 19s. 8d. (say $1,138,849), permitting the payment of £1,100,000 ($5,500,000) in dividends. The yield per ton was 4 oz. 6 dwts. 4 grs., while the working cost was only 17% of the value of the product.

So rich a mine would be expected to have some romance woven about the story of its discovery. Numerous and various tales are told of the first recognition of its value, but the best authenticated facts are as follows: The property consists of the original selection (No. 247) of 640 acres taken up for grazing purposes in 1873 by Donald Gordon. Becoming acquainted with the brothers Morgan, who also held land in the district, he showed them one day a piece of gold-bearing quartz which he had picked up in Mundic Creek. For a consideration, stated to have been £20 and as much whiskey as he could drink, Gordon agreed to indicate to them the locality of the find. On the hill overlooking the creek he showed them the siliceous ironstone, some of which can still be seen cropping out on the northeastern slope. The stone carried visible gold. They found by sending samples to Sydney that it was even richer than they had imagined. So they purchased Gordon's holding at £1 per acre.

The three Morgans subsequently sold first a part, and eventually the whole of their interest in the mine. In 1886 a company was formed with a capital of 1,000,000 shares of £1 each. These shares rose toward the end of 1888 to £17 5s. (about $86.25), giving the mine a market value of £17,250,000, or over $86,000,000.

The mine is opened as a quarry at the top of a hill, only 500 ft. above the village at its base and 1,225 ft. above sea-level, surrounded by very broken hilly country, and almost encircled by a small stream (Mundic Creek), which is in many respects distinct in position and geological structure from the hillocks about it. From the summit can be seen the level line of the "desert sandstone," crowning the highest ridges of the neighboring hills—spurs from the main range which under different names (Blue Mountains in New South Wales and Australian Alps in Victoria) traverses the three colonies near the east and southeastern coast of the Australian continent. The base of the sandstone is slightly lower than the summit of Mount Morgan, and overlies graywacke and quartzite. Dykes, of at least two periods, form an important feature of the structural geology.

The ground is worked in terraces and benches 30 ft. high and 300 ft. long. A central shaft passes from the floor of the second terrace and connects with the tunnels, a series of which have intersected the deposit in various directions. This shaft, at 206 ft., connects with the Freehold tunnel, the main ore-way of the mine, which is 789 ft. long. The next deeper tunnel, called No. 1, starting at right angles with the Freehold, from the southern face of the hill and penetrating it for 1,070 ft., is 155 ft. below the floor of the lowest surface-working and 320 ft. below the original summit.

The Mount Morgan ore is remarkable for its extremely heterogeneous character. The frequent alleged discoveries of "a second Mount Morgan," supported by similarity of the specimens exhibited to specimens of the Mount Morgan ore, are not to be wondered at, in view of the great difference in appearance of fragments broken in different parts of the same heading of this mine. The material quarried in the upper workings is generally so friable and shattered, as to render its removal with the aid of a black powder only, very easy. Standing in one of the open cuts, one can see faces of bluish-gray crushed quartz very similar to Comstock ore; masses of siliceous hematite (usually considered the most typical Mount Morgan stone) resembling the croppings of ordinary gold veins, whether in Victoria or California; heavy black iridescent iron stone which might be the cap of a silver lode; and light-colored reddish ore which might come from the gossan of a copper mine. Some of the material is crushed to the consistency of sugar, while in other portions of the mine, men are seen employed in breaking boulder-like masses of ore. Stalactitic forms occur in cavities, while a vermicular and reniform appearance is also not uncommon. Very rich returns were obtained from a body of bluish-black, beautifully iridescent ore. The Freehold tunnel workings encountered a patch of very pure white, porous, friable "sinter," so light, owing to the imprisoned air, that it would float on water.

Examination of the many varieties of ore shows that while there may be a great difference in outward appearances, due to coatings of many-colored oxides, the ore is always substantially quartzose. As seen in the surface-workings, the deposit may be considered a mass of quartzose material of varying color and specific gravity, traversed by a series of dykes having a general N. W. and S. E. direction. Its extent is approximately indicated by the various workings which intersect the hill. In the upper part of the mine, while the north and northeastern slopes prove it to be continuous in these directions, its eastern limit has been reached in the lower floors or benches; and to the southwest it is bounded by a large felstone dyke, which forms the most marked feature of the surface excavations. The first tunnel to pierce the hill is No. 2, which starts from the fifth or lowest floor, running N. 10° E. and penetrating 120 ft. of ore before it reaches a dyke. This is probably the dyke above mentioned as the boundary of the deposit in the upper floors; but here it has evidently cut into the deposit. Beyond this dyke the tunnel is in ore for 200 ft. further, before meeting another intrusion of felsitic matter, which extends for the remaining 130 ft. to daylight. A branch tunnel proves the continuity of the ore body eastward. At this level the ore is a porous siliceous material, varying between a light "sinter" (sometimes white, sometimes iron-stained) and a heavy iron stone, often manganic, the latter in boulder-like masses.

The next tunnel is the Freehold, which starts from the southeast face of the hill, traversing a decomposed rhyolite for the first 180 ft., and then cuts through 40 ft. of pyritiferous quartzite, a rock which here first makes its appearance and which will be seen to play an important part in the geology of the locality. Leaving the quartzite, the tunnel cuts through 180 ft. of a rock which I recognize as a normal dolerite. The innermost portion is decomposed, and abuts against a much altered felspathic rock. This brings us to 390 ft. from daylight; the remainder of the tunnel (397 ft.) traverses the ore deposit. The ore is a light sinter-like quartz, often iron-stained; but while it contains short, rich patches the general tenor is low. Near the junction with the main shaft, almost at the end of the tunnel, a branch crosscut runs southward for 237 ft. The first 186 ft. are in the deposit, which here also is poor, though in appearance it does not differ from the richer portions.†† The next 20 ft. traverse the dyke, which at this point, as in the upper floors, forms the limit of the ore body. Beyond this there is only to be seen the pyritiferous quartzite, which also appears in a short crosscut to the east.

The next deeper tunnel is No. 1, only 33 ft. below the Freehold. I was denied access to this, and am, therefore, indebted to a government report for the following particulars: This adit, 1,070 ft. long, starts in, and traverses, the quartzite of the country for 132 ft. before passing through a narrow dyke; it then passes through 67 ft., more of highly pyritiferous quartzite, which continues to within 12 ft. of a shaft coming down from floor No. 5. There next succeeds a large felstone dyke (the one noted as cut in the tunnel above), and the remainder of the adit continues in pyritiferous quartzite, alternating with numerous dykes, until the last 200 ft. are reached, which are occupied by an altered dolerite. The auriferous material of the upper workings was represented in this adit by 25 ft. only of siliceous iron stone. Two branch crosscuts similarly prove the absence of the deposit in this part of the mine at this depth, as they also intercept the quartzite of the country.

A still lower tunnel, the Sunbeam, starts from the west face of the mountain, passing through pyritiferous quartzite; but it was not advanced sufficiently at the time of my visit to afford any evidence as to the extent of the ore deposit.

It will be noted that the largest section as yet obtained of the auriferous portion of the deposit is in tunnel No. 2, where its dimensions are 356 ft. (26 ft. of which is occupied by the big dyke) in a north direction, by 310

Fig. 1.

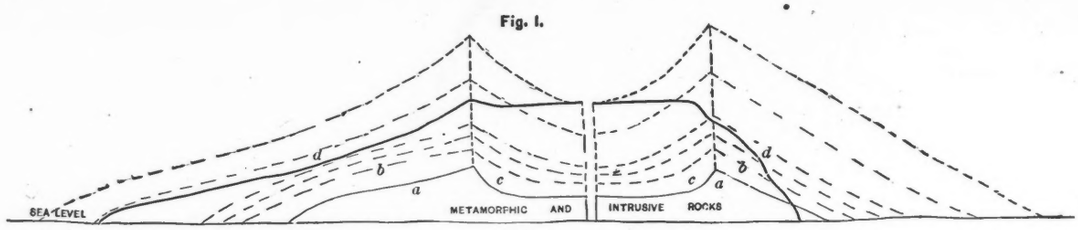
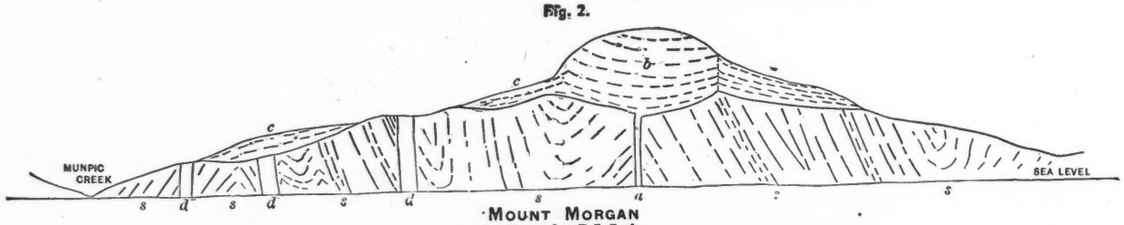


Fig. 2.



MOUNT MORGAN
Sections after R.L.Jack.

* Presented at the Cleveland meeting of the American Institute of Mining Engineers, June, 1891.

† Since writing the above I have received the report of the company for the year ending November 30th, 1890, which shows that the total amount of dividends paid to that date had been £2,358,333, the total gold obtained being 756,042 ounces, worth £3,121,741.

†† It is here that one sees the light, white, pumice-like material which, owing to the air in its cavities, will float on water.

ft. east, as proved by a branch crosscut. The deposit has been proved to extend further eastward in the deeper levels (Freehold tunnel) than it did in the surface excavations, while on the other hand its western limits are more restricted.

THEORIES OF THE FORMATION OF THE ORE DEPOSIT.

The origin of the Mount Morgan ore deposit has been the theme of much controversy. The earliest description came from Mr. R. L. Jack, the head of the Queensland geological survey, well known as a careful observer. His report was made officially for his government and appeared in 1884. Others have contributed their opinions since; and meanwhile the rapid development of the mine, more particularly by the deeper adits, has furnished additional data for a problem, of which the following solutions have been offered: 1. That the deposit is that of a geyser (R. L. Jack). 2. That it is an auriferous zone traversed by a series of quartz veins of auriferous mundic (J. Macdonald Cameron). 3. That it is the decomposed cap of a large pyrite lode (the view held by several local and other mining engineers).

The Geyser Theory.—The first of these explanations, known as the "geyser theory," has been until recently the most widely accepted. Citing as a similar occurrence the hot springs and geysers of the Yellowstone Park, described by Dr. A. C. Peale in the United States Geological Survey reports, Mr. Jack observes in his first report: "Nothing but a thermal spring in the open air could have deposited the material under consideration." The two sections shown in Figs. 1 and 2 are taken from that report. Of Fig. 1 he says: "The above diagram represents my idea of what would take place in the case of a geyser remaining in activity for a (geologically speaking) lengthened period." The original form of the ground is shown by *aa*, the deposit of precipitated material by *bb*, the layer of solid material by *cc*, while the surface-contour is indicated by *dd*. In describing this section he concludes, "Such, I believe, is the history of Mount Morgan as we now see it."

The structure of the mountain is supposed to be shown by Fig. 2, in which Mr. Jack indicates rhyolite dykes at *d* and metamorphic rocks at *s*. He says: "*a* is the pipe of the geyser (theoretical), *b* the cup-deposit and *c* the overflow of the geyser."

The same geologist says, in his description: "After the cessation of thermal activity the powers of sub-aërial denudation would come into play. Denudation would obliterate the lateral terraces which were probably not absent from the slopes of Mount Morgan."

The information obtainable in 1884 as to the nature of the deposit was totally insufficient to enable an observer, however careful and experienced, to build a theory upon it. The amount of work done at that time was mostly limited to one open cut, 10 ft. by 15 ft. in size, which showed a fan-like arrangement of the ore, suggesting to Mr. Jack the structure of a geyser. It was an altogether local appearance, as was proved by the work of a few days later.

In a second report, dated December 12th, 1888, Mr. Jack adds: "The evidence now to hand, in my opinion, goes far to confirm my original view that the auriferous material was deposited by a thermal spring." The deposit had been asserted in the first report to have been formed "in the open air," a condition constituting the whole distinctive value of the theory, which otherwise might not differ materially from the views accepted as to the aqueous origin of ore deposits in general. In the second report the author declares his theory to have been confirmed, but produces evidence which really contradicts its essential feature.

Taking the two reports together, we find that, in support of his explanation, Mr. Jack adduces: (*a*) the "fan-like arrangement" of the material; (*b*) "the frothy and cavernous condition" of the siliceous sinter; (*c*) the hydrated condition of the silica, and (*d*) the fact that one of the dykes intersecting the country does not also intersect the deposit.

(*a*) The "magazine" face, at the time of Mr. Jack's first visit, appeared to him to have a distinctly fan-like structure. But little work having been done since that time at this particular point, it should be possible to verify this statement; but the most careful observation does not confirm it. The cutting shows an arrangement of loose material such as can frequently be seen in surface excavations, probably less marked now than when first seen by Mr. Jack; but the entire absence of any repetition of such an arrangement of material in the other workings must destroy its value as evidence, if it ever had any.

(*b*) The "frothy and cavernous" condition of the quartz is not peculiar to Mount Morgan. Those who are familiar with the pocket-mines of California will remember the very light, pumice-like quartz which often accompanies the gold in those mines. It is the light honeycombed quartz found in the gossan of gold veins in many places. Generally speaking, the Mount Morgan gangue can be duplicated elsewhere: and the particularly light "frothy sinter," noticeable as a patch in the deeper workings, differs only from the bulk of the quartzose ore in that it is remarkably free from accessory minerals. It is the siliceous skeleton produced by surface decomposition of more than ordinary intensity. It is possible to produce artificially in a few minutes, by the application of acid to very dissimilar ironstone ore, a material similar to that noted, which has undergone the chemical action of underground waters during long periods.

(*c*) The hydrated condition of the silica is not unusual in quartz lodes, and while it is valuable as evidence to disprove the suggestion that the ore is the replacement of anhydrous quartzite, it does not necessarily point to the agency of a geyser.

(*d*) The intersection of the country by a dyke which does *not* penetrate the deposit is an important fact. The dyke referred to is that cut by tunnel No. 1 at 120 ft. from the shaft coming down from floor No. 5. Mr. Jack says, at the end of the second report: "This shows that the sinter and ironstone are deposited on, and were not altered portions of, the pyritous quartzite country-rock." Unfortunately the evidence is far from conclusive. In describing No. 1 tunnel the dyke is referred to in the following sentence: "A quartzose rock full of fine pyrites is traversed for the next 37 ft., when a dolerite or rhyolite dyke is cut. The direction of this dyke is uncertain, as the tunnel is here timbered up." In his descriptions Mr. Jack always endeavors to draw a marked distinction between the "felstone" dykes which penetrate the ore and the "dolerite" and "rhyolite" which intersect the country-rock. Now this distinction is arbitrary and misleading. I examined the rocks both *in situ* and, a few days afterward, under the microscope. The dykes penetrating the deposit are so decomposed that it is impossible now to determine which is felstone and which rhyolite. The dykes cutting through the country are similarly, but not to so great a degree, decomposed, especially in the vicinity of the deposit. The statement that a "dolerite *or* rhyolite" dyke does not penetrate a deposit which is freely intersected by decomposed felspatic eruptives, should be supported by proof. It is not so here; for the dyke cut in No. 1 tunnel has not been followed upward, and in the south branch of the Freehold tunnel, just overhead, there is a dyke, which is possibly the one in question.

Fig. 3.

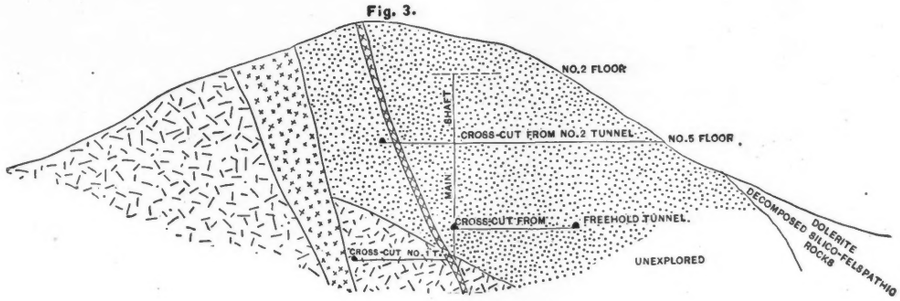
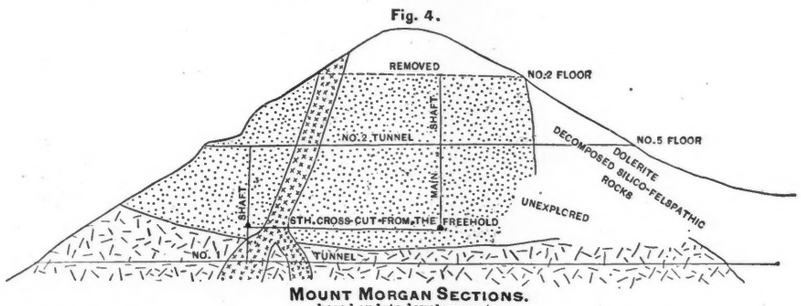


Fig. 4.



MOUNT MORGAN SECTIONS.
based on late developments

ORE DEPOSIT, INTERSECTED BY SMALL DYKES NOT SHOWN. PYRITIOUS QUARTZITE. DYKES.

My sections, shown in Figs. 3 and 4, will illustrate this. The left half of Fig. 4 resembles one of Mr. Jack's sections, being taken along a nearly identical plane (mine is taken due north and south). His section, however, gives a curved contour to the limit of the deposit, very nicely, but unwarrantably, suggesting the shape of a geyser basin. The right half of the section is not filled in, since this part of the mount has not been thoroughly developed. Fig. 3 is taken along a line E. 17° S., and is obtained by projecting the crosscuts from the No. 1 and Freehold tunnels upon the plane of the No 2 tunnel.

In further considering the conditions under which thermal springs and geysers exist, and the similarity of such conditions to those obtaining at Mount Morgan, it may be noted:

1. Isolated geysers are unusual, nothing being more remarkable than the extended area of such phenomena. But vigorous and extensive prospecting, such prospecting as always follows great mineral discoveries, has not led in this region to the finding of anything similar to Mount Morgan or to a geyser. It is true, there is a small hillock adjoining the

mount to the northwest (called Callan's Knob) where somewhat similar material has been found; but it may be considered as an offshoot or spur from the main deposit.

2. Geysers have terrace formations due to the overflow of the siliceous or calcareous waters. The map accompanying Mr. Jack's first report indicated "the overflow from the hot spring" as covering an area of 2,000 ft. by 3,000 ft. But this was purely a guess, for such overflow material is not to be seen. Had the terraces existed, and had they been removed by denudation, would not the adjoining river beds show some accumulations of their *detritus?*

3. Geysers have a central vent, which, when the geyser becomes extinct, is found to be choked up with sinter. Though Mount Morgan has been traversed by a number of adits and crosscuts, not to mention extensive surface excavations, no such vent and no such central column, or anything suggestive of either, has been seen.

(To be Continued.)

MANGANESE STEEL.*

By H. M. Howe, Boston, Mass.

Manganese steel is an alloy of iron and manganese, incidentally, and probably unavoidably, containing a considerable proportion of carbon.

The effect of small proportions of manganese on the hardness, strength and ductility of iron is probably slight. The point at which manganese begins to have a predominant effect is not known: it may be somewhere about 2·5%. As the proportion of manganese rises above 2·5% the strength and ductility diminish, while the hardness increases. This effect reaches a maximum with somewhere about 6% of manganese. When the proportion of this element rises beyond 6% the strength and ductility both increase, while the hardness diminishes slightly, the maximum of both strength and ductility being reached with about 14% of manganese. With this proportion the metal is still so hard that it is very difficult to cut it with steel tools. As the proportion of manganese rises above 15% the ductility falls off abruptly, the strength remaining nearly constant till the manganese passes 18%, when it in turn diminishes suddenly.

Steel containing from 4% to 6·5% of manganese, even if it have but 0·37% of carbon, is reported to be so extremely brittle that it can be powdered under a hand-hammer when cold; yet it is ductile when hot.

We have here another of the endless cases in which the properties of the alloy differ greatly from the mean of those of its components. This usually astonishes the novice, and even experienced metallurgists are often betrayed by it into expressions of surprise. It is, in fact, about as surprising as the parallel fact that the properties of water are not the mean of those of oxygen and hydrogen, and that those of peroxide of hydrogen are not directly deducible from those of water and oxygen.

Passing by such striking properties of manganese steel as its freedom from blow holes; the great difficulty with which it welds; the increase in its toughness caused by quenching from a yellow heat; its electric resistance, enormous, and very constant with changing temperature; its low thermal conductivity: passing these by, one group of qualities stands out as that which must create and yet limit its value in the arts. I refer to its remarkable combination of great hardness, which cannot be materially lessened by annealing, and great tensile strength, with astonishing toughness and ductility; this group, I say, must at once create and limit its usefulness. The very fact that manganese steel cannot be softened, that it ever remains so hard that it can be machined only with great difficulty, at once sets up a great barrier to its usefulness; yet a barrier which, as we shall soon see, is not so insurmountable as it might at first appear.

On the other hand, if, as I believe, this cheap metal has a much higher combination of the important properties of hardness and ductility than exists in any other known substance, metallic or non-metallic, we can hardly hesitate to prophesy for it an important and useful future, for we can hardly doubt that for some important purposes this combination is extremely desirable. This combination is illustrated by strips which have been bent double cold, and yet can barely be filed.

Resistance to Abrasion.—The results given in Table I. were obtained by Mr. T. T. Morrell, chief chemist of the Cambria Iron Works, by pressing weighed pieces of manganese steel and of other steel, with a constant pressure, against a rapidly revolving hardened steel shaft, and ascertaining the loss of weight which each piece underwent per thousand revolutions of this shaft. Here manganese steel indeed wears faster than tempered tool steel; but this is not a material which enters into competition with manganese steel, as it is not ductile. The difference between the wear of manganese steel and of that of the other steels tested is very great.

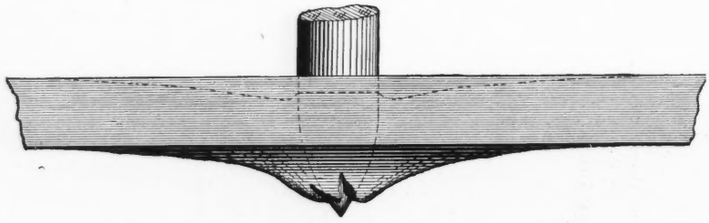


FIG. 4.

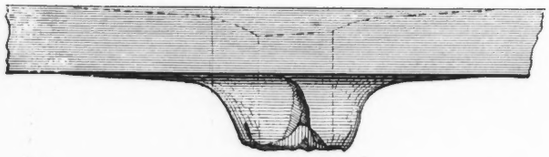
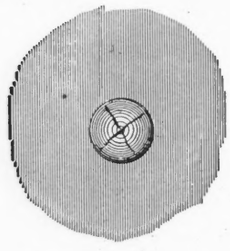


FIG. 5.

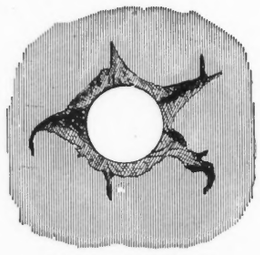
View of Back of Plate.

FIG. 4.



View of Front of Plate.

FIG. 3.



View of Back of Plate.

FIG. 5.

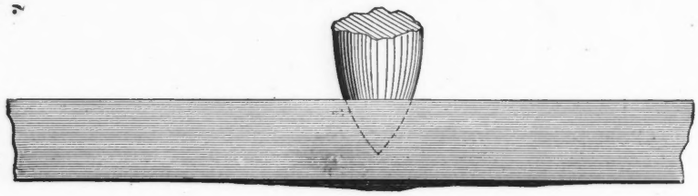


FIG. 3.

TABLE I.

ABRASION BY A REVOLVING HARDENED STEEL SHAFT.

Loss of weight of—		Loss of weight of—	
Manganese steel	1·0	Hardened Otis boiler plate steel	7 0
Blue tempered hard tool steel	0·4	Annealed " " "	14·0
Annealed hard tool steel	7·5		

The advantage of manganese steel is much less striking when it is exposed to abrasion by an intensely hard substance, like emery. This is shown in Table II.

TABLE II.

ABRASION BY AN EMERY WHEEL.

Loss of weight of—		Loss of weight of—	
Hard manganese-steel wheels	1·60	Hardest carbon steel wheels	1·23
Softer " "	1·19	Soft " "	2·85

Hardness and Rigidity.—The hardness of manganese steel seems at first to be of a peculiar nature. We class together under the single term "hardness" what seem to be several tolerably distinct properties. These, though they habitually coexist, do not necessarily. Resistance to abrasion, to indentation by a sharp object, and to compression, habitually go hand in hand; yet, on reflection, we see that there is no *a priori* reason why they must coexist. I think that the tensile elastic limit should be closely related to the cohesion of the substance along the lines of least cohesion, or to the minimum cohesion. The resistance to abrasion, should the lines of low resistance be far apart, may bear little relation to this minimum cohesion, but be dependent on the cohesion between the particles immediately exposed to abrasion and those next them. The tensile

*Presented at the Providence meeting (1891) of the American Society of Mechanical Engineers.

elastic limit and the ultimate tensile strength of an emery wheel are very low; its resistance to abrasion enormous. That is because its minimum cohesion, which occurs between the grains of emery and their cementing matter, is very low; while the cohesion between the molecule of any one individual grain of emery is enormous. Among absolutely homogeneous substances, free from initial stress, the resistance to compression, to abrasion and to tensile distortion should be proportional. It is, I take it, because many substances are heterogeneous, with lines of low resistance, like the joints in brickwork, the cleavage in crystals, the grain in wood, that these properties often bear so little relation to each other.

Again, while the resistance to compression in a material which yields by bulging should be related to the tensile elastic limit, since such substances simply take set under compression, the particles changing their relative positions without solution of continuity; the resistance to abrasion should be related to the ultimate tensile strength, since each is measured by the force needed to break continuity by tearing particle from particle. This force, at the plane where any two particles are torn apart, is in either case a pull, *i. e.*, tensile.

The resistance to abrasion, moreover, should be related to the coefficient of friction of the metal; or, regarding the surface of the metal as like a brush or the surface of a file, the abrasion and the coefficient of friction should depend on the depth to which the teeth of the abrading file fit betweeen those which it is to abrade, and the mode of distribution of the teeth of the two files which are abrading each other.

Be this as it may, the hardness of manganese-steel seems to be of an anomalous kind. The alloy is hard, but under some conditions not rigid. It is very hard in its resistance to abrasion; it is not always hard in its resistance to impact. I do not recall a case in which it has not shown itself very hard when exposed merely to abrasion, yet there are cases in which it has not shown itself hard under repeated impact.

I do not refer to the mere fact that it can be indented by a sharp blow; this power of enduring distortion is almost a necessary consequence of its great ductility. I refer to its behavior under conditions like those of a hammer-head or stamp-shoe. As a material for stamp-shoes, for horse-shoes, for the knuckles of an automatic car coupler, manganese-steel has not met our expectations. When we remember how many of us have been studying carbon steel these long years, and how ignorant we must yet confess ourselves concerning even some of its prominent characteristics, there is little wonder if, in speaking of so little studied a material as manganese steel, I must admit that its rigidity in certain cases, its pliancy in others, is puzzling.

Armor Plates.—The armor plates which I will soon describe give an instance of apparently great rigidity under shock; but it is probable that the reason why the manganese-steel armor plates did not crack while the steel one did, is that the manganese-steel can undergo such great distortion without failure of continuity. For, though the plates as a whole are but little distorted, the metal immediately about the holes must have been distorted greatly, yet but trifling cracks appear.

Car Axles.—Another instance of rigidity under shock is that of a manganese-steel car axle tested by Hadfield, in comparison with a special carbon-steel axle. Each was struck repeatedly by a 20·75 cwt. ram, while resting on supports 3 ft. apart, and each was reversed after every blow, in the usual way. The manganese-steel axle received, up to the time of breaking, blows representing 43% more energy than those received by the carbon-steel axle; yet the total deflection of the manganese-steel axle was very much less than that of its competitor.

Car Wheels.—A case of good behavior under shock is furnished by a 33-in. manganese-steel car wheel, weighing about 612 lbs. It was dropped edgewise on a one-ton steel block, bedded in the ground, repeatedly, from gradually increasing heights with the results given in Table IV. For comparison an American chilled cast-iron wheel, made by one of our best makers, and also some excellent carbon-steel wheels, were tested in the same way.

TABLE III.

TESTS OF MANGANESE AND OF CARBON STEEL AXLES.*—HADFIELD.

Effect produced by the number of blows as under.	Energy developed in foot tons	Sum of permanent deflections or bends in inches produced on—	
		No. 1. Special-steel axle.	No. 2. Manganese-steel axle.
At the fifth	79·883	24·953	8·501
" tenth	208·531	66·188	19·403
" fifteenth	348·291	105·248	30·212
		And broken.	
" twentieth	497·988		36·491
			And broken.

*Excerpt *Proc. Inst. Civ. Engineers*, XCIII., Part III., 1888, p. 29.

The total energy represented by the work done on the manganese-steel wheel was 100 foot-tons, or 18 times as much as in case of the cast iron, and twice as much as in the case of the carbon-steel; and this, although the average fall of the manganese-steel wheels was four times that of the chilled cast iron and nearly double that of the carbon-steel.

Axes.—Again, manganese-steel axes have chopped cold iron bars through. Here we have great rigidity under shock.

Yet in other cases manganese-steel has not shown the rigidity which

FIG. 1.

FIG. 2.

TABLE IV.

DROP TESTS ON MANGANESE-STEEL AND OTHER CAR WHEELS.

Manganese steel wheel.		Soft carbon-steel wheel.		Chilled cast-iron wheel.	
No. of drops.	Height of fall.	No. of drops.	Height of fall.	No. of drops.	Height of fall.
2	16 Feet.	1	10 Feet.	1	4 Feet.
9	28	1	11	1	6
	Rim slightly cracked.	1	12	1	10
		1	13		Broke into six pieces.
3	28	1	14		
	Tread broken through		Cracked slightly.		
		7	15		
		1	18		
			Cracked about ½ across the face of the tread.		
Total height dropped	368	.....	183	.....	20
Average height of drop.	26·3	.....	14·1	.....	6·7

those I have just described would lead us to expect. However, I know of none in which manganese-steel has proved brittle under shock, except in early experimental work, in which the steel was unwisely given too much carbon, and further excepting untoughened manganese-steel castings.

A partial explanation of the cases I have referred to, and of others and an inference from them, is that manganese-steel is more rigid tha,

the soft steels with which it competes in ductility, but less rigid than the hard steels which it excels in hardness.

To sum this up, in resistance to abrasion alone, manganese-steel excels the hard carbon-steels (when unhardened), and *a fortiori* the soft steels. Where both abrasion and repeated shocks are to be resisted, manganese-steel is certainly less liable to break than the hard carbon-steels; but whether, under new conditions, combining shock and abrasion, it will prove as rigid as the carbon-steels with which it will then have to compete, direct experiment alone can tell.

Hardness Evaded and Surmounted.—Having called attention to the great obstacle to the use of manganese-steel, its persistent hardness, let me now point out how this obstacle may be evaded and even surmounted.

Special Forging Appliances.—Fortunately manganese-steel forges readily at a yellow heat, though at a bright white heat it crumbles under the hammer. But it offers greater resistance to deformation, *i. e.*, it is harder when hot, than carbon-steel. This increases the cost of forging to a certain extent, and if very great reduction of cross section is to be effected by forging, the increased cost may be very serious; hence, it is desirable that the ingot or other casting which is to be forged, should have, when cast, as nearly as possible the dimensions of the finished piece, so that but little forging may be needed.

Iron, carbon-steel and the other metals and alloys in general use, are readily tooled when cold. Hence, we have in general tolerated forging appliances which leave the piece in a shape in which a considerable amount of tooling is needed. But, even for these metals, recent years have developed ingenious methods of forging even complicated pieces so closely to the needed shape, as to avoid subsequent tooling, or to greatly reduce it. We have not only the great advances in drop forging, but several different kinds of rolling machines, of the general class to which the Simonds rolling machine belongs.

Bridge Pins.—For example, it appeared that manganese-steel should be a valuable material for bridge pins, since these need not only great shearing strength, but great hardness. If they wear away, the play which arises is extremely injurious to the bridge. We were at once confronted with the difficulty of providing threads on the ends of the pins to hold the lock nuts. The difficulty had hardly arisen when it was overcome by the discovery that Messrs. Wyman and Gordon, of Worcester, had a machine which forges threads on round bars of any size, and apparently accurately enough for this purpose.

Cold Shaping.—Turning now from this way of evading the hardness of manganese-steel by special appliances for working it while hot, we come to appliances for shaping it while cold, despite its hardness. These are, first, emery wheels of various kinds for cutting it; second, hardened carbon-steel rollers, dies, etc., which work it cold.

Emery is so much harder than manganese-steel that it cuts it with great ease. Indeed, as an observer from the summit of a lofty mountain hardly notes the little hills at its base, their elevation being so trifling compared with his, so the hardness of emery exceeds that of manganese-steel so greatly, that when cut by emery, the resistance of this metal to abrasion excels that of carbon-steel much less than when the abrasion is affected by a revolving steel shaft. This is illustrated by table II.

I may almost say that what the common hardened steel tool is to most metals the emery wheel will be to manganese-steel. Just as we turn other metals in the lathe by holding a hardened steel tool against them while they revolve, so we may turn objects of manganese-steel by mounting them in like manner, and simply substituting for the hardened steel tool an emery wheel revolving swiftly. So, too, may the stationary tool of the planer, and in some cases the reciprocating tool of the slotting machine, be replaced by the revolving emery wheel, the piece which is to be planed moving past the emery wheel, that which is to be slotted remaining stationary while the emery wheel, driven by belt or gearing, plays up and down.

Hardened Steel.—Turning now to means of working rather than of abrading it when cold, this thin wire shows at once that it is possible to work the metal cold to a very considerable extent. This wire has been made by drawing through dies when cold in the common way. It is, however, hardly likely that manganese-steel wire will be widely used, the material offers so much resistance in drawing, is so hard, and requires such frequent annealing. After every two draughts it must be highly heated and quenched in cold water.

The great amount of cold working which wire drawing requires may be so costly as to be prohibitory, yet a smaller amount may cost but little. If manganese steel could not be worked cold at all, it might be a serious thing. Even the most accurate methods of hot forging bring the metal only approximately to the size desired, for the following reason. The temperature at which the metal is forged while hot must vary considerably. As that temperature varies, so does the number of degrees through which the metal must pass in cooling thence to the common temperature: and as the contraction of the metal in cooling is proportional to range of temperature through which it cools, so must the amount of contraction which the metal undergoes in cooling vary. So that, no matter how accurately we bring the metal to a given desired shape and size when hot, as we cannot regulate closely the temperature at which we give it that size and shape, the size and shape which the metal has after cooling will vary. For many purposes this variation may not be serious. But for many others it is extremely serious, not to say prohibitory. Yet, so slight is it, that but a very little cold working is needed to compensate for it.

Now it so happens that Mr. Samuel Johnston, of 140 Nassau street, New York City, has devised and constructed machines capable of rolling manganese steel and other metallic substances while cold, and with great ease. I am informed that this machine can produce pieces of exceedingly irregular shape. With the slight familiarity which I have with it, I find it difficult to set a limit to the shapes which it can produce. As we can turn wooden gun stocks and axe handles in a lathe, so can this machine turn out even most irregular pieces.

It is still too early to assign to these two methods of shaping manganese steel when cold their exact fields. In many cases it is probable that either can be used, as in turning bridge pins and car wheels, in trimming armor plates, and in shaping plow points. In other cases, such as that of car-axles, where an irregular cross-section must be given with extreme accuracy, the Johnston machine seems more applicable than the emery wheel.

Established Uses.—When we come to the actually well-established uses of manganese-steel, I must act the apologist. They are few. In addition to the inertia of custom, which properly leads each to cling to the material which does well enough rather than brave the ills he knows not of, we have the really serious obstacles which the very nature—indeed, the very advantages—of this alloy oppose to its use, and certain personal considerations on which I may touch but lightly.

The death of the senior Hadfield shortly after the invention of manganese-steel, threw on his son the cares of a very large and growing business, in addition to those of the development of manganese steel and of many other extremely promising alloys. There has been lack of laborers, rather than lack of promise of harvest.

The most important single use for manganese steel is for the pins which hold the buckets of elevated dredgers. Here abrasion chiefly is to be resisted; here manganese-steel has given remarkable results; and here its use has, I believe, ceased to be tentative. Figs. 1 and 2 show how much better manganese-steel resists abrasion than carbon steel. The manganese-steel pin, Fig. 1, has endured more than three times as much use as the forged carbon-steel pin, Fig. 2, and yet has been worn away very much less than its competitor. Hard as this 6-inch pin is, it can be bent double cold without cracking.

Another important use is for the links of common chain elevators. The manufacturer who uses them most reports that they last more than twice as long as carbon-steel links.

The cyclone pulverizer consists of two propeller blades, set end to end, in a closed chamber, and revolving rapidly in opposite directions. The ore or other substance to be powdered is dropped between these blades. They are thus subjected at once to severe abrasion and to heavy blows; hence they must be tough and hard. While chilled cast iron is found to abrade slightly less under these conditions, yet it often breaks, causing serious accidents. Manganese-steel has been found perfectly safe, and has been regularly adopted.

Besides many smaller uses, a great many points and crossings for both steam and horse railroads have been made; but it is not yet known how the wear of manganese compares with that of carbon-steel under these conditions.

Car wheels probably offer the most promising use for manganese-steel. A car wheel must first of all be so tough and trustworthy that it will not break even under trying conditions; and beyond this, it must resist abrasion; in short, it must have this combination of toughness and hardness which manganese-steel offers. Several serious obstacles have retarded the introduction of manganese-steel for this purpose, but we see our way pretty clear to overcoming these completely. And I hope strongly to see manganese-steel become *the* material for passenger-car wheels within a few years. I am less hopeful as regards freight-car wheels, because the results are less serious when a cast-iron wheel breaks under a freight train than when it derails a passenger train.

The chief difficulty in the way of introducing manganese-steel car wheels has been the extreme hardness of the metal, which made it difficult to turn the thread and to bore the hub true. This difficulty is now well in hand. The tread may be turned by means of emery wheel, the car wheel itself being mounted in a lathe and revolving slowly so as to bring each point in its tread in succession against the emery wheel.

The hub might be bored with an emery cone such as is used successfully for dressing out the conical steel dies through which steel bars are drawn cold. But an objection to this is that the purchaser of a car wheel may wish to bore out his wheel to fit a particular axle after it has left the maker's hands. Hence it will be better to weld or cast into the manganese-steel wheel a center of iron or soft steel, which can be bored readily.

Manganese-steel wheels under a one-horse tram car in Chester, England, were returned after running 80,000 miles. The service under horse-cars is very trying, as the brakes are so often applied, and as so much sand and other gritty matter lies on the rails. The mileage on one of the most important street railroads in this country was or follows:

Maker.	Number of wheels put in.	Number worn out.	Average mileage.
X.....	515	293	7,748
Y.....	78	12	16,373
Z.....	154	14	4,037

Of these three classes of wheels two were of cast iron and one of carbon steel.

I am informed that some mangenese-steel wheels have run over 300,000 miles each without turning, on a New England railroad.

For years exposed to excessive abrasion—*e. g.*, from grit—manganese steel commends itself.

For safes, also, it should be well fitted, as it can neither be broken by sledging, nor cut, nor drilled.

Armor plate.—It is to be expected that manganese steel should make excellent armor plates, for here hardness and toughness should be combined. The plate must be so hard that the shot does not penetrate it, yet so tough that it does not crack and let the water in; and such experimental data as we have indicate that it will fulfill this expectation.

Figs. 3, 4 and 5 illustrate the effects of a shot on manganese steel; on carbon steel containing 0·25% of carbon; and on wrought iron, respectively. The wrought-iron plate was completely perforated; the carbon-steel plate was cracked through; three manganese-steel plates received in all four such shots, which in two cases penetrated ½ in., and in the other two ⅝ in. The manganese-steel plates became somewhat dished by the blows, as is roughly shown in Fig. 3, and in two cases a slight surface crack resulted around the inside of the hole.

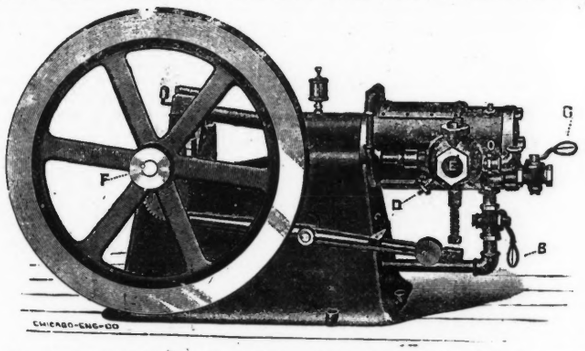
A sliding ram had hard-steel armor-piercing shot attached to its lower face, and was dropped from a height of 8 ft. upon these several plates, which were supported firmly on timber. The manganese steel plates were 9 in. square, and 0·75 in. thick. The conditions of this test do not, indeed, reproduce those of actual warfare; in the one case we have a great mass moving slowly, in the other a small mass moving swiftly.

NOTE.—I must caution the reader that, though I have tried to treat the subject judicially, allowance should be made for bias on my part, owing to direct pecuniary interest.

THE REGAN VAPOR OR GAS ENGINE.

Gas engines as used to-day are products of late years, and make it feasible to apply power where steam, dust, ashes and an expensive engineer are features undesirable. The fact of no increase in insurance rate to users of gas engines also goes far to make them popular. Engines of this description are particularly adapted for work when high speed and uniform motion are required. The one illustrated in the accompanying engraving is operated as follows: The compressed gas in cylinder is ignited by electricity through means of an electrode in piston, which comes in contact with a fixed electrode in cylinder. The circuit is completed on every second revolution through wires connecting *c* and *D*. The connection at *c* is made only once in two revolutions.

The engine has only one port and one exhaust valve, the momentum carrying engine over other center. Gas and air are admitted in proper proportions through valves *G* and *B*, and drawn into cylinder by vacuum force; this gas is compressed by return stroke, and on this return elec-



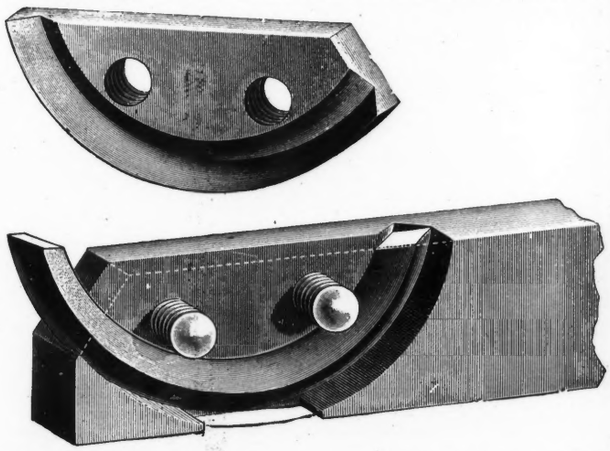
trodes are brought in contact; the breaking of circuit ignites the gas and the explosion follows, giving enough momentum to make two complete revolutions. The exhaust *E* is opened on return stroke after explosion, when port closes and gas is again admitted. Eccentric levers operate the poppet valves in gas and exhaust pipes. The eccentric controlling gas lever also forms, by means of its being keyed loosely, a part of the governor. The governor itself consists of two balls, which by means of centrifugal force slide the eccentric in or out, and thus regulates the gas lever. The cylinder is cooled by means of a water jacket, which completely surrounds it, cold water coming in at the bottom and leaving in the heated or lighter state at the top.

Lubrication is effected by means of ordinary oil cups suitable for a ten hour run. The special claim for this engine is the absence of valve motion, and gas ignitor, also its simplicity, and the fact that no cleaning is required. The engine is being introduced by L. J. Wing, of New York.

THE FRASSE LATHE AND PLANER TOOL.

A new departure in a machine tool is illustrated in the accompanying engraving. The tool has in cutting end a circular steel cutter, which is held in place by means of clamp and nuts, making a practically solid tool that may be adjusted to suit any work by unscrewing nuts and setting cutter at proper angle.

The advantages claimed for this tool are as follows: It has a cutter



that is at all times the same temper. No forging is necessary, and in matter of grinding the work is most simple.

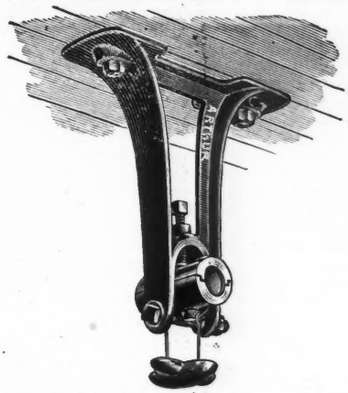
The tool is such as to permit of more changes in cutting angles than is possible in an ordinary tool, and combines with this feature, strength and simplicity. At any time cutters may be obtained to fit holder of any size. Sizes run from $\frac{3}{8} \times \frac{3}{8}$ to $\frac{3}{4} \times 1\frac{1}{2}$ ins. This tool is being introduced by Peter A. Frasse & Co., of New York.

Electro-metallurgy of Zinc.—Herr T. Lange, in his new process for obtaining, by electrical decomposition, metallic zinc from solution of sulphite of zinc, uses zinc sulphite instead of zinc sulphate as electrolyte, as the difficulty of keeping the bath neutral is thereby obviated, and the metal obtained of better quality. Less power is required for the decomposition of zinc sulphite than for that of zinc sulphate, to the extent, it is stated, of 30%.

THE ARTHUR DOUBLE BRACER SWIVEL HANGERS.

A novel swivel box hanger is being introduced by the Arthur Company, of New York, for which several important advantages are claimed, among others, a perfect swivel box, as against the double brace hanger universally used, which has no swivel motion except that which is found in a loose fitting box. The fact that the old style box has no motion, together with the difficulty experienced in putting up a line of shafting, make the advantages of the one in question at once apparent.

To adjust a line of shafting with the old style hanger, it is necessary to fit the box and cap on shaft and then to put yoke in place before the shaft can be released. All this time shaft must be held perfectly level, as box



will not allow of any deviation from this position; while, in the new style, shaft may be slipped in over bolt, and box and cap applied afterward, and during this work one end of shaft may rest on floor. The principal advantage claimed is the uniform wear on shaft by using the swivel box, which has a perpendicular as well as a horizontal movement, and is also self oiling, having in the box two or more cavities filled with waste or other fibrous material, and having grooves to lead oil back to the wells. Another feature, is that box can readily be taken out to clean without removing cross-bolt. The hangers are complete with pivot drip cups, and are made in sizes from $1\frac{1}{16}$ in. upward, drop in proportion.

Statistics compiled by Dr. Brockman, at Bochum, and based upon the 880 firedamp explosions which have occurred during 20 years in the Dortmund district, Germany, show that the accidents that took place on Monday were more than twice as many as on any other day in the week.

Power Plant at the World's Fair.—The power plant at the World's Fair, as now designed, will aggregate about 25,000 H. P., including steam and electric motors. The great Corliss engine at the Centennial developed 1,453 H. P., and at Paris in 1889, 6,000 H. P. was required to drive the machinery. The machinery hall of the coming exhibition will have six lines of shafting, each 800 ft. long. Each line is to be divided into four sections of 200 ft. each, each section to be driven by an engine; or in all 24 engines with a capacity of 125 to 200 H. P. each. The combined pumping plant is expected to have a capacity of 40,000,000 galls. daily. The electric plant is figured at 16,000 H. P.

Arabian Salt Gardens.—An Austrian mining engineer contributes some interesting particulars concerning the salt gardens situated about three miles west of Aden, where the physical and climatic conditions are alike favorable for carrying on this particular industry, says *Iron*. Soft clay beds, flat ground, a temperature of 46°–48° Centigrade maximum, almost continual warm winds, and a rarity of atmospheric depression all unite in producing the best results. The basins, of a superficial extent of 3,000 to 4,000 sq. yds. and 1 yd. deep, are filled with sea water to a depth of from 18 in. to 20 in. and then left for a week, at the end of which period the usable salt is separated and the water containing the magnesia salts is allowed to evaporate to a very slight depth. The magnesia salt solutions are then removed by hydraulic pressure and a new volume of sea water is let in. If the salt bed is sufficiently thick it is broken into small pieces, dried, and ground in a special mill. Sheik Othman's gardens employ from 250 to 300 men, mostly Arabs and negroes. The greater part of the salt produced is exported to Calcutta, small quantities going to Madagascar and the Mauritius, all of which markets were at one time supplied by Italy.

Japanese Copper Mines.—According to a recent report of the British Consul at Yokahama the export of copper from Yokahama showed a large increase last year. It amounted to 11,409 tons, as against 3,255 tons in 1889 and 4,672 tons in 1888. This increase is mainly attributable to the fact that a large part of the production of the principal mines had been held over from the previous year. Production has, however, increased as well. The copper export from Yokahama consists of Furnkawa ingots from the Ashiwo mines, refined in Tokio; slabs from the Kusagurai Segawa, Nosawa, Washinosu, Kodama, and Mitsusawa mines; and Antiles. The production of the Ashiwo mines is now estimated at 7,500 tons per annum; the works there have been extended, and the facilities of transport have also improved. The quantity of this copper exported from there last year was equal to 93% of the whole copper export of the port. The average local value of the copper, of 99% purity, was about $17 to $17½ per picul (133⅓ lbs); and as this exceeded the cost of its production by probably 10% to 13%, transactions must have been sufficiently remunerative to the producer; and should present rates be maintained, an increasing production may therefore be looked for. It is to be regretted that manufacturers of tile copper have, when the demand was good, sometimes allowed their metal to fall below the standard purity of 99½% to 99½%. Complaints have also been made of ingot copper showing, on analysis, traces of arsenic and bismuth. These defects appear to have effected, to some extent, the reputation of the copper on the English market.

DETERMINATION OF THE TEMPERATURE IN THE BLAST FURNACE PROCESS.*

By A. Ledebur. Translated for the Engineering and Mining Journal by H. B. C. Nitze, E.M.

Besides the chemical investigations already discussed (Engineering and Mining Journal, May 23 and 30, 1881), the determination of the temperature is not seldom employed as a means for judging the action of the blast furnace. Indeed, such determinations are of great importance, for, inasmuch as every reaction taking place within the blast furnace is accompanied by a certain temperature—it is only necessary to refer to the influence of the temperature upon the reduction process of the ores previously discussed—some very important conclusions can be deduced concerning the action of the process from the temperatures and variation in the same at different parts of one and the same furnace.

At the same time, in the determination of the temperature in a certain cross-section of the furnace, similar difficulties to those attending the taking of an average sample of the gas are met with. The temperature at the circumference of the furnace is often materially different from that in the center, being at times higher, at times lower, which is explained by the unequal distribution of the materials and gases. The value of the temperature determinations in this discussion is also decreased from the fact that they were obtained by noting the temperature necessary to melt certain definite metallic alloys, which were fastened to an iron rod; the melting points of these alloys were not found by actual test, but were calculated, and the resulting values were in part entirely too high. However, although the figures may be doubtful when considered separately, the results of these examinations will present a pretty clear idea of the variations in temperature within one and the same furnace.

EXAMPLES.

In the charcoal furnace at Eisenerz, running on roasted ores charged hot, the dimensions of which have been given on p. 608 (Engineering and Mining Journal, May 23d, 1891), Kupelwieser found the following temperatures:

Vicinity of the tuyères.	Above the tuyères.				At the throat.
	2 m.	5·0 m.	7·4 m.	10·4 m.	
1,700° C.	960° C.	920° C.	770° C.	500° C.	500° C.

For the production of white iron, upon which the furnace in consideration is running, but a moderate temperature is requisite in front of the tuyères, which sinks rapidly from there on below the melting point of the iron and slag, and then decreases gradually, as in the present case. This slow decrease in the temperature is explained by the fact that the ores are charged in a hot state.

The charcoal blast furnace at Rothehütte, in the Harz, running on grey iron, forms a decided contrast to the above furnace, in reference to the reigning temperature and the smelting practice generally (the temperatures of this furnace were measured by Jüngst†). The vertical distance from the line of the tuyères to the throat was 13 meters. The charge consisted of red and brown hematites, containing on the average about 30% metallic iron; the temperature of the blast was 300° C.; the yield of the furnace in 24 hours was 4·5 tons of pig iron (about ¼ as much as at the Eisenerz furnace, while the cubic capacity of both furnaces is approximately the same.)

The determinations of the temperature showed:

Vicinity of the tuyères.	Above the tuyères.						At the throat.
	1 m.	3 m.	3·7 m.	4·2 m.	4·8 m.	5·4 m.	
2,000° C.	1,300° C.	800° C.	700° C.	525° C.	360° C.	230° C.	50° C.

In front of the tuyères a higher temperature reigns than in the first-mentioned furnace, as is common in the production of grey pig iron; but it decreases more rapidly than in the former case, and falls to the remarkably low point of 360° C., at only one-third of the furnace height. The greater part of the furnace therefore serves for the preparation of the ores, *i. e.*, for the expulsion of the water; reduction can first take place at 5·4 m. above the tuyères, and 7·6 m. below the throat, in which region the temperature is 230° C., or a little above. Even here it takes place in a very limited degree, and the greater part of the oxygen is given up within the zone of the boshes between 2 and 4 meters above the tuyères. For this reason the smelting period is of considerable duration, and the production is correspondingly small. By hastening the action of the furnace, *i. e.*, by increasing the amount of blast, it would presumably have been possible to raise the production, but not without increasing the fuel charge per 100 kg. of iron produced. The gases would have left the furnace at a higher temperature, and accordingly would have carried more heat with them, and the direct reduction would have been increased; this increased heat consumption would have been covered by additional charge of coke, to guard against incomplete reduction.

As a last example the temperature determinations of the coke furnace at Gleiwitz, running on common white iron, are given. The height of the furnace from the tuyères to the throat was 13·6 m.; diameter at the plane of the tuyères 2·56 m.; at the boshes 5·34 m., and at the throat 3·92 m.; cubic capacity, 215 cu. m. The temperature of the blast was 350° C.; quantity of blast per minute, about 150 cu. m. The charge consisted of 180 kg. puddle slag, 135 kg. brown hematite, 135 kg. spathose ore (½ raw and ½ roasted), with 165 kg. limestone flux. The run of the furnace in 24 hours was 36 tons, with a coke consumption of 155 kg. per 100 kg. of pig iron produced.

The temperatures as determined were as follows, in degrees centigrade.

	Plane of tuyères.	Above plane of tuyères.						Throat.
		0·44 m.	1·47 m.	5·54 m.	7·64 m.	9·83 m.	12·03 m.	
	°	°	°	°	°	°	°	°
Center of furnace..	1300	1400	1400	1200	955	850	680	140
Intermediate between center and circumference....	1500	1500	1300	1000	700	525	432	to
At the circumference.....	1600	1300	1400	1200	900	815	575	290

These results are of especial interest from the fact that they show the variation in temperature at differents parts of one and the same cross-section of the furnace.

At the center and directly at the walls the highest temperature was found to reign pretty regularly, while between these was a cooler zone. In the upper part of the furnace a more rapid decrease in temperature is noticeable along the walls than at the center. This phenomenon is explained by the fact that in charging the ores along the circumference of the throat, the coke heaps itself more in the center of the furnace; the ores, however, require a greater amount of heat, on account of their greater percentage of water, than the coke. The higher degree of temperature along the circumference compared with that between the walls and the center, is explained by the ascension of the gases along the walls of the furnace.

On the whole, the above figures show a still more gradual decrease in the temperature from the bottom upward, than was the case in the previously discussed furnace, also running on white iron. In the latter the charge consisted of easily reduced ores, high in iron, and the fuel consumption was therefore unusually low; the charge at the Gleiwitz furnace consisted mainly of refractory puddle slags, and the iron percentage of the charge was lower, and the fuel consumption accordingly high; the high fuel consumption develops a relatively great quantity of gas, which is cooled slowly. The expulsion of water immediately below the throat occasions a rapid decrease in temperature here.

Handbuch der Eisenhüttenkunde, Part II., p. 492 *et seq.*

†*Zeitschrift für Berg—,Hütten—und Salinenwesen in Preussischen Staate*, Vol. 9.

The Price of Platinum.—The Siberian Commercial Bank at Jekaterinenburg announces its readiness to advance holders of platinum metal from 300 to 374 roubles per kilo (= about $77.75 to $92.35 per lb.) on their stocks, says the *Chemist and Druggist*. The object of this announcement is said to be to counteract the schemes of English speculators who have organized a strong movement for the depression of the platinum prices.

An Aluminum Steamboat.—An aluminum steamboat is now running on the Lake of Zürich, Switzerland, says the *Electrician*. The boat weighs only about half a ton, or about half the weight of an ordinary boat of the same size. It was built at the works of Messrs. Escher Wyss & Company, of Zürich, the metal having been furnished by the aluminum works of Schaffhausen. The boat carries eight persons, and, with a 2 H. P. petroleum engine, easily makes six miles an hour.

White Metal Alloys.—The following alloys are used as lining metals by the Eastern Railroad of France:

Number.	Lead.	Antimony.	Tin.	Copper.
1	65%	25%	0%	10%
2	0%	11·12%	83·33%	5·55%
3	70%	20%	10%	0%
4	80%	8%	12%	0%

No. 1 is used for lining cross-head slides, rod brasses and axle bearings; No. 2 for lining axle bearings and connecting rod brasses of heavy engines; No. 3 for lining eccentric straps and for bronze slide valves; and No. 4 for metallic rod packing.

New Method of Preparing Ozone.—In *Elektrotechnische Zeitschrift* of a recent date, Herr Aug. Schneller, of Cologne, publishes a paper on the industrial preparation of ozone by means of electric current transformers which give a current of a tension exceeding 20,000 volts. He obtained a yield of 95%, whereas the Ruhmkorff apparatus gives only about 15%. The primary current employed may be from 100 to 1,000 volts. The only difficulty met with, but finally overcome, was the perfect insulation of the coils.

Production of Coal and Iron in France in 1889 and 1890.—The production of coal in France amounted in 1890 to 26,327,008 tons, against 24,303,509 tons in 1889, an increase of 2,023,499 tons; cast iron production rose from 1,733,964 tons in 1889 to 1,970,160 tons in 1890, an increase of 236,196 tons. Sheet iron, merchant iron, etc., increased from 807,695 tons to 823,219 tons, a difference of 15,524 tons. Steel rails increased from 165,764 tons to 173,930, while iron rails decreased from 1,029 tons to 141 tons. The total production of wrought steel increased from 529,302 tons to 566,197 tons, and that of Bessemer and Siemens-Martin ingots from 626,232 tons to 688,991 tons.

Ammonite, a New Explosive.—A new explosive, called "ammonite," invented by Sir George Elliot, has recently been tested in England. It consists of pure ammonium nitrate and nitro-naphthaline, both of which substances are in themselves inexplosive, but in intimate combination form a highly explosive compound. The ingredients are dried and separately ground, and are afterward incorporated in edge-runner mills under a moderate heat. The resultant is a yellowish powder, which is sifted and filled into metallic cartridges. The method of exploding ammonite is by means of a fulminate of mercury detonator, which is not contained in the cartridges as supplied by the company, but is inserted by the person using the explosive at the moment of firing. The experiments seemed to show that the new substance would not explode by concussion; it does not freeze, and can be detonated while chilled; it is in no way affected by variation of temperature; its power is equal to that of roburite. It is stated that ammonite has been in successful use at the Risca collieries, South Wales, for a considerable time past, and that no flame has been seen or accident occurred. The company exploiting the new invention claims that no fumes are caused by the use of the new explosive.

PERSONALS.

Messrs. J. H. E. and Thomas Waters will open an office in Denver as consulting mining engineers.

Mr. Amos Howard Fiske, of Soutb Framington, Cal., has been appointed Chief Engineer of the Leland Stanford Jr., University.

Mr. John Daniell, superintendent of the Tamarack and other mines of the Lake Superior copper region, was in tbe city last week.

Mr. F. L. Bartlett, general manager of the American Zinc-Lead Company, of Canon City, Colo., is making a sbort visit at Portland, Me.

Mr. William Byrd Page, mining engineer, of Leadville, Colo., was in New York during the past week. He returned to tbe West on the 19tb inst.

Mr. John B. Farish, mining engineer, of Denver, Colo., is at Rico, Colo., temporarily acting as superintendent of the Enterprise mine at tbat place.

The directors of tbe Enterprise Mining Company left New York for Colorado on the 17th inst. to visit the mine at Rico. They will be absent about two weeks.

Mr. W. A. Dunn, of Houghton, Micb., superintendent of the Peninsula Copper Mining Company, attended the meeting of the company's stockholders that was held in tbis city on the 13tb inst.

Mr. John C. F. Randolph, mining engineer, of New York, who returned to tbe United States from Borneo very ill last winter, has entirely recovered his former health, and is spending the summer in Maryland, near Baltimore.

Mr. Thomas T. Morrell, chief chemist of the Cambria Iron Company, of Johnstown, Pa., has resigned his position, and has returned to bis old home in Maine. Mr. Morrell has been the chief chemist of the Cambria Iron Company for more than 25 years.

A scientific expedition to Spitzbergen, organized by Herr Sänglin, of Stutgart, bas just left Bremen. Among tbose taking part in it are Dr. Zeppelin, Prof. Baur and Prince Karl von Urach. Tbe object is to make a thorougb study of tbe geology of Spitzbergen and to examine the fishing grounds of the Northern waters.

Mr. N. W. Musgrove, formerly superintendent of the Elk Garden mines, in West Virginia, but at present witb the Federal Valley Coal Company, of Ohio, is about to sever bis connection witb tbat company, to accept the entire management of the Lyle, Crow & Co. Coal Works, now known as the North Bend Coal and Coke Company, of Nortb Bend, O.

Capt. Isaac P. Gregg, president and general manager of the Eastern Development Company, limited, which owns the Coxheath copper mine, at Cape Breton, N. S., accompanied by a party of gentlemen, principally of Boston, interested in tbe company, visited tbe mine and other points of interest on the island last week, returning to Boston on tbe 18tb inst.

Mr. Joseph Ralpb, a prominent member of the Amalgamated Association of Iron and Steel Workers, has just received the appointment of superintendent of tbe industrial department of the Illinois Steel Company, and bas accepted the office. This is the second company to create tbat position, Carnegie, Pbipps & Co. being the first. His duties will be similar to tbose of Mr. William Martin of tbe Carnegie concerns.

The Society for the Encouragement of the National Industry of France offers prizes of 1,000 francs for the discovery of a new alloy of industrial utility and of 7,000 francs for any of tbe following six desiderata: the manufacture of a steel that has special useful qualities owing to the addition of a foreign substance; a new application of such metals or non-metallic substances as have so far been of small value industrially; a scientific investigation of combustion in furnaces using gas as fuel; an apparatus to determine the caloric value of the various fuels; a rapid and cheap method of deep boring; improvement in tbe mechanical ventilation of mines.

Mr. H. Ward Leonard, general manager of the ligbt and power department, and also of the intelligence department of the Edison General Electric Company, resigned upon August 2d in order to start an independent electrical-machine business under tbe title H. Ward Leonard & Co. The new concern will be an incorporated company under the laws of tbe State of New Jersey. Mr. Leonard will take witb him several well-tried assistants who have been associated with bim in the past, some of tbem as far back as 1885. Among those who will thus be connected witb the company are Mr. A. St. C. Vance, Mr. E. H. Harrison, Mr. C. H Bloomer and Mr. August Munning. The company will operate especially in tbe field of transmission of power by electricity, and the application of electric motors to the operation of special machinery, sucb as is not at present operated by electric motors or wbose operation is subject to improvement by careful attention to the requirements of the case. Mr. Leonard's experience since 1883, wben he became a member of Mr. Edison's first electrical-engineering staff, has brought him into contact with every branch of electric-light and power work. He has held positions from the lowest to tbe highest in the exploiting parts of tbe business, as well as in the constructing and in the operating of every kind of electric-light and power plants.

OBITUARY.

James L. Collins, a well known stove manufacturer, died at Chicago, Ill., on the 16tb inst.

Benjamin L. Burling, secretary of the Bodie mines, died recently. He had been connected witb these mines for many years. Mr. Burling had been in poor health for some time past.

James Currey died at South Evanston, Ill., on the 17tb inst., aged 77 years. He was one of the famous "Forty-niners," and spent several years in California. Judge John Currey, ex-cbief Justice of tbe Supreme Court of California, is his brother.

Micbael Helmbacher, one of the pioneers of the iron manufacturing business in St. Louis, died on tbe 10tb inst., aged about 71 years. Mr. Helmbacher went to St. Louis from Germany when a young man, about half a century ago. He became identified with tbe iron business, and founded tbe Helmbacher Forge and Rolling Mills, of which be was president for 35 years. He was president of the Lafayette Savings Bank for a number of years and was also identified with other large business enterprises.

The Rev. John Jackson Brown, LL. D., Professor Emeritus of Chemistry and Physics in Syracuse University, died on tbe 15th inst. He had been a sufferer from brain trouble for several years and had been incapacitated for work. Dr. Brown was born in Amenia, Dutchess County, N. Y., 70 years ago. He was Professor of Chemistry and Industrial Mecbanics at Cornell University from 1870 to 1871, Professor of Pbysics and Cbemistry in Syracuse University until his deatb. He was inspector of alcohol and coal oils and editor of *Humphrey's Journal of Photography* from 1865 to 1870, and subsequently editor of the scientific department of tbe *Northern Christian Advocate*.

James Boyce, the most extensive coal operator and sbipper in Maryland, died at Baltimore, Md., on the 16tb inst. He was born in 1823 in New York City. In a few years he obtained employment in a coal company's office, and it was not long before he started in business for himself. He went to Baltimore, was elected president of tbe Franklin Coal Company, a small concern at the time, but wbicb be succeeded in developing, and later he became the sole owner of tbe extensive bituminous mines of the company. He then acquired large mining interests in the antbracite regions of Pennsylvania, and during tbe war he made a large fortune, baving tbe contract to supply the government witb anthracite coal. After the war he established the George's Creek Coal Company, and engaged beavily in tbe shipping business, securing the contracts to furnisb the Atlantic liners, and having his own fleet of vessels running in tbe soft coal trade. He leaves a son in the coal business in New York.

SOCIETIES.

The United States Association of Cbarcoal Iron Workers bas been invited by tbe Mayor and Council of Toronto, Ont., to bold its forthcoming meeting at that city, and it is suggested that a date between tbe 8tb and 19tb of September would be most pleasing, as at tbat time tbe Industrial Exbibition will be held. In addition, the secretary of tbe Association is advised that an excursion will probably be made to the iron ore deposits nortbeast of Toronto, and that an invitation will be extended from the city of Kingston. If a sufficient delegation sbould participate, a visit can also be made to some of the Lake Champlain iron mines, en route home. As a general outline of the proposed trip, the following is suggested: Assemble at Niagara Falls, thence to Toronto, to the iron ore district, to Kingston and tbe Tbousand Islands, returning eitber via Lake Ontario or via Lake Cbamplain. Such a trip would require six or seven days.

The American Cbemical Society held a general meeting in tbe Columbian University building, Washington, D. C., on the 17tb inst. The meeting was opened with an address by President George F. Barker, who spoke upon tbe subject of general organization among cbemists in America. He advocated the union of all local chemical societies under the general organization of tbe American Chemical Society, tbe local societies to be branches of the national society wbile retaining tbeir individuality as local organizations. Among the papers read were: "Identification of Arsenic and Antimony," by James T. Anderson; "A New Form of Volt Meter," by G. C. Caldwell; "A Theory of tbe Mica and Cblorite Groups," by F. W. Clarke; "The Occurrence of Tin in Canned Goods," by H. A. Weber; "Composition of American and European Chestnuts," by William Frear. "On Acid Sulphate of Lime," by H. Endemann. "Gluten," by H. Endemann. Among tbe prominent chemists present were: Professor Caldwell, of Cornell University; Professor McMurtrie, formerly chemist of the Agricultural Department; F. W. Clarke, Cbief Cbemist of tbe Geological Survey; A. A. Breneman, formerly of Cornell University; Dr. George F. Barker, of the University of Pennsylvania; Dr. Prescott, of the University of Michigan; Professor Wiley, of the Agricultural Department; Dr. Lupton, of the University of Alabama, and Dr. Kedzie, of the Micbigan Agricultural College.

INDUSTRIAL NOTES.

The Lackawanna Iron and Steel Company bas shut down its lower mill for an indefinite period. Tbe mill will remain idle until an improvement in the rail trade warrants its resumption.

The wrought-iron nail men of the Worcester and Staffordshire districts in England have struck against a proposed reduction of 10 per cent. in their wages. The strike affects no less than 8,000 men and may eventually affect otber trades.

The Wenstrom Dynamo Company, of Baltimore, Md., bas stopped its operations temporarily on account of some internal troubles among the stockholders until a reorganization can be effected. The closing of the works throws 70 men out of employment.

Tbe Jeffrey Manufacturing Company, of Columbus, Ohio, bas in the hands of the printers a revised illustrated catalogue and price list showing all the chain links and specialties manufactured by it. A wrought chain is one of the latest additions to its already large list of chains.

The Chateaugay (N. Y.) mine tailings are to be treated in a mill whicb H. Conklin, tbe inventor of concentrating macbinery, is building. It is reported tbat tbe chief backers of the enterprise are persons identified with the Lackawanna Iron and Steel Company, and that the company will pay 50 cents a ton for tbe tailings.

Messrs. English, Morse & Co., of Kansas, Mo., manufacturers of steam and hydraulic machinery, tools and supplies, bave dissolved partnership, Mr. A. H. Morse retiring from the business. The Englisb Supply and Engine Company has been incorporated with a capital of $50,000 and will succeed the firm of English, Morse & Co.

The Alabama Rolling Mills Company, of Gate City, Ala., is pushing the work of rebuilding its plant very rapidly. The property was almost totally destroyed by fire a few weeks ago. The new mill will be increased in capacity by the addition of seven puddling furnaces. Operations will begin again about the 1st of September.

Light's rolling mill and the Lebanon rolling mill have partially resumed with non-union hands, but the situation at these works is said to be anything but quiet. The 50 non-union hands brought to Ligbt's mill, wbicb is inclosed by a high fence, are quartered in bouses on the property inside the inclosure and are fed there, not being allowed outside.

The Damon Iron Works and several adjoining properties at Cambridge, Mass., were destroyed by fire on the 18tb, involving losses aggregating nearly $300,000, divided as follows: Damon Safe and Iron Company, $200,000; Ed. Kendall & Co., $80,000; machinists employed by both firms, for tools, $10,000; Harvard Dry Plate Company, $8,500.

The Boston Iron and Steel Company's plant, at McKeesport, Pa., a new puddle mill of about 30 furnaces, with necessary muck rolls and hammers, bas been started up. Wben placed in full operation it will employ about 300 men. Work has already been commenced on a big finishing department for the mill, which is now under the control of the newly organized National Tube Works Company.

Tbe Great Western Iron and Steel Works are rapidly pusbing the building of the blast furnace and works at Kirkland, Wash. The blast furnaces will be 75 ft. bigh witb a 17-ft. bosb, and will bave a capacity of 1,000 tons of pig iron per week. The bot-blast stoves will be 72 ft. bigb and 26 ft. in diameter, of the Ford & Moncur pattern. The two blowing engines have steam cylinders 42 ins. in diameter, 5-ft. stroke, and will be capable of developing 1,500 H. P.

The Maryland Steel Company, of Sparrow's Point, Md., rolled its first Bessemer rails on August 7tb on an order from the Pennsylvania Railroad Company. One rail of 100 ft. was first passed through the finishing rolls, and cut in 30-ft. lengths by the same. On August 13th the first rails were produced without reheating. In one hour and twenty minutes after the metal bad left the furnace, it had gone tbrougb the entire process, and was transformed into four rails, without baving lost the initial heat.

Tbe Williams Typewriter Company, of New York, is about to offer to the public a new machine having tbe following points: Tbe writing is at all times in view of the operator, and the alignment is absolutely perfect, as each letter follows a guide in striking the paper; the ribbon is not used, the type being automatically inked; the keyboard has 27 keys, with a combination of 84 characters. Tbe action is very strong, and a manifold

through eight sheets is perfectly plain. The roll works on ball bearings and moves very easily, being of a light description.

The Southern Equipment Company, of Chattanooga, Tenn., makes the following statements regarding sales of phosphate machinery and supplies. From Jan. 1st, 1891, to Aug. 1st, 1891, aggregate sales $32,767.76; from Aug. 1st to 15th, $14,233.38; making a total of $47,001.14. The territory covered includes all of the Southern States, and also as far west as Arkansas, and north to Pennsylvania. Nothwithstanding the reported depression in business, this company intends erecting a factory and warehouse at Ridgedale, and will manufacture and carry a large stock of phosphate machinery at that place.

The New York *Sun's* usually well-informed London correspondent writes: The iron and steel industry in Great Britain is in a bad way. The Mossbay Iron and Steel Company has closed its works and discharged its employees; the steel departments of the West Cumberland Iron and Steel Works are also idle, and there seems no present prospect of an early resumption of work. In Workington alone, the headquarters of steel workers, over 6,000 hands are idle; and so destitute have many of these mechanics become that they are accepting parish relief. In Germany affairs are no better. The great steel works of Jarby & Bench, in Savona, have been definitely closed this week.

In an interview Sir Henry Tyler expressed himself as well satisfied with the progress of the St. Clair River tunnel works, and with the highly beneficial change which the tunnel will work for Grand Trunk traffic. He said: "The opening, which takes place Sept. 19, will be in the nature of an inauguration of the new fast passenger and freight service of the company between West and East. Soon after the formal opening both passenger and freight trains will commence running through the tunnel. Regarding the capacity of the tunnel and volume of traffic likely to pass through, nothing definite can be said until the tunnel is in operation. However, "a second tunnel will without doubt be built, and the prospects are that it will be commenced as soon as the present one is in regular working order." The cost of a second tunnel, according to Sir Henry, will not at all figure up as much as the first, on account of experience gained and the company having the machinery, plant, etc., on hand for the work. Of the prospects of traffic this fall Sir Henry speaks highly, saying that they were never better. He expects a large volume of freight from the Western States east, and also that the company's passenger traffic will increase.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

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

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office. No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

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

GOODS WANTED AT HOME

2,351. Machinery for a saw-mill. North Carolina.

2,352. Elevator for a large hotel. West Virginia.

2,353. Laundry machinery. West Virginia.

2,354. Lighting plant for hotel to cost from $75,000 to $100,000. West Virginia.

2,355. An engine lathe. North Carolina.

2,356. Machinery for manufacturing all kinds of chair stock, stair balusters, fancy spiral turned table legs, etc. North Carolina.

2,358. Machinery and tools for a canning factory to make and put up from 100,000 to 200,000 twelve and three-pound cans per year. South Carolina.

2,359. Medium sized portable stone crusher, engine and road roller, suitable for macadamizing suburban county roads. District of Columbia.

2,360. Shafting, hangers, pulleys, belting, dust separator, collector and blower. West Virginia.

2,361. A 6 horse power engine and boiler. Georgia.

2,362. Machinery for a steam laundry. Georgia.

2,363. Cast iron covering for a building 25 × 40 ft. Georgia.

2,364. Wrought iron picket heads for wrought iron fence and other small drop forgings. Alabama.

AMERICAN GOODS WANTED ABROAD.

2,357. Entire equipment for six miles of 3-ft. gauge railroad and two miles of city street railway, including rails, engines, force pumps, dump and transportation cars. Mexico.

GENERAL MINING NEWS.

OMAHA & GRANT SMELTING AND REFINING COMPANY.—The Omaha works continue idle, and the company is diverting ore to the Denver works. The striking smelter employés are by no means unanimous on the question of settling existing difficulties, as was manifested at a meeting on the 16th inst. One of the men who came out of the meeting before it was over declared that the strikers had agreed not to go back until eight hours were granted for each and every man, and that a schedule of prices had been formulated as follows: Furnacemen, $2; tappers, pot haulers, roaster tenders, kettlemen and all refinery men, $1.75, and roustabouts, $1.50. He was sure that the company would soon have to give in, as it had 500 cars of ore side-tracked at various stations between Omaha and Denver.

President Barton expressed his willingness to meet a committee of the strikers and settle the matter of wages with them, but not until after the works have been started on the old basis. Concerning the contract the men had signed, Mr. Barton admitted it was worthless. He is also advised by his attorneys that the eight-hour law is unconstitutional. He gave the men assurances that their grievances would be adjusted in good time if they returned to work, but that they must come back at the company's terms.

ALASKA.

ALASKA COAL COMPANY.—On the 13th inst, this company sent a full complement of miners and supplies from San Francisco to open its coal claims at Katchekmak Bay, Cook's Inlet. The expedition is in charge of Colonel L. D. Wilgus, of Pennsylvania. Reports are to the effect that the deposits in these mines are large and the coal the hardest ever discovered on this coast. The coal is said to be similar to the block coal of Indiana.

ARIZONA.

PIMA COUNTY.

(From our Special Correspondent.)

CROCKER MINING COMPANY.—The South drift, 440 level, is now advanced 172 ft., the face being in mineral-stained quartz, scattered through which are hunches of fair-grade ore.

PEER MINING COMPANY.—Ore continues to be extracted from the slopes, 100-ft. level, near the north line. The ore is of good milling grade and the vein looks well. The work of sinking has been resumed in shaft No. 1; it is now down 154 ft. with good grade ore showing in the bottom.

PEERLESS MINING COMPANY.—The south drift, 600 level, now extends 203 ft. The vein is strong in the breast with a smooth hanging wall, the formation being mainly quartz, showing fair grade ore.

WELDON MINING COMPANY.—The winze, 100 level, has been sunk 23 ft. The vein shows strong in the bottom, the formation being spar, talc and quartz, with bunches of good ore.

PINAL COUNTY.

SILVER KING MINING COMPANY.—At the delinquent sale of the shares in this company nearly all the stock advertised was sold for the assessment, and bought in by the company. There are now in the company's treasury about 56,000 shares out of 100,000 shares of the capital stock.

YAVAPAI COUNTY.

YUMA COPPER AND SILVER MINING COMPANY.—A meeting of the stockholders of this company has been called to discuss the situation of affairs at the mine and to consider other business in connection with the company. This other business is said to be the consideration of a proposition to convey to certain Eastern parties 200,000 shares of the stock of the company at 50c. per share, the money thus raised to be used in sinking the shaft to a depth of 1,000 ft.—it is now down only 300 ft. This, it is claimed, is the result of a recent visit to the East of some of the officers of the company, where they met and were in consultation with certain mining men and capitalists, and to whom they explained the situation, and to whom they desire to practically give an option on the 200,000 shares aforesaid, contingent upon an examination of the mine.

CALIFORNIA.

SAN FRANCISCO, Aug. 13.

(From our Special Correspondent.)

The assessments upon California mining stocks falling delinquent during the current month amount to $13,500.

Prof. F. Becker, of the Geological Survey, has just returned to the city from visiting the field surveyors who have been for some time investigating the auriferous deposits of this State between parallels 37½° and 40°. While of the opinion that the gold-bearing mines of California are far from being exhausted, it is the immense wealth hidden in the innumerable gravel mines, which could produce from $5,000 to $500,000 annually, that he thinks ought to be utilized and the law against hydraulic mining modified or altogether repealed. In Butte County alone he found 26 mines, to prevent whose operations injunctions had been served on the owners. Topographical and geological maps are being prepared, together with the result of the investigations of the several parties in the field, illustrating the conditions under which miners may expect to find gold and the quantities likely to be obtained. Several of these maps will be ready for issue toward the end of the year.

AMADOR COUNTY.

(From our Special Correspondent.)

CLINTON CONSOLIDATED GOLD MINING COMPANY.—It is the intention of this company to erect chlorination works to handle its shipments and when this is done the property will be one of the most completely equipped in the State. The claim belonging to the corporation covers 4,200 ft. on the strike of ledges which have been opened. There are three quartz veins from 14 ft. to 22 ft. wide with cross veins of from 4 ft. to 5 ft. in width. The formation is slate and porphiry. Two shafts have been sunk, one 360 ft. deep and the other 240 ft. The property of the company, which consists of six full claims, has also been opened by tunnels. The two ore bodies in the mine are known as the Union and Paugh chutes, which have yielded a large amount of ore. The veins contain mostly rihhon rock, charged heavily with auriferous sulphurets, running in some cases as high as $500 per ton. A gravity tramway, 800 ft. long, conveys the ore to the 20 stamp mill which crushes on an average 80 tons of ore per day. The mill is supplied with both water and steam power, the former being now in use, and consisting of a 6-ft. Pelton wheel working under a head of 355 ft. The water is conveyed to the mill by a pipe line 2,000 ft. in length. The stamps weigh 1,000 lbs. each, and a 9 × 15 Blake breaker is used to crush the ore. Eight Frue concentrators are in use, and all the accessories for the proper working of the property are of a most substantial kind.

CLINTON PEAK.—This quartz mine will in all prohability he ultimately merged in the consolidated Clinton & Macato company. It consists of 300 acres, and is an extension of the properties of those companies. There are two ledges upon the location having the same general formation and pitch as the Clinton, and capped with iron oxide and quartz, which prospects $300 per ton in free gold. A tunnel has been run 600 ft. and will be extended to a total length of 1,300 ft.

MACATO GOLD MINING COMPANY.—The property of this company adjoins the Clinton and is on the same ledge. The two claims belonging to the company are held under United States patents. A tunnel has been run 700 ft., opening up ledges in a slate formation. A shaft has been sunk from the tunnel level and is now about 200 ft. in depth. As depth is attained the ledge grows stronger and shows a large percentage of galena. At this point the ledge widens out to 18 ft. and some gold telluride is obtained. The 10-stamp mill is operated by water power, and is equipped with a Dodge rock breaker and six Frue concentrators. Near the town of Willard, on the company's property, ore from a 2½ ft. ledge of quartz in granite fomation is being worked by an arastra and good returns are heing obtained. When the Clinton and Macato properties are consolidated as proposed, many improvements will be made. The chlorination works to he erected will have a daily capacity of three tons. The mines will be supplied with three power drills and air compressors; 40 additional stamps will be added to the plant, and a three-compartment shaft will be sunk 500 ft. below the present tunnel level.

FRESNO COUNTY.

(From our Special Correspondent.)

MINARET.—The deposits of hematite and magnetite opened in this mine property are attracting considerable attention. Eugene H. Barton, U. S. Deputy Mineral Surveyor, thus describes it: "Width of vein, 300 ft. exposed; a perpendicular height of 1,500 ft. of vein showing plainly for two miles in length. Trend of vein southeasterly and northwesterly, standing perpendicular. Character of ore magnetite, and bright, specular hematite of extraordinary purity, notable for the entire absence of sulphur. The ore ranges from 64%, 65% and 66% iron, in quantity unlimited." The quality, according to assays from the State Mineralogist, is unexcelled by any mine on the continent. The mines are situated in the Minaret Mountains about 90 miles from the city of Fresno, and in a district that will be tapped by the San Joaquin Valley Railroad now in course of construction.

MARIPOSA COUNTY.

(From our Special Correspondent.)

A number of people owning locations in the North Fork mining district, which is embraced by the Yosemite Valley National Reservation, and who have been prevented from working their claims by the United States troops, have applied to the State Mining Bureau for aid. An expert will visit the valley to see if the North Fork district cannot he thrown open to prospectors, and if the facts are found to be as represented by the miners, their appeal to Congress to change the law will receive the endorsement of the Mining Bureau.

NEVADA COUNTY.

W. Y. O. D. MINING COMPANY.—The W. Y. O. D. clean-up on the 8th inst. was the largest in the history of the mine, says the Grass Valley *Tidings*,

the returns running considerably over the high average of the ore. The ledge is all that can be desired in the drifts, and in the shaft it is between 4 and 5 ft. in width and of good ore. All but 200 ft. of the shaft has been enlarged to 16 ft., and these 200 ft. are being cut down as rapidly as possible. Sinking is under way for the 900-ft. level. The new hoisting works are of ample capacity, the pumping engine, for instance, being of 150 H. P. The new 10-stamp mill will be in running order in a fortnight. It has four Frue concentrators, a Dodge rock-breaker and other improved gold and labor-saving appliances.

COLORADO.

CLEAR CREEK COUNTY.

COLORADO CENTRAL CONSOLIDATED MINING COMPANY.—John Turck has instituted suit in the United States Court against this company to recover $500,000, says the Georgetown *Courier*. He claims the company has extracted that amount of ore from the ground awarded him by a recent decision of the United States Circuit Court.

LAMARTINE.—During the month of July the Lamartine shipped 300 tons of ore.

OHIO GULCH MINING COMPANY.—Mr. Duncan Drummond, superintendent of this company, informs the Georgetown *Courier* that the tunnel is in about 400 ft. and going steadily ahead. The company owns a group of 20 claims, all of which will be cut by driving the tunnel 1,000 ft. The heading of the tunnel is in a large porphyry dyke.

SENATOR MINING COMPANY.—This company is reported to be working between 40 and 50 men on the Senator and Blue Ridge veins. Some smelting ore is being shipped, but the main product now is concentrating material, which is being put through the Mansfield mill at Dumont, which the company has leased. The mill is running night and day and handling a good deal of ore.

CUSTER COUNTY.

PHŒNIX LEAD COMPANY.—The following is the statement of receipts and expenditures of the Bull-Domingo Mining and Leasing Company, operating the Rull-Domingo mine, owned by the Phœnix Lead company, under lease, from July 15, 1890, to July 15, 1891:

Pounds of ore extracted, 2,713,363; total amount received from smelters, $112,883.23; average per ton, $72.45; ore account, $112,883.23; mining property, $461.12; H. H. Tompkins, treasurer, $524.68; total, $113,869.03; general expense, $3,425.35; mine expense, $2,669.40; mill expense, $1,526.30; coal at mill, $4,154.27; mine labor, $33,288.93; mill labor, $6,570.00; ore hauling, $2,799.33; Denver office, $1,020.60; hardware account, $4,318.93; dividends, $40,999.92; fuel and timber at mine, $6,315.98; royalty, $7,780.02; total, $113,869.03.

DOLORES COUNTY.

ENTERPRISE MINING COMPANY.—The subscription books of this company, whose shares were recently offered in New York, Boston and other cities of this country, were well filled. The shares were underwritten before being placed upon the market, so that the organization of the company was assured. Public subscriptions amounted to nearly $800,000, a large amount coming from Colorado.

LAKE COUNTY.

The smelters did an exceptionally large amount of work during July. Their reports are as follows:

Smelter.	Number stacks.	Tons of ore treated.	Tons bullion.
Arkansas Valley	7	7,500	760
American	6	8,500	863
St. Louis	4	2,300	220
Elgin	2	2,400	220
Total	19	20,700	2,063

LOUISVILLE.—This mine caught fire on the 17th inst. and is still burning. The loss will be heavy.

OURAY COUNTY.

VIRGINIUS MINING AND MILLING COMPANY.—The miners on the Virginius struck, on the 11th inst., to the number of over 100, because the management required them to use lamps instead of candles in the workings, they claiming that the smoke from the lamps made them sick.

PITKIN COUNTY.

EXPRESS SILVER AND GOLD MINING COMPANY.—This company has increased its capital stock from 200,000 to 300,000 shares. The par value of the shares is $10.

PUEBLO COUNTY.

PUEBLO SMELTING AND REFINING COMPANY.—The net sales and products of the Pueblo Smelting and Refining Company for six months ending June 30, 1891, were as shown below:

	Product.	Sales.
Silver, ounces	1,295,874	$1,405,324
Copper, pounds	844,036	92,514
Lead, pounds	8,962,480	337,774
Lead pipe, pounds	773,475	36,732
Total		$1,872,346

FLORIDA.

MARION COUNTY.

PHŒNIX PHOSPHATE COMPANY.—This company has been incorporated at Ocala and will do a general business in this county. The capital stock is $800,000. H. L. Anderson, B. F. Jordan, W. B. Lynch are among the incorporators.

PASCO COUNTY.

LACOOCHEE PHOSPHATE COMPANY.—This company has been organized, with A. J. Phares, Sr., President; T. W. Spicer, Vice-President, and C. M. Nicholson, Secretary, to develop 40 acres of phosphate land at Lacoochee, Fla. The capital stock is $50,000.

POLK COUNTY.

STANDARD PHOSPHATE COMPANY.—This company was incorporated last spring under the laws of Florida, with a paid-up capital of $500,000. J. H. Talbutt is the president, Nat. Poyntz treasurer, and R. E. Rose, general manager. The company owns 2,520 acres of phosphate land in the Peace River Valley. The eastern boundary of the tract reaches very near the Florida Southern R. R., extending westward a distance of three miles. Punta Gordo, the port for European shipment, is distant by rail about 40 miles. The present developments on the property consist of pits and soundings. Satisfactory results are said to have been obtained from examinations covering over 1,000 acres of the territory. Thirty-five pits have been sunk, some of them 19 ft. deep. Five samples from different pits gave, respectively, 68.25%, 69%, 64%, 70.14%, and 68.46% phosphate of lime, running in iron and alumina from 1.05% to 3.10%. The bottom of the deepest pit gave 70.14% of phosphate of lime, and only 1.05% of iron and alumina. The amount of money required to construct the needed railroad connections, to put in a dredging boat costing $15,000, and equip a plant capable of turning out 200 tons of phosphate per day, is estimated at $75,000. In order to obtain this money it is the intention of the company to issue bonds bearing 6% interest, secured by mortgage on all the lands and effects of the company. One hundred and fifty thousand dollars of the capital stock remains in the treasury of the company for purposes of development.

(From our Special Correspondent.)

BARTOW PHOSPHATE COMPANY.—This company has been incorporated at Bartow by local and Charleston S. C. capitalists. It is proposed to do a general phosphate business in this county. The capital stock is $250,000. Among the incorporators are Jas. Allison and W. B. Chisolm.

GEORGIA.

LUMPKIN COUNTY.

(From our Special Correspondent.)

In the issue of June 27th the ENGINEERING AND MINING JOURNAL made mention of the probable purchase and development of a pyrites deposit near Dahlonega, on the property of Col. Moore. Arrangements to that end have been going on since then. Prof. Pratt, of Atlanta, the expert who reported upon the property, advised its development by putting down test holes with diamond drills. A drill is now being put in place, and some half a dozen holes will be sunk with a view of ascertaining the character and extent of the ore body. In the event of satisfactory results being obtained, the property, which is bonded at present, will be purchased, and a plant erected for reduction of the ore, the sulphur contents of the latter being used for acid making.

FORT PAYNE MINING COMPANY.—This company, which has been operating the Capps mine, has shut down, and its Dahlonega office has been discontinued. It is reported that the results obtained were not satisfactory to the company.

IDAHO.

ALTURAS COUNTY.

CYCLOPS.—M. B. Loy, president of the First National Bank of Hailey; T. T. Loy, James W. Burns and others have taken hold of this mine, adjoining the Red Cloud group, at the head of Narrow Gauge gulch, Deer Creek, with the view of developing it. Mr. Burns is the superintendent. The Cyclops is probably a continuation of the Red Cloud ledge.

BOISE COUNTY.

The Moriarty Brothers' mine on Elk Creek, 10 miles north of Idaho City, has developed into a big property. After driving the tunnel into the hill about 100 ft. a crosscut was carried across the vein, which was found to be 45 ft. wide, all free-milling gold ore. This mine is on the same vein as the Forest King, Sub Rosa and Washington. The Moriarty Brothers have commenced the construction of a wagon road from Idaho City to the mine. In the vicinity are many other promising locations. The Washington is still yielding largely of gold. The station has been cut out on the 300-ft. level, and the mine reached by a crosscut, where it has been found to be rich in both gold and silver and very large. Mr. Charles Balbach, the principal owner, has ordered new hoisting works and a cage.

OWYHEE COUNTY.

DE LAMAR MINING COMPANY.—During the month of July 1,500 tons of ore were crushed, producing $44,795 bullion; estimated value of shipping ore was $13,000; miscellaneous receipts, $1,430; total revenue, $59,225; total expense on revenue account, $28,000. Extensive explorations were made during the month whereby the expenses on revenue account were materially increased.

FLINT MINING COMPANY.—Work on this company's mines is being pushed. New tracks are laid in all the tunnels, and the work of developing new ground is going on. This work has already developed several large bodies of rich ore. The mill has proved a success on low-grade ores such as will not stand shipping to Denver. The parties in charge say they intend increasing the mill capacity at once. The mine is in shape now to earn dividends without the profits of the mill, the new bodies of ore recently found being rich enough to ship.

LAST CHANCE.—This mine at Flint is said to have become a very rich property; 4 ft. of 200 oz. silver ore is showing in the face of the north drift, 2 to 3 in. of it assaying 2,000 oz. silver.

POORMAN MINES, LIMITED.—Tunnel No. 3 has been connected by a short crosscut west with the north shaft. The ore recently found in the face of the tunnel still continues. It is now proved, says the Idaho *Avalanche*, that this ore is the continuation of the original body, from which nearly $6,000,000 was taken out, going to a depth of 200 ft. by windlass. Afterward what is known as the north shaft was sunk to a depth of 400 ft. by machinery for purpose of continuing work on the bonanza chute of ore. This shaft missed the ore, and it was supposed that the ore did not go down. The work now being done shows that the shaft at 350 ft. deep was within less than 4 ft. of the ore The amount of virgin ground above tunnel No. 3 is fully 150 ft. or up to where work was discontinued in the discovery shaft. Three to four carloads of rich ore is obtained each day from dr fting. As soon as stoping is commenced a big output from the mine can be relied on.

RUTH.—Three different tunnels are being driven by day and night shifts. The upper tunnel is on the same level as No. 3 tunnel of the Poorman, from which a drift is now being run north to connect with this tunnel. The middle tunnel on the Ruth is 175 ft. lower than tunnel No. 3 of the Poorman. A cross-cut from this into the Poorman would enable the Poorman Company to gain 175 ft. more in depth at a very little expense. The latter company may be able to make an arrangement to this effect with the Ruth owners.

STODDARD.—The new incline shaft is now down 25 ft. on the hanging wall of the lode, which is about 5 ft. wide.

STORMY HILL.—Some very gold ore is being mined by the small force of men working in this property, and the small hoisting engine is taxed to its utmost capacity. The ore was struck in drifting south on the 200-ft. level.

TRADE DOLLAR MINING COMPANY.—The group of mines recently acquired by this company consists of the Trade Dollar, Jim Blaine, Black Bart, Gold Dollar, Jumbo and Allegheny claims. At the Jim Blaine a force of miners is engaged in driving tunnel No. 2, which is now in 375 ft. and which will be continued 1,100 ft. further, into Trade Dollar ground, and will eventually be the working tunnel for these two properties, says the *Avalanche*. Tunnel No. 1 of the Blaine is 120 ft. in length and connected with No. 2 by a winze 112 ft. deep. A very rich streak of gold ore has recently been struck in the face of No. 2 tunnel. A cross cut is being run from this tunnel to cut the East Blaine, a parallel ledge. It is now in 28 ft., and the face shows considerable quartz, demonstrating that the ledge is not far distant. At the Trade Dollar work is progressing in all three levels. No. 1 is in 460 ft., attaining a depth of 250 ft. from the surface, and shows good ore in the face. Stoping is going on, and rich shipping ore is being sacked. In No. 2, which is now in 560 ft., and 67 ft. lower than No. 1, a crosscut is being run west to cut the rich chute of shipping ore found in No. 1, and which dips to the west. This crosscut is 460. ft. from mouth of tunnel; 490 ft. in a crosscut is being run east to intersect the big ledge which lies parallel to the Trade Dollar vein. No. 3 is 62 ft. lower than No. 2, and is in 112 ft. The rich chute found above at the mouth of No. 2 has just been cut and this tunnel will be pushed ahead as fast as possible. Besides the ore which is being sacked, some 200 tons of high-grade milling ore is piled in the ore house waiting the erection of the company's new mill. The mill will be located in Long Gulch, and the machinery has already been ordered, and will be delivered in September. The engine ordered is a 150 H. P. compound condensing Corliss, with a high pressure cylinder 12 × 36 in., and low pressure cylinder 22 × 36 in. The balance band wheel is 14 ft. in diameter and weighs 7 tons. Two tubular boilers will supply the steam, each of 75 H. P. The whole mill will have all modern improvements, and will be completed this fall. An incline tramway will connect the mill with the upper workings.

INDIANA.

SULLIVAN COUNTY.

PITTSBURG COAL AND COKE COMPANY.—Fire almost completely destroyed the machinery in this company's mine at Alum Cave on the 15th inst. There has been a strike at the mine for some time, and it is thought the fire was of incendiary origin. The company estimates the loss at $100,000, with two-thirds insurance.

MAINE.

SAGADAHOC COUNTY.

The prospectors who have been drilling at Cape Small Point, on the Kennebec River, have struck a vein of coal 2 ft. thick, at a depth of 870 ft. It is

reported that the members of the company are now trying to buy the land in the immediate vicinity. According to the reports received here the deposit resembles English cannel coal. For many years fragments of coal have been washed ashore at Cape Small Point after every heavy storm, and it was to ascertain whence they came and the extent of the deposit that the present operations were begun.

MICHIGAN.

The Michigan State Board of Equalization opened its session on the 17th inst., at Lansing, with representatives from seventy counties. It is the most important meeting ever held, as the special tax has been taken off mines in the upper peninsula and a direct tax substituted, making a difference of millions in equalization. The Board will adjourn next week and make a tour of the state to determine valuation, especially of upper peninsula mines.

COPPER.

ARNOLD MINING COMPANY.—Capt. Moyle, the agent of this mine writes: "I am more than pleased with the appearance of the bed in going deeper. Some of the rock is looking very rich for copper; all of the rock coming from sinking the shaft is good stamp rock. Machinery is working well and we are making good progress in sinking the shaft."

CALUMET & HECLA MINING COMPANY.—The annual stockholders' meeting of this company was held in Boston on the 19th inst. About 20 persons, representing 68,405 shares, were present. The Board of Directors was re-elected with the exception of Mr. Wright, at present in Europe. Thomas L. Chadbourne was elected the Michigan Director until the return of Mr. Wright. The Board now stands: Alexander Agassiz, Quincy A. Shaw, Francis L. Higginson, F. W. Hunnewell, Thomas L. Chadbourne. President Agassiz said that, owing to the great drought, the mine would have been closed for four or five weeks had it not been for the two pumps of the Lake Superior Water Supply Company, owned by the company which pumped water from Lake Superior to the mine.

NATIONAL MINING COMPANY.—Work was begun at the stamp mill July 29th, with one head of stamps, running half time. After September 1st it is expected that the mill will run full time, when something like 100 tons of mineral will be produced monthly. The agent writes that the eleventh level east of the crosscut in the amygdaloid vein is turning out rich stamp rock. It is probable that the crosscut at the twelfth level will strike the amygdaloid about the 25th inst.

NORTH TAMARACK MINING COMPANY.—The management has decided to run the pumps and drills by electricity. A building is in course of erection near the boiler-house at No. 4, to contain the engine, which will have 250 H. P., and the dynamos. No. 3 shaft, which is now down about 1,250 ft., was with two drills sunk 90 ft. last month. No. 4 shaft, in which much difficulty has been experienced with water, is down about 1,030 ft.

(From our Traveling Correspondent.)

PENINSULA COPPER MINING COMPANY.—A meeeting of the stockholders of this company was held at No. 80 Broadway, New York, on the 13th inst., for the purpose of taking action relative to the disposal of the company's property. Mr. H. L. Terrell, the owner of 41,346 of the 80,000 shares, was authorized to sell the property if he deemed it advisable. Parties are negotiating a sale which, if consummated, will be followed by the investment of a considerable sum of money in a thorough equipment and systematic development of the mine. Pending any action which may be taken the mine will be wrought as before.

In addition to Mr. H. L. Terrell, the principal shareholders are as follows: King & Wheeler, 13,134 shares; C. R. Cummings, 6,840 shares; Wm. L. Boyle, 2,000 shares; O. E. Cleaves & Son, 1,754; D. P. Eels, Trustee, 1,600; Edgar M. Johnson, 2,000; John G. Moore, 2,000; C. M. McGhee, 2,000; J. B. Schley, 2,000; E. M. Wilson, 1,555.

Following is given a summary of the condition of the property on December 31st, 1890: Actual cash paid in on capital stock, $350,000; amount of capital paid in by the conveyance of property to the corporation, $2,150,000; entire amount invested in real estate, $175,000. Entire amount of personal estate: cost of construction and plant, $161,669 05; cash on hand, $1,802.01; fuel on hand, $10,855.57; supplies on hand, $6,058.15; total, $180,384.78; floating or unsecured debt, $42,936.84; amount due the corporation, $5,804.51; number of tons of copper obtained for the year ending December 31st, 1890, 554,660.

The capital stock of the company was on July 1st, 1890, increased from $1,000,000 to $2,000,000. Of this amount one-half was subject to call and assessment upon the stockholders; $122,602 has been paid in, leaving $877,398 subject to call.

GOLD.

PENINSULA MINING COMPANY.—At this company's mine prospect work has been stopped. The shafts are full of water, and the mining captain, Thos. Trevithic, has accepted a position elsewhere. What the intentions of the company are regarding the property is not known, but it would look as if it expected to give up the lease, which is valueless, says the Ishpeming *Iron Ore*, under the present condition of things.

ROPES GOLD AND SILVER MINING COMPANY.—The bullion product of this mine for July exceeded $5,000. Adding to this the concentrates will make the total nearly $6,000.

(From our Traveling Correspondent.)

We inspected several pieces of rock the size of a man's fist that were taken from the Michigan gold mine on the 11th inst. They would assay $10,000 to the ton, and came from a pocket in No. 4 shaft that is sinking. The discovery has stiffened the backbone of the management, and the property, under the management of Supt. Zukoski, recently of the California gold fields, will be given a thorough test. This will mean more extensive openings than have heretofore been made.

IRON—MARQUETTE RANGE.

REPUBLIC IRON MINING COMPANY.—Gas is still generating in the mine, which would indicate that there is still timber burning underground. Nos. 1, 7 and 8 pits have been closed, but it is thought that a resumption of operations at these points will commence shortly. Various sums have been set forth representing the damage caused by the fire. The fire cannot extend to other portions of the mine.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

The mines throughout the district put in full time last week and made the usual heavy output of ore. The zinc ore market has remained steady for the past three weeks at about an average of $23 per ton. Lead ore sold at $25.50 per thousand up to Saturday morning, when it dropped to $25.25. There are several new strikes of zinc ore reported from Newton County, along the line of the Beef Branch district.

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

Joplin mines, 1,188,700 lbs. zinc ore and 179,100 lead: value, $17,042.

Webb City mines, 722.040 lbs. zinc ore and 70,100 lead; value, $10,055.50.

Centerville mines, 1,659,260 lbs. zinc ore and 58,370 lead; value, $20,546.

Zincite mines, 296,000 lbs. zinc ore; value, $3,626.

Galena, Kans. mines, 848,890 lbs. zinc ore and 97,800 lea i; value, $11,783.

District, total value, $63,052.56.

The Roaring Springs Land and Mining Company, operating just south of the city, is now working on a good run of ore at a depth of 140 ft., and last week made a turn in of 34,200 lbs. of zinc ore. Mr. Hoover, the superintendent, has been prospecting all summer, and finally caught the run of ore by drifting and cross cutting.

The Manhattan and Little Nugget mines on the Sterling Lead and Zinc Company's land produced last week 43,730 lbs. zinc ore.

The Lead and Zinc Association of southwest Missouri and southeast Kansas is just in receipt of a letter from its agent, Mr. A. V. Weisse, whom it sent to Europe some time ago to present the zinc interests of this district with a view of opening up a new market. Mr. Weisse states that the smelters of Belgium and Germany are much surprised at the samples of ore shown them, and find from analysis that they contain from 54% to 64% metallic zinc. At first they were inclined to think that the samples had been selected with extra care as to richness, but when they were convinced that they were grab samples from the ore bins throughout the district they wished for information as to the amount this district could produce, and when informed that the supply was almost inexhaustible they commenced to investigate rates of freight, etc. The Lead and Zinc Association held a special meeting to-day to take action on Mr. Weisse's letter, and if the matter is properly handled this district should soon be making regular shipments to Belgium and other smelting points in Europe.

MINNESOTA.

Vermilion Range ore shipments from Two Harbors for the season, as reported by the superintendent of docks, up to August 12th, are as follows:

Minnesota	261,007 tons
Chandler	182,990 "
Total	443,997 "

IRON—VERMILION RANGE.

(From our Traveling Correspondent.)

ZENITH MINING COMPANY.—This company is the lessee of 80 acres of land lying east of the Chandler Iron Company's property. The controlling interest in the fee is owned by the Harvey Iron Company, which recently settled all of its contestants' claims. Three lenses of high-grade hematite Bessemer ore have been opened, showing the ore bodies to compare favorably with others on the range. The property is being developed with an idea of its producing 30,000 tons in 1892. The Duluth & Iron Range Railroad will be exteuded to the location.

MONTANA.

JEFFERSON COUNTY.

ELKHORN MINING COMPANY, LIMITED.—The secretary of this company writes to us as follows: We have received the following information from the mine: During July the mill ran 28 days, crushed 918 tons of ore, and produced bullion value $36,285. Smelting ore sold, 285 tons, valued at $17,273. Total produce, $53,558; total expenses, $22,790. Bullion produced for week ending August 8th, $8,410.

NEVADA.

(From our Special Correspondent.)

The mining assessments falling delinquent during the current month in the State amount to $381,150.

ELKO COUNTY.

(From our Special Correspondent.)

NAVAJO MINING COMPANY.—At the annual meeting of the stockholders of this company on the 11th inst., 80,277 shares were represented, and the following directors elected for the ensuing year: E. Scott, president; F. A. Berlin, vice president; J. T. Shackleford, M. A. Jackson and J. W. Pew, directors. J. W. Pew was re-elected secretary and his financial statement showed an overdraft amounting to $11,769.68, which is offset by $12,000 due from other companies on pumping account.

GRAND PRIZE MINING COMPANY.—Thomas Cole has been appointed president of the company, to fill the vacancy caused by the death of John E. Dixon.

NORTH COMMONWEALTH MINING COMPANY.—An intermediate drift has been run on the vein level from the top of No. 2 raise, in fair-grade ore, the average assay of a car sample being $62 per ton. The north drift from No. 1 winze has been advanced 28 ft. in vein matter.

EUREKA COUNTY.

EUREKA CONSOLIDATED MINING COMPANY.—It is reported that there is lead valued at about $50,000 at this company's mine awaiting shipment.

LINCOLN COUNTY.

PIOCHE CONSOLIDATED MINING & REDUCTION COMPANY.—Official advices state that this company is laying a broad foundation for thorough and permanent work in this section of the country. It has in addition to a model smelting plant of large capacity constructed nearly 20 miles of railway by which the ores will go to the works all the way by gravity. The mines are reported in excellent condition with extensive ore reserves ready for extraction.

STOREY COUNTY—COMSTOCK LODE.

The Woodworth mill, on the Carson River, shut down on the 10th inst. for want of water.

Owing to the small volume of water in the Carson River the Brunswick mill, at work upon Overman ore, is running to only half its capacity.

The dismantling of the California Pan mill was begun on the 12th inst., says the San Francisco *Evening Post*, preparatory to its demolition. This will be followed by the tearing down of the California Battery mill of 80 stamps, which will be useless after the Pan mill is demolished. The Pan and Battery mills were erected immediately after the discovery of the bonanza in the Consolidated Virginia & California mines in 1874, and turned out in the two years following nearly $100,000 daily in gold and silver bullion from the crushing of 320 tons of ore every 24 hours. The cost of the plant in both mills exceeded $1,500,000, and the ownership was vested in Messrs. Fair, Mackay, Flood and O'Brien, representing the Pacific Mill and Mining Company. From 1875 to 1878 the two mills turned out above $30,000,000 in bullion. In 1887 the mills were operated by water power transmitted to the surface on wire ropes from the 1740 level of the C. & C. shaft. A volume of water with a fall of 2,000 ft. discharged on Pelton wheels, furnished the power. The cost of that plant exceeded $300,000, and it was found too expensive on account of the rapid wear of the wire cables. The management states that the dismantling of the mills is done for the purpose of saving $10,000 annually in taxes and wages of watchmen.

ALTA MINING COMPANY.—At the Alta the Cornish pumps have been started, and they are now raising 800,000 gallons of water daily over and above the quantity raised by the bailing tanks. They started smoothly and easily although they had been idle and submerged nearly seven years. The pump rod was found to be perfectly sound, with the exception of one length of 42 ft.

BELCHER MINING COMPANY.—It is known, says the Virginia *Enterprise*, that Belcher has a good deal of gold-bearing ore in the neighborhood of its 1,900 level, which has not been well prospected. Crown Point is also well fixed for ore, and the Alta people are anxious to prospect just at about the point where the pumping operations will leave them.

CHOLLAR MINING COMPANY.—During the month of July 2,280 tons of ore from the Chollar mine were worked at the Nevada mill, producing bullion of the gross assay value of $27,018. The cost of reduction was $15,960, leaving net proceeds in bullion of $11,058.69. The assay value per ton was $19.25, and the ore was worked up to 65% of its value, or $12.50 per ton. The gross average yield per ton was $11.85, and the net average $4.85.

JULIA CONSOLIDATED MINING COMPANY.—At the annual meeting of this company on the 12th inst., the following directors and officers were elected: Thomas Cole, president; C. Hirshfeld, vice-president; C. W. Kelogg, W. W. Erskine and Thomas Anderson. J. Stadtfeld, Jr., was appointed secretary, and Bank of California treasurer. The

company had a cash balance of $714.85 on August 1st. An assessment, of 10 cents per share, was levied at the meeting. It will be delinquent September 16th.

POTOSI MINING COMPANY.—At the Potosi crosscutting has commenced simultaneously on the 1,100, 1,200 and 1,300 levels. The 1,300 level south drift extends over 300 ft. into Bullion ground. From the 1,800 level of the Ward shaft in Bullion ground there is a drift that runs to the Exchequer line. On the 1,500 level of the Potosi incline there is a station cut out from which a drift is being run south. This preparatory work opens out for exploration a section of mineral country 1,500 ft. in length by 400 ft. in depth.

SAVAGE MINING COMPANY.—The official letter from the Savage mine for the past week contains the following: During the week have hoisted 619 cars of ore from the 500, 750, 950 and 1,400 levels. Shipped to the Mexican mill 539 tons, and milled 588 tons, average battery assay $19.36. Have bullion on hand amounting to $9,733.36 on August account. Are still retimbering the Sinaloa shaft to its connection with the E-street tunnel. The west drift from the new station, Potosi tunnel level, was advanced 27 ft., making its total distance 323 ft. On the 1100 level the north drift from Hale & Norcross side was advanced 15 ft., making its total distance 260 ft. from the south boundary; face is in quartz and porphyry. The east drift from new station of the Savage shaft on this level is advanced 90 ft. On the 1400 level the northwest drift from the station at bottom of the 1300 winze is advanced 28 ft., face is in porphyry and stringers of quartz. The Hale & Norcross north lateral drift, 1500 level, having reached our south boundary, was taken by this company and advanced into our ground 10 ft.

(From our Special Correspondent.)

SAN FRANCISCO, Aug. 13.

The following is the weekly statement of ore from Comstock mines milled, with the battery assay values:

Mine.	Mined, tons.	Milled, tons.	Assay Value. Aug. 8.	Aug. 1.
Con. Cal. & Va....	1,374	1,290	$24.55	$24.50
Chollar.....	157	157	19.11	19.40
Justice.....	175	175	18.41	18.41
Occidental.....	315	305	18.15	17.30
Overman.....	767	751	*13.58	....
Savage.....	†619	539	19.36	20.00

* Car samples $17.92. † Cars of ore.

CROWN POINT MINING COMPANY.—The sinking pumps are holding the water below the 1,700 station. On this level the pump station is a little more than half cut out and all timbered closely. The 14-in. water column, which will be needed for the station pumps, is being put in position.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—During the month of July there was worked at the Morgan and Eureka mills 9.870 tons of ore. Total bullion produced: Gold, $83,031.55; silver, $101,978.77; total, $185,010.32. Average yield in bullion per ton: Gold, $8.41; silver, $10.33; total, $18.74. Average assay value of ore, $24.25. The profits on the July product are said to be about $30,000, which, with the $230,000 previously on hand, would mean $260,000 at the beginning of the current month. A 50-cent dividend, amounting to $108,000, was declared this week, payable on the 17th. Deducting the amount of the dividend there will be left in the treasury $150,000. This month the bullion product of the mine will be small, as the Eureka mill has been closed down. The ostensible reason for closing down this mill is on account of the low water in the Carson River. The unregenerate, however, do not hesitate to say that it is to clean up slimes and gobble the mill owners' "perquisites." It was intended to have closed down the Morgan instead of the Eureka mill, but the Philistine element conveyed an intimation that if the Morgan was closed down there would be an injunction suit brought that would make things unpleasant. The Eureka was therefore closed down.

KENTUCK CONSOLIDATED MINING COMPANY.—The south drift from the north raise, 1,000 level, is out 30 feet. The pay streak continues in the face and varies in width from 14 in. to 30 in., and assays from $16 to $30 per ton.

OPHIR MINING COMPANY.—The 299 tons of ore shipped to the Morgan mill has yielded bullion of the assay value of $7,043.88.

OCCIDENTAL CONSOLIDATED MINING CO.—The raise from the 550 level at the head of No. 2 winze is up 22 ft., the top being in good ore. South drift No. 2 crosscut 650 level has been advanced 12 ft., the face being in ore averaging $32 per ton. The company has shipped 25,000 lbs. of concentrates to Salt Lake City.

WHITE PINE COUNTY.

CORNELL.—Negotiations are under way for the sale of this mine on White Pine Mountain. The mine is said to be yielding about $500 a day, with 6 men employed. The ore is a gray carbonate, going over 60% in lead and from $26 to $29 per ton in silver and gold.

NEW MEXICO.

New Mexico is preparing a mineral exhibit for the World's Fair. Judge W. T. Thornton, president of the New Mexico managers, says: "In my opinion New Mexico's mineral exhibit especially demands great attention, and I am pleased that its collection and arrangements have been placed in such eminently able hands. We have employed Professor J. C. Carrera, of Las Cruces, to superintend this work, and are sure that it will be done thoroughly and well. A full and complete exhibit should be made, showing the vast and varied mineral wealth of the territory, and to this end we earnestly request the co-operation of all whose interests lie in the development of these resources." The New Mexican board offers a $200 gold medal for the best mineral exhibit of the territory. Professor Carrera, of La Cruces, will give any information asked.

SANTA FE COUNTY.

SANTA FE COPPER COMPANY.—Commenting on a letter in our correspondence column, last week, the Boston *Transcript* says: "So far as it relates to treating 2% ore, no exception is taken to the figures. The fact, however, is that Santa Fé ore runs higher than 2%. That 2% ore is not susceptible of working or concentration at a profit does not admit of argument. Everybody connected with the Santa Fé mine readily admits this. The reason why such ore has been concentrated is this: Some months ago parties in New York who controlled the Luhrig concentrator asked permission to put one up at the Santa Fé mine, claiming that it could produce wonderful results on low-grade ore. The Luhrig concentrator was put up and the 2% ore was selected by the Luhrig people for their experiments. The result of its workings was satisfactory. This action was independent of the company, as it works no such ore. In June the Santa Fé ore ran a little over 7½%, and in July the average was 9½% by the official returns of the superintendent. The matte averaged 55% of fine copper in these months, 16 oz. of silver and 1 oz. of gold to the ton. The shipments in June were 165,000 lbs. of matte, equal to 90,750 lbs. of refined copper. The July product was the same, practically, although exact figures have not been received. For August much larger product and shipments are indicated by the superintendent's advices. The Santa Fé people feel well satisfied with the results thus far obtained, and feel that the mine is doing very well, all things considered, with every prospect of profitable operation. The mine is now earning expenses, and enough over to pay off old claims and to give a very good outlook for making money, especially if the new vein, now being tested, realizes early promises of richness."

PENNSYLVANIA.

The final report of the State Geologist, J. P. Lesley, on the Second Geological Survey of Pennsylvania, is now in press. The volume gives a summary of the seventeen years' work of Professor Lesley and his associates, and will conclude the work of the survey. Since June, 1874, nearly 40,000 specimens of rocks and minerals have been collected, forming an invaluable series for engineers and students. The State Legislature has appropriated $100,000 for the display of this collection, and by January 1, 1892, it will be arranged in the building which is now being erected adjoining the academy of Natural Sciences, at Nineteenth and Race streets. A special report upon every county in the State has been published, making over 100 volumes that have been issued. The coal, iron and oil interests of the State have been the subject of special investigation, and the volumes issued upon those subjects are of great value to scientists and business men. The extent of the natural gas and oil supply was first determined by the Survey, and statistics were prepared with the assistance of Mr. Fulton, an experienced engineer, showing the extent of the supply and estimating the rate of decrease. The geologists predicted at that time the present condition of the oil field—gushers that began with a flow of 4,000 to 5,000 barrels daily are now working on the "grass-hopper" plan, 20 to 30 wells being pumped by one engine and yielding a flow of 400 to 500 barrels per day.

COAL.

ACHESON COKE COMPANY.—This company, of Dunbar, received its charter on the 10th inst. The incorporators are Col. J. M. Reid, of Connellsville, T. J. Donahue and J. H. Harrison, of Pittsburg, and J. S. Dillinger, of Pennsville. The company has purchased and is operating the Anchor Coke Works. The capital stock of the company is $20,000.

OLIVER COKE AND FURNACE COMPANY.—This company was chartered on the 13th inst. It is building 300 ovens at Redstone Junction, near Uniontown, and will shortly contract for the building of 300 more. The output will be used by the Oliver Iron and Steel Company in its furnaces at Pittsburg. If more is manufactured than can be consumed by the Oliver Iron and Steel Company it will be placed on the market. The company is composed of David B. Oliver, Henry Roberts, Jas. B. Oliver, Stephen W. Tener and Charles D. Fraser, of Pittsburg. David B. Oliver holds 780 shares and each of the other incorporators five shares each. The capital stock is $400,000. The office of the company will be in Pittsburg. The Oliver Iron and Steel Company has purchased a tract of land in Unity township, near Derry, from H. W. Oliver, Jr., for $200,000.

IRON.

In making the excavation for the new supply reservoir at Lebanon, 3 miles east of Cornwall, the workmen uncovered an 18-ft. vein of iron ore. The land on which the new deposit was found is owned by William C. Freeman, who is also largely interested in the Cornwall mines. An assay of the ore shows that it contains from 65% to 70% of iron.

OIL.

The McCormick test well, drilled by McCandless & Co., at Bentleysville, Washington County, has been drilled to a depth of about 2,500 ft. and abandoned. All the oil and gas rocks usually found in that county were drilled through and were barren, except the Gantz, which had a little gas. The Pittsburg coal vein was found at 180 ft.

WASHINGTON REFINING COMPANY.—This company has built a loading track west of Washington, on the Baltimore & Ohio road, and will load cars with crude and refined oil for the Eastern cities and for export. The oil will be carried from New York in tank steamers to foreign ports. The freight on a barrel of oil from Washington to Europe is about $1.

SOUTH DAKOTA.

The reopening of the Deadwood Mining Stock Exchange is again being agitated, and there is no good reason why it should not be done, says the Black Hills *Times*. The various mining companies that paid for the privilege of having shares quoted, are entitled to what they have paid for. By having a daily call the actual value of stocks would soon become known. As matters are at present, there is a good deal of guess work about quotations.

Newcastle is shipping about 60 cars of coal per day, says the Black Hills *Times*, and the coke ovens have again been started. At least 25 ovens will now be kept running continuously. One oil well was put down to the depth of 1,400 ft., when difficulties arose in the way of a surplus of water and impediments that necessitated the drawing of casings. A cave occurred and matters now stand *statu quo*.

LAWRENCE COUNTY.

DEADWOOD & DELAWARE SMELTING CO.—The furnaces are again in full blast.

GOLDEN REWARD CHLORINATION WORKS.—The clean-up for ten days is under way, the works being temporarily shut down to permit the rebuilding of the dust chamber. A White & Thompson roaster will replace two of the Brückner cylinders now in use; its capacity will be 60 tons per day. Those now in use are insufficient for the capacity of the three barrels, which is 80 tons per day.

LEAD CITY GOLD AND SILVER MINING COMPANY.—A deal was consummated on the 12th inst., whereby the controlling interest in this company passed into the hands of A. D. Clark and parties from Iowa and Illinois. After the purchase was made, a meeting of the stockholders was held. The following board of directors for the ensuing year was elected: A. D. Clark, Wm. Welden, W. A. Rinehart, Jos. Moore and W. A. Wilson. At a meeting of the board of directors, W. A. Wilson was chosen president and Joseph Moore secretary and treasurer. The property of the company is in Ruby Basin, south of the Carthage and Ross-Hannibal mines. An average assay of the ore body gives returns of $37 per ton in gold and silver. The new owners have put a force of men to work extending present open cuts and tunnels.

PENNINGTON COUNTY.

SPOKANE.—Arrangements have been perfected, says the Rapid City *Journal*, for the concentration of the ores from the Spokane silver mine at the Glendale mill which is only about 2 miles from the mine. By this arrangement the owners will realize considerably greater profit in working the mine, as there is quite a quantity of ore that is hardly rich enough to pay for shipping to Omaha or Denver, but which will pay a nice profit by concentration in the Hills. This will also create a larger demand for a number of men, both at the mine and at the mill.

TENNESSEE.

ANDERSON COUNTY.

(From our Special Correspondent.)

TENNESSEE COAL MINING COMPANY.—Latest reports from Briceville are to the effect that the State Board of Prison Inspectors has ordered the immediate removal of the convicts there. It appears that this action is taken in consequence of an investigation of the condition of the mine and works by the mine inspector, who reported, that there were several serious violations of the mining laws. In the first place, there is but one shaft to the mine and no ventilation. the mine being filled with stagnant air; in places there is over a foot of water to stand in; the roof of the mine is not properly supported; the stockade was not secure, allowing the convicts to escape, and that the sanitary conditions of their quarters were very bad. The lessees are given the option of returning them to the main prison at Nashville or o sending them to any other branch prison.

UTAH.

IRON COUNTY.

Mr. Thomas Taylor, of Cedar City, writes to the *Bulletin* of the American Iron and Steel Association that he and some other gentlemen have incorporated a company to build a blast furnace in Iron County. They started work on the furnace but have had to stop for lack of funds. Iron County ha very extensive deposits of iron ore and coal, both of which are easy of access. Concerning these deposits Prof. J. S. Newberry, of the Columbia Schoo

of Mines, of New York City, says: "These ore beds have been long known, and were to some extent utilized by the Mormons in their first advent. They constitute, perhaps, the most remarkable deposit of iron yet discovered on this Continent. The iron region lies nearly 200 miles directly south from Salt Lake City, and is situated in what is really the southern prolongation of the Wasatch mountains. The iron ores occur in the northern portion of a subordinate range, which attains its greatest height in Pine Valley Mountain, near Silver Reef. The ore beds form a series of protruding crests and masses set over an area about 15 miles long in a northeast and southwest direction, and have a width of three to five miles. Within this belt the iron outcrops are very numerous and striking, and many claims have been located upon them. The most impressive outcrops are in the vicinity of Iron City, Oak Springs and Iron Springs. Near Iron City, the 'Big Blowout,' as it is called, is a projecting mass of magnetic ore, which shows a length of 1,000 ft. by a width of 500 ft., and rises in castellated crags 100 ft. or more above its base. There is considerable diversity in the character of the ore, although it is about equally divided in quantity between hematite and magnetite. Some of the beds of both are exceedingly dense and compact, while others, though rich in iron, are soft and can be mined with a pick. Most of the ore is very pure, containing a small amount of earthy matter and no foreign minerals."

SALT LAKE COUNTY.

Petro Mining Company.—This company has begun its survey for a long tunnel from the Cottonwood side through the hill to the Petro mine in Carr Fork gulch, Bingham. This tunnel will cut through the Democrat and Adella claims, owned by the company, and will shorten the distance in taking the ore to the cars by about a mile. Another object in driving the tunnel is to find water in sufficient quantity to run a concentrator at the mine. The Petro is shipping steadily. A bid of $16 per share has been made for a block of the stock, which is held by six or seven persons.

SUMMIT COUNTY.

Park City is enjoying great activity in mining matters this season, and its ore output, according to the *Park Record*, will be much larger than for several years past. Extensive improvements in the way of new machinery have been made. Within the year the Anchor has put up fine hoisting works, the Daly is sinking a new working shaft and erecting a new hoisting plant and a refinery for treating the sulphides produced by the Marsac leacher; the Glencoe has built a large dressing works; the Crescent has been drained by the Hanauer tunnel; the Meears Silver Mining Company and the Lucky Bill Mining Company have each started working shafts that will develop valuable ground; the Roaring Lion, Gem, Silver Key, Glencoe and other properties have been transformed into producers; the Alliance is breaking into ore and strikes are reported on every band.

Modoc Chief Mining Company.—This company intends to put up a hoisting plant at the mine, and to commence regular shipments. Since the strike recently made in the property an eastern syndicate has made an offer for the entire capital stock of the company. The offer however, was refused by the directory, which was not satisfied with the price offered. The money raised by the sale of the treasury stock will be used in improving the property.

VIRGINIA.

CHARLOTTE COUNTY.

(From our Special Correspondent.)

Mr. A. J. Clifford has commenced work on a small scale on his farm near Keysville. There are said to be several small veins on the property that show up quite well. This gold is rather coarse and easily saved by crude methods.

WASHINGTON.

Some of the features of the coal veins of Washington, which have already been noted, have a great bearing on the economic value of the mines, says the Seattle *Mining News*. The high angles at which the veins dip, permit the veins to be traced on the surface and allow them to be opened by tunnels and the product to be extracted on a down grade, saving the large amount of money that hoisting would cost. The underlaying and overlaying sandstone is in thick seams, which stand so well that the cost of timbering is light. Timber is very abundant and consequently cheap, making the cost of bunkers, trestles, etc., less than in other regions. Good water is abundant in quantity for water power, for washers, etc. The cost of breaking ground at the present price of labor is from 75c. to 90c. per cubic yard. The cost of freighting from any vein in western Washington to tide water will not exceed 75c. per ton; in most cases one-half of that amount will suffice. An abundance of coal could be profitably laid down at Puget Sound ports at $2.50 per ton. The same coal could be laid down in San Francisco at a cost not to exceed $5 per ton. The consumer of Puget Sound port has paid for the last 38 months an average of $5.45 per ton, and the consumer of San Francisco $8.15 per ton.

STEVENS COUNTY.

Bullion.—This mine is said to have 15,000 tons of smelting ore in sight and has shipped 1,500 tons to Tacoma.

WEST VIRGINIA.

MASON COUNTY.

(From our Special Correspondent.)

Mason County Oil and Gas Company.—This company has been organized at Hartford City with a capital stock of $100,000. The officers are: J. M. Hensly, president, and L. F. Roush, secretary and treasurer. It is proposed to sink an develop an oil well on the company's property.

WISCONSIN.

Statement of ore shipped from Ashland for the season up to and including August 12th, 1891:

Wisconsin Central Docks.—Ashland, 141,365; Aurora, 38,212; Tilden No. 2, 1,178; Tilden, 19,303; Germania, 203; Iron Belt, 1,506; Montreal South Vein, 21,226; Palms, 11,127; Bessemer, 17,195; total, 251,319. M. L. S. & W. Ry. Docks.—Carey, 44,103; Eureka, 10,380; Federal, 929; Trezona, 15,759; Germania, 11,454; Mount Hope, 39,688; Norrie, 157,090; East Norrie, 66,998; Pahst, 60,038; Ruby, 913; Sunday Lake, 30,455; total, 437,812.

Statement of ore shipped from the port of Gladstone, for the season up to and including Wednesday, August 12th, 1891:

Ludington, 77,892; Hamilton, 10,164; total, 87,966.

Gogebic Development Company.—An important suit involving several million dollars has been begun in the United States Circuit Court for the Western District of Wisconsin by the American Loan and Trust Company against the Gogebic Development Company. In 1887 the defendant executed to the plaintiff a trust deed on a large amount of valuable mining property owned it to secure the payment of 2,000 of its bonds at $1,000 each, amounting in all to $2,000,000. This mortgage provided for the payment of 6% interest, semi-annually, and the principal in 1907, and also, in case of default for six months in the payment of any installment, and on demand of the owners of the bonds to the amount of at least $160,000, the mortgagee should declare the whole amount of principal and interest due, and proceed to foreclose. The complainant alleges that the defendant sold the whole $2,000,000 of bonds at par and that there have been such default and demand. The answer admits the execution of the bond and mortgage, and that 500 of the bonds, amounting to $500,000, were sold and negotiated by the defendant, but denies that the rest of the bonds were sold. The latter, it alleges, were wrongfully and fraudulently parceled out by the former officers of the company without any value being paid therefor, and it is alleged that the present owners of them had full knowledge of such fraud.

WYOMING.

ALBANY COUNTY.

Lucky Six Mining Company.—It is reported that this company was offered $35,000 a short time ago for the Brooklyn mine, which it recently purchased for $250, and that the offer was refused. The Brooklyn is in the La Plata district, 35 miles west of Laramie, on the south side of the snowy range, across which lies Gold Hill. The offer came from a syndicate composed of Messrs. Tabor, of Denver; Myers, of Kansas City, and Tootle, of St. Joseph, through the former owner of the mine. The wealth of the mine is supposed to be in the carbonates discovered recently. Some very rich ore has been uncovered.

(From our Special Correspondent.)

C. N. Bramel and others have opened up a very large lead of a lead-carbonate ore in their property in the La Plata district, of which average samples have assayed 28 ozs. of silver per ton. Quite a number of men are at work in the district, and more are coming in daily.

Centennial.—This mine, in the La Plata district, discovered in 1876, from which over $50,000 (gold) was taken, although worked but a short time and in a desultory and expensive manner, subsequently being abandoned and mill moved to other section of country, is again being opened, some distance from the old working, by Messrs. Johnson & McCune. They are at present down about 60 ft., and have a small, well-defined and very rich lead.

CARBON COUNTY.

(From our Special Correspondent.)

There are now more than 350 men in the Gold Hill camp. Large quantities of low-grade ore are lying on the various dumps, most of it having been raised in doing assessment and development work. The average value of this ore is about $12 per ton. A considerable quantity of high-grade gold ore has been taken from the Acme and other mines. Several lots are sacked, ready for shipment to Omaha and Denver. Average value of this ore is $200 per ton. A 10-stamp mill is being brought into the district by D. W. Downey. It has been delayed on account of the bad roads, and now will hardly get to work before October 1st. It will be run as a custom mill. A vast amount of work has already been done in this district, and all by poor people. Capital is sadly needed but as yet but little money has been furnished by the outside world. This camp is now so far developed, however, that there is little or no question as to its permanency. Although the camp now covers five miles square the mineral limits are not as yet determined.

FOREIGN MINING NEWS

BELGIUM.

The Midland Miners' Federation, England, has voted £100 per week to the Belgian Miners on strike in the Charleroi district of Belgium; that amount is to be continued as long as the strike lasts. The Somersetshire (England) Miners' Council has also determined to support the men on strike, but the amount of their contribution is not yet fixed. The Yorkshire miners have voted £400, the second installment of which has been forwarded, together with £100 from Lancashire, and £100 from Derbyshire.

CANADA.

PROVINCE OF NOVA SCOTIA.

Oxford Gold Mining Company.—The July output amounted to 111 oz. of gold. Manager Reid reports the mines looking well in all particulars, and is well pleased with the results from the work of his air drills. Work has been renewed on one of the old leads of the property with prospect of success. The Oxford Company is a close corporation, in which New York capitalists are interested. It has been a profitable investment, having produced over $500,000 to date.

MEXICO.

LOWER CALIFORNIA.

An exchange gives the following particulars about Carmen Island, which lies in the Gulf of California, about at latitude 26° North and longitude 12° West of the City of Mexico, and some 5 miles from the Peninsula. It is only 19 miles long by 6 miles broad, but it is one of the most valuable small islands in the world, as it contains immense deposits of pure white rock salt. It is owned by James Viosca, a Spanish-American, who went to Lower California 30 years ago. He resides at La Paz, but spends much of his time on the island superintending the salt mines. The salt deposits cover a surface of 1,000 acres. About one-third of this acreage is a mass of pure, clean white salt; the remainder is covered simply with a layer of soil brought there by the rains from the adjacent mountains, and also in places with a thin coating of coral, all of which, when removed, show the pure white salt beneath. The salt deposits in the basin have proved by actual investigation to be 14 ft in thickness.

NUEVO LEON.

A correspondent of the *Two Republics* (Mexico) writing from Monterey, says: "The decision on the 10th ult., made by the Secretary of the Treasury at Mexico, on the exportation of base bullion, places the tax at 7 milesimos on the silver contents, and thus enables our smelters here to handle dry ores from interior points, that assays from 200 to 220 ounces silver per ton, and mix it with lead ores, thus producing a lead bullion that will not exceed the .0007 of silver contents, and will allow a free exportation of their products. The proposed erection of smelters and reduction works at any point on the Texas border or in the United States would therefore have no advantages over our home industries. Mining and smelting men here appear to be for the most part satisfied with the .0007 decision, although a considerable number hold that a greater percentage should be conceded to the smelters by the Mexican government."

Great National Smelting Company.—A report was current recently that this company would not erect its proposed plant at Monterey, on account of a dispute with the Government concerning the bullion export tax. The company reconsidered its determination not to erect a smelter at Monterey, however, and has given orders to forward to that city 15 car-loads of machinery purchased for the smelter, which were held back at the border awaiting the decision of the Minister of Finance in defining what constituted "base bullion."

SONORA.

The new placer diggings in the Cerro Pelon, district of Arizpe are bolding out well, according to the Sonora papers. These placers are 33 miles from Baeuachi. Returning miners have brought in an abundance of fine gold with them. From four pans a miner extracted 4 ozs. of gold; another took ¼ oz. out of one pan. Water is plenty, but provisions are scarce and dear. Many miners are reported to be on the road to the diggings.

The reports of extensive anthracite coal fields in Sonora are confirmed by advices received by the Bureau of American Republics at Washington, D. C. Operations at the coal fields are being carried on about 40 miles from Ortiz, a town on the Sonora Railway, between Hermosillo and Guayamas. The concession is owned by a Mexican company, covering 4,000,000 acres. Coal has been found in borings 50 miles apart. The diamond drill has gone through three veins, one of 2 ft., another of 4 ft., and a third of 7½ ft., and in a fourth it has already penetrated 22 ft., and is still working in coal. The coal, it is said, can be traced for miles on the surface, the four veins showing the same thickness throughout the whole extent. A railway 60 or 65 miles in length will carry the coal to the harbor at Guayamas.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Aug. 21.

The market for building materials shows no signs of improvement. The state of affairs reported in this column as prevailing for some time past continues, no abatement in the quietness having occurred.

Brick.—A considerable quantity of brick has been sold during the past week at unchanged prices. The accumulation reported in our last issue is decreasing somewhat, due to the fact that the supply has been curtailed. It should he said that no concerted effort has been made by manufacturers to bring about this change. Natural causes have interfered. and a diminution of stocks followed. It is to be feared that the supply will continue to exceed the demand and that this market will not improve until measures to avoid this are taken by those interested.

Our quotations this week are: Havers' raw, $5@$5.50 per M.; Uprivers, $4.50@$5; Jerseys, $4.25@$4.50; pale, $2@$2.50.

Lime.—The report published in this column last week would he as pertinent to the condition of the lime market this week as it was then. There have been a few arrivals, which have been hought up at once, and there is barely enough lime on the way to meet the current demand. Maine lime is $1 per barrel for hoth common and finishing. The St. Johns article sells at 85c. for common and $1 for finishing. We quote: State lime, $1.

NOTES OF THE WEEK.

James Hanley, walking delegate to the Bricklayers' Union, and Thomas P. Quinn, president of that organization, who were held for examination by Justice Meade in the Harlem Police Court on Aug. 6 on a charge of conspiracy in causing a strike on the works of Daniel J. Sullivan in Amsterdam avenue, near 132d street, waived further proceedings on the 17th inst., and were held in $1,000 bail each for trial.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Aug. 21.

Heavy Chemicals.—The main features of this market continue as last reported. The dullness usual at this time of the year is generally felt. There has been some inquiry for forward shipments, hut sellers' views are above those of huyers', and actual business has not been very great.

Caustic Soda.—There has been some inquiry for this article, but the offers have not been satisfactory to holders. We quote: 60%, 3·25c.; 70-74%, 3·02½@3·07½c.

Carhonated Soda Ash.—There has been a slight demand for this. We quote: 48%, 1·55@1·60c., and 58%, 1·52½@1·57½c.

Caustic Soda Ash.—The market is very quiet and stocks continue light. We quote: 1·50@1·55c., according to quantity and quality.

Alkali.—Very little is doing in this market. For the 48% variety 1·52½@1·57½c. is asked, and for 58%, 1·42½@1·45c.

Sal Soda.—Some business has been done in English sal soda, which has ruled higher in price than during the preceding week. Quotations are all the way from 1·07½ to 1·20c., according to hrand, quantity, and time of delivery, the latter quotation being for spot.

Bleaching Powder.—Some sales for future delivery are reported. We quote: 1·95@2c.

Acids.—Generally speaking the acid market remains in precisely the same condition reported in this column for some weeks past. There is a good demand for the various acids; indeed, some manufacturers state that they are entirely sold up. In regard to the volume of husiness the majority of dealers cannot complain. Prices, however, are not to their liking. The effects of last year's demoralization are apparent to this day, and in all prohability will continue so for some time. We quote: Acid, 100 pounds in New York and vicinity: Acetic, $1.50@$1.65; alum, $1.50@$1.65; muriatic, 18°, 80c.@$1; muriatic, 20°, 90c.@$1.10; muriatic, 22°, $1@$1.20; nitric, 40°, is selling for $4.50, and from that upward, according to quality, etc.; nitric, 42°, $5@$6; oxalic, $7@$7.25; sulphuric. 60°, 75c.@$1; sulphuric, 66°, 85c.@$1; tartaric, $3.30@$3.40.

Brimstone.—Some arrivals are reported, but the market is very quiet and weak. Quotations are for best unmixed seconds, $27; best unmixed thirds are 50 cents less.

Fertilizing Chemicals.—Generally speaking this market continues dull and featureless. There have been some sales of various fertilizers for early fall delivery. The fall trade has not yet set in, and dealers in fertilizers can only wait until it commences in earnest. We quote this week: Suphate of ammonia, 3·05@3·10c. Bone sulphate at 3·02½@3·05c. Dried blood, $1.95@$2 per unit. Tankage, $19@$21. Azotine, 1·95c. Bone meal, $22.50@$23.50; raw, $24@$26. Fish scrap, $21.50@$22.50. Acidulated fish scrap, $11.50.

Double Manure Salts.—We quote the syndicate price of 1·10@1·12½c. for 48%. For 90% to 95% basis, 90% foreign invoice, weights and lists, 2·07½@2·10c. Lots under 50 tons are proportionately higher.

South Carolina phosphate rock is unchanged. We quote for land rock $7@$8, wet and dry, respectively, f. o. b. vessels at mines, and $7.25@$8.25 f. o. b. cars. There is but little high grade river rock in the market. Low grades taken from marshes are selling at about $7.25.

Our special correspondent at Charleston, S. C., writes us as follows: The phosphate market remains in about the same condition. Florida has had no effect on values. With very few exceptions our miners have sold far ahead, and have been refusing offers. It is difficult to buy any standard grade for early shipments. There is a limited amount of grades running from 48% to 52% and 55% on the market, hut with the delay of shipments from other points, they may be taken up at any moment. High grades are firm at $7.50 f. o. h. vessels or cars, for kiln dried; some high grades may he bought a little under this, f. o. b. cars, and low grades at $6 @$6.75 f. o. h. vessel; wet rock $1 less.

We are indebted to Mr. Paul C. Trenholm, of Charleston, S. C., for the following interesting statistics: Shipments of fertilizers from Charleston, S. C., from September, 1889, to April, 1890, 260,169 tons; September, 1890, to April, 1891, 280,869 tons. Excess of 1890-1891 over 1889-1890, 20,700 tons.

Shipments of phosphate rock from Charleston from September 1st, 1890, to July 31st, 1891.

	Crude.	Ground.
Coastwise	162,839	1,341
Railroads	55,381	....
Foreign	3,438	....

Shipments from Beaufort, S. C., from September 1st, 1890, to June 30th, 1891:

	Crude.	Ground.
Coastwise	29,917	....
Foreign	110,005	....
Charleston's total shipments	221,658	1,341
(Estimated) consumption	125,000	.....
Beaufort's total shipments	139,922	.....
(Estimated) consumption	15,000	.....
	Total crude.	Total ground.
Charleston	346,658	1,341
Beaufort	154,922	.....
Grand total, tons	501,580	1,341

Kainit.—Very dull. Quotations remain: $8.75@$9.25, according to quantity.

Muriate of Potash.—There was no change in this. During the week there were 300 tons sold for future shipment, and the arrivals were in excess of 600 tons, most of which went into consumption.

Nitrate of Soda.—Notwithstanding the recent large arrivals, this market is strong and shows a tendency toward a further improvement. Quotations are: $1.75@$1.80, according to quantity. Store lots are held at $1.85.

Liverpool. Aug. 12.

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

Our market for heavy chemicals is very steady but the actual business is not large. There have been a fair number of inquiries from your side principally for bleach, for which article, however, orders have had to he returned as the resale parcels have been cleared, and the "Union" decline to sell except through its "New York agents."

The threatened strike of the chemical laborers has been averted, the Union having settled the matters in dispute hy compromising with their men.

At the close of last week there was considerahle excitement here owing to the rapid decline in the Alkali Company's shares, and a number of holders seemed quite in a panic to get clear of their stock. The ordinary shares were sold as low as £5¼, and the preferred at £7¼. A firmer feeling prevails this week, however, and shares have recovered, the ordinary being quoted to-day at £7 and the preferred at £8¼, although, of course, these quotations are still considerably under par value.

Soda ash is only in moderate demand, hut quotations are without change, as follows: Caustic ash, 48%, £5 2s. 6d. per ton; 58%, £6 4s. per ton; Carb ash, 48%, £5 7s. 6d. per ton; 58%, £6 10s. per ton, all net cash. A premium on above figures is demanded for prime hrands.

Soda crystals are also in light request, hut prices steady at £3 5s. to £3 7s. 6d. per ton, net cash, while orders at a shade under the lower figure have been declined.

Caustic soda is inanimate, hut prices steady. For their immediate requirements buyers have to pay full values, as there are practically no second-hand parcels on the market at present. Quotations are unchanged, as follows: 60%, £9 10s. to £9 15s. per ton; 70%, £10 15s. to £11 per ton; 74%, £11 15s. to £12 per ton; 76%, £13 and upwards per ton; all net cash according to quantity and brand.

Bleaching Powder.—The nominal quotation for hardwood is, £7 10s. per ton net cash, except for the states for which quarter £8 per ton net cash is nominal figure, hut the "Union" declines to sell on this market, referring buyers to its New York agents. A few odd lots have been sold lately at a shade under £8, but the market is now practically cleared of second-hand parcels and a number of orders have had to be returned unfilled.

Chlorate of potash has gone rather quiet again, but firm at 5½d. per lb., less 5%.

Bicarh. soda, selling at £6 15s. to £7 per ton, less 2½% for 1-cwt. kegs, according to brand and quantity, with usual allowances for larger packages.

Sulphate of ammonia has advanced, owing to scarcity, and nearest values f.o.b. here are £11 2s. 6d. per ton for good gray 24% in double hags, and £11 7s. 6d. per ton for 25% in double bags, less 2½% discount.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Birmingham, Ala., Pittsburg, St. Louis, London, and Paris, see pages 232 and 233.]

New York, Friday Evening, Aug. 21.

The week under review shows no change, and dullness prevails on the Mining Exchange. The features, if they can be called so, have been a demand for two or three stocks, which has not, however, resulted in large sales.

There were 25,545 shares sold, of which 4,275 were dividend-payers, and 21,270 non-dividend. Last week there were 7,770 dividend-paying shares sold, and 19,820 non-dividend-payers, making a total of 27,590 shares sold, a decrease of 2,045 shares this week.

It will be noticed that the number of non-dividend shares sold this week exceeded that of the week previous. To a casual observer this might lead to the helief that a greater speculative tendency had been displayed. However, this great number has been due really to the purchase of stocks like Astoria, 6,500 shares of which sold at 1c., and Middle Bar, 3,500 shares at 1c. and 2c. The number is a big one, 10,000 shares, hut the amount realized was scarcely $100! It will, therefore, become evident to all that in addition to an exceedingly small number of shares sold, most of these are so low-priced as to he insignificant. And the worst is that no signs of an improvement are perceptihle anywhere.

During the present week Alta declined from 70c. to 65c. Alpha shows a single sale of 100 shares at $1.10. Best & Belcher was dealt in to the extent of 620 shares at $3.60@$3.80; Bullion had a sale of 100 shares at $3.40; Chollar declined from $2.55 to $2.25; Exchequer was quiet at 90c.; Mexican shows sales of 500 shares at $2.45@$2.70.

Potosi had a single sale of 100 shares at $4.75; Scorpion advanced from 46c. to 50c, with sales of 700 shares; Segregated Belcher, which had not been dealt in for a long time, appears this week with a sale of 100 shares at $1.20. There were 200 shares of Union Consolidated sold at $2.75@$2.85; of Utah, 500 shares changed hands at 85@90c.

Consolidated California & Virginia shows a sale of 500 shares at $7, an advance of 50c. over the highest price paid last week; Crown Point was neglected at $1.90; Gould & Curry was steady at $1.75; Ophir opened at $3.75, advanced to $4, hut declined at the close to $3.80, with 500 shares sold. There were 500 shares of Yellow Jacket sold at $1.75@$1.90; Sierra Nevada was quiet at $3.05.

Of the Tuscarora stocks we note a sale of 100 shares of Nevada Queen at 25c.; Belle Isle, which is usually a stranger here, returned to the Exchange with a sale of 200 shares at 60c.

Of the California stocks, Plymouth had a sale of 100 shares at $2. Astoria, at 1c., is reported to have disposed of 6,500 shares; Emmet was quiet at 65c. to 70c.; Middle Bar at 1 and 2c. shows sales of 3,500 shares.

Brunswick Consolidated shows sales of 2,000 shares at 10c. The superintendent of the company writes: "We are extracting from 6 to 14 carloads of ore daily. The raise is up 23 ft., and ground stoped 33 ft. The quartz is full of sulphurets and is all blue ribhon rock. The mill has not been started up yet owing to the delay at the San Francisco foundry of the parts ordered."

Of Belmont 1,400 shares changed hands at 81@83c. The superintendent of this mine writes under date of the 14th inst.: "For the week ending today the mill has lost 12 hours, on account of cleaning up. Tunnel No. 1 is now in 392 ft. and the face is all in milling ore. Stope No. 1 is showing up hetter this week both in width and grade of ore."

Alice was not in as great demand as last week. There were 250 shares sold at $1.90@$2, an advance over last week's price.

For some reason or other El Cristo was in considerable demand. It opened at 25c. and advanced to 43c., with total sales of 1,700 shares.

Of the Colorado stocks, Aspen, which had not been dealt in for a long time, shows a sale of 400 shares at $4.50; Iron Silver had a single transaction of 1,000 shares at $1.05, and Rohinson Consolidated one of 100 shares at 48c.

The gross sales of ore at the Horn Silver mine during the month of July amounted to $40,000. The Superintendent writes that the drift on the second level is 15 ft. in ore and the face of the drift is in solid ore. The ore reserves are steadily increasing.

Boston. Aug. 20.

(From our Special Correspondent.)

There has been a much more cheerful feeling in copper circles the past week, and the improvement in prices has given a better tone to the market, while there is more disposition to buy stocks than we have noted for a long time. The advance in the leading stocks has caused some realizing, as stocks hought on the recent depression show a good margin of profit. The Montana stocks have been the most active on the list, and Boston & Montana has advanced from $41¾ to $44¾, losing the fraction only in the later dealings. Butte & Boston opened at $14 and sold up to $16½, and held the advance; over 4,000 shares of these two stocks changed hands during the week.

Calumet & Hecla advanced from $246 to $255, and closed at $254. Centennial is showing up well, and is in good demand. The first sale for the week was at $14⅝, an advance of $1½ over last sale,

selling up to 16½ to-day, and is quite firm. Kearsarge advanced from $10 to $12½, and closed at $12¼.

Osceola advanced from $34¾ to $37, which was the last sale. Franklin has not participated in the advance to any extent, and in the early dealings declined to $14½, but rallied later and sold up to $15¾, a gain of $0.75 for the week. Quincy, on small lots, advanced from 98c. to $1.05½, and is not freely offered. Tamarack is unchanged at $1.55, at which all the sales were made. Atlantic holds steady at about $13@$13¼. Allouez advanced from ⅛ to 1⅛c., and National sold at $2.

The reports from the Santa Fé mine are considered favorable, and the stock is more inquired for, with sales at 47½c. to 52½c. Mesnard appeared with a sale of 100 shares at 35c. Recent reports from the Arnold are very encouraging, and although no sales of the stock were made at the Board, we hear that it is wanted at about $1.

Denver.

Prices and sales for the week ending Aug. 15th 1891:

Company. Mines.	Opening.	H.	L.	Closing. Bid.	Sales.
Alleghany	....	....	....	....	.....
Amity	02¼b	*03	02	02	10 200
Bangkok-C.-B.	05½	05½	05½	04¾	1,700
Bates-Hunter	67	*69	67	....	4,700
Brownlow	06¼b	†07	06	06¼	2,000
Calliope	16h	....	....	15¼	.....
Cash	15b	....	....	15	.....
Clay County	110h	114	113	114	700
Gettysburg	16b	17	16	16½	1,100
Gold Rock	64b	65	64	64	900
Leavenworth	06½b	....	....	08	.....
Little Rule	*108b	....	....	†108	.....
Matchless	285b	....	.		.....
May-Mazeppa	125a	....	....	85	.....
Oro	99h	....	....	75	.....
Pay Rock	02h	02¼	02	01½	200
Puzzler	03¼b	03¼	03¼	03¼	500
Reed National	....	62	62	59	900
Rialto	†110b	110	110	†112	1,000
Running Lode	19¼b	21¼	21	21¼	2,500
Whale	27¾b	27½	27½	26	100
Bal. Smuggler	†59b	†60	†60	57	200
Prospects.					
Argonaut	20a	....	....	05½	.....
Big Indian	10a	10	10	....	100
Big Six	06¼b	....	....	06	.....
Century	30b	....	....	....	.....
Claudia J	05b	05	04¾	04	2,200
Nat. G. & Oil Co	16¾h	*17½	14	15½	15,000
Diamond B	03½	04¼	03½	03¾	28,300
Emmons	45½	*48	45¼	*48	9,200
Golden Treas	31b	†37	31	31	3,000
Ironclad	06b	07	04½	*.5½	9,500
John Jay	04¼b	*04¼	*20¼¼	....	5,000
Justice	10¼b	11	10	10	4,500
Legal Tender	02h	02¼	2	01½	5,300
Morning Glim	10h	....	....	42	.....
Park Consolidated	10b	....	....	10	.....
Potosi	04¾h	04½	‡04½	04	5,700
Total					115,000

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

Lake Superior Iron, Gold and Silver Stocks.

(Special Report by A. M. Helmer, Milwaukee, Wis.)

Iron.			
GOGEBIC RANGE:		Milwaukee Iron Co.	$5.00
Anvil	$3.50	Negaunee	....
Ashland	51.00	Pittsburg and Lake Angeline	140.00
Aurora	9.50	Republic	26.00
Bessemer Consolidated Bonds	20%	Riverside	2.00
Brotherton	2.50	MENOMINEE RANGE:	
Cary	....	Aragon	....
Colby	...	Chapin	...
Father Hennepin	....	Commonwealth	10.50
Germania	8.00	Florence	....
Gogebic Iron Syndicate	.25	Hamilton Ore Co	....
Iron Belt	2.00	Lincoln	2.00
Metropolitan Land and Iron Co	62.00	Mansfield	....
Montreal	10.50	Mastodon	....
North Pabst	2.25	Monitor	....
Northern Chief	30.00	Norway	....
Odanah	13.50	Paint River	....
Pabst	....	Pewabic	....
Palm	1.75	Quinnesec	...
Pence	1.25	Sheldon and Shafer	....
Penokee and Gogebic Developm. Co.	....	Sheridan	5.00
Ruhy	....	Vulcan	.
Ryan	.35	Youngstown	....
Section 33	13.50	VERMILION RANGE:	
Windsor	....	Chandler	35.50
Wisconsin Iron and Steel Co	.60	Chicago and Minnesota Ore Co	100.00
MARQUETTE RANGE:		Clingstone	.25
American	$2.25	Inter-Ocean	.25
Champion	75.00	Minnesota Ore Co	72.50
Cleveland	16.00	Northwestern	.25
Cleveland Cliff Iron Co	....	Pioneer	....
East New York	2.00	Vermilion	.25
Humboldt	....	Vermilion P. & L. Co	2.25
Iron Cliffs	....	*Gold and Silver.*	
Jackson	104.00	Badger Silver Mining Co	3.00
Lake Superior	54.00	Michigan Gold Co	.30
MARQUETTE RANGE:		Peninsula Gold Mining Co	....
Michigamme	....	Ropes Gold and Silver Co	1.50

San Francisco. Aug. 13.

(From our Special Correspondent.)

The volume of business expanded during the past week and trading has been quite active. Yesterday the total sales were larger than at any time during the past six or seven weeks, and large orders kept coming in from Virginia City, especially for Consolidated California & Virginia and other north-end stocks. What this may indicate, it is impossible to say; Mr. Mackay is at present directing affairs during the absence of Superintendent Lyman, and that fact alone has had some effect on the Comstock shares. A rumor is current, however, that a new ore body is being developed between the 1,300 and 4,000 levels, and also that overtures are being made to the West Consolidated Virginia people with a view to commence active work on the west ledge without being handicapped by injunction proceedings. Be that as it may, Consolidated California & Virginia, that sold a week ago for $5.87½ has steadily advanced, until to-day when it sold to $7.50. Ophir ruled at $3.80 on the purchases of the chippers. Mexican sold for $2.60, and Union Consolidated, $2.75.

The middle group of Comstocks has benefited materially by the advance of the north-enders. Best & Belcher was in fair demand at $3.75, but Chollar has hung fire and has not ruled higher than $2. Potosi, that was unsteady during the early part of the week, sold at $4.95 on very small openings, while Bullion sold for $3.30 and Hale & Norcross, $1.90.

The Gold Hill group has been comparatively inactive. Belcher sold at $1.45, Overman, $1.95, Occidental, $1.15, and Yellow Jacket, $1.75. The last named has gained 15 cents during the week, but as no news, official or otherwise, is given to the public, it appears to be a stock, to all intents and purposes, no better than the veriest "wildcat."

The Bodies, Tuscaroras and Ouijotoa stocks have had scarcely a quotation during the week, and as no news of importance has been received from the mines, there has been no reason for any movement in them.

St. Louis. Aug. 12. 1891.

(From our Special Correspondent.)

St. Louis markets are regaining their old activity, and mining stocks were more active during the past week, as far as the volume of business is concerned, than they have been for some time Prices, on the whole, were slightly lower, and today's quotations are generally below what was offered a week ago.

On August 20th a proposition to bond the Little Albert mine for $40,000 will be voted on by the company. Of the $40,000 bonds, $15,000 is needed at once, and already about $8,000 has been subscribed. If the vote is favorable the amount will be issued in $25 bonds, so that all stockholders can take them. Little Albert stock is quoted at 2c., and no sales have been made for some time.

Yuma continues to attract attention, and last week several small lots sold at fair prices. The market opened at 42½c. with a sale of 400 shares, then until Monday the stock was held at 43c. On Monday 200 shares sold at 43¾c. To-day the market closes at that figure.

Silver Age had an off week, and on a few sales fell from 97½c. to 90c.

Nellie was again on the market and a sale of 4,000 shares at 1c. was made.

Central Silver had but one sale, 1,000 shares selling at 4½c. Present quotation is 4c.

American & Nettie had a fluctuating market, opening at 31¼c., and closing at 30c., with 27c. the lowest bid during the week. Only one sale of 100 shares was made. The market appears very steady, and the stock is held at 32½c.

Granite Mountain opened and closed at $23. Two lots of 10 shares each sold at $23, though at one time $22.75 was the best bid to be had.

Elizabeth sold well, and closed at $1.50. On Friday 100 shares sold at $1.52½, and on Saturday 400 shares more sold at the same figure. Demand was very good and market steady.

Montrose was again the leading stock. It opened at 62½c., and sold 150 shares on Friday at 68¾c. Saturday, 1,500 shares sold at 72½@71½c., and on Tuesday 500 shares brought 70c. The market closes at 68¾c.

Adams was very quiet, opening at $1.85 and closing at $1.87½.

Mickey Breen fell from 47½c. to 40c. There were no sales, and very little demand.

MEETINGS.

Bower-Barff Rustless Iron Company, at the office of the company, No. 31 Nassau street, New York, September 21st, at 2:30 P. M.

DIVIDENDS.

Alice Gold and Silver Mining Company, dividend No. 28 of .06¼ per share, $25,000, payable August 25th at the Farmers' Loan and Trust Company, New York. Transfer books close August 17th and reopen August 26th.

Daly Mining Company, dividend No. 54 of 25c. per share, $37,500, payable August 31st at the office of Messrs. Lounsbery & Co., Mills Building, New York. Transfer books close August 25th and reopen September 1st.

Hecla Consolidated Mining Company, dividend No. 112 of 50 cents per share, $15,000, payable August 25th at the office of the company in Butte Mont.

Homestake Mining Company, dividend No. 157 of 10 cents per share, $12,500, payable August 25th at the office of Messrs. Lounsbery & Co., Mills Building, New York. Transfer books close August 20th and reopen August 26th.

Mollie Gibson Consolidated Mining and Milling Company, divided No. 10, of five cents per share $50,000, payable August 25th at the office of the Company in Colorado Springs, Colo. Transfer books close August 20th and reopen August 26th.

Ontario Silver Mining Company, dividend No. 183, of fifty cents per share, $75,000, payable August 31st at the office of Messrs. Lounsbery & Co., Mills Building, New York. Transfer books close August 25th and reopen September 1st.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Am't. per share.
Anchor, Utah	1	July 17	Aug. '8	Sept. 5	1.00
Belcher, Nev	42	Aug. 4	Sept. 7	Sept. 28	.50
Bullion, Nevada	36	July 16	Aug. 20	Sept. 8	.50
Challenge, Nev	9	July 31	Sept. 2	Sept. 23	.50
Chollar, Nev	30	July 14	Aug. 18	Sept. 8	.50
Crown Point, Nev.	55	July 9	Aug. 13	Sept. 3	.50
Exchequer, Nev	31	July 23	Aug. 27	Sept. 17	.25
Garden City, S. Dak		July 14	Aug. 14	Sept. 2	.001
Golden Fleece Gravel, Cal	15	June 30	Aug. 12	Sept. 19	5.00
Gould & Curry, Nev	67	July 22	Aug. 25	Sept. 17	.30
Hartrey Con., Cal	8	July 7	Aug. 11	Aug. 29	.05
Honorine, Mich		June 26	Aug. 1	Aug. 31	.05
Iron Hill, S. Dak	20	June 27	Aug. 3	Aug. 25	.03
Justice, Nev	48	July 11	Aug. 15	Sept. 4	.25
Massachusetts, Utah	1	July 17	Aug. 18	Sept. 5	1.00
Mexican, Nev	43	Aug. 10	Sept. 14	Oct. 6	.25
Northwestern G. & S., B. C	3	June 18	July 31	Aug. 24	.08
Pocahontas, S. Dak.	7	July 15	Aug. 18	Sept. 15	.001
Potosi, Nevada	36	July 21	Aug. 25	Sept	.50
Savage, Nev	76	July 16	Aug. 18	Sep. 7	.50
Teresa, Mex	5	Aug. 11	Sept. 14	Sept. 30	.10

PIPE LINE CERTIFICATES.

(Special report by Messrs. WATSON & GIBSON.)

The petroleum market is dull and listless. The Buckeye product is without quotation, and it will never revive until the Standard Company, which absolutely controls it may see fit to inaugurate dealings and make fluctuations. The Standard is organizing companies in the various countries of Europe to handle their illuminating oils economically, and to compete with the growing Russian industry.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales
Aug. 15	70	70¼	69¼	69¼	7,000
17	66	66	64	64	27,000
18	66	66¼	66	66¼	8,000
19	64¾	65⅝	64¾	65⅝	2,000
20	65⅛	65⅛	64¼	64¼	17,000
21	64	64	63⅞	63⅞	15,000
Total sales in barrels					76.000

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Aug. 15	69	69	69	69	10,000
17	....	....	....	....	.....
18	....	....	....	....	.....
19	....	....	....	....	.....
20	....	....	....	....	.....
21	....	....	....	....	.....
Total sales in barrels					10,000

NOTES OF THE WEEK.

A dangerous fire is burning at McDonald Station, Washington County. An oil tank caught fire and burst, communicating with many wells and buildings. Trains on the Pan-Handle Railroad are unable to get through the town.

Later—The fire at 2 P. M., Aug. 21, was confined to one oil well, which is still burning. More than 11,000 barrels of oil have been consumed.

Lentz & Schlegel's well on the Gavin farm at Butler, Pa., shows little change. A 24-hour gaug. shows the well making close to 500 barrels a day The same firm has decided to drill two more wells as soon as they can get rigs up. The news from the MacDonald field is of such a prepossessing aspect that the producers in this field are rather in favor of letting the drill rest, except in cases where drilling is compulsory.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Aug. 21.

STATEMENT of shipments of anthracite coal (approximated) for the week ending August 15th, 1891, compared with corresponding period last year.

Regions.	Aug. 15, 1891.	Aug. 16, 1890.	Difference.	
Wyoming Region. Tons	383,768	417,717	Dec.	33,949
Lehigh Region "	119,032	131,302	"	12,270
Schuylkill Region "	220,911	189,344	Inc.	31,597
Total Tons	723,741	738,363	Dec.	14,622
Total for year to date Tons	23,280,836	20,435,258	Inc.	2,845,578

PRODUCTION OF BITUMINOUS COAL for week ending August 15th, and year from January 1st:

WESTERN SHIPMENTS.

	1891. Week.	1891. Year.	1890. Year.
Pittsburg, Pa	20,058	785,198	529,550
Westmoreland, Pa	23,552	1,276,171	786,205
Monongahela, Pa	14,073	374,171	300,095
Total	57,683	2,435,540	1,615,850
Grand total	382,891	13,315,260	11,279,229

EASTERN AND NORTHERN SHIPMENTS.

Phila. & Erie R.R.	2,497	117,194	82,908
Cumberland, Md.	84,261	2,583,282	3,322,124
Barclay, Pa.	3,671	115,878	93,382
Broad Top, Pa.	8,416	306,104	316,333
Clearfield, Pa.	65,575	2,484,695	2,387,750
Allegheny, Pa.	21,266	797,077	827,708
Beach Creek, Pa.	47,121	1,485,088	1,174,042
Pocahontas Flat Top	44,113	1,561,965	1,194,487
Kanawha, W. Va.	48,288	1,428,437	1,264,745
Total	325,208	10,879,720	9,663,379

STATEMENT of anthracite coal shipments for month of July, 1891; compared with the corresponding period last year (compiled from returns furnished by the Mine Operators).

	July, 1891.	July, 1890.	Difference.
	Tons.	Tons.	Tons.
Wyoming Region	2,024,941.18	1,758,124.07	Inc. 266,817.11
Lehigh "	569,487.12	532,843.18	" 36,643.14
Schuylkill "	1,196,910.00	1,019,110.13	" 177,799 07
Total	3,791,338 30	3,310,077.88	Inc. 481,259.32

	For year 1891.	For year 1890.	Difference.
	Tons.	Tons.	Tons.
Wyoming Region	11,609,194.09	9,613,856.07	Inc. 1,995,338.02
Lehigh "	3,473,209.05	3,463,459.08	" 9,749.17
Schuylkill "	6,674,029.07	5,598,716.01	" 1,075,313.06
Total	21,756,432.21	18,676,030.26	Inc. 3,080,401.05

The stock of coal on hand at tidewater shipping points July 31st, 1891, was 703,634 tons; on June 30th, 1891, 678,144 tons; increase, 25,490 tons.

PRODUCTION OF COKE on line of Pennsylvania R. R., for the week ending August 15th, 1891, and year from January 1st, in tons of 2,000 lbs.: Week, 105,376 tons; year, 2,368, 297 tons; to corresponding date in 1890, 3,337,004.

Anthracite.

Mr. John H. Jones, the statistician of the Anthracite Bureau, has issued his statement covering the production of anthracite for the month of July and the seven months to July 31, the comparison with previous corresponding periods being as follows:

Region.	1891.	1890.	Increase.
Month of July—			
Wyoming	2,024,941	1,758,124	266,817
Lehigh	569,487	532,484	36,643
Schuylkill	1,196,910	1,019,110	177,799
Total	3,791,338	3,310,078	481,259
Year to date:			
Wyoming	11,609,194	9,613,856	1,995,338
Lehigh	3,473,209	3,463,459	9,749
Schuylkill	6,674,029	5,598,716	1,075,313
Total	21,756,432	18,676,031	3,080,400

The stock of coal on hand at tide water shipping points July 31, 1891, was 703,634 tons; on June 30, 1891, 678,144 tons; decrease, 25,490 tons.

The production for the week ending August 15th was 723,741 tons, a decrease of 14,622 tons over the corresponding period of 1890. The total production of the year up to the same date is 23,280,836 tons, as compared with 20,435,258 tons for the same time last year, an increase of 2,845,578 tons in favor of 1891.

The trade in anthracite is, we are happy to state, commencing to show signs of improvement. We cannot say that great prosperity is now being enjoyed by the coal companies, but all indications point in the direction of a change for the better, and it is quite probable that September will witness a revival in the trade. During the past week some new business has been done, and better prices have been obtained. Retailers are well supplied, but they are by no means over stocked, and they should, by next month, commence to send in their orders. The conviction that the companies will act according to their agreement seems pretty well fixed in the minds of most buyers by this time. There are a few doubting Thomases who still believe that the axiom "History repeats itself" holds good in the coal trade as in politics, but in view of the sincere determination evinced by the companies to keep faith and, what is perhaps more to the point, the measures taken to hold the output to the figures agreed upon, it would appear that history will not repeat itself in the near future at least. The retail dealers are of course loath to buy at advanced prices when they believe that a little later some competitor will enable them to obtain lower figures. They should study the situation and should bear in mind that, while conservatism in business is very good, there is such a thing as being overcautious.

The next meeting of the sales agents will be held on the 27th inst. Reports have been published in the Philadelphia papers to the effect that the meeting of the sales agents last week was far from satisfactory and that serious disagreements were manifested by some of the representatives. We are authorized to state that this report is incorrect. While there was some difference of opinion it was not of a kind that would justify calling the meeting an inharmonious one. The sales agents here declare that they are satisfied with the results achieved.

Bituminous.

The general conditions which prevail in this market are much the same as they have been during the past month or two. The downward tendency of ocean freights has brought about a condition of affairs that has never been duplicated in the history of the trade. Charters have been made from both Baltimore and Philadelphia to Boston at 50c., when prompt loading and discharge have been guaranteed, and at the present moment it would not be safe to say that the lowest point has been reached.

We learn of some vessels tying up, and all of them hoping that next month will bring about a change through the diversion of a large proportion of tonnage to the South and the West Indies. Low ocean freights have been the prominent factor in this business for many weeks, and as long as they continue they will inevitably exercise a controlling influence upon it.

Deliveries of coal upon contracts have been quite large during the past week. New business has been small. Baltimore shipments have been hampered by insufficient car service, but Philadelphia has been free from this annoyance.

We quote freights from Norfolk, Newport News, Baltimore and Philadelphia on a parity as follows, alongside: Providence, 50@60c.; Boston, 55@65c.; Salem, 55@65c.; Portsmouth, 60@70c.; Bangor, 70@75c.

Prices of best coal are as follows: Free on board at Norfolk, Newport News and Baltimore, $2.50; Philadelphia, $2.60; South Amboy, $3.15.

The most competent observers are practically unanimous in their belief that the coming fall will see prices well maintained and the demand equal to that of any previous season. The railroads will necessarily increase their purchases and the great majority of consumers and dealers carrying no large stock will certainly appear in the market in due course. One of the conditions affecting the trade in the inferior variety of bituminous coal which is often overlooked. We refer to the danger of holding such coal in large quantity for any length of time. Bearing this in mind it is entirely safe to say that a great deal of coal is still to be moved this season.

NOTES OF THE WEEK.

A Denver, Col., dispatch says: "The Marsball Coal Company has completed a tunnel from the main shaft of its Louisville mine to the old inclines on the same vein, 2,823 ft. distant. The tunnel has a width of 6 ft. and enables the company to resume active operations, as work has been shut down for some time owing to lack of ventilation."

The Atlantic Trust Company and Messrs. George H. Prentiss & Co. offer at par, for subscription, $750,000 8% cumulative preferred stock of the Colorado Fuel Company of Denver, Colo., an industrial enterprise that has been in process of development for several years. The company owns 21,000 acres of coal lands, and the six mines in operation have a capacity of 6,100 tons daily.

George S. Clemens, civil and mining engineer for the Philadelphia & Reading Coal and Iron Company, left Thursday morning on the 9 a. m. train for Milwaukee, where he will superintend the putting up of the machinery at the company's mammoth coal wharves and chutes, which were just finished this spring. The machinery was all built in the Pottsville shops. Mr. Clemens will be gone two weeks. He was accompanied by Carpenter Steidle, who will direct the work under Mr. Clemens.

An officer of an Ohio coal road is quoted as saying: The coal output of Ohio last year amounted to nearly 12,000,000 tons, a gain of over 750,000 tons over any previous year. The demand for coal at lake ports at times materially exceeded the carrying capacity of the lines. Over 5,000,000 tons were shipped from the lake ports between Buffalo and Toledo. Perry, Athens, Hocking and Jackson counties produced over 1,000,000 tons each. This year the output will be larger, and in some cases better rates will be obtained. Several of the companies have made provision for largely increased equipment.

Hon. R. M. Hazeltine, chief inspector of mines of this State, filed the sixteenth annual report of his department on the 13th inst. The report shows the coal trade of 1890 to have been one of unusual prosperity. The total tonnage was 11,788,859 tons, a gain over the preceding year of 881,474 tons. It is also 877,915 tons in excess of 1888, which was the greatest in the state's history up to that time. The demand for coal at the lake ports to supply the trade in the Northwest during portions of the year exceeded the carrying capacity of the railroads to such a degree as to greatly injure the trade in the mining regions, which depend on local markets for their trade. The total amount of coal shipped from the various lake ports from Buffalo to Toledo, inclusive, was 5,000,449 tons. Of this amount 1,808,749 tons was Ohio coal and 3,191,700 tons came from Pennsylvania mines. Perry county was the largest producing county of the state, followed closely by Athens, Hocking and Jackson, all of which produced over a million tons each, Nineteen thousand one hundred and seventy-seven miners and 3,015 day hands found employment in the mines during the year. This is a loss of 1,146 in the number of miners and 43 in the day hands as compared with the previous year. The average time worked was 203 days, a gain of 36 over 1889. The average amount of coal produced by each miner was 614 tons, it being a trifle over three tons per day. The daily average production for the State was 58,075 tons. Of the year's production, 1,148,449 tons were mined by machinery which is being worked successfully in 10 counties of the state. In 13 mines compressed air is used as a power, while electricity has been installed in 15 during the year, making eight in all now using this power. Seven hundred and twenty-four mines were in operation during the year; 369 employing more than 10 men, and 355 a less number. Thirty-six new mines were opened during the year, 57 remained idle, and 29 were exhausted or abandoned. The presence of light carburetted gas (fire damp) has been discovered in 30 mines in the state. These are distributed over 11 counties and generate from veins No. 1 and No. 6 of the geological series. But one fatal and three minor accidents occurred from this source of danger in 1890.

Boston. Aug. 20.

(From our Special Correspondent.)

The anthracite coal market has not improved during the past week, yet the feeling is considerably better as regards agents. Improvements in the market situation depends upon the continued curtailment, and this has been promised. The general opinion is, that if the coal company presidents live up to their agreement, it will not be long before the market will be forced into a stronger position. The September circular has not been given any consideration to speak of, but it will doubtless be a factor in the remainder of the August business.

The bituminous situation continues very dull. The only new feature is the lack of cars for shipment. Cars are really scarce, but their absence is not keenly felt owing to the lack of business. The $3.40 price on cars continues easy.

The present low condition of freights has caused considerable comment and speculation as to their future, but has not proved an incentive to shipping. From New York 45@50c. is quoted; from Philadelphia 55@60c. and from Baltimore 55c.

The retail market is in harmony with the general situation, the demand being comparatively small for August. The dealers are well supplied and daily expect an improvement. The prices are ruling firm.

The receipts of coal at this port for the week ending Aug. 15 were 66,205 tons of anthracite and 26,847 tons of bituminous, against 39,815 tons of anthracite and 22,312 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 1,191,124 tons of anthracite and 753,048 tons of bituminous, against 1,025,175 tons of anthracite and 630,872 tons of bituminous for the same period last year.

Buffalo. Aug. 20.

(From our Special Correspondent.)

In the absence of any change in prices and conditions of trade, there is but little to report on the anthracite and bituminous coal business of this city. Lake freighting is only moderate in quantity at rates given below:

During July the largest traffic ever reported in any one month passed through the Sault Ste. Marie canal; among the freight was 436,254 net tons of coal westbound and 798,686 net tons of iron ore, 13,692 net tons of copper and 120 tons of silver ore eastbound.

The quantity of coal shipped hence by lake from August 13th to 19th, both days inclusive, aggregated 43,490 net tons, distributed about as follows: 25,910 to Chicago, 11,250 to Milwaukee, 1,500 to Superior, 1,100 to Green Bay, 200 to Bay City, 400 to Saginaw, 500 to Kincardine, 80 to Alpena, 350 to Traverse City, 2,200 to Gladstone.

Coal freights hence to following ports were, for the past week: 50c. to Chicago, Milwaukee, Superior, Green Bay and Kincardine; 40c. to Saginaw, Gladstone, Alpena and Duluth; 25c. to Bay City, and 75c. to Traverse City. Receipts of coal by canal at this port for second week of August, none; shipments, 451 net tons.

Chicago. Aug. 19.

(From Our Special Correspondent.)

There is a little more inquiry for anthracite coal, but of actual business there is vast room for improvement. In point of fact coal can now be bought for 5@10c. less than it could a month ago; $5 was the price then, and to-day all sizes can be purchased for $4.90, or even less, in from one to five-car lots or more. The truth is, stocks at this distributing center are very large and the difficulty to move them just at present is almost insuperable, excepting at such figures as are entirely out of the question. It is conceded by consumers that this condition of affairs cannot continue for any length of time, and yet the inquiry, though better than a month ago, is considerably less than it should be at this season. As this is the heated term, people do not care to talk coal, but they must do it soon or there will be some bare coal bins. We have now in stock here, 800,000 tons (estimated) of anthracite. Chicago ships and consumes about 2,000,000, the difference 1,200,000 tons, has yet to come, and from present appearance of lake traffic, a very large proportion of it will be all-rail coal. What with the car shortage there may yet be a scarcity of black diamonds before the New Year. Some dealers are of opinion that demand for coal will increase from now on, and that in the very near future they

will be enabled to stiffen upon price. Shipments from the East are being steadily curtailed and receipts are claimed to be less than they were a week ago. Several of the larger shippers state that inquiry is better from the country and far Western points.

Smithing coal is now in better supply, though there is no large stock on hand, and prices on this grade are firm at $3.65@$3.80 for Piedmont and Sonman quality. There is a plentiful supply of soft coal and prices are easy—Indiana block at $2.35 and Illinois $1.85@$2.10, according to quality, and these are not inside prides either. Notwithstanding the shortage of cars, there is an abundance of coal of all classes and grades, with inquiry only fair for anything on the list. Eastern coal is probably in better demand than any other and we hear of an order for 15,000 tons being refused for Sunday Creek coal for extended delivery.

Demand is steady for best grades, though not by any means active, the hot weather restricting consumption. Inferior grades are dull and neglected.

Prices of anthracite per ton of 2,000 pounds f. o. b. Chicago are: Lehigh lump, $6.75; large egg, $5; small egg, range, and chestnut, $5. Retail prices per ton are: Large egg, $6; small egg, range, and chestnut, $6.

Prices of bituminous per ton of 2,000 pounds f. o. b. Chicago are: Pittsburg, $3.25; Hocking Valley, $3; Youghiogheny, $3.40; Indiana block, $2.40@$2.50; Illinois block, $1.90@$2.

Coke.—Connellsville, 72-hour, per ton f. o. b. Chicago, $5.05; crushed, $4.75; Walston, $5; New River, $5; West Virginia, $4.50.

Pittsburg. Aug. 20.

(From our Special Correspondent.)

Coal.—The market since our last report shows no particular change Coal men are preparing for the fall trade, which undoubtedly will be very large. Tow boats, barges and coal boats are being put in order to be ready for business when the time comes. The amount of coal now loaded aggregates about 3,500,000 bushels; this will be increased as fast as the empty boats and barges can be filled. The outlook for the fall trade is bright; the local trade, on account of the scarcity and high price of gas, will be heavy. Lake shipments have been liberal, which will continue so long as the supply of cars holds out. The rates are unchanged. Prices at Pittsburg are as follows: River, by boat load, $5@$6 per 100 bushels; railroad, $5@$5.50 per 100 bushels.

Connellsville Coke.—The market since our last report has undergone no particular change. The blowing out of ovens at the Frick works, owing to a scarcity of orders, has reduced the production, with a corresponding effect on shipments. The Frick works are running five days per week. The McClure, Cambria, South West and Rainey Companies are running six days. The outlook, according to well-posted individuals, is still satisfactory. Shipments for the week are as follows: Cars west of Pittsburg, 3,543; to Pittsburg, 2,150; cars to points east, 912; total, 6,605; previous week 6,813; showing a decline of 208 cars. The rates are: Furnace coke, $1,90; foundry, $2,30; crushed $2.65, all f.o.b, cars at ovens.

FREIGHTS.

From Port Richmond to: Alexandria, †85c.; Boston, 60@75c.; Portland, *60c; Portsmouth, *70c.; Providence, *60c.; New York, †90c.; Washington, †85c.; Richmond, 70c.

*And discharging.
†Alongside.

METAL MARKET.

NEW YORK, Friday Evening, Aug. 21.

Prices of Silver Per Ounce Troy.

Aug	Sterling Exch'ge	Lond'n Pence.	N. Y. Cts.	Aug	Sterling Exch'ge.	Lond'n Pence.	N. Y Cts.
15	4.86	45½	98⅞	19	4.86	45 5/16	98½
17	4.86	45⅜	98¾	20	4.86	45 5/16	98¼
18	4.86	45 5/16	98⅝	21	4.86	45 3/16	98⅛

The silver market continues weak and depressed from lack of any support and pressure to sell.

The London market is flat and nominal, while silver certificates continue dull without any speculative inquiry. The Government having completed its month's purchases does not buy again till September 2d, and this fact adds to the general depression.

The United States assay office at New York reports the total receipts of silver for the week to be 101,000 oz.

Silver Bullion Certificates.

	Price. H.	Price. L.	Sales.
Aug. 15	.....	.....	.....
Aug. 17	.....	.....	.....
Aug. 18	.....	.....	.....
Aug. 19	99	98¾	35,000
Aug. 20	.....	.....	.....
Aug. 21	98⅝	98	122,000
Total sales			157,000

Domestic and Foreign Coin.

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

	Bid.	Asked.
Trade dollars	$ .76	$ .78
Mexican dollars	.76¾	.77½
Peruvian soles and Chilian pesos	.73	.74
English silver	4.84	4.88
Five francs	.94	.95
Victoria sovereigns	4.86	4.89
Twenty francs	3.88	3.92
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.78	4.83
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.90
Ten guilders	3.96	4.00

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its minimum rate of discount, which remains at 2½%. In the week the bank lost £327,000 bullion, but the proportion of reserve to liabilities was raised from 44·23% to 45·22%, against an advance from 41·93% to 43·70% in the corresponding week last year, when its discount rate was reduced from 5% to 4%. On the 20th inst. the bank lost £144,000 bullion on balance. The weekly statement of the Bank of France shows a gain of 100,000 francs gold and 1,675,000 francs silver.

Copper.—There has been more business during the past week than for a considerable time, and it is quite evident that consumers are very badly stocked, as most sales were made for immediate delivery or immediate shipment. The Calumet & Hecla Company is holding for 12½ cts., and is evidently doing only a limited business. Other producers have been selling quite freely at from 12c. to 12¼c., according to brands, quantities and deliveries, but at the close there are more sellers, and the market is easier at, say 12⅛c. Casting copper also had a good sale, but prices were easier, and we have to quote 11⅝@11⅞c. There has been a good inquiry for electrolytic copper, with sales at 11¾@12c. The Anaconda is still closed and there are no signs that work will soon be resumed.

In Europe the market has been rather unsteady and disappointing. After hardening somewhat early in the week, when G. M. Bs. went as high as £53, an easier feeling was noticeable, and we close at £52 5s.@£52 7s. 6d. The demand from consumers is slack, and manufacturers complain at not having many orders on their books for future delivery. We quote: Best selected £56 @ £56 10s.; English tough, £54@£54 10s.; strong sheets, £65@£65 10s.; India sheets, £60@£61; yellow metal sheets, 5⅝d.@5⅞d.

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

To Havre—	Copper.	Lbs.	
S. S. La Touraine	140 casks	175,500	$24,000
" "	112 plates	5,000	700
" "	2,543 bars	349,757	45,468
S. S. La Gascogne	270 bbls	337,500	43,875
" "	140 bars	45,044	5,000
To Liverpool—	Copper Matte	lbs.	
S. S. City of Berlin	2,152 bags	240,000	$16,000
To Antwerp—	Copper.	Lbs.	
S. S. Waesland	279 pigs	89,527	$10,000
To Rotterdam—	Copper.	Lbs.	
S. S. Wirkendam	205 bars	60,119	$6,700

Paris advices are that the *Tribunal Civil* condemned the directors of the late *Societe des Metaux*, on the 29th ult., and imposed very severe monetary fines. Messrs. Secretan and Emile Laveissiere are to pay six million francs; Arbel, Champoullion and Girard, 1½ millions; Joseph Laveissiere, Hentsch, Labelouge, and Puerari, one million; and finally, Joubert and Lecuyer, 500,000 francs.

Tin.—The volume of business has been quite satisfactory, but not so prices, which gave way and are now again somewhat below the parity of import prices. A few hundred tons changed hands at 20¼c. early in the week, but later on there were full sales at 20.10@20.20c. for spot and futures. Shipments from the East continue on quite a fair scale, and stocks here have been replenished by the heavy arrivals lately, and further supplies are near at hand.

The English market showed a somewhat firmer tendency a few days ago, but this has given way to a dull feeling, and prices close at £91 7s. 6d. spot and £92 three months.

Lead has been in steady demand at full values. It is reported that the Omaha & Grant Company has started its Omaha works again, but at the time of writing we are not sure whether they are producing at the old rate or what. Consumption is good, and there are no reserves worth speaking of, which ought to be considered whenever reviewing the position. We have to quote 4. 45@4.50c.

Spelter is decidedly flat, and we hear of lower prices. Sales have been made at from 4.95 to 5c. New York, and at the latter prices there are further sellers.

Antimony is steady at the decline. We quote Cookson's at 11¾c., LX at 11c. and Hallet's at 10¼ @10½c.

Quicksilver.—The market for this metal is quiet, London quotations are £7 10s. and New York $42.50.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Aug. 21.

The iron market in general has undergone no change. The buying has been of a hand-to-mouth nature, but the aggregate has been fairly large. There is little probability of a speedy radical change in the situation, either as to prices or volume of business. Manufacturers are pinning their faith to the cheerful reports of excellent crops throughout the country, believing that an era of general prosperity will be experienced, and that they will come in for a due share of this.

American Pig Iron.—The condition reported last week still prevails in this market. There has been some demand for the higher grades of iron; Northern furnaces report that they are well sold ahead, and it is a fact that No. 1 foundry, both Northern and Southern, is quite scarce, all rumors to the contrary. There is no Southern iron pressing on this market. Our quotations are: Northern, No. X, $17@$18; No. 2 X, $16@$16.50. Southern, No. 1, $16.50@$17.50; No. 2, $15.50@$16.50.

Scotch Pig Iron.—There is a small but steady business doing in Scotch pig. The recent arrivals have been disposed of at the following prices: Eglinton, $20.50; Summerlee, $22.50; Coltness, $22.75@$23.

Spiegeleisen and Ferro-manganese.—No new business is doing in either spiegel or ferro. We hear that some rail mills have requested that the deliveries of imported spiegel be deferred, owing to the slackness in the rail trade. We quote this week: 20% Spiegeleisen, $27.50@$28, and 80% ferro-manganese, $63.50@$64.

Steel Rails.—No sales are reported this week. Eastern mills now working on old contracts are not very hopeful, inasmuch as when the orders are filled they will find themselves without new work, and there is a probability that some will be obliged to close down for some time. Quotations are unchanged at $30 at mills and $30.75 at tide water.

Rail Fastenings.—So far as the local market is concerned rail fastenings are dead. No business of any kind is reported. We quote nominally: Spikes, $2.10@$2.15; angle plates, 1·70@1·80c; bolts and square nuts, 2·75@2·85c.; hexagonal nuts, 2·95c.; complete joint, iron and steel, according to weight.

Tubes and Pipe.—This market shows more firmness. Manufacturers report business improving, and the outlook is promising. We quote ruling discounts on carload lots as follows: 52½% on butt black; 42½% on galvanized; 62½% on lap, black; 50% on lap, galvanized; boiler tubes under 3 ins. and over 6 ins., 55%; 3 ins. to 6 ins., 60%.

Merchant Steel.—Better business has been done during the week, and a slight but steady improvement is noticeable. Quotations are as follows: R. Mushet's special, 48c.; English tool, 15c, net; American tool steel, 7@8c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2·50c.; open-hearth spring, 2·60c.; tire steel, 2·50c.; toe calks, 2·50c.; first quality sheet, 10c.; second quality sheet, 8c.

Structural Material.—The trade in structural iron and steel is fairly good. There is not an extraordinary rush of business, but a satisfactory amount is reported. Quotations show no change from last week and we repeat them accordingly: Universal plates, $2.20; bridge plates, $2.10; beams, $3.10.

Old Rails.—Nothing is doing in this market. Old iron rails are scarce, and old steel rails are by no means plentiful. Quotations are nominally $20@$21. The price depends on whether the purchasers need the rails badly or whether the seller is anxious to dispose of them, and therefore it is difficult to quote accurately.

Wrought Iron Scrap.—No business is reported in wrought iron scrap. We quote, nominally, $19 @$20.

NOTES OF THE WEEK.

A general advance in iron rates will be made by the Central Traffic Association lines on Sept 1st. All the special tariffs which were put in effect March 30th will become void on August 31st. The new rates between Chicago and Pittsburg are $2.50 per ton; between Chicago and the Mahoning Valley, $2.20 and between Chicago and the Hocking Valley, $2.20 per ton. The rates are for car loads of 12 tons or more, the gross or net ton being applied according to the rules of the official classification.

In the work of completing the enlarged locks at the Sault Ste. Marie ship canal on Lake Superior, excavation having been completed, construction is about to commence after 2 years of labor in excavating. The entire cost is estimated by Engineer Poe, at $4,585,000, of which $350,000 is for lock gates and machinery. This season a boat trading between Lake Superior and Lake Erie ports can load to a depth of but little over 14 ft. When the canal is completed the same vessel can load to 19 ft. The E. C. Pope now carries through the canal about 3,000 tons of ore on a draft of 14 ft. On 16 ft. it is estimated she will carry 3750 tons, and on 19 ft. probably about 4800 tons.

The Carbon Iron and Pipe Company, of Parryville, Pa., has been devoting special attention for some time past to the manufacture of low phos-

phorus pig iron for open-hearth purposes, which is now being offered to the trade under the brand of "Viking," the chief object being to obtain a pig combining low silicon with low sulphur, says the Catasauqua *Dispatch*. Generally speaking, in order to produce iron of extremely low silicon it has been found necessary to run the furnace on mottled and white iron, and by doing this iron of low silicon can be produced, but it almost invariably contains high sulphur. The Carbon company has finally succeeded in manufacturing an iron of Nos. 1, 2 and 3 grade with silicon under 1%, and of late the silicon has been averaging under ½%.

Chicago. Aug. 20.

(From our Special Correspondent.)

The impression is gaining ground, which evidence fully confirms, that the shortage of cars will be more severely felt this season than ever before. Most of the trunk lines with terminals at this point will be short anywhere from 500 to 5,000 cars, and some mines in this and adjoining States are already working on short time. The market is without any special features, if we except a little better inquiry for coke iron, with some further large sales of Lake Superior charcoal pig to eastern consumers. The advance in freight rates, which will go into effect September 1st, will affect all classes of crude and manufactured iron, and some mills decline to quote for delivery after that date excepting at an advance. Demand generally is fair for bars, plates, and sheets, with a heavy business looming up in the near future for structurals. Steel rails will be in good demand later. Old material and scrap are rather more quiet.

Pig Iron.—The volume of business bas been fair, and while there has been no activity, probably on account of the heated term, the outlook is altogether more favorable for an increased consumption of iron of all grades. Several more large sales of lake charcoal iron to Eastern parties are reported by dealers, prices in the East being relatively higher than they are here; shipments to car-wheel men continue good, considering the condition of this branch of the iron market. Increased activity will be noticed for this grade as soon as railroads come into the market for rolling stock. Some Southern furnace agents report that they could do a large business in best grades of coke iron if they would accept orders at current rates for long extended deliveries. The poorer grades, No. 3 grey forge and mottled, are weak, and low prices must be made to move them. Orders are mostly for small quantities, with here and there a 500 or 1,000-ton lot. Scotch softeners are in moderate demand in car loads up to 100 or 200 tons.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, $17@$17.50; Lake Superior coke, No. 1, $15.25@$15.75; No. 2, $15@$15.25; No. 3, $14@$14.50; Lake Superior Bessemer, $17; Lake Superior Scotch, $17@$17.50; American Scotch, $17.75@$18.25; Southern coke, Foundry No. 1, $15.75; No. 2, $15.25; No. 3, $14.50; Southern coke, soft, No. 1, $15.50; No. 2, $14.50; Ohio silveries, No. 1, $18; No. 2, $17; Ohio strong softeners, No. 1, $18; No. 2, $17; Tennessee charcoal, No. 1, $17.50; No. 2, $17; Southern standard car wheel, $21@$22.50.

Structural Iron and Steel.—There is a decided improvement in the general inquiry. Plans are on the boards for a large warehouse system on the Northern Pacific Terminal in this city, particulars of which are not yet made public. Quotations for car lots f. o. b. Chicago are as follows: Angles, $2@$2.10; tees, $2.60@$2.70; universal plates, $2.35@$2.45; sheared plates, $2.30@$2.40; beams and channels, $3.20.

Plates.—The large dealers continue to stock up in anticipation of a heavy trade, and they report business as very satisfactory and in a healthy condition. There is a good deal of work in sight and much that is talked of. Steel sheets, 10 to 14, $2.70@$2.80; iron sheets, 10 to 14, $2.60@$2.70; tank iron or steel, $2.50@$2.70; shell iron or steel, $3@$3.25; firebox steel, $4.25@$5.50; flange steel, $3.25@$3.40; boiler rivets, $4.25; boiler tubes, 2¾ in. and smaller, 55%; 3 to 6 in., 60%; 7 in. and upward, 55%.

Merchant Steel.—A number of implement men who have placed season's contracts are already ordering on account of same, and are making preparations earlier than usual to continue manufacturing. Several good sized contracts for soft steels have been placed during the week, and wagon and carriage makers are inquiring for tire, etc. Tool steel is in good demand. Tool steel, $6.75@$7 and upward; tire steel, $2.30@$2.50; toe calk, $2.50@$2.65; Bessemer machinery, $2.20@$2.30; Bessemer bars, $2@$2.10; open-hearth machinery, $2.60@$2.75; open-hearth spring, $2.75@$3; crucible spring, $3.75@$4.

Steel Rails.—There is quite a large amount of inquiry, but the great stumbling block appears to be that railroads still ask manufacturers to accept bonds in payment. This class of business is promptly declined. All the large trunk systems of the Northwest have been buying in small quantities only during the past two years, by no means sufficient to cover necessary repairs, and as soon as the earnings will permit they will be in the market for rails for renewals. Business at present is mostly confined to small lots, with an occasional large order. Quotations are steady at $31.50@$32.50. Splice bars and spikes are in moderate demand. Regular quotations are: $1.95@$2 for steel and $1.85@$1.90 for iron; spikes at $2.15@$2.20 per 100 lbs. track bolts; hexagonal nuts, $2.85@$2.90.

Galvanized Sheet Iron.—Store trade from agents' warehouses continues good and mill business is large, and some refuse September shipments at present price. We quote 67½% off on Juniata and 67½% and 5% off on charcoal.

Black Sheet Iron.—Most mills have about all the business they can take care of for delivery during the next 60 to 90 days, and prices are now quite firm at 2·90@2·95c. for No. 27 Common, f. o. b. Chicago. Dealers quote 3·10c. for same gauge from stock.

Bar Iron.—A local mill booked an order for 1,000 tons car iron at 1·70c. flat, and there is no disposition to shade that figure. Business is fair for carloads and upward, but not by any means active. Valley mills quote 1·57½@1·60c., half extras at mill, and the former is an inside price. Jobbing trade is improving at 1·80@1·90c. rates.

Nails.—Business in factory lots of steel-cut is limited, and large orders are scarce, though the price is perhaps a little stronger. Mill price is $1.65 regular average, but shaded on desirable orders; jobbers quote $1.75. Wire nails are in good demand, and more sales are reported than there were ten days ago, and price is steady at $1.90 mill or $2.05 Chicago; jobbers quote $2.15 from stock.

Scrap.—This market is again quiet and values are more or less weak than earlier in the month.

Quotations are: No. 1 railroad, $19.50; No. 1 forge, $18.50; No. 1 mill, $14.50; fishplates, $21; axles, $23; horseshoes, $19; pipes and flues, $13; cast borings, $8; wrought turnings, $10.50; axle turnings, $12; machinery casting, $12; stove plates, $8; mixed steel, $11; coil steel, $14.50; leaf steel, $15.50; tires, $17.50.

Old Rails and Wheels.—A sale of 2,000 tons is reported at $23 and several small lots changed hands at $23.25. Car wheels were sold to the extent of 9,000 tons to one consumer at about $15.50. Steel rails are dull at $14@$16, according to length, etc.

Louisville. Aug. 15.

(Special Report by HALL BROTHERS & Co.)

Since our last review the market has a shade better tone in so far as demand is concerned, but prices rule very low. About 3,000 tons of charcoal iron have been sold the different car-wheel manufacturers; some car orders are being let this week; good crop reports give a shade better feeling. Coke irons are dull. We continue to quote:

Hot Blast Foundry Irons.—Southern coke, No. 1, $14.25@$14.50; No. 2, $13.50@$14; No. 3, $13@$13.25. Southern charcoal, No. 1, $16@$17; No. 2, $15.50@$16. Missouri charcoal, No. 1, $17@$17.50; No. 2, $16.50@$17.

Forge Irons.—Neutral coke, $12.50@$12.75; cold short, $12.25@$12.50; mottled, $11.75@$12.

Car Wheel and Malleable Irons.—Southern, standard brands, $19@$19.50; Southern, other brands, $17@$18. Lake Superior, $20@$21.

Philadelphia. Aug. 20.

(From our Special Correspondent.)

Pig Iron.—A very fair amount of business has been done during the current week both in low and high grades of pig iron; as for prices, they remain about the same as quoted for some time past, although better prices are looked for in the near future. Business is improving steadily but slowly. The better grades are selling well, and there are few stocks on hand. No. 1 Foundry iron is quoted at $17.75@$18; No. 2, $16.50@$17; Southern No. 1, $16.75@$17.25; No. 2, $15.75@$16; grey forge, $14.50@$15.

Foreign Material.—As regards foreign material we hear of nothing of importance to report at this time.

Steel Billets.—Quite a good deal of inquiry has been coming in for billets and slabs, and bids are had from $26.75 to $27.50, for billets delivered. It is thought that a few orders have been received at these prices.

Muck Bars.—Very little business has been done in muck bars during the past week. Buyers and manufacturers do not seem to agree as to prices, and therefore few orders are being placed. $26.25@$27 is asked at mill, while inquiries are being received daily.

Bar Iron.—There bas been some weakness in prices of bar iron noticeable for the past week. Quite a little business has been transacted, however. There are no car builders in the market as yet, notwithstanding the talk. $1.70@$1.80 is the price asked for city delivery, $1.65@$1.70 at interior points.

Plate and Tank Iron.—There is a pretty good demand for plate and tank iron in small sized lots at this time, and at usual prices. The mills are running along, in most cases pretty well filled with business, but, of course, are always ready for more orders. Some concessions have been made, especially on steel. Tank plates are quoted at 1·90@2c.; refined, 2·20@2·30c.; flange, 3·20@3·30c.

Wrought Iron Pipe.—The outlook for the future of wrought iron pipe is good, and there is a fair demand moving along at present, especially for small sizes. Prices are a little irregular and weak, however. Quotations are as follows: Butt-welded black, 52½%; butt-welded galvanized, 42½%; large boiler tubes, 55%.

Sheet Iron.—There is not much doing in sheet iron at this time, although we are looking for the placing of some orders very soon. Thin sheets are not much inquired for, while heavy sheets are selling moderately well. Prices remain about the same as last quoted, namely, best refined, 3@3½c.; best soft steel, 3@4c.

Structural Material.—Some small orders are being placed, but there is no call for large ones just now. The labor troubles were the cause of some delay in work last month, but mills are now working along at first-class rate, making up on old orders. They are looking around at the same time to catch any new business that may be placed. Angles are quoted at $2 10@$1.60; sheared plates, $2@$2.10; tees, $2.50@$2.60; beams, $3.10 for both iron and steel.

Old Rails.—We are unable to note the least change in the steel rail market to-day. Small lots when called for bring $30 at mill, but there is very little inquiry. Old Rails—Iron, $21.50@$22.50; steel, $17.50@$18.50. Scrap—No. 1 railroad is quoted at $20.50@$21.50.

Pittsburg. Aug. 20.

(From our Special Correspondent.)

Raw Iron and Steel.—That we are in the midst of the dull season of the year, the sales that follow this report will furnish all the evidence necessary to convince the most skeptical reader. Notwithstanding the fact that sales have been very much restricted, there has been a reasonable amount of inquiry, and, in some instances, for good-sized blocks. Buyers at present are offering very low figures for most descriptions of iron and steel; to this fact must be attributed the limited amount of sales reported.

So far as the market is concerned we have no improvement in values to note. City furnaces show no disposition to shade prices, having an abiding confidence that these figures will be realized on the resumption of business in the fall. The builders' strike, inaugurated on the 1st of May (which still continues), had far more to do with depressing the market than some parties are willing to admit. A number of large buildings, some of them ten stories and upward, were projected and were to be constructed this season, but had to be abandoned. The said buildings would have required thousands of tons of iron and steel in their construction.

Furnacemen from the Shenango and Mahoning Valleys report a fair demand for both grey forge and Bessemer iron, with some sales made extending over the next two months. Prices in the Valleys show up well.

In regard to the Eastern iron trade a leading dealer has this to say: "On the whole it is probable that the market is a trifle better than it was a week ago, but the improvement is not very pronounced. The leading feature is an increased demand. It is easier to find buyers than for some time past, but sellers appear so anxious for business that anything like improvement in prices seems to be out of the question. The fact that there is a more general demand is a good feature, however, as it is a necessary preliminary to improvement in other directions.

The situation may be summed up as follows: Bessemer prices rule low, even below those reported last week. Grey forge, demand restricted; prices show no change. Muck bar, prices shaded fully 25 cents per ton. Steel slabs and billets are weaker, and can be purchased at a decline from last week's figures. Skelp iron, demand restricted; prices unchanged. Scrap material dull; prices uncertain. Ferro manganese, demand light; prices unchanged. Old iron rails, scarce and firm.

Coke Smelted Lake and Native Ores.

1,000 Tons	Bessemer, August and September	15.80 cash.
1 000 Tons	Bessemer, August and September	15.80 cash.
1,000 Tons	Bessemer	15.75 cash.
1,000 Tons	Bessemer	15.75 cash.
500 Tons	Grey Forge	14 00 cash.
500 Tons	Grey Forge, October and November	14.10 cash.
500 Tons	Grey Forge, Youngstown. Del	13.75 cash.
500 Tons	Grey Forge	14.00 cash.
300 Tons	Grey Forge, all ore	15.25 4m.
200 Tons	No. 2 Foundry, all ore	16.00 cash.
200 Tons	No. 1 Foundry	16.00 cash.
100 Tons	White Iron	13.25 cash.
100 Tons	Grey Forge, all ore	15.25 4m.
100 Tons	No. 1 Foundry	16.00 4m.
100 Tons	No. 2 Foundry	15.50 4m.
100 Tons	Mill Iron	14.00 cash.
50 Tons	Silvery	16.00 cash.
50 Tons	No. 3 Foundry	14 75 cash.
50 Tons	No. 3 Foundry	14.50 cash.

Charcoal.

100 Tons	Cold Blast	25.50 cash.
100 Tons	No. 2 Foundry	21.00 cash.
50 Tons	Warm Blast	19 50 cash.

Steel Slabs and Billets.

1000 Tons	Nail Slabs	25.10 cash.
500 Tons	Billets	25.25 cash.
500 Tons	Billets, at mill	25.00 cash.

Muck Bars.

700 Tons	Neutral Aug. Sept. Oct	26.50 cash.
500 Tons	Neutral	26.25 cash.

Ferro-Manganese.

150 Tons	80%, Domestic	66.50 cash.

Mill Cinder.

1250 Tons	Mill Cinder	per ton 2 50 cash.

Scrap Material.

2 0 Tons	No. 1, RR. W Scrap, net	19.50 cash,
150 Tons	Cast Borings, gross	10.50 cash.
50 Tons	Hammond Iron Axles, net	27.00 cash.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

Name and Location of Company.	Aug. 15. H.	Aug. 15. L.	Aug. 17. H.	Aug. 17. L.	Aug. 18. H.	Aug. 18. L.	Aug. 19. H.	Aug. 19. L.	Aug. 20. H.	Aug. 20. L.	Aug. 21. H.	Aug. 21. L.	Sales.
Adams, Colo.													
Alice, Mont.	1.90		2.00										250
Aspen, Nev.					4.50								400
Atlantic, Mich.													
Bassick													
Belle Isle, Nev.			.60										200
Bodie Cons., Cal.													
Bos. & Mont., Mont													
Breece, Colo.													
Bulwer, Cal.													
Caledonia, S. Dak.													
Catalpa													
Chrysolite, Colo.													
Colorado Central, Colo.													
Commonwealth, Nev.													
Comstock T. bonds, Nev.													
" scrip., Nev.													
Cons. Cal. & Va., Nev.									7.00				500
Crown Point, Nev.					1.90								100
Deadwood, Dak.													
Eureka Cons., Nev.													
Father de Smet, S. Dak.													
Franklin, Mich.													
Freeland, Colo.													
Gould & Curry, Nev.	1.75		1.75				1.75						525
Granite Mountain, Mont.													
Hale & Norcross, Nev.													
Homestake, Dak.													
Horn-Silver, Utah													
Independence, Nev.													
Iron Silver	1.05												1,000
Leadville Cons., Colo.													
Little Chief, Colo.													
Martin White, Nev.													
Mono, Cal.													
Mt. Diablo, Nev.													
Navajo, Nev.													
N. Belle Isle, Nev.													
Ontario, Utah													
Ophir, Nev.	3.75		3.90				4.00		3.90		3.80		500
Osceola, Mich.													
Plymouth, Cal.											2.00		100
Quicksilver, Pref., Cal.													
" Com., Cal.													
Quincy, Mich.													
Robinson Cons., Colo.											.48		100
Savage, Nev.													
Sierra Nevada, Nev.											3.05		100
Silver Cord, Colo.													
Silver King, Ariz.													
Silver Mg. of L. V., N. M.													
Small Hopes, Colo.													
Standard													
Yellow Jacket, Nev.	1.85		1.90		1.85		1.80		1.75				500

NON-DIVIDEND-PAYING MINES.

Name and Location of Company.	Aug. 15. H.	Aug. 15. L.	Aug. 17. H.	Aug. 17. L.	Aug. 18. H.	Aug. 18. L.	Aug. 19. H.	Aug. 19. L.	Aug. 20. H.	Aug. 20. L.	Aug. 21. H.	Aug. 21. L.	Sales.
Alpha, Nev.					1.10								100
Alta	.70		.70		.70		.65	.60	.65		.65		700
American Flag, Colo.													
Andes, Cal.													
Astoria, Cal.	.01		.01		.01		.01		.01		.01		6,500
Augusta, Ga.													
" bonds													
Barcelona, Nev									.08				100
Belmont, Cal.	.81		.81		.82	.81	.83	.82	.83		.83		1,400
Best & Belcher, Nev.	3.70								3.80		3.60		620
Bonanza King, Cal.													
Brunswick, Cal.	.10				.16				.10		.10		2,000
Bullion, Nev.					3.40								100
Butte & Bost., Mont.													
Castle Creek, Idaho													
Challar	2.55								2.25		2.25		250
Comstock T., Nev.													
Con. Imperial, Nev.													
Con. Pacific, Cal.													
Crescent, Colo.													
Del Monte, Nev.													
El Cristo, Rep. of Col.	.26						.38	.35	.41	.40	.43		1,700
Emmett	.70	.65											40
Exchequer, Nev.					.90								900
Hollywood, Cal.													
Huron, Mich.													
Justice, Nev.													
King & Pembroke, Ont.													
Lacrosse, Colo.													
Lee Basin, Colo.													
Mexican, Nev.	2.65		2.60				2.70		2.60		2.45		500
Middle Bar, Cal.	.02		.01				.01						3,500
Monitor, Colo.													
Mutual S. & M. Co., Wash.													
Nevada Queen, Nev.											.25		100
N. Standard, Cal.													
N. Commonwealth, Nev.													
Occidental, Nev.													
Oriental & Mil., Nev.													
Phœnix Lead, Colo.													
Phœnix of Ariz.													
Potosi, Colo.	4.75												100
Rappahannock, Va.													
S. Sebastian, S. Sal.													
Santa Fe, N. M.													
Scorpion, Nev.					.46						.50		700
Seg Belcher, Nev.					1.20								100
Shoshone, Idaho													
Silver Hill, Nev.					.50						.40		1,300
Sullivan Con., Dak.													
Sutro Tunnel, Nev.													
Syndicate													
Tornado Con., Nev.													
Union Cons., Nev.			2.85				2.75						300
Utah, Nev.			.90				.90				.85		500

*Ex. dividend. †Dealt at in the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 4,275. Non-dividend shares sold. 21,270. Total New York, 25,545.

BOSTON MINING STOCK QUOTATIONS.

Name of Company.	Aug. 14.	Aug. 14.	Aug. 15.	Aug. 15.	Aug. 17.	Aug. 17.	Aug. 18.	Aug. 18.	Aug. 19.	Aug. 19.	Aug. 20.	Aug. 20.	Sales.
Atlantic, Mich	13.00	12.75			13.00		13.00		13.25		13.25		429
Bodie, Cal.													
Bonanza Development													
Bost. & Mont., Mont.	42.00	41.75	43.25	42 25	44.75	44.00	45.00	44.00	44.50	44.00	44.00		1,096
Breece, Colo.													
Calumet & Hecla, Mich.	250	246	250		253	250	255	253					114
Catalpa, Colo.													
Central, Mich.													
Cœur d'Alene, Id.													
Con. Cal. & Va., Nev.													
Dunkin, Colo.													
Eureka, Nev.													
Franklin, Mich.	15.50		15.00	14.50					15.75	15 50	15.63		325
Honorine, Utah													
Horn Silver, Utah													
Kearsarge, Mich.	10.00		11 50	11.00	12.50	12.00	12.50		12.00		12.50	12.25	660
Little Chief, Colo.													
Little Pittsburg, Colo.													
Minnesota Iron.													
Napa, Cal.													
Ontario, Utah													
Osceola, Mich.	35.00	34.75	36.50	35.00	37.00		37.00	36.50	37.00				535
Quincy, Mich.					100		106		105½				25
Ridge, Mich.													
Sierra Nevada, Nev.													
Silver King, Ariz.													
Stormont, Utah													
Tamarack, Mich.			155		155				155				25
Tecumseh, Mich.													

Name of Company.	Aug. 14.	Aug. 14.	Aug. 15.	Aug. 15.	Aug. 17.	Aug. 17.	Aug. 18.	Aug. 18.	Aug. 19.	Aug. 19.	Aug. 20.	Aug. 20.	Sales
Allouez, Mich.			1.75		1.88		1.88	1.75			1.88		1,150
Arnold, Mich.													
Aztec, Mich.													
Brunswick, Cal.													
Butte & Boston, Mont.	14.50	14.00	15.50	14.50	16.00	15.63	16.38	16.00	16.50	16.00	16.50	16.38	2,790
Centennial, Mich.			15.00	14.63	15.88	15.50	16.25	15.75	16.00		16.50	16.00	1,848
Comstock, T., Nev.													
Copper Falls, Mich.													
Crescent, Colo.													
Dana, Mich.													
Don Enrique, N. M.													
El Cristo, S. A.													
Hanover, Mich.													
Humboldt, Mich.													
Hungarian, Mich.													
Huron, Mich.													
Mesnard, Mich.	.35												100
National, Mich.			2.00										50
Native, Mich.													
Oriental & M., Nev.													
Phoenix, Ariz.													
Pontiac, Mich.													
Rappahannock, Va.													
Santa Fe, N. Mex.					.50		.47½		.50	.47½	.52½	.50	3,980
Shoshone, Idaho.													
South Side, Mich.													
Star, Mich													
Washington, Mich.													
Winthrop, Mich.													

Dividend shares sold, 3,209. Non-dividend shares sold, 9,838. Total shares sold, 13,047.

COAL STOCKS.

Name of Company.	Aug. 15. H.	Aug. 15. L.	Aug. 17. H.	Aug. 17. L.	Aug. 18. H.	Aug. 18. L.	Aug. 19. H.	Aug. 19. L.	Aug. 20. H.	Aug. 20. L.	Aug. 21. H.	Aug. 21. L.	Sales.
American Coal.													
Cambria Iron.													
Cameron Coal & I. Co.													
Ches. & O. R. R.													
Chic. & Ind. Coal R. R.													
Do. pref.													
Col. C. & I.	30½		31⅝	31⅛	32½	32	33	32⅝	34¼	33¼	34⅛	34⅜	3,725
Col. C. & Hocking C. I.													
Consolidation Coal.													
Del. & H. C.	128	126¾	126¾		128¾	128			128	127½	128		1,215
D., L. & W. R. R.	136	135¾	137½	135¾	137⅜	136¼	136⅝	136¼	136¾	136	136⅝	136¼	19,828
Hocking Valley	25½	24¾	26¾	25⅝	27	26¼	26	25½	26¼	26	26	25⅝	3,335
Hunt & Broad Top.	22		22½										200
Do. pref.			44¾		44				44				362
Illinois C. & Coke Co.													
+Lehigh C. & N.	46¾		46¾	46¼	46¼		47¼	46¾	47⅛	47			2,266
†Lehigh Valley R. R.	47⅛		48		48		48⅜		48¼	48			537
Lehigh & Wilk. Coal.													
Mahoning Coal.													
Do. pref.													
Maryland Coal.													
Morris & Essex.					144¾						144¾		60
+New Central Coal.			10										400
N. J. C. R. R.	112½	112	113¾	112⅜	113¼	113¼	113	112⅜	113¼				2,820
N. Y. & S. Coal.													
N. Y., Susq. & West.	7		7¼	7	7¾		7¾		7½	7¼			1,689
Do. pref.	26½		29¼	27	29¼	28⅞	29¼						1,693
N. Y. & Perry C. & I.													
†Norfolk & West. R. R.			13¾	13	14	12¾							515
+Do. pref.			49	48½							50	49¾	600
+Penn. Coal.	262½	260	265										148
+Penn. R. R.	50		50⅜	50	50¼	50	50⅜	50	51¼	50⅜			11,887
+Ph. & R. R.	29¼	29	30⅛	29¼	30⅜	29⅞	30¼		30⅛	29⅞	30¼	30⅛	23,938
Sunday Creek Coal.													
Do. Pref.													
Tennessee C. & I. Co.	28		30	28½	31	29⅞	30¾	30	30¾	30¼	31⅛	30⅛	7,780
Do. pref.							85	83					200
Westmoreland Coal.													

† Par value, $50. Total shares sold, 83,198.

Deadwood.

Aug. 16.

The following are the closing quotations:

	Bid.	Ask'd.
Anna		
Bullion	.02	.03
Carthage		
Cora	.05	.05½
Double Standard	.10¾	.11
Emmett	.01½	.03
Equitable		
Florence	.02	.03
Golden Reward	.33	.33⅓
Harmony	.07½	.09
Hermit		
Hesta		
Iron Hill	.15	.20
Isidora	.25	.30
New Era		
Maggie		
Mikado		
Mutual		
Parson	.01	.01½
Rainbow	.02	.03
Retriever	.16	.18
Ross Hannibal		
Ruby Bell	.10	.12
Ruby Wilkes		
Scab'ry-Calkins	.02½	.03
Steward	.09	.10
Tornado	.13	.15
Troy	.01	.02
Uncle Sam		.05

Aspen.

Highest and lowest prices for the week ending Aug. 18:

Argentum Juniata	$1.50	$1.50
Aspen Deep	.11	.11
Best Friend	.24	.25
Bushwacker	.31	.39½
Della S		
Little Annie	.23	.23
Mollie Gibson	4.12½	4.15
Nolan Creek		
Park, Mamie & Queen.		
Pontiac		
St, Joe & Mineral F'rm	.25	.25

San Francisco Mining Stock Quotations.

Names of Stocks.	Closing Quotations. Aug. 14.	Aug. 15.	Aug. 17.	Aug. 18.	Aug. 19.	Aug. 20.
Alpha						
Alta	.60	.60	.50		.55	.60
Belcher						
Belle Isle	.55	.55			.50	.45
Best & Bel.	3.50	3.55	3.70		3.70	3.45
Bodie	.60	.60	.65		.60	.60
Bulwer	.25	.25	.30		.30	.20
Challar	2.40	2.30	2.15		2.10	2.10
Com'wealth	.35		.35		.25	.25
Con. C. & V.	6.88	7.75	7.25		7.13	6.50
Con Pacific						
Crown Point.	1.80	1.90	1.90		1.85	1.75
Del M'te, Nev.						
Eureka C						
Gould & C.	1.60	1.60	1.65		1.55	1.45
Hale & N.	1.90	1.95	1.90		1.90	1.75
M. White						
Mexican	2.50	2.55	2.55		2.45	2.30
Mono	.40	.40	.35		.30	.25
Mt. Diablo						2.85
Navajo	.15				.20	.20
Nev. Queen	.20	.20	.16		.20	.20
N. Belle Isle		.40	.35		.35	.35
N. Com'w'lth.						
Ophir	3.60	3.	3.85		3.80	3.65
Potosi	4.50	4	4.00		3.15	3.15
Savage	2.05	1.90	2.35		2.35	2.25
Sierra Nev.	3.05	3.10	3.15		3.05	2.5
Union Con.	2.60	2.70	2.60		2.55	2.40
Utah	.80	.85	.85		.75	8.75
Yellow Jack.	1.70	1.75	1.70		1.60	1.55

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and Amount of last			Dividends. Total paid.	Date & amount of last.		
1	Adams, S. L. C.	Colo.	$1,500,000	150,000	$10	*				$585,000	June	1891	.05
2	Alice, S.	Mont.	10,000,000	400,000	25	*				945,000	Aug.	1891	.06¼
3	Alma & Nel Wood., G	Idaho	300,000	30,000	10	*				60,000	Jan.	1889	50
4	Amador, G.	Cal.	1,250,000	250,000	5	*				31,250	Aug.	1890	.12½
5	American Belle, S.G.C	Colo.	2,000,000	400,000	5	*				50,000	April	1891	.12½
6	Americ'n & Nettie, G.S	Colo.		300,000						150,000	Nov.	1889	.10
7	Amy & Silversmith, S.	Mont.		341,419						247,530	Aug.	1887	.12½
8	Atlantic, C.	Mich.	1,000,000	40,000	25	$280,000	April	1875	$1.00	700,000	Feb.	1891	1.00
9	Argenta, S.	Nev.	10,000,000	100,000	100	335,000	July	1889	.10	40,000	Feb.	1880	.20
10	Aspen Mg. & S., S. L.	Colo.	2,000,000	200,000	10	*				660,000	May	1891	.10
11	Aurora, I.	Mich.	2,000,000	100,000	20					255,000	Mar.	1891	1.00
12	Badger, S.	Ont.	250,000	50,000	5					37,500	Mar.	1890	.25
13	Bangkok Cora Bell, S.	Colo.	600,000	600,000	1	*				44,510	Aug.	1890	.00½
14	Belle Isle, S.	Nev.	10,000,000	100,000	100	190,000	Dec.	1889	.15	300,000	Dec.	1879	.25
15	Belcher, S. G.	Nev.	10,400,000	104,000	100	2,978,000	Feb.	1891	.50	15,397,000	April	1876	1.00
16	Bellevue, Idaho, S. L.	Idaho	1,250,000	125,000	10	120,000	Dec.	1889	.25	200,000	Jan.	1890	.10
17	Bi-Metallic, S. G.	Mont.	5,000,000	200,000	25					760,000	June	1891	.35
18	Bodie Con., G. I.	Cal.	10,000,000	100,000	100	550,000	June	1890	.25	1,602,572	April	1885	.50
19	Boston & Mont., G.	Mont.	2,500,000	250,000	10	*				520,000	June	1886	.15
20	Boston & Mont., C. S.	Mont.	2,500,000	100,000	25	*				1,950,000	Aug.	1891	1.00
21	Breece, I.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1880	.01
22	Brooklyn Lead, L. S.	Utah	500,000	50,000	10					127,000	July	1887	.05
23	Bulwer, G.	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	.25	175,000	Jan.	1884	.10
24	Bunker Hill & S. S.L.	Idaho	3,000,000	300,000	10	*				150,000	Oct.	1883	.06⅔
25	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	192,000	Oct.	1890	.08
26	Calliope, S.	Colo.	1,000,000	1,000,000						140,000	Jan.	1891	.00½
27	Calumet & Hecla C.	Mich.	2,500,000	100,000	25	1,200,000				35,850,000	June	1891	5.00
28	Catalpa, S. L. I.	Colo.	3,000,000	300,000	10	*				270,000	May	1884	.10
29	Centen'l-Eureka, S.L	Utah	1,500,000	30,000	50					352,500	July	1891	2.00
30	Central, C.	Mich.	500,000	20,000	25	100,000	Oct.	1861	.65	1,970,000	Feb.	1891	1.00
31	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
32	Clay County, G.	Colo.	200,000	200,000	1	*				40,000	July	1891	.02
33	Cœur D'Alene, S. L.	Idaho	5,000,000	500,000	10					270,000	Aug.	1891	.02
34	Colorado Central, S.L.	Colo.	2,750,000	275,000	10	*				406,250	Aug.	1889	.05
35	Commonwealth, S.	Nev.	10,000,000	100,000	100	170,000	Nov.	1888	.50	20,000	Nov.	1890	.20
36	Confidence, S. L.	Nev.		24,960		328,880	May	1890	.75	199,680	April	1889	1.00
37	Cons. Cal. & Va., S.G.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	3,466,800	April	1890	.25
38	Contention, S.	Ariz.	12,500,000	250,000	50					†2,587,500	Dec.	1884	.25
39	**Cop. Queen Con., C	Ariz.	1,400,000	140,000	10					210,000	Feb.	1889	.50
40	Cortez, S.	Nev.	1,500,000	300,000	05	*				481,000	Feb.	1891	.46
41	Crescent, S. L. G.	Utah	15,000,000	600,000	25	*				228,000	Oct.	1888	.03
42	Crown Point, G. S.	Nev.	10,000,000	100,000	100	2,425,000	Sept.	1889	.50	11,588,000	Jan.	1875	2.00
43	Cumberland, L. S.	Mont.	5,000,000	500,000	10	*				15,000	Nov.	1889	.03
44	Daly, S. L.	Utah	3,000,000	150,000	20					2,062,500	Aug.	1891	.25
45	Deer Creek, S. G.	Idaho	1,000,000	200,000	5	*				20,000	June	1889	.05
46	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*				1,010,000	Aug.	1891	.05
47	DeLamar, S. G.	Idaho	2,000,000	400,000	5					72,000	July	1891	.13
48	Derbec B. Grav., G.	Cal.	10,000,000	100,000	100	90,000	Dec.	1881	.10	240,000	Oct.	1890	.10
49	Dunkin, S. L.	Colo.	5,000,000	200,000	25	*				390,000	Oct.	1889	.05
50	Dunstone, G. S. L.	Mont.	1,000,000	200,000	5	*				6,000	Nov.	1888	.03
51	Eclipse, L. S.	Colo.	100,000	100,000	1					20,000	Nov.	1887	10
52	Elkhorn, S. L.	Mont.	1,000,000	200,000	5	*				¶396,000	June	1891	1.00
53	Enterprise, S.	Colo.	100,000	10,000	10	*				40,000	May	1888	1.00
54	Eureka Con., S. L. G.	Nev.	5,000,000	50,000	100	550,000	June	1889	.50	4,892,500	Oct.	1890	.25
55	Evening Star, S. L.	Colo.	500,000	50,000	10	*				1,450,000	Dec.	1889	.25
56	Father de Smet, G.	Dak.	10,000,000	100,000	100	200,000	Nov.	1878	1.00	1,125,000	Dec.	1885	.20
57	Franklin, C.	Mich.	1,000,000	40,000	25	220,000	June	1871		1,040,000	July	1891	2.00
58	Freeland, S. G.	Colo.	5,000,000	200,000	25	*				190,000	July	1886	.10
59	Garfield Lt., G. S.	Nev.	500,000	100,000	5					90,000	April	1888	.12½
60	Gould & Curry, S. G.	Nev.	10,800,000	108,000	100	3,988,800	Sept.	1890	.25	3,826,800	Oct.	1870	10.00
61	Grand Prize, S.	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	.30	495,000	Mar.	1884	.25
62	Granite, S. L.	Idaho	500,000	500,000	1	*				28,400	Oct.	1889	.02
63	Granite Mountain, S.	Mont.	10,000,000	400,000	25					11,600,000	June	1891	.25
64	Green Mountain, G.	Cal.	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
65	Hale & Norcross, G. S.	Nev.	11,200,000	112,000	100	5,142,800	April	1890	.50	1,822,000	Aug.	1888	.50
66	Hecla Con., S. G. L. C.	Mont.	1,500,000	30,000	50					1,680,000	Aug.	1891	.50
67	Hel'a Mg. & Red, S.L.G.	Mont.	3,315,000	663,000	5	*				197,979	July	1886	.06
68	Holmes, S.	Nev.	10,000,000	100,000	100	370,000	May	1890	.25	75,000	April	1886	.25
69	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	4,731,750	Aug.	1891	.10
70	Honorine, S. L.	Utah	500,000	250,000	2	37,500	April	1889	.05	125,000	Sept.	1887	.05
71	Hope, S.	Mont.	1,000,000	100,000	10	*				233,250	April	1888	.25
72	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	*				4,300,000	June	1891	.12½
73	Hubert, G.	Colo.	1,000,000	1,000,000	1	*				247,000	Dec.	1889	.00½
74	Idaho, G.	Cal.	310,000	3,100	100					2,303,750	July	1891	3.00
75	Illinois, S.	N. M.	100,000	100,000	1	*				45,000	April	1889	.20
76	Iron Hill, S.	Dak.	2,500,000	250,000	10	134,000	July	1889	.03	156,250	Nov.	1887	.07½
77	Iron Mountain, S.	Mont.	500,000	500,000	1					120,000	Feb.	1891	.05
78	Iron-Silver, S. L.	Colo.	10,000,000	500,000	20	*				2,500,000	April	1889	.20
79	Jackson, G. S.	Nev.	5,000,000	50,000	100	237,500	Nov.	1880	.20	64,000	Jan.	1891	.10
80	Jay Gould, G. S.	Mont.	2,000,000	40,000	5	*				459,000	May	1890	.04
81	Kearsarge, C.	Mich.	1,000,000	40,000	25	190,000	Oct.	1887	1.00	80,000	Jan.	1890	2.00
82	Kentuck, S. G.	Nev.	3,000,000	30,000	100	417,439	Dec.	1890	.35	1,350,000	Dec.	1886	.10
83	La Plata, S. L.	Colo.	2,000,000	200,000	10	*				610,000	Sept.	1882	.30
84	Leadville Con., S. L.	Colo.	4,000,000	400,000	10	*				423,000	April	1887	.05
85	Lexington, G. S.	Mont.	4,000,000	40,000	100	*				565,000	Jan.	1885	2.00
86	Little Chief, S. L.	Colo.	10,000,000	200,000	50	*				820,000	Dec.	1890	.05
87	Little Rule, S.	Colo.	500,000	500,000	1					170,000	July	1891	.02
88	Mammoth, S. L. C.	Utah	10,000,000	400,000	25	110,000		1882	.25	960,000	June	1891	.10
89	Martin White, S.	Nev.	10,000,000	100,000	100	1,225,000	Oct.	1890	.25	140,000	Dec.	1886	.25
90	Mary Murphy, S. G.	Colo.	350,000	3,500	101	*				175,000	May	1888	5.00
91	Matchless, S. L	Colo.	500,000	500,000	1	*				15,000	Feb.	1890	.00½
92	May Mazeppa, S. L.	Colo.	1,000,000	100,000	1					168,000	July	1891	.01¼
93	Minas Prietas, G. S.	Mex.	1,000,000	100,000	10	*				350,000	Dec.	1890	.50
94	Minnesota, C.	Mich.	1,000,000	40,000	25	420,000	April	1886	1.00	1,820,000	Mar.	1876	
95	Mollie Gibson, S.	Colo.	5,000,000	1,000,000	5	*				500,000	Aug.	1891	.05
96	Monitor, G.	S.Dak	2,500,000	250,000	10					45,000	Oct.	1890	.03
97	Mono, G.	Cal.	5,000,000	50,000	100	760,000	Sept.	1890	.25	12,500	Mar.	1886	.25
98	Montana, Lt., G. S.	Mont.	3,300,000	660,000	5	*				2,619,075	June	1891	.12½
99	Morning Star, S. L.	Colo.	1,000,000	100,000	10					925,000	April	1891	.25
100	Moulton, S. G.	Mont.	2,000,000	400,000	5	*				380,000	Dec.	1887	.05½
101	Mount Pleasant, G.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
102	Mt. Diablo, S.	Nev.	5,000,000	50,000	100	137,500	June	1880	2.00	180,000	Sept.	1890	.40
103	Napa, Q.	Cal.	700,000	100,000	7					420,000	July	1891	.10
104	Navajo, G. S.	Nev.	10,000,000	100,000	100	500,000	April	1890	.15	229,950	April	1889	.10
105	New California, G.	Colo.	800,000	160,000	5	*				48,800	May	1890	12½
106	New Guston, S.	Colo.	550,000	110,000	5					785,000	April	1891	1.00
107	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06½
108	Northern Belle, S.	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	April	1883	.50
109	North Belle Isle, S.	Nev.	10,000,000	100,000	100	395,000	April	1890	.20	230,000	May	1888	.50
110	North Star, G.	Cal.	1,000,000	100,000	10					300,000	April	1889	.50
111	Ontario, S. L.	Utah	15,000,000	150,000	100					12,125,000	Aug.	1891	.50
112	Ophir, G. S.	Nev.	10,000,000	100,000	100	4,210,640	April	1890	.50	1,595,800	Jan.	1880	1.00
113	Original, S. C.	Mont.	1,500,000	60,000	25	*				138,000	Jan.	1889	.05
114	Oro, S. L. G.	Colo.	500,000	100,000	5					95,000	July	1890	.20
115	Osceola, C.	Mich.	1,250,000	50,000	25	480,000	April	1876	1.60	1,547,500	July	1891	1.00
116	Parrot, C.	Mont.	1,800,000	180,000	10					850,000	May	1891	.10
117	Peacock, S. G. C.	N. M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
118	Plumas Eureka, G.	Cal.	1,406,250	140,625	10					2,548,000	Oct.	1889	.37½
119	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
120	Quicksilver, pref., Q.	Cal.	4,300,000	43,000	100					1,770,161	Jan.	1891	1.50
121	" com., Q	Cal.	5,700,000	57,000	100					643,867	July	1882	.40
122	Quincy, C.	Mich.	1,000,000	40,000	25	200,000	Dec.	1862		5,970,000	Aug.	1891	5.00
123	Reed National, S. G.	Colo.	500,000	500,000	1	*				50,000	Dec.	1890	.01
124	Rialto, G.	Colo.	300,000	300,000	1	*				13,500	July	1891	.01¼
125	Richmond, S. L.	Nev.	1,350,000	54,000	25	*				4,332,887	Jan.	1891	.62½
126	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar.	1886	.50	99,785	Feb.	1880	.50
127	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
128	Running Lode, G.	Colo.	1,000,000	1,000,000	1	*				15,000	June	1891	.00½
129	Savage, S.	Nev.	11,200,000	112,000	100	6,604,000	Nov.	1889	.50	4,460,000	June	1869	3.00
130	Sheridan, S. G.	Colo.	300,000	3,000	100	*				225,000	Dec.	1890	3.33⅓
131	Shoshone, G.	Idaho	150,000	150,000	1					7,500	April	1883	.01
132	Sierra Buttes, G.	Cal.	2,225,000	122,500	10					1,492,557	April	1888	.12½
133	Sierra Nevada, S. G.	Nev.	10,000,000	100,000	100	6,296,910	May	1890	.50	102,000	Jan.	1871	1.00
134	Sierra Nevada, S. L.	Idaho	1,000,000	1,000,000	1	*				40,000	May	1889	.02
135	Silent Friend	Colo.	500,000	500,000	1					32,500	April	1891	.02½
136	Silver Cord, S. L. G.	Colo.	4,500,000	450,000	10					265,000	April	1889	.10
137	Silver King, S.	Ariz.	10,000,000	100,000	100	130,000	Nov.	1890	.30	1,950,000	July	1887	.25
138	Silver Mg. of L.V., S.L.	N. M.	500,009	500,000	1					375,000	May	1891	.05
139	Small Hopes Con., S.	Colo.	5,000,000	250,000	20	*				3,162,500	Oct.	1890	.10
140	Spring Valley, G.	Cal.	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan.	1881	.25
141	Standard, G. S.	Cal.	10,000,000	100,000	100	100,000	June	1890	.50	3,595,000	June	1888	.05
142	Stormont, S.	Utah	500,000	500,000	1	*				155,000	Nov.	1881	.05
143	St. Joseph, L.	Mo.	1,500,000	150,000	10	*				1,974,000	Dec.	1890	.02
144	Tamarack, C.	Mich.	1,250,000	50,000	25	520,000	April	1885	3.00	2,090,000	Aug.	1891	4.00
145	Tombstone, G. S. L	Ariz.	12,500,000	500,000	25	*				1,250,000	April	1882	.10
146	United Verde, C.	Ariz.	3,000,000	300,000	10	*				127,500	May	1890	.10
147	Viola Lt., S. L.	Idaho	750,000	150,000	5					337,500	Nov.	1888	.37½
148	Ward Con., S.	Colo.	2,000,000	200,000	10					20,000	Dec.	1889	.05
149	Woodside, S. L.	Utah	100,000	100,000	10					25,000	Oct.	1889	.25
150	W. Y. O. D.	Cal.	30,0,00	15,000	2	11,250	Feb.	1890	.10	4,500	May	1891	.10
151	Yankee Girl, S.	Colo.	2,500,000	250,000	10					1,405,000	April	1891	.50
152	Yellow Jacket, G. S.	Nev.	12,000,000	120,000	100	5,508,000	Mar.	1889	.50	2,184,000	Aug.	1871	2.50
153	Young America, G.	Cal.								175,000	Jan.	1889	.10

NON-DIVIDEND PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and am't of last.		
1	Allegheny, S.	Colo.	$5,000,000	500,000	$10	*			
2	Alliance, S. G.	Utah	100,000	100,000	1	$120,000	Feb.	1891	.20
3	Allouez, C.	Mich.	2,000,000	80,000	25	737,000	Jan.	1890	.70
4	Alpha Con., G. S.	Nev.	3,000,000	30,000	100	112,500	Sept.	1890	.25
5	Alta, S.	Nev.	10,080,000	100,800	100	3,359,800	Sept.	1890	.50
6	American Flag, S.	Colo.	1,250,000	125,000	10	300,000	June	1887	
7	Amity, S.	Colo.	250,000	250,000	1				
8	Anchor, S. L. G.	Utah	3,000,000	150,000	20	410,000	June	1890	.20
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	5				
10	Astoria, G.	Cal.	200,000	100,000	2				
11	Barcelona, G.	Nev.	5,000,000	200,000	25	*			
12	Bechtel Con., G.	Cal.	10,000,000	100,000	100	173,500		1883	.10
13	Belmont, G.	Cal.	500,000	500,000	1	*			
14	Belmont, S.	Nev.	5,000,000	50,000	100	735,000	April	1886	.10
15	Best & Belcher, S. G.	Nev.	10,080,000	100,800	100	2,279,275	Aug.	1890	.25
16	Black Oak, G.	Cal.	3,000,000	300,000	10	*			
17	Boston Con., G.	Cal.	10,000,000	100,000	100	170,000	Nov.	1883	.25
18	Bremen, S	N. M.	5,000,000	500,000	10	*			
19	Brownlow, G.	Colo.	250,000	250,000	1				
20	Brunswick, G.	Cal.	2,000,000	400,000	5	*			
21	Buckeye, S. L.	Mont.	1,000,900	500,000	2				
22	Bullion, S. G.	Nev.	10,000,000	100,000	100	2,790,000	Dec.	1889	.25
23	Butte & Boston, C. S.	Mont.	5,000,000	200,000					.25
24	Calaveras, G.	Cal.	500,000	500,000	1	*			
25	Carisa, G.	Wy.	500,000	100,000	5	*			
26	Carupano, G. S. L. C.	Ven.	200,000	100,000	2	*			
27	Cashier, G. S.	Colo.	500,000	250,000	2	*			
28	Cherokee, G.	Cal.	1,500,000	150,000	10				
29	Chollar, S. G.	Nev.	11,200,000	112,000	100	1,540,000	Nov.	1889	.50
30	Cleveland, T.	Dak.	1,000,000	500,000	2	*			
31	Colchis, S. G.	N. M.	500,000	50,000	10				
32	Colorado Silver	Colo.	1,625,000	325,000	5				
33	Comstock Tun.	Nev.	10,000,000	100,000	100	35,000	Mar.	1887	.15
34	Con. Imperial, G. S	Nev.	5,000,000	50,000	100	1,875,000	July	1890	.05
35	Con. New York, S. G.	Nev.	5,000,000	100,000	50	70,000	Nov.	1890	.15
36	Con. Pacific, G.	Cal.	6,000,000	60,000	100	198,000	June	1890	.10
37	Con. Silver, S.	Mo.	2,500,000	250,000	10				
38	Crescent, S. L.	Colo.	3,000,000	300,000	10	*			
39	Crocker, S.	Ariz.	10,000,000	100,000	100	150,000	June	1890	.15
40	Crowell, G.	N. C.	500,000	500,000	1				
41	Dahlonega, G.	Ga.	250,000	250,000	1	*			
42	Dandy, S.	Colo.	5,000,000	500,000	10				
43	Decatur, S.	Colo.	1,500,000	300,000	5	*			
44	Denver City, S.	Colo.	5,000,000	500,000	10	*			
45	Denver Gold, G.	Colo.	300,000	60,000	5				
46	Dickens-Custer, S.	Idaho	2,100,000	420,000	5				
47	Durango, G.	Colo.	500,000	500,000	1	*			
48	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990,000	Mar.	1886	1.00
49	El Cristo, G. S.	U.S.C.	1,000,000	500,000	2				
50	El Dorado, G.	Cal.	1,000,000	250,000	4	*			
51	El Talento, G.	U.S.C.	1,000,000	500,000	2				
52	Emmons, S. L.	Colo.	2,000,000	2,000,000	1				
53	Empire, S.	Utah	10,000,000	100,000	100				
54	Eureka Tunnel, S. L.	Nev.	10,000,000	100,000	100	*			
55	Exchequer, S. G.	Nev.	10,000,000	100,000	100	865,000	July	1890	.25
56	Found Treasure, G. S.	Nev.	10,000,000	100,000	100	81,500	May	1890	.25
57	Gogebic I. Syn., I.	Wis.	5,600,000	200,000	25				
58	Gold Cup, S.	Colo.	500,000	500,000	1	*			
59	Golden Era, S.	Mont.	2,000,000	200,000	10	*			
60	Gold Rock, G.	Cal.	1,000,000	500,000	2	*			
61	Goodshaw, G.	Cal.	10,000,000	100,000	100	*			
62	Grand Belt, C.	Tex.	12,000,000	120,000	100				
63	Grand Duke	Colo.	800,000	80,000	10				
64	Great Remance, G.	U.S.C.	1,000,000	500,000	2	*			
65	Gregory Con., G.	Mont.	3,000,000	300,000	10				
66	Harlem M. & M. Co., G.	Cal.	1,000,000	200,000	5				
67	Hartery Con., G.	Cal.	1,000,000	100,000	10	22,000	Oct.	1890	.05
68	Head Cent. & Tr., S. G.	Ariz.	10,000,000	100,000	100				
69	Hector, G.	Cal.	1,500,000	300,000	5	45,000	Jan.	1889	.15
70	Highland, C.	Mich.	500,000	25,000	20				
71	Holywood	Cal.	200,000	100,000	2				
72	Hortense, S.	Colo.	2,000,000	200,000	10				
73	Huron, C.	Mich.	1,000,000	40,000	25	280,000	May	1887	3.00
74	Iron, Gold & Silver, S.	N. M.	2,000,000	200,000	10	*			
75	Ironton, I.	Wis.	1,000,000	40,000	25				
76	Iroquois, C.	Mich.	1,250,000	50,000	25				
77	J. D. Reymert, S.	Ariz.	10,000,000	100,000	100				
78	Julia Con., G. S.	Nev.	11,000,000	110,000	100	1,463,000	Jan.	1889	.10
79	Lacrosse, G.	Colo.	1,000,000	100,000	10	*			
80	Lee Basin, S.	Colo.	5,000,000	500,000	10	*			
81	Madeleine, G. S. L.	Colo.	750,000	750,000	1	*			
82	Mammoth Gold, G.	Ariz.	245,000	49,000	5	*			
83	Mayflower Gravel, G.	Cal.	1,000,000	100,000	10	585,000	Mar.	1890	.56
84	Medora, G.	Dak.	250,000	250,000	1				
85	Merrimac Con., G. S.	Colo.	5,000,000	500,000	10	*			
86	Mexican, G. S.	Nev.	10,000,000	100,000	100	2,791,960	Oct.	1890	.25
87	Middle Bar, G.	Cal.	400,000	200,000	2	*			
88	Mike & Starr, S. C.	Colo.	1,000,000	200,000	5	*			
89	Milwaukee, S.	Mont.	500,000	500,000	1	12,500	May	1891	.01
90	Monitor, G.	Colo.	100,000	1,000,000	1	*			
91	Mutual Mg. & Sm.	W'sh.	100,000	100,000	1	*			
92	Native, C.	Mich.	1,000,000	40,000	25				
93	Neath, G.	Colo.	1,000,000	100,000	10				
94	Nevada Queen, S.	Nev.	10,000,000	100,000	100	200,000	Oct.	1889	.25
95	New Germany, G.	N. S.	100,000	100,000	1	*			
96	New Pittsburg, S. L.	Colo.	2,000,000	200,000	10	*			
97	N. Commonw'h, S.	Nev.	10,000,000	100,000	100	85,000	April	1890	.25
98	North Standard, G.	Cal.	10,000,000	100,000	100	20,000	Nov.		
99	Noonday	Cal.	600,000	60,000	10	208,000	Dec.	1881	.10
100	Oneida Chief, G.	Cal.	500,000	125,000	100	*			
101	Oriental & Miller, S.	Nev.	10,000,000	400,000	25				
102	Osceola, G.	Nev.	5,000,000	500,000	10	*			
103	Overman, G. S.	Nev.	11,520,000	115,200	100	3,832,800	Dec.	1889	.25
104	Park, S.	Utah	2,000,000	200,000	10				
105	Peer, S.	Ariz.	10,000,000	100,000	100	165,000	Oct.	1890	.10
106	Peerless, S.	Ariz.	10,000,000	100,000	100	405,000	Oct.	1890	.15
107	Phœnix	Ariz.	500,000	500,000	1	*			
108	Phœnix Lead, S. L.	Colo.	100,000	100,000	1	*			
109	Pilgrim, G.	Cal.	600,000	300,000	2	*			
110	**Pioche M.&R., S.G.L.	Utah	20,000,000	2,000,000	10				
111	Potosi, S.	Nev.	11,200,000	112,000	100	1,573,000	Mar.	1890	.50
112	Proustite, S.	Idaho	250,000	250,000	1	*			
113	Puritan, S. G.	Colo.	1,500,000	150,000	10	*			
114	Quincy, C.	Colo.	3,000,000	300,000	10				
115	Rappahannock, G. S.	[illegible]	250,000	250,000	1	*			
116	Red Elephant, S.	Colo.	500,000	500,000	1	*			
117	Red Mountain, Ltd., S	Colo.	300,000	60,000	5	*			
118	Ropes, G. S.	Mich.	2,000,000	80,000	25	147,200	July	1887	.50
119	Ruby & Dun., S. L. G.	Nev.	25,300	506	50	*			
120	Russell, G.	N. C.	1,500,000	300,000	5				
121	Samson, G. S. L.	Utah	10,000,000	100,000	100	288,157	July	1888	1.08
122	San Sebastian, G.	San S.	1,600,000	320,000	5	*			
123	Santa Fe, C.	N. M.	5,000,000	500,000	10				
124	Santiago, G.	U.S.C.	400,000	200,000	2				
125	Silver Age, S. L. G.	Colo.	2,000,000	200,000	10				
126	Silver Queen, C.	Ariz.	5,000,000	200,000	25	*			
127	South Bulwer, G.	Cal.	10,000,000	100,000	100	100,000	May	1881	.25
128	South Hite	Cal.	10,000,000	100,000	100	195,000	Jan.	1883	.05
129	South Pacific	Cal.	500,000	100,000	5				
130	Stanislaus, G.	Cal.	2,000,000	200,000	10				
131	St. Kevin, S. G.	Colo.	100,000	100,000	1	*			
132	St. Louis & Mex., S.	Mex.	5,000,000	500,000	10	*			
133	St. Louis & St. Elmo	Colo.	2,000,000	200,000	10				
134	St. L. & St. Felipe, G.S.	Mex.	1,500,000	150,000	10				
135	St. L. & Sonora, G. S.	Mex.	1,500,000	150,000	10				
136	St. Louis-Yavapai	Ariz.	3,000,000	300,000	10	*			
137	Sunday Lake, I.	Mich.	1,250,000	50,000	25				
138	Sullivan Con., G.	Dak.	600,000	200,000	3	*			
139	Sylvanite, S.	Colo.	5,000,000	500,000	10	*			
140	Taylor-Plumas, G.	Cal.	1,000,000	200,000	5	10,000	Feb.	1888	.10
141	Tioga Con., G.	Cal.	10,000,000	100,000	10	295,000	May	1888	.25
142	Tornado Con., G. S.	Nev.	100,000	100,000	1	*			
143	Tuscarora, S.	Nev.	10,000,000	500,000	20	15,000	Oct.	1889	.10
144	Union Con., G. S.	Nev.	10,000,000	100,000	100	2,310,000	July	1890	.25
145	Utah, S.	Nev.	10,000,000	100,000	100	245,000	Aug.	1890	.25
146	Ute & Ulay, S. L.	Colo.	500,000	100,000	5	*			
147	Whale, S.	Colo.	500,000	500,000	1				
148	Washington, C.	Mich.	1,000,000	40,000	25				
149	West Granite Mt., S.	Mont.	5,000,000	500,000	10	*			
150	Yuma, C. S. G.	Ariz.	10,000,000	400,000	25				
151	Zelaya, G. S.	C. A.	600,000	300,000	2	*			

G., Gold. S., Silver. L., Lead. C., Copper. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid $275,000 in eleven dividends and the Terra $75,000. Previous to the consolidation in August, 1884, the California had paid $31,320,000 in dividends, and the Con. Virginia 40,000,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid $1,350,000 in dividends. ¶ This company paid $190,000 before reorganization in 1890. **This company acquired the property of the Raymond & Ely Company which had paid $3,075,000 in dividends.

STOCK MARKET QUOTATIONS.

Baltimore, Md. Aug. 20.

COMPANY.	Bid. L.	Asked. H.
Atlantic Coal	$1.00	$1.30
Balt. & N. C.	....	....
Big Vein Coal	....	....
Conrad Hill	....	.10
Cons. Coal	.24@.26	.27
Diamond Tunnel	....	....
George's Crk. C.	....	....
Lake Chrome	.25	.30
Maryland & Charlotte	....	....
North State	....	....
Silver Valley	.58	.75

Prices bid and asked, lowest and highest, during the week ending Aug. 20.

Birmingham, Ala. Aug. 19.

COMPANY.	Bid. L. H.	Asked. L. H.
Ala. Coal & I. Co.	....	$100
Ala. Conn. C. & C. Co.	....	$23
Ala. R. Mill Co.	$100	$105
*Alice Furnace	$3½	$5½
Bessemer Land	$29	$30
Bir. Mg. & Mfg.	....	$35
Cahaba Coal Mg. Co.	....	$61
Camille Gold Mg. Co.	$¾	$1
De Bardeleben C. & I. Co.	$81½	$91½
Decat. L. Imp.	$83¾	$91½
Decatur Min. L.	....	$19
Ensley Land	$7½	$9
*Eureka	....	....
Florence L. & Mg. Co.	$15½	$18
Gadsen Land	$3⅜	$3⅞
Hecla Coal Co.	....	....
Hen. S. & M. Co.	$2¾	$4¼
Jagger-Townl'y C. & C. Co.	$8½	$10
Mag-Ellen	$100	....
Mary Lee C. & R. Co.	....	$25
Sheffield C. & I. Co.	$52½	$55
Sloss I. & S.	$18½	$21
†Sloss I. & S.	$85	$87
†† Sloss I. & S.	$49	$52½
Ten. C. & I. Co.	$32½	$35
" pref.	$86	$88
Tuscaloosa C. I. & L. Co.	$23	$25
Vulcan C. & C. Co.	$5	$7½
Woodstock I. Co.	$28	$29

* Bonds. † First mortgage. †† Second mortgage. ** Without interest.

Helena. Aug. 15.

Prices lowest and highest for the week ending Aug. 15, 1891:

Bald Butte, Mont.	$2.75@$3.50
Buckeye, Mont.	.10@ .15
Butte & Boston	16.00@17.00
California, Mont.	.25@ .50
Castle Crescent, Mont.	.10@ .12½
C. & D, Mont.	.35@ .40
Champion, Mont.	.30@ .45
Cleveland & Anchor, Idaho.	.15@ .25
Combination, Mont.	.55@ .75
Copper Bell, Mont.	.15@ .20
Cumberland, Mont.	2.60@3.00
Curlew, Mont.	2.60@3.50
De La Mar, Idaho.	5.75
East Granite, Mont.	.25@ .30
Florence (Neihart), Idaho.	.25@ .30
Fourth of July, Wash.	.20@ .25
Glengary, Mont.	1.45@2.00
Gold Dust, Mont.	.50
Goodyear, Mont.	.10@ .15
Grand Central, Mont.	.10@ .12½
Great Eastern, Mont.	.40@ .50
Hiawatha, Mont.	.05@ .10
Hidden Treasure, Mont.	.15@ .25
H. J. Griffin, Mont.	.02@ .05
Iron Mountain, Mont.	.75@1.00
Jersey Blue, Mont.	.10 ....
Landowner, Mont.	.15@ .25
Legal Tender (Dillon), Idaho.	.10@ .15
Legal Tender, Mont.	.15@ .25
Lightning Grey Copper, Mont.	.02@ .03
Lion, Mont.	.05@ .10
Mac, Mont.	.25
Milwaukee, Mont.	.02½@ .05½
None Such, Mont.	.25
North Drumlummon, Mont.	.05@ .10
Ontario, Mont	.15@ .20
O. R. & N, Mont.	.05@ .07
Park, Mont.	.25@ .50
Phillipsburg Treasury, Mont.	.50
Ruby, Mont.	.05@ .10
Silver Arrow, Mont.	.02½@ .05
Silver Crown, Mont.	.15@ .20
Southern Cross, Mont	.20@ .25
Sunrise, Mont.	.50
Triumvirate, Mont.	.10@ .15
W. A. Kelly, Mont.	.02½@ .05½
Wall Street (Elliston)	.07½@ .10
West Cumberland, Mont.	.05½@ .07½
Yellowstone, Mont.	.35@.45

Pittsburg, Pa. Aug. 20.

COMPANY.	B.	A.
Allegheny Gas Co.	$42.00	$43.50
Bridgewater Gas Co.	....	....
Chartiers Val. Gas.	8.75	9.50
Columbia Oil Co.	1.50	2.25
Consignee Mg. Co.	.23	.45
Consolidated Gas Co.	45.00	46.50
East End E. Light Co.	....	....
East End Gas Co.	....	....
Forest Oil	....	....
Hazlewood Oil Co.	....	....
Hidalgo Mining	3.50	3.65
La Noria Mining	.33	.42
Luster Mg. Co.	12.75	14.00
Mansfield C. & C. Co.	....	....
Manufacturers Gas Co.	24.00	25.50
Nat. Gas Co. of W. Va.	58.00	60.00
N. Y. & Clev. Gas Coal	37.50	40.00
Ohio Valley Gas	20.00	....
Pennsylvania Gas	9.50	11.00
People's Natural Gas	....	30.00
People's N. G. & P. Co.	7.25	....
Philadelphia Co	11.25	11.38
Pine Run Gas Co	....	....
Pittsburg Gas	72.00	....
Silverton Mg. Co.	1.88	2.13
South Side Gas	....	....
Sterling Silver Mg. Co.	4.00	5.00
Tuna Oil Co.	53.50	54.75
Union Gas	....	....
Washington Oil Co.	....	91.50
W'house A. B. Co.	99.00	101.00
W'house Brake Co	....	75.00
W'house E. Light	10.88	12.00
W'moreland & Camb.	....	....
Wheeling Gas	....	20.00

St. Louis. Aug. 19.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo.	$1.70	$1.90
American & Nettie.	....	.40
Aztec, N. Mex.	....	.10
Bi-Metallic	34.75	....
Central Silver	.04	.04½
Cleveland, Colo.	....	....
Elizabeth	1.20	1.30
Four Mile	....	.25
Gold King	....	....
Granite Mountain, Mont.	....	23.25
Hope	....	1.50
Ingram	....	....
L. X. L., Colo.	....	....
La Union	....	....
Little Albert	.01½	.02½
Major Budd, Mont.	....	....
Mexican Imp	....	.09
Mickey Breen	.45	.47½
Montrose Placer, Colo.	.45	.52½
Mountain Key	.45	.50
Nellie	04	....
Old Colony	....	....
Pat Murphy, Colo.	.05	.05½
Puzzle	....	....
Richmond Hill	....	....
St. Louis & Aspen	.10	.10½
Samoa	....	....
Silver Age, Colo.	.90	1.00
Small Hopes, Colo.	.72½	.73¾
Tourtelotte	.25	....
West Granite, Mont.	....	....
Wire Patch	....	....
Yuma, Ariz.	.47½	.50

Trust Receipts.

Sales at the New York Stock Exchange week ending Aug. 21:

	Sales.	Price H.	Price L.
American Cotton Oil	....	....	....
National Lead	11,028	17⅝	15⅝

* Trust receipts.

Trust Stocks. Aug. 21.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.

Am. Cotton Oil, Com.	$22¼@$22½
" " " Pfd.	45 @ 45½
Am. Sugar Refineries, Com.	85⅞@ 86
" " " Pfd	89½@ 90
Distillers' & Cattle Feeders'.	45⅞@ 46
Linseed Oil	23 @ 25
National Cordage, Com.	93¾@ 94
" " Pfd.	99 @100¼
National Lead	16⅞@ 17
Standard Oil	159½@160½
W. U. Beef Co.	10 @ 14

Foreign Quotations.

London. Aug. 14.

COMPANY.	Highest.	Lowest.
Almada, Mex.	1s. 9d.	1s. 3d.
Amador, Cal.	2s. 3d.	1s. 9d.
American Belle, Colo.	11s.	10s.
Appalachian, N. C.	3d.	2d.
Canadian Phos., Can.	£½	£¼
Colorado, Colo.	2s. 6d.	2s
Comstock, Utah.	....	....
Cons. Esmeralda, Nev.	1s. 6d.	1s.
Cordova	....	....
De Lamar, Idaho.	£1 4s. 6d.	£1 3s. 6d.
Denver Gold, Colo.	....	....
Dickens Custer, Idaho.	2s.	1s. 6d.
East Arevalo, Idaho.	2s.	1s.
El Callao, Venezuela.	£¾	£½
Elkhorn, Mont.	£1 7-16	£1 5-16
Elmore, Idaho.	1s. 7½d.	1s. 4½d.
Emma, Utah.	2s.	1s. 9d.
Empire, Mont.	....	....
Flagstaff, Utah.	6s. 3d.	5s. 6d.
Garfield, Nev	9d.	3d.
Golden Leaf, Mont.	2s. 6d.	2s.
Jay Hawk, Mont.	9d.	3d.
Josephine, Cal.	....	....
Kohinoor, Colo.	....	....
La Luz, Mex.	1s. 6d.	1s.
La Valera, Mex.	....	....
Mammoth Gold, Ariz.	2s. 9d.	2s. 3d.
Montana, Mont.	7s. 6d.	6s. 6d.
New California, Colo.	....	....
New Consolidated	....	....
New Eberhardt, Nev.	....	....
Newfoundland, N. F.	....	....
N. Gold Hill, N. C.	....	....
New Guston, Colo.	....	....
New Hoover Hill, N. C.	....	....
New La Platte, Colo.	....	....
New Russell, N. C.	....	....
New Viola, Idaho	....	....
Old Lout, Colo.	£⅜	£⅛
Palmarejo, Mex.	7s. 6d.	7s.
Parker Gold, N. C.	6d.	6d.
Pinos Altos, Mex.	5s. 3d.	4s. 9d.
Pittshurg Cons., Nev.	4s. 6d.	3s. 6d.
Richmond Con., Nev.	£⅜	£⅜
Ruby, Nev.	6d.	3d.
Sam Christian, N. C.	....	....
Sierra Buttes, Cal.	5s. 6d.	4s. 6d.
" Plumas Eur., Cal.	12s.	12s.
United Mexican, Mex.	£5-15	£3 16
U. S. Placer, Colo.	....	....
West Argentine, Colo.	1s. 6d.	1s.

Paris. Aug. 6.

	Francs.
Belmez, Spain	800.00
Callao, Venez.	10.50
Callao Bis., Venez.	15.00
East Oregon, Ore.	4.00
Forest Hill Divide, Cal.	80.00
Golden River, Cal.	130.00
" parts	30.00
Lexington, Mont.	95.00
" parts	2.50
Rio Tinto, Spain	583.12
Tharsis, Spain	163.75

CURRENT PRICES.

Those quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, No. 8, pure, 1.040, ℔ lb. .04½
Commercial, in bbls. and cbys. 01¾@.02¼
Carbonic, liquefied .40
Chromic, ch pure .$1.00
for batteries .50
Hydrobromic, dilute, U. S. P. .35
Hydrocyanic, U. S. P. .55
Hydrofluoric .30
Alumina Chloride—Pure, ℔ lb. 1.25
Amalgamating solution, ℔ lb. .60
Ammonia—Sul., in bbls., ℔ lb. 3-16
Carb, ℔ lb. .14
Muriate, white, in bbls., ℔ lb. .08½
Ammoniates—Fish guano, dried. $21
wet. 8 50@ 9 50
Acid phosphate, 14¼ per cent. 72½@ 80
Aqua Ammonia—(in chys) 18° ℔ lb .03¾
20°, ℔ lb. .04¾
22°, ℔ lb. .06¾
Antimony—Oxymur, ℔ lb. 43¢
Argols—Red, powdered, ℔ lb. .15
Arsenic—White, powdered ℔ lb. 3@3¼
Red ℔ lb. .5@5½
White at Plymouth, ℔ ton .£12 2 6
Asbestos—Am., ℔ ton .$50@$300
Italian, ℔ ton, c. l. f, L'pool .£18@£60
Ashes—Pot, 1st sorts, ℔ lb. .4¾@4⅞
Pearl .6¼@6½
Asphaltum—P. ton .13.00
Prime Cuban, ℔ lb. .4½@5¼c.
Hard Cuban, P ton .$28.00
Trinidad, refined, ℔ ton .$30.00
Egyptian .8@9
Baryta—Carbonate, pure, ℔ lb. .45
Carbonate, commercial, ℔ lb .10
Chlorate, crystal, ℔ lb. .75
Chloride, commercial, ℔ lb. .10
pure, ℔ lb. .16
Iodide, ℔ oz. .40
Nitrate, powdered, ℔ lb. .15
Sulph., Am. prime white .17@20
Sulph., foreign, floated, ℔ ton .19½@21.50
Sulph., off color, ℔ ton .11.50@14.00
Carb., lump, f. o. b. L'pool, ton .£6
No. 1, Casks, Runcorn, " " .£4 10 0
No. 2, bags, Runcorn, " " 3 15 0
Bichromate of Potash—Scotch. 10@12
American .10@12
Bichromate of Soda. .8½@11½
Borax—Refined, ℔ lb. 11
Concentrated .8¼@8½
Refined " Liverpool ℔ ton .£29
Bromine—℔ lb. .55
Cadmium Bromide—℔ lb. 2.00
Iodide, ℔ lb. 5.50
Chalk—℔ ton. 1.75
Precipitated, ℔ lb. 4¾@5
China Clay—English, ℔ ton .13½@21.00
Southern, ℔ ton .13.50
Chlorine Water—℔ lb. .10
Chrome Yellow—℔ lb. .10@25
Chromalum—Pure, ℔ lb. .40
Commercial, ℔ lb. 1.12
Cobalt—Oxide, ℔ lb. 2.50@2.90
Copper—Sulph. English Wks. ton £20@£21
Vitriol (blue), ordinary .03
" " extra .3¾
Nitrate, ℔ lb. .10
Copperas—Common, ℔ 100 lbs. .70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks. £1 15s.
Corundum—Powdered, ℔ lb. 4½@.9
Flour, ℔ lb. .3
Cryolite—Powdered, ℔ lb. .12
Emery—Grain, ℔ lb. (℔ kg.). 4½@5
Flour, ℔ lb. 2½@10
Epsom Salt—℔ lb. .1½
Feldspar—Ground, ℔ ton. 20.00
Fluorspar—Powdered, No. 1, ℔ ton. 30 00
Fuller's Earth—Lump, ℔ hhl. 90@95
Powdered, ℔ lb. 1¾@2
Gelatine—Cox's, doz. 2.00
Coignet's Gold Label, ℔ lb. 1.00
Silver Label, ℔ lb. .88
Heinrich's Gold Label, ℔ lb. .75
for emulsion, ℔ lb. 1.00
Nelson's No. 1, ℔ lb. 1.10
No. 1, Shreds, ℔ lb. 1.25
No. 3, ℔ lb. .75
Glauber's Salt—in bbls., ℔ lb. ¾
Glass—Ground, ℔ lb. .10
Gold—Chloride, pure, crystals, ℔ oz. 12.00
pure, 15 gr., c. v., ℔ doz. 5 40
liquid, 15 gr., g. s. v., ℔ doz. 5.50
Chloride and sodium, ℔ oz. 6.00
15 gr., c. v., ℔ doz. 2.88
Oxide, ℔ oz. 27 25
Gypsum—Calcined, ℔ hhl. 1.25@1.50
Iodine—Resublimed .2.75
Iron—Nitrate, 40°, ℔ lb. 1½
47°, ℔ lb. 2½
Kaolin—*See China Clay.*
Lead—Red, ℔ lb. 6¾@7¼
White, American, in oil, ℔ lb. 6½@7¼
White, English, ℔ lb. 8¾@9
Acetate, or sugar of, white. 12@13
Nitrate. 9@10
Lime Acetate—Amer., Brown 1 10@1.20
" Gray 2.00@2.15
Litharge—Powdered, ℔ lb. 6½@7¼
English flake, ℔ lb. 9@9½
Magnesite—Greek, ℔ ton. 20.00
Manganese—Crude, per unit. 23@28
Oxide, ground, per lb. 2½@6½
Marble Dust—℔ hbl. 1.25
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. .89
Powdered, ℔ lb. .99
Metallic Paint—Brown per ton. $20@25
Red. $20@25
Mineral Wool—Ordinary slag. 1½
Ordinary rock. 2½
Mica—In sheets according to size.
1st quality, ℔ lb. 25@$6.00
Naphtha—Black. 60
Nitre Cake—℔ ton. 8.00
Ochre—Rochelle. 1.35@1.50
Washed Nat Oxford, Lump. 6½@6¾
Washed Nat Oxford, Powder. 7@7½
Golden. 3¾@4
Domestic. ¾@1½
Oils, Mineral
Cylinder, light filtered. 15@20
Dark filtered. 11@15
Extra cold test. 18@20
Dark steam refined. 10@18
Phosphorus—℔ lb. 55@60
Precip., red .88
white .93
Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7
Potash—Kiescrite. $9@$10
Potassium—Cyanide, ℔ lb., C. P. .72
Special .50
Fused .45
Bromide, ℔ lb .33
Chlorate, English, ℔ lb .11@14
Chlorate, powdered .13@14
Carb, ℔ lb .54@.70@5
Caustic, ℔ lb. .7½@8
Iodide. 2.65@2.70
Nitrate, refined, ℔ lb .6@8
Bichromate, ℔ lb. 10½@11
Yellow Prussiate. 32½@35
Red Prussiate. 42@45
Pumice Stone—Select lumps, lb. 3½
Original cks., ℔ lb. 1¾@2
Powdered, pure, ℔ lb. 2 @2½
Pyrites—Non-cupreous, p. units. 11@.12
Quartz—Ground, ℔ ton. 14 00@16.00
Rotten Stone—Powdered, ℔ lb. 3½
Lump, ℔ lb. 5½@15
Original cks. 4½@5½
Rubbing stone. 7
Sal Ammoniac—In bbls., ℔ lb. 10¼
Salt—Liverpool, ground, ℔ sack 75@80
Turk's Island, ℔ bush. 25@28
Salt Cake—℔ ton. 8 00
Saltpeter—Crude, ℔ lb. 3¾@4¾
Refined, ℔ lb. 6@8
Soda—Prussiate. 17½@18
Phosphate .7@18
Stannate. 8@15
Strontium—Nitrate, ℔ lb. 9½@10
Sulphur—Roll, ℔ lb. .021
Flour, ℔ lb. .02
Sylvinit, 23@27%, S.O.P., per unit. 40@42½
Talc—Ground French, ℔ lb. 1¼@1½
Domestic, ℔ ton. $18@$20
c. i. f. Liverpool, ℔ ton. £4 5
Tin—Crystals, in kegs or bbls. 16½
feathered or flossed. 25
Muriate, single. 7
Double or strong, 51° B. 9
Oxy. or nitro. 10
Bar. 25
Vermillion—Imp. English. .90 @ .95
Am. quicksilver, hulk. .67 @—
Am. quicksilver, bags. .68 @ .71
Chinese. .95 @1 00
Trieste. .90 @ .95
American. 11½@ .12
Artificial. 8 @ .35
Zinc—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 7¼
Paris, Red Seal, ℔ lb. 8½
Muriate solution 4
Sulphate crystals, in bbls., ℔ lb. 3
* Spot.

THE RARER METALS.

Aluminum—Pure, per lb. $ .50
Arsenic—(Metallic), per lb .40
Barium—(Metallic), per gram. 1.00
Bismuth—(Metallic), per lb. 2.75
Cadmium—(Metallic), per lb. 1.00
Calcium—(Metallic), per gram. 10.00
Cerium—(Metallic), per gram. 7.50
Chromium—(Metallic), per gram. 1 00
Cobalt—(Metallic), per lb. 6.00
Didymium—(Metallic), per gram. 9.00
Erbium—(Metallic), per gram. 7.50
Gallium—(Metallic), per gram. 140.00
Glucinum—(Metallic, per gram. 12.00
Indium—(Metallic), per gram. 9.00
Iridium—(Metallic), per oz. 7.00
Lanthanum—(Metallic), per gr. 10.00
Lithium—(Metallic), per gram. 10.00
Magnesium—Per lb. 4.50
Manganese—(Metallic), per lb. 1.10
Chem. pure, per oz. 10.00
Molybdenum—(Metallic), per gm .50
Niobium—(Metallic), per gram. 5.00
Osmium—(Metallic), per oz. 65.00
Palladium—(Metallic), per oz. 35 00
Platinum—(Metallic), per oz. 16.50@20.00
Potassium—(Metallic), per lb. 28.00
Rhodium—(Metallic), per gram. 5.00
Ruthenium—(Metallic), per gm. 5.50
Rubidium—(Metallic), per gram. 2.00
Selenium—(Metallic), per oz. 1.86
Sodium—(Metallic), per lb. 2.50
Strontium—(Metallic), per gm. .60
Tantalium (Metallic), per gram. 9.00
Telurium—(Metallic), per lb. 5.00
Thallium—(Metallic), per gram. .25
Titanium—(Metallic), per gram. 2.25
Thorium—(Metallic), per gram. 17.00
Tungsten—(Metallic), per lb. 1.00
Uranium—(Oxide), per lb. 5.00
Metallic, per gm. .20
Vanadium—(Metallic), per gm. 22.00
Yttrium—(Metallic), per gram. 9.00
Zirconium—(Metallic), per oz. 65.00