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To deny that Honduras contains great mineral wealth is to insult a Honduran. It has become part of his creed that his country is one of the richest on the globe, and this conviction is so strong that an adverse report upon Honduran mining property is regarded with scorn and the engineer with commiseration. It is true, moreover, that the sole successful large mine in Central America, the Rosario, is in Honduras and the native finds in this success confirmation of his views and justification for his enthusiasm.

This property, which has been worked for a number of years, is well known to readers of the ENGINEERING AND MINING JOURNAL. The amount of its dividends are not known, but are said to have been large. The profits must have been large to allow the erection of the handsome reduction works and the thorough exploration of the mine.

It was reported some time since that the ore shoot in this property had pitched into the adjoining claim and out of the Rosario property. The purchase of this property for a considerable sum has given new life to the mine, and its prospects are locally considered good.

In Guscuran, which will probably prove the best camp in Honduras, the Montserrat mine is being developed. This property was examined in 1891 by American engineers who reported unfavorably upon it. Since that time, however, the levels are said to have come into ore, of which there is considerable now in sight in the property. The New Guyabillas, in the same camp, belongs to an English company which made the characteristic mistake of building a mill before having a mine. The Zurcher Brothers, owning an extensive group of properties, are conducting their work with more discretion. They have been engaged for some time in driving a long drift into the Montserrat Mountain which has cut several veins, stopping on some of which is producing enough ore to keep a 5-stamp battery and two ball mills running.

The gravel mines of Olancho, which were floated in London by Major BURKE, of New Orleans fame, have not yet proved profitable, notwithstanding the large sums of money expended upon them. The gravel is poor; the pay gravel is only in the channel of the river, and the stream has to be diverted to wash that. It is somewhat remarkable, but not entirely an insignificant fact, that whenever a clean-up of the sluices is to be made, the river is perverse enough to have a creciente, or flood, which invariably washes the sluices and gold away.

Vein mining is progressing slowly in several localities, such as San Martin, San Marcos, El Valle de Los Angeles, Santa Lucia and Santa Rosa—near the latter place, several American mining men of capital have purchased property, which they are developing legitimately and with good prospects of success. In general, it may be said, that vein mining presents good opportunities in Honduras, particularly in Guscuran and neighboring districts. The veins are fairly large and strong, and the grade of ore good. The veins, moreover, in a number of instances, have been proved in depth, and have yielded large amounts of the precious metals, particularly silver. The difficulties to be contended with are great.

To Guscuran from Amapala, the seaport in the bay of Fonseca, the freight is seven cents a pound. Labor is not plentiful, and that obtained of poor quality. The Government, however, is anxious of stimulating the industry, and endeavors to aid the operator as much as possible, but low taxation, or even an absence of it will not make a poor mine profitable. There is no doubt with an extension of transportation facilities that mining will be profitable in Honduras, more so probably than any other Central American State.

A SOLUTION OF THE SILVER QUESTION.

The very favorable reception which our proposed "Solution of the Silver Question" has received and which is illustrated in the highly appreciative and thoughtful letter of Mr. MUHLEMAN, Cashier of the United States Sub-Treasury, is extremely gratifying. The demand for copies of The JOURNAL containing it induces us to reproduce it here. It becomes more and more evident that the conference at Brussels is at sea without any definite plan that promises a solution, and it is to be hoped that attention will now be directed to one which would assuredly prove of great advantage to all nations and most of all to Great Britain.

No effective or durable plan can be based on the purchase of a limited amount of the metal, all that is offered must be taken and paid for in gold or its equivalent. No plan which does not unite the interests of the participants and remove any inducement to violate it, can be permanent.

Dr. SOETBEER's proposition to make the ratio between gold and silver 20 to 1 is sound; probably no higher ratio could be maintained for many years without greatly overproducing silver, owing to improvements in its metallurgy. His proposition to use silver in all coins and certificates of a less denomination than \$5 is also good, and it would, it is estimated by some authorities, provide an additional use for some \$200,000,000 of silver. If necessary to still further increase this amount it can be done safely by requiring that all certificates of from \$5 to \$10 shall be redeemed

able in gold and silver in equal proportions, while certificates at \$10 or above would be payable in gold or silver at the option of holder. These propositions provide for utilizing the silver in coin or in certificates representing the metal.

Having closely studied the silver question both from the producing and the commercial sides, we would suggest the following plan which aims at an absolute, permanent, and complete solution of the problem.

The appointment by the associated nations (which we assume would be all nations) of an INTERNATIONAL MONETARY CLEARING HOUSE, with powers:

1. To ascertain, periodically, the amount of money, that is, of gold, silver and uncovered notes, held by each country during the preceding one or two years. These amounts to form the basis for the proportions in which the several nations will join in the purchase of all silver offered.
2. To clear every national transaction in the purchase or sale of money.
3. To purchase, for common account, such an amount of silver (say 25 per cent. of their holdings) from each of the silver basis countries as is necessary to put it on the gold or bimetallic basis.
4. To issue international certificates, redeemable in gold or silver, at holder's option, for the gold and silver purchased.
5. To determine from time to time, say at intervals of 5 or 10 years, what, if any, change in the value-ratio of gold and silver is called for by the changed conditions of production.
6. To publish the transactions of the monetary clearing house daily or weekly.

This clearing house to be composed of one or more representatives of each country and to act through the mints of the several countries as depositories, and to have a central clearing house at one of the capitals.

Such, in outline, is a plan that would render the interests of all nations identical, that would put, and maintain, all on the gold basis and would increase, beyond any limit that has ever been suggested, the facilities for international commerce, and would practically increase in an enormous degree the availability or usefulness of the world's supply of money.

The amount of money, that is, of gold, silver and uncovered notes, in the world, is, in round numbers, approximately \$10,000,000,000, of which nearly one-half is held by four nations: France having about 17 per cent., the United States 16½ per cent., Germany 9 per cent., the United Kingdom 7 per cent. England's quota in the purchases of silver would therefore be but 7 per cent. India would sell say \$200,000,000 of silver for gold, of which England would contribute \$14,000,000 and would receive the silver which would be absolutely on a par with gold in the currency of the world, and which she herself would require under Dr. SOETBEER'S plan. The other silver countries would require, say, \$100,000,000 of gold to put them on the gold basis, which would at once increase, by far more than that amount, the value of their securities held by England, Germany and France, and would vastly increase their ability to buy goods that these countries make.

Suppose the new silver offered to the Clearing House should amount to \$100,000,000 a year. Since it will be absolutely and indissolubly on par with gold at the standard ratio, no nation could lose except the very small amount by which the ratio might be lowered by the Clearing House from time to time should the production of silver increase unduly.

Under this plan, after the first purchase, the interests of all nations would be identical, and there would be no inducement, or possibility (in the face of publicity), of any nation taking unfair advantage of another.

The production of gold and silver, on the value ratio of 20 to 1, is now nearly equal, say \$120,000,000 of gold and \$135,000,000 of silver annually, and as more silver than gold is used in the arts, the amounts to be offered through the clearing house would be about the same of each metal.

Every one is familiar with clearing house functions and operations, and nearly all nations have appointed arbitration courts with powers. There is, therefore, nothing unaccustomed or dangerous in the plan.

R. P. ROTHWELL.

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THE HARSHAW MINE, ARIZONA.

It is reported that the Hermosa mine, at Harshaw, Pima County, Arizona, which readers of the ENGINEERING AND MINING JOURNAL and many investors in mining stocks during the boom from 1879 to 1882 will well remember, has been sold by JAMES FINLEY to SENATOR MCGOVENY, of Colorado, for \$200,000. Whether or not this rumor be true this mine at least has a very interesting history, instructive to investors and mine managers alike. In the condition of a mere prospect the mine was bonded in 1879 to San Francisco parties who expended considerable sums in developing it. Three veins were disclosed all carrying rich ore which was developed at a number of points by surface cuts, shafts, etc., following the usual custom of mine development. In 1880 an examination was made and calculations based on careful sampling of the ore where exposed,

assuming that it was continuous between these points, arrived at the conclusion that with the deepest shaft at 72 ft. 6 in. and intermediate ones at 66 ft. and 40 ft. there was 43,546 tons of ore averaging \$135 to the ton, or a total of nearly \$6,000,000 gross value, "in sight." The sampling was undoubtedly correct; there was ore of extremely high grade present in exceptionally large quantities, but the hypothesis that it was a continuous body between the shafts was utterly false. In reality these shafts were sunk on the apexes of, and in small irregular shoots of ore, between which was only barren county rock or unprofitable vein matter.

The mine was looking so well, however, when it was offered for sale during the boom in mines that an eminent mining engineer had no hesitation in recommending its purchase at a high figure to his clients and personal friends, as well as investing his own money in it.

The purchase concluded, development work was resumed, and the erection of a continuous process 20 stamp mill was commenced. During the period of the construction of the plant favorable reports were frequent, and when the mill started in August, 1880, the stock, which had been placed on the market at from \$10 to \$12 a share, was selling at over \$40 and later rose, in September, 1880, to as high as \$60. The ENGINEERING AND MINING JOURNAL in August and September, 1880, made frequent reference to the absurdity of these figures. Suddenly, in September of that year, the secretary of the company received a message from the mine that it had played out.

This was startling and wholly unexpected to even the insiders, and it offered to them one of those chances familiar to Wall Street, and which are often termed excellent business opportunities, to make a considerable sum by withholding the information and shorting the stock which then was held firm. To the credit of these gentlemen, Messrs. HIGGINSON, AGASSIZ, OLMSTEAD and others, this information as soon as it was verified beyond doubt was given at once to the stockholders. Stock was sold in such quantities that the price fell to \$5 a share. Less scrupulous than the other officers, the then superintendent of the property, who had made a large sum through its sale, was said to have been the cause of this decline, he and an associate making large profits by short sales.

The mill ran on the rich ore which had been accumulating during the development work, and from August to the end of December produced \$365,000. This paid all working expenses and left a considerable margin of profit, which was utilized in further exploitation, but no other rich ore bodies were struck. Finally the directors became discouraged, and acting upon the advice of a new superintendent, a man of good business qualifications, but not a miner, they put the company's affairs in the hands of a receiver, who wound them up.

If the directors were discouraged it was not without reason, but if they had known and regarded the opinion of several of their mine foremen instead of their superintendent they would have reduced expenses and worked on the ore already in sight, low grade, it is true, but sufficient to make a profit with careful management, and, above all, would not have parted with their patented ground to one of these foremen, JAMES FINLEY, who, biding his time, purchased the entire property for \$300.

The mill had then been sold to one of the Quijotoa companies, but FINLEY erected works, consisting of Huntington mills and pans. He made a profit from the beginning, and for a number of years his production averaged \$8,000 a month, with expenses of about \$3,000. The company, it will be remembered, was not able to declare dividends, although the ore worked by it was of comparative high grade.

This result would certainly seem to prove that FINLEY'S management was better than that previous to his ownership and that an individual miner can make a considerable profit where a company fails, as well as that snap judgement by a business man must not be taken as decisive when a mine is in question. It would be interesting to the many Boston and New York investors who were stockholders in this property to know whether it was speculation or a better knowledge of the resources of the property which led JAMES FINLEY and DOMINICK BRIDEN, both foremen of this mine, to say that with proper management it could pay, as later events have proven it did.

BOOKS RECEIVED.

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

Engineer's and Fireman's Time, Expense and Memorandum Account Book. Published by the Railroad Gazette, New York, 1892. Price 50c.

Report of Proceedings of the Twelfth Annual Meeting of the American Water Works Association. at New York, 1892. Published by the Association. Pages 232. Price 50 cents. Illustrated.

Intellectual Pursuits, or Culture by Self Help. By Robert Waters. Published by Worthington Company, New York, 1892. Pages, 361. Price \$1.25.

Original Papers on Dynamo Machinery and Allied Subjects. By John Hopkinson, M. A., D. Sc., F. R. S. Published by the W. J. Johnston Company, Limited, New York, 1893. Pages, 249. Price —. Illustrated.

NEW PUBLICATIONS.

GEMS AND PRECIOUS STONES OF NORTH AMERICA: A popular description of their occurrence, value, history, archaeology, and of the collections in which they exist; also a chapter on pearls and on remarkable foreign gems owned in the United States. Illustrated with eight colored plates and numerous engravings. By George Frederick Kunz. Second edition, with appendix. New York: Scientific Publishing Company, 1892. Imperial octavo, pp. 363.

The unanimous admiration with which the handsome volume was regarded when it first appeared has been significantly confirmed by the demand for a second edition within less than two years. Not only the beauty of the exquisite colored plates and the artistic perfection of the typography, but also, and in not less degree, the contents of the book furnished good grounds for this favorable popular verdict. Among the *editions de luxe* which are annually offered in increasing numbers to book-lovers, there is seldom one which combines in so high a degree the ornamental with the useful. There is, indeed, some danger that the outward and material attractions of the book may obscure for the casual reader the value of the text, as a report upon authority of the first rank of what may be called the economic and æsthetic situation concerning gems and precious stones. As a mere mineralogical treatise, it could not be deemed equal to more technical text-books; but as a treatise from the hand of an expert in the uses and values of the minerals concerned, it possesses an interest and importance which the work of a simple mineralogist, however learned or skillful, could not claim.

This opinion, with much more to the same effect, was expressed in many quarters when the first edition of Mr. Kunz's book appeared. I suppose that in noticing the second edition I should resist the temptation to descant upon the beauties and excellences which it possesses in common with the first, and should call attention to the features of novelty which it presents.

One of these is not an addition, but a disappearance. There was in the first edition a Table of Errata, much more extensive than comported with the style of publication. A book exhibiting such splendor and taste ought not to have been marred to such an extent in the proof-reading. I do not know who was to blame, whether Mr. Kunz or the Scientific Publishing Company, or circumstances, or (as is most probable) all three. My friend Mr. Kunz is not likely to be an exception to the rule that authors cannot read their own proofs with critical accuracy. This phenomenon, perfectly familiar to editors, has its chief source, I think, in the fact that authors cannot separate in their minds the thing they have written, spelled and punctuated from the thing they intended. Only a stranger can take a perfectly "objective" view of the printed text. And my friends of the Scientific Publishing Company are, I fancy, like other publishers, too easily content with the author's revision and too little inclined to pay for thorough, independent, critical re-examination of all details. I may be excused for citing, in illustration of my general statement, my own experience in the editing of the "Transactions of the American Institute of Mining Engineers." The papers comprised in the annual volumes of these Transactions, after having undergone repeated revisions (amounting for important papers to eight in number), are submitted upon final printing to the minute examination of an expert who has never seen them before, and I am bound to confess that not one in a hundred of them fails to disclose, under this ultimate test, some defects, typographical or other, which deserve attention and correction. Finally, circumstances, as we all know, are exceedingly wanton and mischievous. There are mysterious accidents which happen at the printer's after the last correction of the press; there is a judicial blindness which descends on authors, editors and proof readers, permitting some obvious blunder to escape them all. And there is a residuum of error, inexplicable upon any hypothesis except that of the finite imperfection of man and the infinite depravity of things.

But whatever may have been the source of the errata in the first edition of the book before us, it is a consolation to miss the list thereof in this second issue, which thereby acquires a mechanical excellence worthy of its own ideal.

Apart from this most agreeable improvement, the present edition contains much additional information. The material contained in the Appendix deserves special notice in this connection. Under the head of "The Diamond," Mr. Kunz gives an interesting account of the discovery of diamonds in 1887, in the State of Wisconsin, and also summarizes the paper of Professor Koenig on the demantoid carbon found in a meteorite from Arizona, in 1891. To his previous discussion of the sapphire, he adds a description of the Montana occurrence, which has been made, very recently, the basis of commercial adventure. Additional information is given concerning the turquoise of New Mexico; and new localities of topaz, tourmaline and garnet are described. It is a somewhat sensational fact, by the way, which we have from these pages, that the finest large garnet crystal we find in the United States was discovered in 1885 in the heart of the city of New York, by a laborer employed in the excavation of a sewer. Yet, after all, why not?

Numerous other subjects are treated in the Appendix, of which, perhaps, agatized wood receives the largest additional light. It is not necessary to enumerate them. Taken as a whole, the Appendix perfects, by bringing up to date, an admirable survey of a fascinating theme. The author and his publishers are to be alike congratulated upon the result of their joint endeavor.

R. W. R.

Prince Edward Island Tunnel.—The novel feat of obtaining perfectly cylindrical cores of rock formations overlaid by over 100 ft. of water has recently been accomplished in obtaining data for the new tunnel between Prince Edward Island and New Brunswick, under the straits of Northumberland. A diamond drill driven by steam at the rate of 1,000 revolutions a minute is attached to an iron tripod resting on the bottom of the sea and secured in its position by anchors. The steam was conveyed to the drill in flexible pipes from a scow on which are placed the boilers and which is anchored alongside. The credit of overcoming many difficulties and carrying to success a plan for obtaining borings of formations under water and in spite of a four-knot current and perpetual storms belongs to the contractor, Mr. Alfred Palmer, C. E., of this city.

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.

An International Monetary Clearing House.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The many points of merit contained in the plan for the solution of the silver problem outlined by Mr. Rothwell in the last issue of the ENGINEERING AND MINING JOURNAL cannot fail to strike the thinking reader as affording a basis for the most advantageous settlement of this vexed and vexing question; advantageous not only to the United States but to the entire civilized world.

Were the nations of the earth whose decisions govern the destinies of all peoples, speaking in a politico-economic sense, actuated by far-seeing and not self-interested motives, an elaborated plan of this general character would be possible and effective.

It must, however, be conceded with keen regret, that preconceived notions, prejudices and selfish interests, will prevent the realization of the advantages to the entire world, through the labors of the congress now assembled at Brussels.

The plan includes no impossibilities; in fact the success of the Latin Union, an agreement similar in its general outline, demonstrates the possibility of its being successful if the parties whose assent is necessary thereto could be persuaded. It contemplates the utilization of a commercial device, on an enlarged scale, familiar to every banker, affording to each nation on an equitable basis, the facility for supplying itself with circulating media abundant for all needs.

Were it to promise nothing more than the manifestly greater stability to the currency of the "weaker sister" among the family of nations, it would be worthy of the most thoughtful consideration. But it does more; it holds out a prospect of relief to commerce from burdens which now unnecessarily tax the interchange of commodities; it gives new impulse to the movement toward an international unit of value; it lays the foundation of an international bureau of exchanges which would obviate the costly and unnecessary transfer of bullion hither and thither.

It is surprising to find how singularly backward civilized nations have been in devising and adopting expedients for the more efficient and less expensive transaction of business. The Clearing House system as it now exists is comparatively a very modern institution, and yet how simple, how inexpensive, how secure. Without it the immense commercial transactions of our times could not be effected except at a great loss to trade generally. Nor have the benefits possible under the concerted action of the banks been fully realized. It is but a step to the application of the same operation to international financial transactions, and yet that step remains to be taken. This can only be attributed to the potency of the inertia exercised by over-conservatism in financial and commercial circles—an over-conservatism which frequently amounts to stupidity in this as well as in other fields of human activity, which prevents the abolition of the semi-barbarous methods of our great-grandfathers, and robs the civilized generation of the advantages which improvements would afford. It belongs to the same category of sociological facts to which the opposition of working men to labor-saving machinery has been assigned; and just as this advance has always proven an ultimate benefit to the laborer, so would the change in methods finally prove even more profitable than the present. It is, therefore, even more surprising to find the apparent blindness to advantage involved in the belief, current among so many and influencing in a great degree the economic opinions of a majority of the people of all nations, that the advantage of one is necessarily the disadvantage of the other; for it seems clear that a creditor nation can only gain by the prosperity of its debtor.

Thus England, the principal creditor nation of the world, whose investments extend to every country and every clime—whose money interests are used to forward schemes of development in every branch of human activity—England, which by its greatest of magnets, the London market, draws all the world to its ports, could only gain by the prosperity of Mexico and the South American States, not to mention India; and yet to-day she alone practically bars the way to such a settlement of the silver problem as would place the currency of these countries upon a basis so stable as to insure prosperity, enabling them to pay their debts, interests and principal, promptly and in a medium not in danger of depreciation.

Is it of permanent advantage to the British that Mexico is compelled to sell its silver money (one of its principal products), at a depreciated valuation to pay for the rather scanty supplies needed by its people? Would it not be better to make them prosperous by establishing a stable bimetallic currency, guarded by an international board, affording to the land of the Aztecs a medium as good as that of Albion, and thus place the securities issued by the Mexicans and held chiefly in England, as high as those of any nation? Would not the increased prosperity mean larger purchases of commodities, hence greater profits to English manufacturers?

Have the British, when they struck a balance internationally, found that the unfortunate currency difficulties of the Argentine Republic has benefited them? Nay, is not the Baring catastrophe an almost conclusive argument in favor of an international regulation of monetary affairs, a more civilized method of conducting the fiscal affairs of nations?

It would seem that the time has come for thinking men to perceive that practical humanitarianism is a paying investment; eliminating all moral or ethical considerations, the increase of the welfare of our neighbors pays.

The proposed plan should therefore be welcome as the forerunner of a new dispensation in financial affairs, pregnant with tremendous possibilities, in the direction of uniformity of standards, furnishing stability of the medias, equitably throughout the world, cheapening as well as guaranteeing exchanges and freeing commerce from burdens which cannot but enhance by this expensive clumsiness the cost of commodities to the consumer. The civilized world has provided international regulation of the exchange of thought through the post, how long must we continue to work upon old lines in the transmission of material objects.

M. L. MÜHLEMAN.

SANITER'S PROCESS FOR THE ELIMINATION OF SULPHUR FROM PIG IRON AND STEEL.

In conducting some experiments relating to the elimination of sulphur from pig iron by means of lime, Mr. E. H. Saniter, of Wigan, England, found that if calcium chloride was added to the lime the purifying action was greatly accelerated. From this discovery he has elaborated a commercial process which is at present in use at the works of the Wigan Coal and Iron Company. A paper describing his process was read by Mr. Saniter at the last meeting of the Iron and Steel Institute and from this paper we have obtained the information on which this article is based.

The first set of experiments, conducted by Mr. Saniter, gave the following results. The iron worked with was sulphury and was melted in plumbago crucibles.

Number of experiment.	Hours.*	Sulphur in iron		Mixture used.
		Before treatment.	After treatment.	
4.....	2 3/4	Per ct. '38	'03	Lime.
6.....	1 3/4	'30	'12	"
15.....	1/2	'42	trace	{ Lime, 90%; calcium chloride, 10%.
16.....	1/2	'42	"	{ Lime, 90%; calcium chloride, 10%.

* Time during which the molten iron was in contact with the mixture.

These results show (1) that lime alone removes a considerable quantity of sulphur from iron if the contact is sufficiently prolonged. (2) That a mixture of calcium chloride and lime in the short space of half an hour completely eliminated the sulphur. The lime and chloride of calcium mixture only softened but did not fuse. This mixture of 10% calcium chloride and 90% lime gave such good results that the process was adopted on a large scale and exact commercial conditions ascertained.

In treating ordinary sulphurous pig by this process, a mixture of calcium chloride and lime is prepared, which will fuse readily at the temperature of the iron to be operated upon. The desired combination is made by grinding calcium chloride and lime together in a mill to thoroughly mix them, and also to bring them to a moderately fine powder. About equal parts of each are required to give the desired fusibility. This mixture is then placed on the bottom of a ladle or receiver, and consolidated by heat or kept in position by other suitable means. The heat may be applied in the first instance by means of a blowpipe arrangement using blast furnace gas, but when in continuous use the heat of the ladle itself is quite sufficient. The receiver is then filled with iron, which may be drawn direct from the blast furnace. The heat of the iron melts the mixture, which, rising up through the metal, removes the sulphur very completely. It is not necessary to have a reducing atmosphere, and, indeed, oxidation may be going on concurrently with the removal of the sulphur. Notwithstanding this, however, the sulphur is removed as sulphide. Should it be desirable to remove silicon, as well as sulphur, the lime of the mixture is replaced by hydrate or carbonate of lime, or even oxide of iron in addition, if the first-named be insufficient. About 25 lbs. of chloride of calcium and an equal weight of lime per ton of iron have been found sufficient to effect purification. In the many trials made, about three tons of iron direct from a blast furnace were treated in a ladle at each operation. Although the first or coldest iron from the furnace and hydrate of lime in the mixture were used, no "skull" was made. This is a fact of the very greatest importance, for there can be no doubt that if such a small quantity of metal is not materially chilled, it is safe to assume that large masses would never "skull." The uniformity of the results obtained was very marked, as will be seen by the accompanying analyses:

Number.	Class of Iron.	Sulphur.		Silicon.		Mixture used.
		Before.	After.	Before.	After.	
1.....	No. 5 hematite.....	p. c. '220	'060	p. c. 1'6	1'2	Ca Cl ₂ and Ca ₂ HO
2.....	Hard forge, 1.5 per cent. phosphorus.....	'300	'060	1'7	1'6	"
3.....	Grey forge.....	'070	'008	2'2	1'9	"
4.....	Basic iron.....	'197	'072	Not estimated.		"
5.....	"	'191	'062	"	"	"
6.....	"	'109	'031	"	"	"
7.....	"	'102	'032	'56	'32	"
8.....	"	'065	'026	'84	'46	"
9.....	"	'038	'016	'32	'09	"
10.....	"	'089	'024	'42	'18	"
11.....	"	'083	'020	'37	'09	"
12.....	"	'133	'030	'70	'32	"
13.....	"	'091	'025	Not estimated.		Ca Cl ₂ & limestone
14.....	"	'060	'008	"	"	"

Nos. 7 to 13 are consecutive charges, and show the regularity of the results. It should be stated that the results obtained above were from the application of the process when it was well known from the appearance of the cinder that the resulting pig would be abnormally high in sulphur.

The above table shows an average elimination of: Sulphur, 73.6%; silicon, 85.77%. The removal of silicon is due to hydrate of lime only.

The following is an average slag produced by the above treatment: Calcium chloride, 39.1%; calcium sulphide, 5.8%; lime, 38.6%; silica, 12.9%. A considerable part of the chloride of calcium in this slag may be dissolved out with water, and recovered for future use.

Only a limited quantity of iron (about 50 tons) has been treated in this way owing to proper plant not being as yet available, the small 4-ton ladle being only a makeshift. The ladle was lined with ordinary firebricks, which were practically unattacked by the slag at the comparatively low temperature at which the process was conducted. Appliances are in course of construction which will deal with the whole output of the furnace as the metal is run. The plant required is of a simple and inexpensive character, consisting of ladles or receivers on wheels. The cost of materials at present prices is about 6d. per ton of iron treated, and this

will be less when a more efficient receiver is used. It is also very probable that should a demand arise for chloride of calcium the price would go down. Against this extra cost may be set the cheaper production and enhanced price of the pig iron produced.

This process can be adapted to a considerable number of uses, such as: (1) The purification of hematite, basic and common (1.5% P.) irons as they run from the blast furnace or cupola, thus producing these qualities of iron low in sulphur and silicon, after which they might be used for direct steel making or cast into pigs. (2) The purification of steel in the ladle after it leaves the furnace or converter.

It is a fact pretty well known and established that no sulphur is eliminated in the "basic open-hearth" process as ordinarily worked, and that not only is this the case, but when ore containing much sulphur is used for feeding, the bath of steel takes up sulphur, so that under these circumstances it may contain twice as much sulphur as that in the pig and scrap originally used. This is shown by Wedding (*Journal of the Iron and Steel Institute*, page 547, Part II, 90) In Mr. Saniter's process, however, as applied to the basic open hearth, sulphury iron and mineral may be used, and not only is the sulphur not increased in the steel, but a very considerable elimination takes place.

In order to attain this result, it is necessary at an early period after the charge is melted to obtain an exceedingly basic slag, and to add a suitable quantity of calcium chloride to it. By a very basic slag is not meant what has hitherto been considered as such, but a step in advance of that, with about 50 to 60% of lime. If these conditions be obtained and maintained it will be found that sulphur is eliminated along with the carbon and phosphorus, and in as satisfactory a manner.

The best method of obtaining this condition of slag is to charge, along with the metal and scrap, a much larger proportion of limestone than usual, about 2 cwt. to the ton. When the charge is melted the slag will be of the required composition, and when the chloride of calcium may then be added in several lots at intervals. The quantity of 70% chloride used is slightly under 1/2 cwt. on the ton of ignots made. The following table shows the quality of iron which has been used and the steel made from it.

No.	Pig Iron Used.				Average p.c. of sulphide in metals charged.	Steel Made.				
	Si.	S.	P.	Mn.		C.	Si.	S.	P.	Mn.
1	p. c. '04	'76	1'3	'18	'58	p. c. '215	trace	'081	'027	'68
2	'10	'45	2'1	'50	'35	'20	"	'072	'052	'75
3	'10	'45	2'1	'50	'35	'19	"	'048	'054	'59
4	'04	'25	2'6	1'00	'20	'08	"	'048	'025	'43
5	'20	'23	2'6	1'00	'19	'17	"	'048	'045	'57
6	'23	'22	2'9	1'00	'18	'145	"	'063	'042	'73
7	'20	'23	2'6	1'00	'18	'30	"	'053	'045	'61
8	'40	'22	2'5	1'30	'18	'18	"	'018	'034	'40
9	'20	'17	2'6	1'20	'14	'15	"	'038	'040	'58
10	'18	'16	3'1	1'50	'13	'13	"	'032	'040	'20
11	'44	'15	3'5	1'50	'13	'75	"	'042	'040	'60
12	'20	'15	2'6	1'00	'13	'15	"	'038	'040	'58
13	'65	'13	3'3	1'50	'11	'155	"	'025	'035	'68
14	'56	'05	0'05	3'00	'05	'115	"	'016	'010	'12

The pig iron used in the above charges was 75.0 per cent. These analyses have been selected to show the varying percentages of sulphur in the cast iron used, and the different grades of steel made. No. 10 is conductivity steel. No. 14, made from white hematite, is Swedish bar quality.

The Wigan Coal and Iron Company have now manufactured over 2,000 tons of steel, of which the above are examples, from sulphurous iron, the process being continually and successfully worked by them. The steel has been sold for all purposes for which basic open-hearth steel is used, namely, wire, hoops, rivet steel, tin bars, etc., and has been found to be fully equal in quality to that made from pure cast irons.

It is evident from what has been said that no great care is necessary in the selection of material, the only objectionable elements being silica and silicon. The commonest descriptions of iron scrap and ore may be used, subject to the above reservation. The yield of ingots obtained is as good as that in the use of low-sulphur iron. The use of common iron high in sulphur and low in silicon and carbon has the advantage that a less quantity of steel scrap is required, and that the consumption of ore for feeding is reduced very considerably.

BIDS ON THE TRUNK SEWER TUNNEL, NIAGARA FALLS, NEW YORK.

Through the kindness of Mr. E. Z. Burns, City Engineer of Niagara Falls, we are able to give the figures of the bids opened on the 25th ult. Plan 1, it may be well to state, includes the pipe outlet and half-lining throughout and complete at canal and shafts. Plan 2 includes pipe outlet and half-lining for 2,000 ft., complete at canal only.

DESCRIPTION.	Quantity.		Chas. Donoghue & Co. Bid.	Chambers & Casey. Bid.	Theo. Kandeler. Bid.
	Plan 1.	Plan 2.			
Sinking Shafts.....	895 yds.	895 yds.	\$9.00	\$9.00	\$18.50
Raising Shafts.....	100 yds.	100 yds.	10.00	12.00	23.00
Tunnels.....	5,018 ft.	5,018 ft.	19.00	19.50	25.00
Trenching.....	590 yds.	590 yds.	2.25	3.00	2.75
Masonry (tunnel).....	402 yds.	402 yds.			
Masonry (furnished).....	402 yds.	402 yds.	9.00	12.00	14.00
Lining No. 1.....	4,429 ft.	2,000 ft.	3.50	4.50	6.25
Lining No. 2.....	526 ft.	300 ft.	10.00	11.00	16.50
Furnishing iron, etc.....			1,700.00	3,800.00	3,300.00
Extra Brick.....	16 yds.	16 yds.	10.00	14.00	15.00
Extra Concrete.....	25 yds.	125 yds.	6.00	7.00	12.00

The totals were: Chas. Donoghue & Co., plan 1, \$132,114; plan 2, \$121,952.50; Chambers & Casey, plan 1, \$143,615.50; plan 2, \$130,899; Theo. Kandeler, plan 1, \$191,758.25; plan 2, \$174,048. The maximum preliminary estimate by Mr. Burns was \$138,681 and the minimum, \$126,056.

Cost of Laying Brick Pavement.—The cost of laying 13,224 sq. yds. of fire brick pavement in Wilmington, Del., during the fiscal year 1891-2, was \$2.10 per sq. yd. Most of the paving was on the stone foundation, and most of it was tarred. Some of the paving which was not tarred was grouted. On the different streets the percentages of loss of bricks per sq. yd. varied from 1 1/2% to 4 1/2%. Nearly all the brick used averaged about \$18.50 per thousand in cost, but some were bought for \$14.

MILLS ON THE LAHN, NASSAU, GERMANY.

Written for the Engineering Mining and Journal by John W. Meier.

The Werlau Company.—The Werlauer Gewerkschaft near St. Guar owns a mine and works on the left bank of the Rhine. The vein cropping there runs through to Holzappel; its ores are argentiferous galena, blende, copper pyrites, some iron pyrites and siderite, but no gray copper. The gangue is quartzose and slaty. Here is a modern mill, constructed by Lührig, under a contract said to be somewhat similar to that undertaken at Laurenburg.

As the hill rises rather abruptly from the bank of the Rhine, the mill has been built against it, with the foundation for the crushers secured on its rocks. The ores pass downward by gravity and elevators are partly dispensed with. From the mine, the ores are carried through a tunnel to the surface. The track is continued along the edge of the hill to a tippie *T* in Fig. 7, the construction of which has been already described in the ENGINEERING AND MINING JOURNAL. The car is turned over and rights itself while the ore falls on a platform, and is fed to a shaking screen *S*, which receives its motion from a cam underneath. This delivers the coarse ore to a Blake crusher *k*. The screen has large square holes in the bottom *g*; a sprinkler pipe *p* supplies water and the ore falling through is dumped on top of a culling table *r*, where the crushed ore is also delivered. Culling is done by two boys, who throw the waste into a central opening and put clean blende and galena into boxes; a scraper deflects all the remaining ore into a large screen *a*, with holes of several sizes (3 mm., 8 mm. and 14 mm.), and the rejections over 14 mm. in diameter pass to a second culling table *r*¹, which is attended by six or more boys (at 75 pfennigs or 18c. per day). A scraper clears this revolving table and throws the ores into a hopper of a pair of rolls, from which they pass into a long screen *c*, with 3 mm., 4 mm., 5

raised from it by a rotary pump, and are carried by launders to a large series of large *spitzkastens* outside of the buildings. These measure 15 m., 6 m. inside and 4½ m. high (see Fig. 10). These are probably intended to even off the surplus of water. They have no ascending current of water, but the slimes settling at the bottom are delivered through launders to other rows of *spitzkastens* which supply the vanners with pulp. These small *spitzkastens* are 4½ ft. high, 3½ ft. wide at top. The pulp from the bottom is raised in a pipe 2 ft. high to launders which convey it to the vanners. See sketch (Fig. 10).

The Lührig Vanners and Slime Treatment.—The difficulty in treating these slimes is to get clear blende. The apparatus consists of vanners and Salzburg tables. The Lührig vanner is claimed to be an improvement on the Stein. The gum cloth is supported by several small rollers instead of by a floor. (See Fig. 9). The table or floor will undoubtedly present a smoother surface. There will be slight catenary curves between the rollers, which are unobjectionable. As the division between the blende line and galena line is not perfect, the blende will run over into the galena at the lower edge of the cloth, hence the superintendent of the Werlau Mill has added a small scraper. A wooden lever pivoting at *J* has inserted at its other end a small piece of gum *K*, which rests on the edge of the cloth to keep the blende back. This blende from the Lührig vanner is not clean, it is mixed with some galena and iron pyrites (the latter not in sufficient quantity to materially injure the quality). The tailings likewise are not clean.

The blende from the first vanner is shoveled into a feeder which is of a

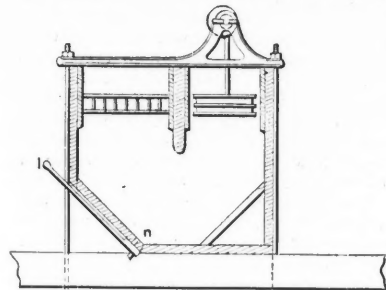


Fig. 8. Jig



Belt of Lührig Vanner

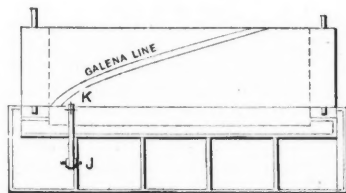
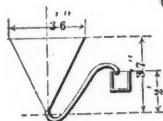
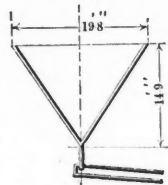


Fig. 9.



Spitz Kastens

Fig. 10.

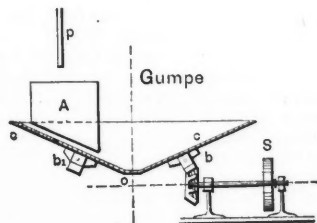


Fig. 11.

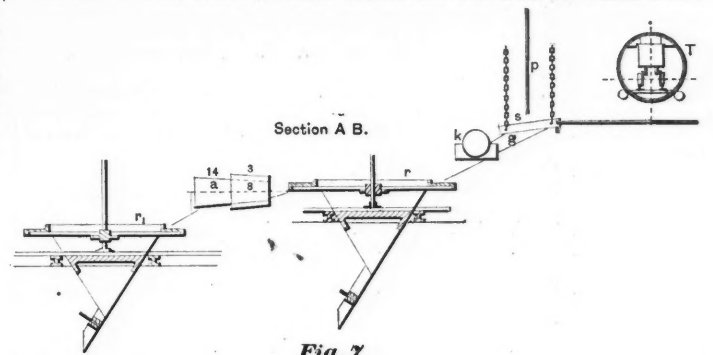
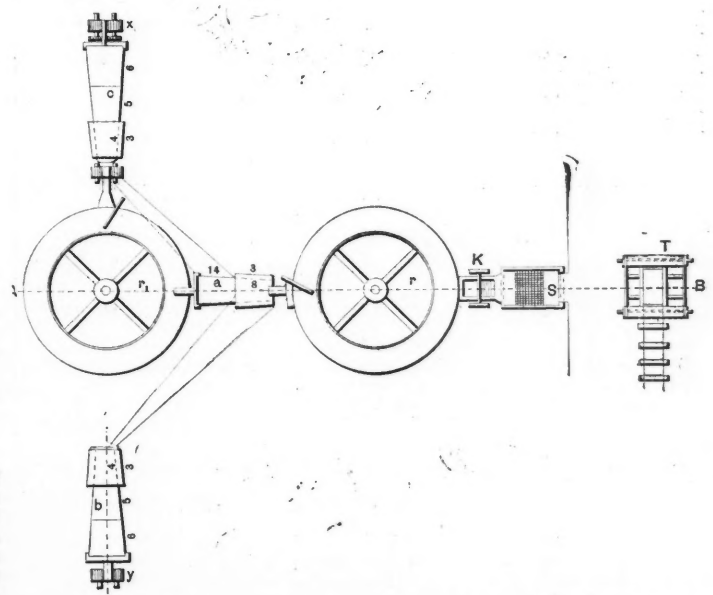


Fig. 7.



mm. and 6 mm. holes. The rejections from this go to another pair of rolls *x*. A screen *b* to the right of the table *r* receives all grades which pass through the screen *a*. The rejections from screen *b* go to a pair of rolls *y*. The fines passing through the 3 mm. holes are carried by a launder to a large *spitzkasten*. There are, therefore, three grades of coarse ore sent to as many jigs placed below the screen *c*. Lührig has adopted for these works the most modern practice for finely disseminated ores, viz: 1. Screening both before and after crushing to avoid making of fine sands and slimes; 2, two careful cullings; 3, very careful sizing before jigging; 4, saving of labor by using tippie feeder and avoiding shovelling of ore and wheeling; 5, no elevators to hoist ore into screens, thus saving elevators, belts, buckets, power and lubricants.

The Jigs.—These most important machines ordinarily give a great deal of trouble by fouling of the beds: long pieces of ore with sharp points are apt to get stuck in the meshes or the holes of the bottom, and it is necessary to frequently stop the mill to shovel out the jigs and to clear the bottoms. At Werlau all the jigs discharge through the bed, and for coarser grades the beds are made of punched boiler plates. The sieve bottoms are made of sheet iron with square-punched holes, as a rule 2 mm. (⅜ in.) larger than the size of ore jigged. Such a jig is shown in Fig. 8. The boxes are made of pine wood, and cast iron housings support the shaft, which carries the variable eccentrics giving motion to the plungers. In the bottom of the box at *n* there is a hole which can be opened or closed by the lever *l* and the valve plate attached to discharge the hutchwork concentrates. The pieces are too small to lodge tightly in the sieve bottom if they are carefully sized, as a piece of ore having the requisite weight will fall through as soon as it reaches the bottom. In absence of comparative tests, we may infer that these jigs will work clearer and more rapidly than those with vents or other more or less intricate discharging apparatus. All these jigs have five compartments, and concentrates from the four last of these go to a set of mills to be ground fine. All fine sands and slimes, with, of course, an excessive amount of water, are collected in a large pit in the centre of the mill floor. These are

somewhat novel construction. The upper part (see Fig. 11) of it is a wooden cone *C*, which receives a slow revolving motion from the bevel wheels *b b'* and the pulley *S*, placed below it (a worm gear can also be used to advantage). The box *A* hangs suspended over the cone and receives the pulp, while water is added from the pipe *p*. The revolving cone carries with it the required amount of pulp, which passes through an opening *O* to the distributing apron of a second Lührig vanner. The tailings from this go to Salzburg tables, of which there are four in the mill. Each of these has a feeder of different construction again. These are wooden or iron hoppers into which pulp is shoveled, sufficient water added from a pipe and the pulp fed by a screw conveyor. The Salzburg tables work in two pairs: the first treats certain sands carrying lead—they are first washed for a while on one of the tables, then the table is shoveled off and the upper portion is worked a second time on Salzburgs, while the lower portion goes to stamps and thence to sandjigs. The other pair of Salzburgs is used for the washing of middlings from the second Lührig vanner.

The expectation of securing a continuous working mill was not realized. The blende proved to be too difficult an ore to separate. If shoveling and other rehandling of slimes can be avoided by it, and the large settling boxes and wheeling from them be dispensed with, it will be creditable to Mr. Lührig. There is one difficulty which may interfere with successful treatment, i. e., the middlings running off the lower edge of the first vanner are very liquid, and if the sprinklers on the second vanner add much more water, there will be an excess and the cloth will be washed clean and no concentrates will remain.

This new concentrator saves largely in labor and fuel. The old Werlau concentrator in 24 hours cleaned 20,000 kilos of wash dirt, employing 90 laborers and burning 28,000 kilos of coal. The present cleans 40,000 kilos in 10 hours, with 45 laborers and 1,600 kilos of coal. The tailings are lean; coarser sizes carry at most 2% zinc and a fraction of 1% PbO. The assays of tailings from slimes could not be obtained. The wash dirt carried 9.26% gallons and 18.96% blende. Concentrates have 64-65% PbO., 41-42% Zn, and 11 oz. Ag.

NON-UNIFORMITY OF IRON MADE IN ONE CAST.

Written for the Engineering and Mining Journal by Morton Stevens.

It is well known that the iron cast from a blast furnace at one time is not of uniform composition, but only a few analyses have been given. Mr. Thomas (Jour. Anal. Chem., Vol. II., pages 148 and 301) and Mr. Browne (Jour. Anal. Chem., Vol. VI., page 462) have given some, though they have not fully described the iron analyzed.

It might be interesting to note here that while Mr. Thomas found the first beds cast to show the most silicon and Mr. Browne found the last beds to have the most, I have always found that in our iron the bed with the most silicon lies somewhere near the middle of the cast. Mr. Thomas' and my results contradict the theory that the silicide of iron, being of lower specific gravity than iron, rises to the top, and therefore the iron coming out last would have the most silicon.

In the two casts given here the samples were taken from the second pig in each bed, at the end opposite the runner. No. 1 bed means the bed farthest from the furnace.

First cast was made on June 29th, 1892, at 5 A. M. and consisted of 28 tons of gray forge iron. Following is the description of the pigs analyzed:

Pig from No. 1 bed.—Open in center of pig to close on edges, medium color.

Pig from No. 2 bed.—Same as No. 1.

Pig from No. 3 bed.—Medium forge, close and open thoroughly, mixed, medium color.

Pig from No. 4 bed.—Same as No. 3.

Pig from No. 5 bed.—Same as No. 3, but "half soled" one-half of pig, medium color.

Pig from No. 6 bed.—Same as No. 3, but "half soled" one-third of pig, medium color.

Pig from No. 7 bed.—Same as No. 3.

Pig from No. 8 bed.—Very open forge or plain No. 2 foundry, medium color.

Pig from No. 9 bed.—Medium forge, close and open mixed, "half soled," one-third of pig, medium color.

Pig from No. 10 bed.—Good, medium in center of pig to mottled on edges, medium color.

Pig from No. 11 bed.—Fair, medium in center of pig to mottled on edges, medium color.

Pig from No. 12 bed.—Medium in center of pig to mottled on edges, medium color.

Pig from No. 13 bed.—Same as No. 12.

	Silicon.		Silicon.		Silicon.
1st bed.....	1.85	6th bed.....	2.37	11th bed.....	1.80
2d bed.....	1.82	7th bed.....	2.72	12th bed.....	1.77
3d bed.....	2.11	8th bed.....	2.92	13th bed.....	1.86
4th bed.....	2.50	9th bed.....	2.55		
5th bed.....	2.50	10th bed.....	2.06		

Second cast was made September 18, 1892, at 5 A. M. and consisted of 20 tons of gray forge.

Pig from No. 1 bed.—Close iron, very even grain, no mottled on edges, of pig; good color.

Pig from No. 2 bed.—Same as No. 1.

Pig from No. 3 bed.—Hard medium iron running from close on edges of pig to good medium in centre; good color.

Pig from No. 4 bed.—Same as No. 3.

Pig from No. 5 bed.—Medium iron, close and open, thoroughly mixed; medium color.

Pig from No. 6 bed.—Medium iron, upper $\frac{2}{3}$ of pig, medium grain, lower $\frac{1}{3}$ close; medium color.

Pig from No. 7 bed.—Medium iron, upper $\frac{1}{2}$ of pig, medium grain, lower $\frac{1}{2}$ close; medium color.

Pig from No. 8 bed.—Same as 7.

Pig from No. 9 bed.—Medium iron, upper $\frac{1}{3}$ of pig, medium grain, lower $\frac{2}{3}$ close and medium mixed; close spot in center; medium color.

Pig from No. 10 bed.—Close iron, running from mottled on edges of pig to fair grain in center; medium color.

	Silicon.	Phosphorus.	Manganese.	Sulphur.
1st bed.....	1.736	.727	.473	.058
2d bed.....	1.908	.737	.473	.071
3d bed.....	1.806	.716	.473	.071
4th bed.....	1.876	.723	.473	.060
5th bed.....	2.006	.736	.489	.071
6th bed.....	1.927	.729	.489	.071
7th bed.....	1.768	.701	.489	.046
8th bed.....	1.764	.702	.489	.058
9th bed.....	1.745	.686	.489	.060
10th bed.....	1.554	.654	.473	.066

A sample taken from the runner end of bed No. 10 gave 1.68 silicon.

It is interesting to note how the phosphorus follows on silicon; each time the silicon increases the phosphorus does also. When we take the end bed in which the silicon is higher than either of its neighbors the phosphorus is higher also.

The manganese is practically the same all the way through. It was determined by titrating with permanganate, but the standard solution was so strong that the difference between .473 and .489 represents only $\frac{1}{10}$ c.c. of permanganate.

The sulphur and manganese do not vary as the silicon and phosphorus. In general iron which has the most silicon and phosphorus has the least sulphur, but in these different beds such does not appear to be the case; for bed No. 5, which has the highest amount of silicon and phosphorus has also the most sulphur. The results, however, are too few to draw any conclusions from.

VARIATIONS IN THE MILLING OF GOLD ORES—NO. 2, THE THAMES, NEW ZEALAND.*

Written for the Engineering and Mining Journal by T. A. Rickard.

(Concluded from page 534.)

The gratings or screens are all made of round punched Russia iron, imported from Swansea. The fineness varies from 148 to 180 holes per square inch. The shorter life of the screens in the mills treating surface ore, notwithstanding the lesser hardness of the material which passes through them, is due to the presence of the acid sulphates, derived from the oxidation of sulphurets, which, by the reactions induced, corrode the iron of the grating. Owing to the greater speed of crushing, however, the gratings in Comer's mill, for instance, last during the passage through them of 90 tons (long), as against 54 tons at the Saxon. The result compares badly with that of other districts, and is due to the direct action of the acid mine waters, as well as to the more indirect reactions induced by those waters, when in the battery, upon the partially decomposed metallic sulphides. It may be mentioned here that the chemical reactions produced by the underground waters in the mines of this district are so marked as to suggest the effects of a slowly dying solfataric agency.

The loss or consumption of mercury does not vary much, and is represented by one bottle (75 lbs. avoirdupois) per month for 30 stamps. It is a high consumption, and is due to the flouring of the mercury by the grinding of the pans, as well as to the evil effects ("sickening") produced by the presence in the pulp of antimonial and arsenical minerals.

The bullion is of low grade, having a fineness which ranges from 589 to 674 per thousand. At the Moanataeri and Saxon it varies as follows: Saxon: Gold 652.3, silver 341. Gold 674.4, silver 316; gold 638, silver 342; gold 641.9, silver 343; gold 643.2, silver 349.

Before venturing upon a further criticism of the methods of treatment, it will be well to give a general description of the character of the ore. The lodes from which it is obtained are small and not very regular veins, which traverse a hornblende—andesite which is often brecciated. The lode formation is confined to certain belts marked by the decomposition of the country rock. The millstuff consists of a large proportion of the country rock, which has a hardness varying according to the degree of its decomposition. The ore is silver bearing as well as gold bearing. The gangue is largely quartz which is arranged in veinlets and stringers through the country rocks, included within the limits of the vein. Sometimes the quartz is soft and sugary. While the gold is frequently visible in the quartz in the form of minute threads and particles, it is also largely associated with copper and iron pyrites, blende, galena, etc. Silver occurs in various forms, such as pyrargyrite, proustite, argentite, etc. The two precious metals are found associated with tellurium, as petzite and sylvanite. Selenides are known to exist in the ore. Antimony in beautiful crystals of stibnite is often seen.

Generally speaking, the ore has a very varying hardness and composition; it contains a very large variety of metallic sulphides, and must be considered both a silver and gold ore. Containing from $\frac{1}{2}$ to 10 per cent. of sulphurets, with an average of from 2 to 3 per cent., it approaches the boundary line which divides a "free milling" from a "refractory" ore.

An endeavor will now be made to pass in review the chief characteristics of the milling.

In none of the mills is there a rock-breaker; therefore there are also no grizzlies or sizing screens. In every case the feeding is done by hand and in most cases done badly. The feeding is very rough. Instead of using trained men for this important work, it is left to boys who shirk the breaking of the big pieces of rock, preferring to throw them into the feed opening of the mortar box, where, if they stick, they are rammed in with a few blows from the sledge hammer. The results due to the absence of rock-breakers and automatic feeders, coupled with the bad hand feeding which obtains in the mills, is seen in the excessive wear and tear of the shoes and dies. The average wear is at the rate of 22 oz. of iron per ton of ore crushed—14.5 oz. for the shoe and 7.5 oz. for the die.

The feeding, while it is irregular, is also too high. The batteries are kept almost choked up with ore, so that the stamps do ineffective work.

The mortar boxes are all of the same pattern, whether employed for the rapid crushing of soft material or the slower treatment of the average ore. Seeing that no amalgamation is attempted inside, they are too wide. When the battery is simply a pulverizer the pulp should be expelled from the mortar as soon as it has been reduced to the size required; with an unnecessarily roomy mortar the pulp lingers after it has been reduced to a fineness which will allow of its passage through the grating. When amalgamation takes place inside this serves a purpose, but at the Thames it only allows that unnecessary hammering of the gold which destroys its amalgamating power. Narrower mortars are, therefore, advisable.

The gratings are all of one description. As already pointed out, the wear is much affected by the character of the ore. Material which has lain for some time in the stopes, or waste from surface, destroys the iron of the gratings by reason of the sulphuric acid produced by the decomposition of the sulphides. The mine waters contain an unusual quantity of the protosulphates of iron, copper, manganese and alumina, and, as a consequence, when the millstuff is very wet, the action upon the gratings is very marked. As is usual in the colonial mills, the screens are arranged vertical, instead of having a slight forward inclination. This tends to wear the lower portion much faster than the upper. The amalgamating plates are made variously of copper and Muntz metal. At the Saxon and Kuranui mills Muntz alone is used; at the Moanataeri plain copper, but at the Cambria and Comer both are used. In the former the top portion of the plates or tables is Muntz, and the lower part copper; in the latter it is vice versa. The use of Muntz metal will be fully discussed later on.

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As already pointed out, the wells serve but little purpose, since they are not of the type that compels the pulp to pass through the body of the mercury bath. The small amount of gold which is collected by them only confirms the general experience that with ores containing an appreciable percentage of sulphurets, ordinary mercury wells are rendered comparatively inoperative by the formation of a scum over the surface of the bath. The "blind ripples" are still more useless, since they serve no particular purpose, either as arresting free gold or collecting sulphurets. The amount of attention which is given to them is out of proportion to the quantity of sulphurets and heavy sand which they collect.

The blankets at most of the mills are washed at intervals which are too long. Tributaries understand this, for when putting through a lot of ore at any of the custom mills, they themselves attend to this part of the work. In such cases they will usually wash the blankets and skim the wells every half hour. The blankets cost 12s. per yard of two yards wide. They are manufactured particularly for mill use at Mosgell, near Dunedin, in the south island. They last for three months.

The Berdan pans have a good feature, that is, the use of a drag in place of a ball. It is a step in the right direction. The ball always remains in the lowest portion of the pan; the mercury also collects there, and, as a consequence, the latter is ground by the former, with

tailings estimated to amount to at least a million tons, carrying half an ounce of bullion per ton. That this is not an exaggerated statement is proved by the success of the tailings mills. These are engaged in the treatment of both the old accumulations and the "waste" now being sent down. It is a sufficiently severe condemnation of the work done at the Thames to state the fact that the tailings mills, using the same methods of extraction as the mills themselves (that is pans, not even preceded by finer crushing), are enabled to pay well. It is a sorry fact to have to record that even after this second treatment the tailings still contain a notable amount of gold and silver.

The largest of these plants to treat the tailings contains 12 Watson & Denny pans. The tailings are elevated and conveyed by water. This is very effectively and simply done by a small "hydraulic elevator." The jet is $\frac{5}{8}$ -in. diam., the supply or pressure pipe $2\frac{1}{2}$ in. and the elevator or discharge pipe 3 in. The water used is under a pressure of only 60 lbs. per sq. in. The launder from the upper end of the elevator pipe conveys the tailings to wide strakes or buddles, where the poor slime is washed away and the rough stones picked out before feeding the material into the hopper of the pans. A handsome profit is being obtained. The total cost per ton—including insurance, interest on plant, wear and tear, etc.—amounts to 3s. 6d. per ton.

But what is the remedy may naturally be asked after such a severe



VIEW OF PORTION OF THE THAMES DISTRICT.

the formation of "floured" mercury, which escapes with the slimes. The drag, which is fixed to one side of the pan, keeps the work of grinding apart from that of amalgamation.

The concentration of the rich sulphide minerals is unattempted save by blankets and in rare cases by such a rude method as "ties." An attempt was made to encourage this portion of the milling, and a Newberry-Vautin chlorination plant was erected at the Thames, but owing to the impossibility of obtaining a regular supply of concentrates the works had to be shut down.

In summarizing the treatment which the ore undergoes at the mills it is not too much to say that it is very crude and incomplete; it succeeds in arresting only that portion of the gold which is readily amalgamated, and fails entirely in saving the silver contents. The silver in the bullion is not the result of amalgamation with the silver in the millstuff, for the proportion of silver to gold in the bullion is that of the native gold of the district, which, like that of the Transylvanian gold field, is of very low caratage. On the most favorable estimate the treatment cannot be said to be even half carried out, for scarce 50% of the gold is extracted, leaving out of account the silver. The waste of many of the mills will assay about half an ounce. Much of the gold, and nearly all the silver, is carried out in the slimes, which, being deposited along the foreshore, have produced an accumulation of

condemnation of existing methods. First to point out one vital error in the treatment. No reference is here intended to the fact that the rich silver bearing minerals are allowed to go out to sea without any attempt at saving or concentrating them—that is no error, but lunacy. While blanket strakes followed by pans form a process which is quite ineffectual as regards the saving of the silver contents of the ore, it is also badly suited to the extraction of any free gold remaining in the pulp after its passage over the plates. The grinding action of the pans upon the sulphurets forms slimes, which sickening the mercury, cause its direct loss as well as spoiling its power of catching the gold by amalgamation.

The ore is both silver and gold bearing; the former is chiefly associated with the sulphurets, the latter occurs mainly in the quartz, while both metals occur combined as tellurides, etc. Some separation is, therefore, needed between the silver-bearing and the gold-bearing portions of the ore. The tellurides, etc., would be saved in the same operation as the former. It is suggested, therefore, that from the plates the pulp should pass direct, discarding the blankets, to concentrators and thence to the pans. The concentrators would separate out the silver-bearing sulphurets and some of the combined gold and the pulp freed from the sulphides would go to the pans, which would complete the extraction of any free gold remaining.

This is a very obvious improvement on the present treatment. It is the so-called "combination" process. It is not necessary to erect an expensive plant of concentrators; it will answer well enough to commence with some simple form of shaking table, and of this type of machine there are various forms to choose from, among which may be mentioned the shaking table of the Colorado mills, or that extensively used in Victoria—both simple and inexpensive.

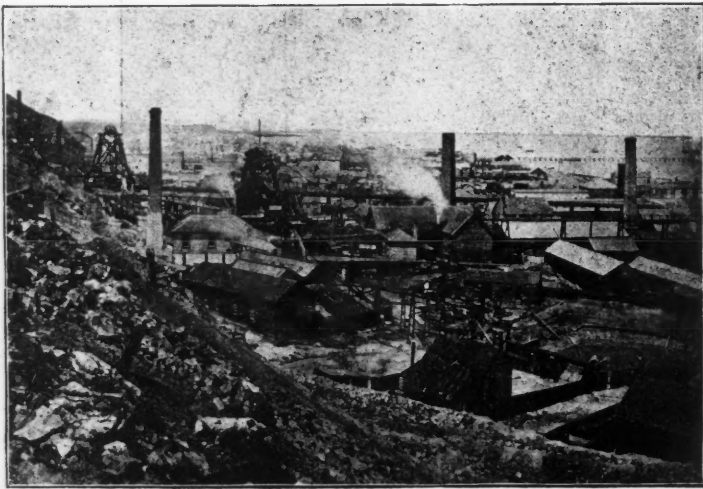
The process would be made more correct and the work of the concentrators much lightened by the intervention of classifiers between the amalgamating tables and the concentrators. Spitzlutte or water jet classifiers would be most simple, inexpensive and complete machines for this purpose.

The treatment above suggested would not interfere with the present amalgamation upon the tables; it would be supplementary. The initial cost of such an addition would be small, and as the machines are practically automatic the additional cost of treatment would be extremely small.

As to the handling of the concentrates, their after treatment, that need not concern us here as it is outside the scope of stamp milling proper.

The mills of this district offer one point of particular interest, namely, the use of Muntz metal on the amalgamating tables. The composition of Muntz metal is 60% copper and 40% zinc. Its first introduction into mill use took place in 1875. At that time copper plates were not obtainable in sufficient quantity, and the Thames being a seaport the local ironmongers who imported Muntz for the purpose of sheathing vessels' bottoms sold it in place of the copper. The first trials were very satisfactory, its use spread, and it has now largely replaced the simpler metal. Sheets of proper size for mill use have not been introduced; those employed at present are generally of insufficient size, and require patching together, so as to fit the width of the tables. The sheets used are also too thin for the purpose, being of the thickness known as No. 18. They last, however, from three to five years.

Silverplated copper is not used in the mills of this district, hence the



MILLS IN THE THAMES DISTRICT.

comparisons to be made will be confined in this instance to Muntz metal and plain copper. In many respects the facts noted will apply also to the better class of amalgamating plates.

Muntz metal, as used for amalgamation, has the following characteristics. It does not absorb amalgam like copper. The latter has to be well coated with gold amalgam before it does any good work, and in a new mill it is always advisable to allow the copper to become thoroughly amalgamated before the plates are cleaned. Muntz metal has very little absorbing power over the mercury, that is the amalgamation is, as compared to that of copper, very superficial. In practice several results follow. First, the cleanup is much facilitated, for the amalgam formed on the Muntz is very readily detached, not requiring the more laborious cleaning up demanded by copper plates. A steel tool is never used, rubber being always sufficient. Secondly, test crushings are more reliable. Gold will not collect upon a poor copper plate as it will upon a rich one, so that in practice the yield from a lot of ore will be much affected by that of the previous lot. It is not possible to scrape a copper plate closely without injuring its amalgamating capabilities. It is not so with Muntz metal, which can be readily deprived of all its previous gain of gold amalgam without impairing its efficiency. It is, therefore, particularly suited to custom mills.

On the other hand, for very rich ore Muntz is not advisable, for "there is no body in it," as the Thames millmen say, that is, it is sooner saturated with gold amalgam than is the copper. In the same way silver-plated copper will carry more amalgam than the plain copper. This is a disadvantage to be partially overcome by frequent cleaning up, a remedy, however, which does not get over the defect.

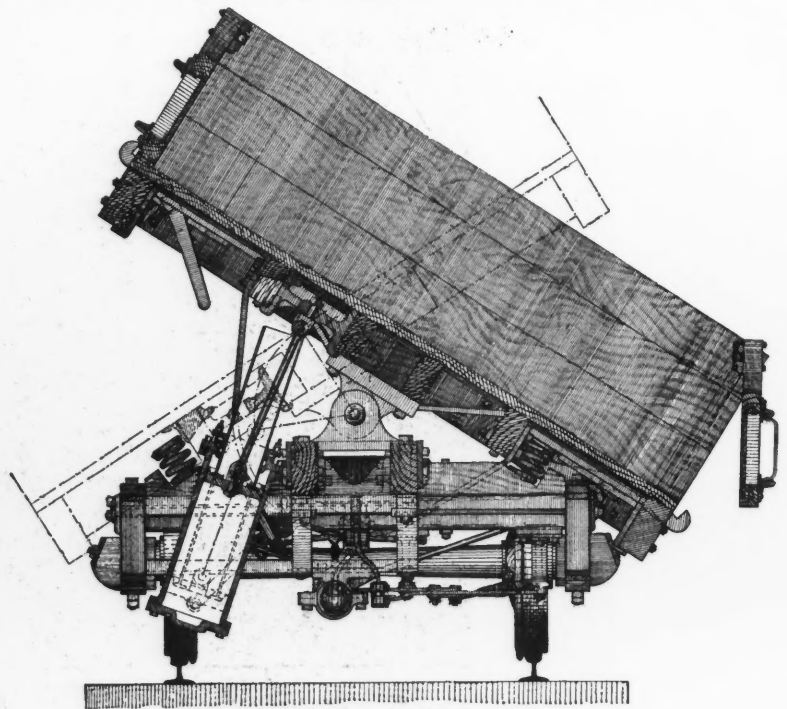
When ores contain minerals injurious to the mercury Muntz metal is preferable. It is noted that in the presence of base minerals "sickening" of the mercury does not occur as with copper plates. The explanation is to be found in the action of the zinc, of which it is partly composed, which forming an electrolysis of the water liberates the hydrogen, which, being in a nascent state, exerts a powerful reduc-

ing effect, somewhat after the way of the so-called "hydrogen amalgam" process. In practice there results the fact that Muntz metal plates are easier to keep in good order than the copper. When the millstuff contains a notable percentage of the heavy sulphurets, particularly such as are directly injurious to amalgamation and "sicken" the mercury, it is seen that the Muntz is hardly affected. The "verdigris" of the millmen, caused by the presence of grease and other impurities in the ore and battery water, is not formed upon Muntz metal plates. At the Saxon Mill it required over a jar (7 lbs., costing 23 shillings) of potassium cyanide to dress the copper plates, and so keep them in order; it was found upon introducing Muntz metal that half a bottle (one bottle costing 6s. 8d.) of sulphuric acid would suffice during the same length of time—viz., one month.

On the other hand it is known that for highly acid ores, such as certain heaps of waste ("mullock tips" or dumps), which contain much sulphuric acid, resulting from the oxidation of pyrites, the copper is to be preferred. Under such conditions a scum is formed upon the Muntz, while the acid tends to keep the copper clean. In both cases, however, in the latter case perhaps to a less extent, the amalgamation is interfered with.

At the Cambria, which is a custom mill, both varieties of plates are used, Muntz for the top and copper for the lower portion of the tables. This is done to meet the requirements of different classes of ore. At the Comer Mill the arrangement is inverted, the top plate being of copper.

The result of the experience of the Thames Mills has been, therefore, to recommend the use of Muntz metal for amalgamating plates where poor ore is being crushed, also in custom milling and where the ore is charged with minerals which injuriously affect the mercury. For material containing acid waters or for very rich ore, unac-



THE THACHER DUMP CAR.

companied by a large percentage of sulphurets, copper is to be preferred.

In general it may be added further that Muntz metal is the cheaper of the two, it lasts longer and requires less attention.

It would be well to try Muntz metal in other districts where somewhat similar conditions obtain. It possesses two certain advantages: it wears better than the ordinary plates and it facilitates a rapid and complete cleanup. This should recommend it to custom mills. Its other advantages must depend upon the character of the particular ore whose gold contents it is called upon to amalgamate.

In dressing new Muntz metal plates the following are the steps to be taken: Rub the surface of the new plate with fine clean sand to get it mechanically clean, then wash it with a weak (1 to 6) solution of sulphuric acid to make it chemically clean. Then start to rub in a little mercury, rub in one place "until it bites," that is, the plate becomes amalgamated. Give a circular movement to the flannel or mop. Once started the amalgamation spreads in ever widening circles.

Every mining district has a lesson to give, every mill has some suggestion to offer; in the case of the Thames the point of most interest is undoubtedly that which we have last considered.

Printing Lantern Slides on Gelatine Sheets.—Mr. W. J. Waggener, Professor of Natural Philosophy of the State University of Colorado, has tried the experiment of making diagrams and pictures for projection by the magic and the solar lantern by printing the same, with the ordinary printing press and engraved blocks, on sheets of transparent gelatine. The results were gratifying even beyond the expectations which he had long entertained for the process. It is safe to say that by this means excellent lantern slides from diagrams and engravings of nearly if not quite all kinds can be made and multiplied as rapidly and almost as cheaply as paper prints. No patent will be asked for this process, but all are invited to make free use of it.

NEW CANADIAN IRON FIELDS.

Written for the Engineering and Mining Journal by Richard A. Parker.

There are three points now attracting a good deal of attention—Aticokan, Arrow Lake and the vicinity of Gunflint Lake, Canada. Here the Laurentian gneisses have been traced northward to the west end of the lake, across the border and range a little north of east, about half a mile to a mile and a half, north of the lake. On the south side, the Animikie slates hold in more or less isolated areas deposits of hard hematite of good merchantable grade and of a Bessemer quality.

One Paulison, of Minneapolis, has been operating here this fall, and is now sending in machinery for the winter's work. There is probably 5,000 tons of ore on the dump. So far the workings are quite shallow in this, resembling the development at the Mesaba range, of which this section is doubtless a continuation.

The gabbro overflow found both south and north of the lake contains deposits of ore lying horizontal, as though they filled in the troughs caused by the synclinal folds in the erupted gabbro. These ores, however, were doubtless hematites originally, and by the heat have been partly deoxidized into magnetites.* They usually carry a noticeable percentage of titanium, an element quite common in this district, and which must, of course, be guarded against by any intending purchaser of such lands.

The building of the Port Arthur, Duluth & Western Railway, from Port Arthur southwesterly, and following the foothills of the gneiss range, will open this district and afford opportunities for explorers to examine these lands, that will be apt to bring to light some of the mineral deposits that are now hidden. The road, after leaving Gunflint Lake, turns south, and will, it is expected, next summer reach Tower, Minn., thus affording

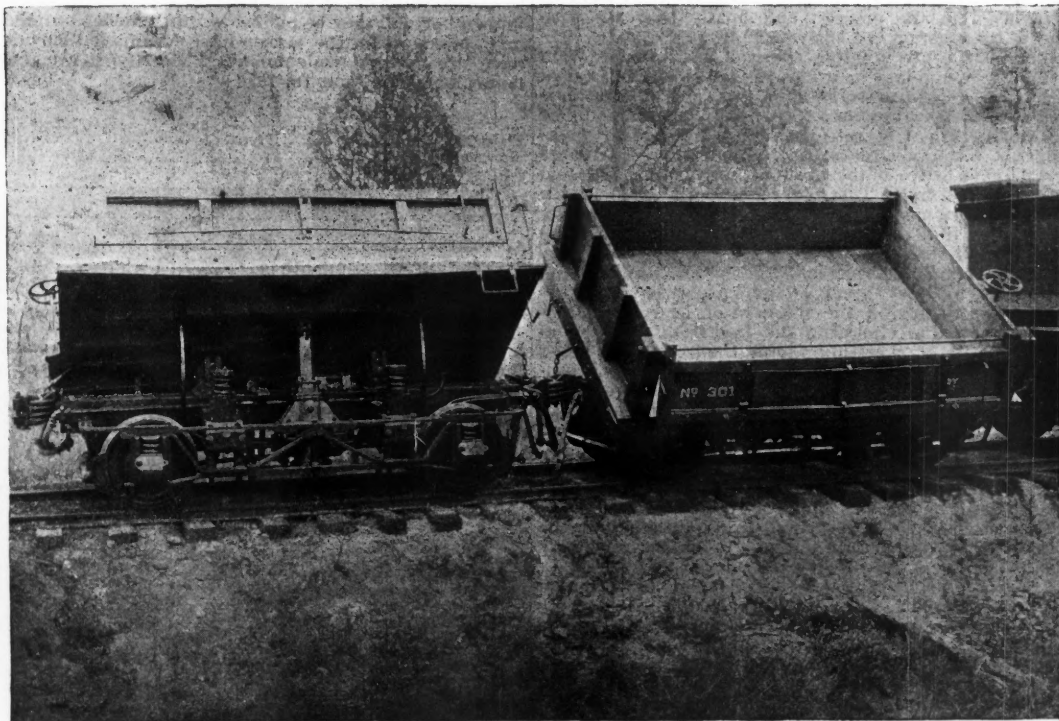
may be met by its cheapness per bushel, but, as is inevitable, the wood will be getting further and further away, and the cost, therefore, will be augmenting in proportion to the distance it is hauled.

The furnace cannot be one of the largest, for the fuel will not stand the pressure of the burden. None but the largest furnaces to-day can make pig iron at a profit; but right here, while on the horns of this dilemma, steps in the Dominion government to say that to help them along they will give the manufacturers of iron \$2 per ton. This is guaranteed for three years, I believe. This will certainly help them out for that time, and I have no doubt that it will be continued, as those in authority over there see and feel the necessity of encouraging their own industries.

It may not be generally known that during the session of the 1891 Provincial Parliament the royalty on iron ore was fixed at not exceeding 2% to "be calculated upon the value of the ore at pit's mouth, less the actual cost of labor and explosives for mining and raising the same to the surface, and shall be payable, etc., etc." so that the royalty is practically removed. And, again, it is provided that "the royalty hereby reserved shall not be imposed or collected upon any ores mined, wrought or taken until after seven years from the date of the patent or lease, thus giving still greater freedom and inducement for citizens to enter upon their lands and explore for mineral.

THE THACHER RAPID UNLOADER.

We herewith illustrate a new method of unloading cars which is being introduced by the Thacher Car and Construction Company, of Bennett Building, this city. The cars are pivoted in their centers and they are



THE THACHER RAPID UNLOADER.

shipping facilities for mines along its route, both in the United States, at Two Harbors, and in Canada, at Port Arthur.

Large tracts of land are now being surveyed and purchased from the Dominion by Americans, upon which it is expected iron ore deposits may be found. There are several large areas on the other side of the boundary line that are covered by the iron-bearing series of rocks that are closely allied to those of the Mesaba range. The quartzites are somewhat finer grained and more apt to be bedded there than here. The greenstones both compact and conglomeratic abound, while the brecciated jasper seen in Canadian ore fields is identical with that found at Tower, Minn. The logical conclusion to these occurrences is that these fields will be explored and more iron fields opened up.

And for what? In the United States there is more iron ore produced than the country can consume in spite of the increased population and increased consumption of pig iron *per capita*. Should the duty be removed it will be an added incentive to owners of these lands to prospect and develop them, as, if they have iron ore they will want to sell it. The result of this vast overyield of ore will be a general cutting of price, which means that only the largest mines yielding the highest grades of ore can live; that they will make much, if any, profit will be a doubtful question.

I understand that a charcoal furnace is about to be started at Port Arthur, using soft wood charcoal, and for the time being, at least, using the spathic iron ores found north of the town. These they will doubtless roast as there are sawmills in the vicinity which will yield waste enough to calcine the ore. So far, so good—but what of the fuel supply? There is along the lines of the Canadian Pacific and Port Arthur, Duluth & Western roads, large tracts of soft woods (none other grow so far north) consisting of spruce, jack pine, white birch, poplar and tamarack; while the wood is conveniently close to the furnace, a large fuel charge

* Some of these ores exhibit strong polarity.

tipped on either side by compressed air in cylinders underneath. The cylinders are fixed to the frames of the cars and the piston rods are connected to the body of the cars. The compressed air is supplied to either end of the cylinders by two train pipes, which are exactly similar to those used for distributing air to the brakes, and the air engine on the locomotive used for operating the brakes can be also employed for supplying the compressed air to the tipping cylinders.

The cars are held in their normal position by latches, and when tipping is to be commenced the latches are withdrawn by pistons which work in small air cylinders. The air to these cylinders is supplied by a third train pipe of smaller dimensions. In later designs, however, this third train pipe is dispensed with, and the air from either of the other two pipes is made to pass through the small cylinders first before it goes to the dumping cylinders. This is a decided improvement, as it automatically prevents the dumping commencing before the latches are loosened.

When the body of the car is horizontal the piston is midway along the dumping cylinder, and the admission of air into one or other of the train pipes depresses or raises the piston after having undone the latch. Suitable springs are used for checking the motion of the body of the car, and plenty of clearance is allowed in the cylinders in order to afford cushioning. Some of the cars made are only arranged to tip on one side, and then only one train pipe is needed.

The cars shown in the illustrations have a capacity of 8 cu. yds. The cylinders are 10-in. diameter, and the air pump on the engine is set to 80 lbs. per sq. in. pressure. The actual power possible is 9,984 lbs. upward and 7,808 lbs. downward. Two trains each of 25 cars of this type have been used with great success on the Canadian Pacific Railway, where it was found that the dumping and righting operations could be done in not more than one minute. The tipping did not require any more air power than the brakes, so that no additional air pumps were required. Another

advantage of this system is that no labor is required in tipping, as the whole of the work is done by the engineer and fireman on the locomotive. Then as no labor is required the cars can be tipped while on a trestle or other place where men cannot follow the cars. The two trains on the Canadian Pacific have been used in filling in a trestle. A similar train, but composed of narrow gauge cars, has been used in one of the mining districts in Colorado. Another advantage of the system is that it can be applied without difficulty to any type of tipping car which may be in use at present, and it is not necessary that the cars should be of the exact shape shown here; though, of course, the apparatus would have to be modified to suit each design of car.

A VOLUMETRIC METHOD FOR THE DETERMINATION OF LEAD.*

By F. C. Knight.

A technical method for the volumetric determination of lead, requiring but an ordinary amount of manipulation and occupying a short space of time, has long been desired. A number of such methods have been suggested from time to time that promised more or less success. Of these there are but two which give results that are sufficiently accurate even for technical work, a brief outline of which will be given.

The first, which is the more practical, consists of neutralizing the nitrate of lead solution with ammonia or carbonate of ammonia, then adding an excess of acetate of sodium, and effecting the titration with a standardized solution of bichromate of potassium, the end reaction being indicated by a red coloration on bringing a drop of the lead solution in contact with a drop of neutral solution of nitrate of silver. With careful manipulation this process yields good results. The greatest objection to be brought against the method is the uncertainty of the complete precipitation of the lead as the chromate, if special precautions are not observed, the length of time involved in the process, and finally the ease with which the end point of the reaction can be overstepped.

The other method consists in precipitating the lead as carbonate from its solution, dissolving the precipitate in a measured quantity of normal nitric acid, to which then a neutral solution of sulphate of sodium is added. The sulphate of lead is precipitated and an equivalent amount of nitrate of sodium formed. The free nitric acid is subsequently determined with a normal alkali solution, the lead percentage being calculated from the observed difference between the original amount of nitric acid used, and that found to be still free. This plan requires the lead solution to be quite free from other elements, for which special precautions are necessary, and the length of time involved in the operations quite unfits the process for technical laboratories.

There is another method which has been lately described, which, while not volumetric, appears to offer great advantages over the preceding ones. It consists in dissolving the sulphate of lead in an ammonium chloride solution, and precipitating the lead from the same in the metallic form by means of sheet aluminum, the lead finally being weighed. The results appear to be very accurate. The existing prejudice in technical laboratories against any method which involves a gravimetric determination will, however, operate as a bar against its general introduction, if a method equally as accurate, or sufficiently so for all purposes, but volumetric, can be found.

The method about to be described is offered in the hope that it will meet the required conditions. It is based on the formation of oxalate of lead, the decomposition of this salt by sulphuric acid, the determination of the liberated oxalic acid by permanganate of potassium solution, and the calculation of the lead percentage from the amount of oxalic acid with which it was originally combined.

In the analysis of ores and furnace products the following plan of operation has been found most suitable:

Place 1 gram or 0.50 gram, according to richness of the material, in a 4-in. casserole; add 15 c.c. conc. nitric acid and 25 c.c. conc. sulphuric acid; cover with watch glass and heat on a hot plate until the decomposition is effected and the fumes of sulphuric acid appear. Remove and cool; when cool, gradually add about 50 c.c. of cold water, heat to boiling and immediately filter. Wash well with boiling water slightly acidified with sulphuric acid, and finally with plain hot water. Now rinse the insoluble residue into a beaker of about 200 c.c. capacity, using not more than 50 c.c. of water, add 50 c.c. conc. hydrochloric acid, cover with watch glass and boil briskly for five minutes. The sulphates of lead and lime pass into solution.

If much silica and sulphate of barium be present, it is well to filter and wash well with boiling water. If such filtration is undertaken, it must be done rapidly. Small amounts of silica do not interfere, but larger quantities prevent the subsequent precipitation of the lead in one spongy mass.

Dilute the solution with water to about 100 c.c., keeping it hot, but not boiling. Now add 2 grams of granulated zinc. The lead begins immediately to be deposited as a metallic sponge. When the action of the acid on the zinc has apparently ceased add an additional 0.50 gram. After five minutes the solution is again boiled for a few minutes and then 10 c.c. conc. hydrochloric acid added. This dissolves the remainder of the zinc very quickly, and when the reaction is completed the lead sponge will be found floating on the surface of the liquid. Decant solution, wash the lead sponge with cold water and press it out flat with the finger. Dissolve it in 1 c.c. conc. nitric acid and 20 c.c. hot water. Add now a slight excess of carbonate of sodium (the salt is preferable to the solution), and re-dissolve the precipitated carbonate of lead by adding 5 c.c. strong acetic acid; add 20 c.c. of 95% alcohol, heat the solution to 65° C. and precipitate the lead with a saturated solution of pure crystallized oxalic acid. The lead comes down at once as a dense white crystalline precipitate. Stir briskly until the precipitate settles rapidly, leaving a perfectly clear supernatant liquid. Filter and wash precipitate three times with a hot mixture of alcohol and water (1 alcohol, 1 water), and then four times with hot water alone. (In washing the precipitate it is well to use a fine jet, keeping the stream on the filter and not allowing it to flow on the glass, as otherwise the precipitate is apt to creep on to the funnel, and thus occasion loss.) When thoroughly washed, the precipitate is rinsed

into a flask or beaker with about 50 c. c. hot water, 5 c. c. conc. sulphuric acid added, and the oxalic acid determined by permanganate of potassium solution in the usual way.

The only precautions to be observed are those which have already been mentioned with reference to bismuth, and when large amounts of silica or sulphate of barium are present.

As the ratio of the atomic weight of lead to that of the combined oxalic acid is very high, any error occurring in the titration will be magnified. It is advisable, therefore, to use quite dilute solutions of permanganate of potassium, the strength of this being not greater than 1.58 grams $KMnO_4$: 1 litre, which will give a strength of solution, 1 c. c. = about 50 milligrams of lead.

The standard of the solution in terms of lead is obtained by multiplying the standard in terms of crystallized oxalic acid by 1.6428.

The time involved in the execution of the method on a single assay occupies from 35 to 40 minutes, and the carrying out of a number of assays simultaneously is easily feasible.

The following results indicate what concordance can be obtained by the method:

Exp. No.		Percentage.
23	Broken Hill ore.....	27.61-27.50
24	Silver precipitate of leaching process.....	28.86-28.75
25	Oxidized ore.....	2.56-2.66
26	Galena associated with pyrite and chalcopryrite.....	22.25-21.95
27	Galena ore (gravimetric, 66.75% Pb.).....	66.58-66.66
28	Oxidized ore.....	41.04-41.29

THE LAKE SUPERIOR ORE SHIPMENTS FOR 1892.

The shipments of ore from the Lake Superior iron ore districts promise to exceed those of the great year 1890. The rail shipments are as yet unknown nor will they be published until the beginning of next year. The lake shipments for the season have terminated however and the figures have already been made public. These figures are given in the following table along with those for 1890 and 1891:

	Gross Tons.	
	1891.	1892.
Escanaba.....	3,478,590	4,001,600
Marquette.....	1,056,027	993,113
Ashland.....	1,261,658	1,227,407
Two Harbors.....	890,299	1,155,490
Gladstone.....	177,866	105,000
Superior.....	4,200
Total.....	6,441,440	8,485,210

If the rail shipments for 1892 exceed 518,491 gross tons, and this is almost a certainty, the total shipments by rail and lake for 1892 will be the largest on record. Compared with 1891, the lake shipments from Escanaba, Ashland and Two Harbors show increases, while the shipments from Marquette and Gladstone have shrunk. This year Superior makes its first appearance in the list, and it is represented by 4,200 gross tons of Mesaba ore.

The returns giving the receipts of iron ore at Lake Erie ports during the season, and the stocks on hand at these ports on December 1st, 1892, are also to hand. The following tables give these figures, compared with the corresponding returns in previous years:

Ports.	Iron ore receipts at Lake Erie ports, gross tons.		Iron ore on dock at Lake Erie ports Dec. 1, gross tons.	
	1891.	1892.	1891.	1892.
Toledo.....	191,105	139,987	122,515	71,419
Sandusky.....	105,907	49,736	122,000	87,500
Huron.....	14,910	65,000	14,910	45,000
Lorain.....	266,009	190,400	250,842	147,600
Cleveland.....	1,257,775	1,954,224	1,111,762	1,317,992
Fairport.....	699,434	866,611	57,617	6,069
Ashtabula.....	1,599,785	2,555,416	903,957	1,312,658
Conneaut.....	1,130	None.
Erie.....	393,759	645,230	252,916	401,683
Buffalo.....	410,000	7,000	129,000	125,000
Total.....	4,932,684	6,650,734	3,508,489	4,149,451

It will be seen that the total receipts 6,660,734 gross tons is rather less than the receipts in 1890, viz., 6,874,664 gross tons. As the total shipments by lake of iron ore in 1892 are greater than those in 1890, it follows that the receipts at other than Lake Erie ports must have been greater to the Chicago.

On looking through the tables of receipts at Lake Erie ports we notice that the lead of Ashtabula is becoming more marked. Buffalo is sinking into insignificance; Lorain, Toledo and Sandusky are receding, while the ports of Cleveland, Fairport and Erie retain pretty much the same proportion of business. The new port, Conneaut, appears for the first time in these tables.

Home Defects in Freight Cars.—At a recent meeting of the Central Railway Club of Buffalo, Mr. Waitt from the special committee on "Home defects on freight cars—defects that may be passed to the owners by inspectors," submitted the following report: "We would recommend for the consideration of the Club that the following defects on home-bound cars, when they do not give evidence of recent origin, or of being caused by derailment or wreck, or by unusually rough handling, should be considered as home defects, and the cars should be passed home to the owners by inspectors, without a defect card: 1. Brake shoes worn out. 2. Journal bearings worn out. 3. Truck bolsters broken or cracked. 4. Truck transoms (wood) broken or cracked. 5. Body bolsters broken or cracked. 6. Spring planks broken or cracked. 7. Truck spring broken or cracked. 8. Roof boards loose or missing, or tin or iron roof loose. 9. End or side sheathing loose. 10. End or side finish loose or missing. 11. Ends or sides bulged, not broken. 12. Corner plates cracked. 13. Draft springs broken. 14. Draft timber bolts broken. 15. Center plate bolts broken. 16. Bolster guide bars broken. 17. Bolster guide blocks broken. 18. Truck truss rods broken. 19. Body truss rods broken. 20. Pedestals cracked. 21. Oil box covers missing or broken. 22. Spread trucks. 23. Loose dead blocks. 24. Cars low on trucks where wheels come in contact with intermediate timbers. 25. Side bearings and bolts broken. 26. Arch bars broken or cracked. 27. Decayed timber. 28. Leaky roofs.

* Abstract of a paper read before the Colorado Scientific Society, November 7th, 1892.

THE JEFFREY TRACTION WHEEL FOR ELEVATOR CHAINS.

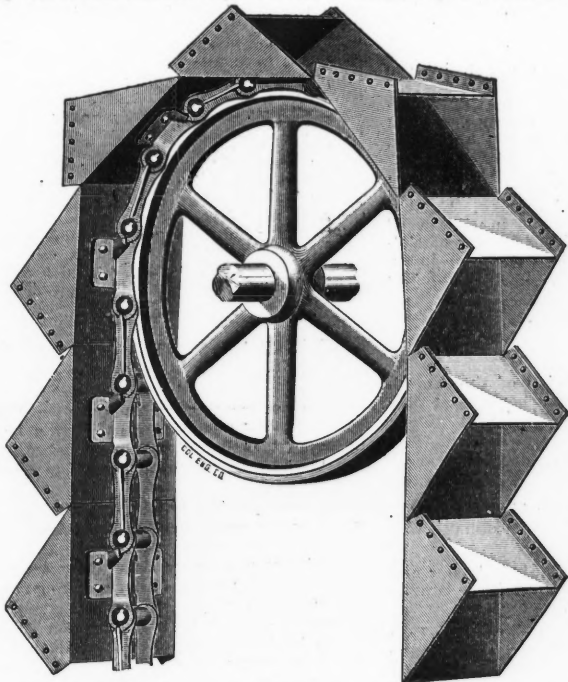
The accompanying illustration shows the Jeffrey traction wheel which is used in the manufacture of chain elevators and conveyors by the Jeffrey Manufacturing Company, Columbus, O. It is a plain wheel turned on the face and sides to correspond with the space between the ribs on the head of the link. The weight on the chain and buckets upon the wheel produces sufficient friction to drive the elevator, while the ribs keep the chain in position. One of the greatest advantages to be gained by the use of this wheel is that the chain slips upon the smooth surface of the wheel in case of clogging caused by over-feeding or loading. The style of wheel has equal advantages at the foot of an elevator.

DIGEST OF RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Department of the Interior Decisions.

MINING LOCATION—RESERVOIR SITE—SELECTION OF LAND SITE—ACT OF OCTOBER, 1888—SEC. 2322.

1. A mineral location, made after the report of the Act of October 2d, 1888, and prior to the selection of a reservoir site, defeats the selection as to the land in conflict.
2. Mineral lands are not excepted from the operation of the Act of October 2d, 1888.
3. Section 2322 of the Rev. Stats. (U. S.) gives to the locators of all mining locations, so long as they comply with the United States laws, and with State, territorial and local regulations not in conflict with the United States laws, governing their possessory title, the exclusive right of possession and enjoyment of their locations, in all cases where no adverse claims existed on May 10th, 1872. This right has been uniformly recognized by the courts and the departments.—*Decision of the Commissioner*



THE JEFFREY TRACTION WHEEL FOR ELEVATOR CHAINS.

of the General Land Office *In re. John U. Gabauthler, reversed.* [Decision of Secretary, Nov. 12th, 1892.]

RAILROAD GRANT—MINERAL LAND.

1. Third Section, Act July 2d, 1864, excludes "all mineral lands" from the operation of the Act making grant to the Northern Pacific Railroad Company.
 2. Land is mineral in character, and as such is excepted from the grant to this company, where the development and its results display some promise that a prudent and reasonable man would be justified in expending money and labor in legitimate mining operations.
 3. Where the development of a property and its results show such a condition of things as to the same that a prudent and reasonable person would be justified in expending money, pains and labor in legitimate mining operations, untainted by speculation or the appearance thereof, the land must be held as "mineral" within the meaning of that term as used in the granting act. If it were otherwise held, the mining industry, so far as it pertains to odd sections within the railroad grant, would be paralyzed.
- The rule is that paying mines are only shown to exist after years of labor and much money are expended in their development. Prospectors find no riches at the surface. Profit is not derived from the grass roots down. They must have an opportunity given them to open the mine as their means will permit. Judgment of the Commissioner of the General Land Office in *Casey et al. vs. The Northern Pacific R. R. Co.* affirmed. [Decision of Secretary, Nov. 15th, 1892.]

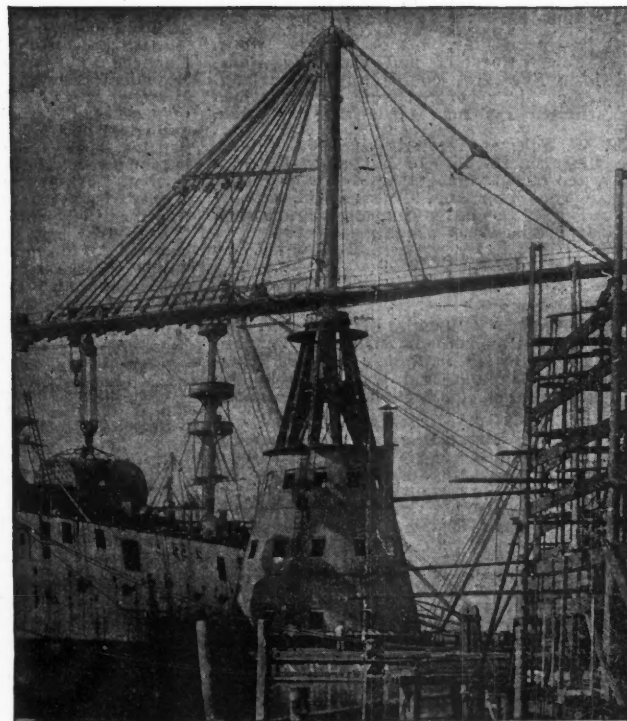
Efficiency of Electric Transmission at Lauffen.—In transmitting electric power from Lauffen to Frankfort, 108 miles, the actual loss of energy was 18 to 20% in the triple process of transforming a current of from 200 to 300 volts into a current of high intensity but small volume, transmitting this current over naked copper wires on ordinary telegraph poles, and finally transforming it again into a current of ordinary pressure.

THE 125-TON FLOATING CRANE AT CRAMP'S SHIPBUILDING YARD.

What is probably the largest floating crane which has ever been built is at present being used at Messrs. Cramp's shipbuilding yard at Philadelphia for placing the armorplate, machinery, and boilers on the new United States cruisers, which are being constructed by that firm. As will be seen by the accompanying illustration, a large vertical mast projects upward from a conical steel framework, which rests on the floating pontoon. The conical framework is enclosed with wood, and inside the house thus formed are four engines of 40 H. P. each controlling the drums for the pulley cables and the machinery for turning the arms around and propelling the lifting pulleys toward the outer end of the main boom. The height of the cone is 65 ft. The mast is 51 ft. high above the boom. It is of steel and hollow, being 3 ft. in diameter and braced here and there inside with extra thicknesses of metal. It rests in a socket on ball bearings consisting of 42 steel balls, each 4 in. in diameter and absolutely true. Another set of balls is used at the cap of the cone for lateral pressure as the arms swing around.

From three stay plates that hook themselves over the top of the mast strong guy cables stretch to the lifting arm to prevent it from breaking. The arm with which the lifting is done is 65 ft. long, and the other is 50 ft. long. They are made of built-up steel of the toughest quality. The longer one is fitted with traveling machinery, so that it may deposit its burden at any required distance within its range away from the mast. The short arm is anchored to the foot of the cone by strong cables, and, when a very heavy burden is lifted, two long steel arms are dropped from the outer end to the side of the pontoon below.

The long arm is fitted with two sets of pulleys, one for light lifts and one for heavy lifts. This pulley apparatus is fitted with 1½-in. wire



125-TON FLOATING CRANE AT CRAMP'S SHIPBUILDING YARD.

ropes. There are 10 coils on the heavy hoist and two on the light. The pulleys of the heavy hoist are 30 in. in diameter.

The pontoon on which the derrick rests is of iron and fitted with a system of water compartments. It is 13 ft. deep, 69 ft. long and 62 feet wide. When a boiler or any heavy weight is to be hoisted the water is let in on the opposite side of the pontoon so as to keep the derrick on an even keel. As the burden travels toward the outward end of the lifting arm more water is admitted, and before any lowering begins the machine is carefully adjusted and made level. The derrick is fitted with pumping machinery so that when its burden is left in place the water is pumped out. In admitting the water no pump is used. It is allowed to run right in from the river.

The derrick is operated by the engineer in the third story. By means of capstans on the pontoon it can tow itself about the shipyard.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE

The following is a list of the patents relating to mining, metallurgy and kindred, subjects issued by the United States Patent Office:

TUESDAY, DECEMBER 6TH, 1892.

- 487,243. Ore Separator and Concentrator. George Carson, Council Bluffs, Iowa.
- 487,261. Ore Concentrating Machine. Andrew Fraser, San Francisco, Cal.
- 487,286. Glass Tank Furnace. William F. Modes, Streator, Ill.
- 487,310. Method of Heating by Metal Bath. Frederick L. White, Milwaukee, Wis., Assignor of one-half to Albert J. Pickett, Chicago, Ill.
- 487,523. Ore Concentrator. Alfred Gonzalez, San Francisco, Cal.
- 487,541. Device for Operating Ore Concentrators and Allied Machines. Charles E. Seymour, Lake Geneva, Wis.
- 487,572. Ore Car. Frank A. Huntington, San Francisco, Cal.
- 487,605. Combined Furnace for Treating and Reducing Ores and for Refining the Resulting Metals. Antoine Chabaud, L. Leopold Van Heers, and Louis A. Allard, St. Louis, Mo.
- 11,293. Rock Catcher. George W. Veronee, Ten Mile Hill, S. C.

PERSONALS.

Mr. O. M. Harris, the prominent mineral broker of Montreal, Canada, is at present on a visit in New York.

Mr. J. B. West of West & Penrose, large sellers of phosphate, has returned from Florida, and sails for London.

If our Utah and Ishpeming, Mich., correspondents will communicate with this office they will learn of something to their advantage.

Mr. Douglas Curphey, mechanical engineer, has been appointed superintendent of the Ansonia Brass and Copper Company's brass and tube mills.

Dr. F. V. Vanderbergh, of Buffalo, has returned from a professional engagement on the Pacific coast, where he has examined deposits of chromo iron, gyserrite and kaolin.

The report that Lieutenant-Commander Lucien Napoleon Bonaparte Wyse, so well-known for his connection with the Panama Canal concession, had died at Cannes, France, on the 4th inst., was unfounded.

Mr. William H. Keller, late superintendent of the Blue Bird Mining Company, Limited, of Butte Mont., has been recently engaged professionally in examining mining property in Holeham Bay, Alaska.

Capt. J. H. Buddle retired from the Superintendency of the Superior Iron Company December 1st. He was succeeded by Mr. W. H. Colgate. But little work will be done on the property during the winter months.

Mr. C. Hoyer Millar, author of the work, "Florida, South Carolina and Canadian Phosphates," is in New York on his way to England. Mr. Millar has just recovered from a very serious illness contracted in the malarial districts of Florida.

Mr. F. W. Sargent, formerly engineer of tests for the Chicago, Burlington & Quincy Railway Company, and recently general agent for the Congdon Brake Shoe Company, Chicago, Ill., is now superintendent of the latter company's brake shoe and iron department.

OBITUARY.

Joseph Walton, the millionaire coal operator, died on the 6th inst., at his home in Allegheny, Pa. He was well known by all river men between Pittsburgh and New Orleans, and was probably the largest mine owner in this section. He was about 70 years old.

Mr. A. R. West, Mexican agent for Fraser & Chalmers and who has been for 12 years connected with that company, died in Chicago November 11th. Mr. West was formerly one of the best-known men in Denver, Colo., and his energies contributed in no small degree to the success of his firm in the West.

The eminent German electrician Dr. Werner Siemens, died at Berlin on the 6th December, aged 76. Dr. Siemens came of a very distinguished family; it is not too much to say that no family ever gave to science so many prominent sons. To his brother the late Sir William Siemens, we owe the open-hearth steel process, and Sir William and Frederick, another brother, were the inventors of the regenerative gas furnace. The invention of the dynamo in its present form is a matter of dispute, but the honor of being the first to make a commercial machine belongs without doubt to Werner Siemens. He commenced life in the German army. While holding his commission he invented the process of electro-gilding, of the differential governor and of the electric automatic recording telegraph. As member of a commission of the Prussian General Staff for the introduction of the electric telegraph system in place of optical telegraphs, he proposed in 1847 the application of subterranean conductors insulated by gutta percha, by means of a press invented by him for that purpose, which is still being used in the manufacture of cables. With the help of these insulated wires he succeeded in the spring of 1848, together with Professor Himly, in laying the first submarine mines with electric ignition for the protection of the harbor of Kiel from the Danish fleet. In the same year he carried out the first great telegraph line in Germany between Berlin and Frankfort-on-the-Main, and in the following year the subterranean line between Berlin and Cologne. Dr. Siemens left the government service in 1850, and devoted himself afterward entirely to scientific studies and to private enterprises. In 1847 he had already laid the foundation of the telegraph works afterward carried on by him under the firm of Siemens & Halske, in Berlin. Among his many achievements in science and the technical arts may be mentioned the invention and practical application of the quicksilver resistance unit, the gutta percha press, the development of methods for testing underground and submarine cables, and determining the position of faults in them; the invention of polarized relays, and the Siemens armature.

Prof. John Storey Newberry, died in New Haven, Conn., on the 7th inst. He was one of the most eminent members of the faculty of Columbia College, a geologist and mineralogist famed not only in this country, but in others as well. Born in Windsor, Conn., on December 22d, 1822, he went with his parents to Ohio at an early age, and was graduated from the Western Reserve College in 1846, and from the Cleveland Medical College in 1848. He spent two years traveling and studying in Europe, and then addressed himself to the practice of medicine in Cleveland. In 1855 he joined the army, and was sent with a Government expedition for exploring the region between San Francisco and the Columbia River. This region invited his attention to those sciences which became his life study, and the impulse toward them which he there got was further developed by the Ives expedition along the Colorado River in 1857-58. In 1859 he aided in exploring the San Juan and upper Columbia. During the war he was a member of the United States Sanitary Commission for the Mississippi Valley, and made inspections and distributed stores and means of shelter. In 1866 he became professor of geology in the Columbia School of Mines, and the development of the department of geology has been his chief work. He has collected the most extensive geological museum in the country, its specimens and exhibits numbering over 1,000,000 separate pieces. He was actively engaged in the work of his professorship until December, 1890. In 1869 he reorganized and directed the Ohio Geological Survey. After this he took part in the New Jersey Geological Survey, was made paleontologist to the United States Geological Survey, was a judge in the Centennial Exposition, was a corporate member of the National Academy of Science under appointment from Congress. He became president of the New York Academy of Sciences in 1867 and afterward of the Torrey Botanical Society. He was made LL.D. by the Western Reserve College in 1867. For a quarter of a century his opinion upon geological and mineralogical matters has been most highly esteemed and his services were frequently sought as a mining engineer. He had a stroke of paralysis in December, 1890, and, as he did not improve in health, a year's leave of absence was given him. Then he was made emeritus professor of geology. Until a few months ago he traveled about in search of health. At the next meeting of the faculty of Columbia College suitable resolutions will be introduced, and also at the January meeting of the Board of Trustees.

SOCIETIES.

The thirteenth annual convention of the American Water-Works Association will be held at Milwaukee, Wis., September 5th to 9th, 1893.

INDUSTRIAL NOTES.

Schwartz's dynamite mill, near Tamaqua, Pa., blew up on the 5th inst, and a workman, was literally blown to atoms.

The Boston & Montana Consolidated Copper and Silver Mining Company will use three large Sturtevant blowers in their Great Falls plant.

The South Fifteenth St. mills of the Oliver Iron and Steel Company, at Pittsburg, Pa., have closed down, "owing to an overstocked mill and lack of orders." It is reported that 1,000 men are thrown out of work.

The plant of the Millvale Iron and Steel Company, Pittsburg, Pa., was started up on the 8th inst. after having been idle several months. The Amalgamated scale was signed, and the mill will be run with union men.

The Bessemer rail mill of the Bethlehem Iron Company, at South Bethlehem, Pa., shut down on the 6th inst. because of the lack of orders, throwing 150 men out of work. The change does not affect the ordnance works.

The Pottstown Iron Company, of Pottstown, Pa., writes that the Associated Press dispatch, published in our last issue, relative to the closing down of the 112-in. plate mill, is unfounded. There has been no strike at the works and all the mills are running as usual.

The report to Congress of the Board of Army Engineers appointed to make an examination of the relative merits of San Pedro and Santa Monica (Senator J. P. Jones' selection) as the site for a deep water harbor and port on the Pacific, is to the effect that the former is the most eligible for the purpose.

St. Mary's Falls canal closed December 7th after the greatest season in its history. The freight which passed through this year reached 11,241,000 tons, an increase of 2,235,000 tons over last year. Every important article of commerce shows an enormous increase. Grain increased 61%, flour, 43%, and iron ore 38%.

The Central Railroad of New Jersey's new iron bridge across the Delaware River at Easton, Pa., was tested on the 3d inst. It is a double track structure 1,020 ft. long. Four big Wooten

engines, weighing about 80 tons each, were used in the test. They moved slowly over the bridge close together. The bridge was formally accepted by the company.

The works of the Canton Steel Roofing Company, Canton, O., the largest in America, were totally destroyed by fire which originated from an explosion of oil in the paint shop December 7th. The loss on machinery, stock, and fixtures will reach \$100,000, with an insurance of \$50,000. The flames spread to the Canton File Works, and caused damage amounting to \$25,000. The surrounding residences were scorched and damaged to the extent of \$5,000.

Messrs. A. M. Kidder & Co., of New York, and the National Exchange Bank and the American National Bank of Hartford, are the agents for the preferred stock of the Pratt & Whitney Co. of Hartford, Conn., one of the largest manufacturers of machinery and tools in this country. The business has been established over 30 years. The subscription books will open December 15th and close on or before December 17th. Full particulars can be seen in our advertising column on page 23.

The semi-annual meeting of the American Association of Iron and Steel Sheet Manufacturers was held at Pittsburg, Pa., on the 6th inst. At the close of the session John Jarrett, secretary and treasurer, said: "The possible reduction of duties by the next Congress and administration upon the products manufactured by the members of the association was thoroughly discussed, but there was no uneasiness felt concerning any immediate action in this direction. We will go right on making American tin, with the hope that no tinkering with the tariff will be allowed to destroy this industry. We believe the workmen themselves will appreciate their present advantage and wield a strong influence against any reduction. We do not expect to do anything in the matter until a reduction is threatened when, of course, we shall earnestly protest. A large buyer of tin plate and an extensive manufacturer of tinware said at the meeting to-day that he found American tin stood heavy stamping much better than the imported article, and that he found the Bessemer plate superior in every way to the Siemens product. The average prices to-day are only a little above the average for the nine months preceding the adoption of the McKinley bill, so that a very slight reduction of the existing tariff would necessarily cause a reduction in the wages now paid."

MACHINERY AND SUPPLIES WANTED AT HOME AND ABE CAD.

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

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

No charge will be made for these services.

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

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

Goods Wanted at Home.

2,839. Machinery for making coiled hoops. Michigan.

2,841. Apparatus for loading mine cars in gondolas by machinery. Ohio.

2,842. Road engine for drawing loaded wagons over ordinary country roads; capacity 20 to 30 tons. Delaware.

2,843. Six to ten flat cars, second-hand, standard gauge not less than 30 ft. and any capacity over 15 tons. Alabama.

2,844. Circular saw mill and mill stones for grinding corn. North Carolina.

2,845. A 12 x 20 engine and a return tubular boiler. South Carolina.

2,846. A double circular saw mill, shingle and lath mills, and bolter. South Carolina.

2,847. Good second-hand planing mill machinery. Texas.

2,848. Good second-hand steel rails. Texas.

2,849. 240 kegs track spikes 5 in. x 1/2 in. Alabama.

2,850. Wheat threshing machine with engine. Georgia.

Goods Wanted Abroad.

2,840. A good luminous paint that will show in darkness. Australia.

2,851. Coke crushing machinery that will turn out different sizes to correspond with those of anthracite coal, the capacity to be 2 or 3 cars daily. Maryland.

GENERAL MINING NEWS.

ARIZONA.

The mineral production of the territory, during the current year to November 1st has been estimated as follows: Gold, \$3,000,000; silver, \$2,000,000 and copper, \$1,500,000.

Cochise County.

The Tombstone "Epitaph" publishes the following: "Much activity in mining circles is being felt in and around Tombstone. Many chloriders who have leases on different properties and who own mines elsewhere in the district are doing assessment work on them."

Tombstone Mining and Milling Company.—This Company, says the Tombstone "Epitaph," is making shipments of from 800 to 1,000 tons per month. In addition, the expansion joints for the new pump have arrived and have been placed in proper position. The depth is now 130 ft. below water level and the intention is, with the present capacity of this pump, the shaft will be sunk about 200 to 250 ft. lower and operations will commence on November 1st. The diamond drill is in operation on the Gilded Edge, also belonging to the Toughnut. Work is progressing slowly owing to the difficulty of getting through the loose gravel and cement. When bedrock is reached, which is expected in a day or two, a depth of from 30 to 40 ft. a day will be made.

Maricopa County.

(From our Special Correspondent.)

An extra force of men has been placed at work on the line of the Phoenix Railroad. The company expects to have the line in operation between Prescott and Ash Fork by February 1, 1893. This line will open a belt of fine mineral country to which the attention of investors has been drawn for some time past. During the last three months the arrivals in Phoenix have averaged 35 each day, the city's population increasing at the rate of 1,000 per month. Fully 90% of these are permanent residents, and while a number are capitalists looking for mining investments, a still larger number are men of small means who are also directly or indirectly interested in the development of the mineral lands soon to be opened.

CALIFORNIA.

Butte County.

Morning Star Mining Company.—According to the Oroville "Register," this company has struck bedrock and is now drifting to reach the gravel channel; the bedrock is pitching to the north. The Grove Company is now down 150 ft. and will have to sink the shaft about 50 ft. further before the bedrock will be reached. The Turner company sunk a shaft, but the water came in so rapidly that it could not be worked to advantage and this was abandoned and a second shaft sunk 150 ft. further west. Bedrock has been reached in this, and the company is now drifting toward the east to tap the gravel beds. The Catskill, Bishop, and Hay & Clark mines, are now taking out gold and getting good returns.

Wheeler.—Work is being pushed ahead in this gravel mine on Wymar's ravine, says the Oroville "Register," and the shaft is now down 110 ft., and drifts are being run in different directions to develop the channel. The pay gravel is from 3 to 4 ft. thick and the bedrock is still pitching. There is no water to prevent work and the arrastra will soon be completed and ready for operations.

Kern County.

(From our Special Correspondent.)

Bright Star Mines.—This group of mines owned by St. Louis and San Francisco men, who are about to reopen the Bright Star mine which in times past was wonderfully productive. The main shaft is down 440 ft. and, when pumping commenced recently had water in it to within 80 ft. of the surface. Already the water has been lowered 100 ft. There are several thousand tons of tailings on the dumps which are about to be treated by the cyanide process, tanks for the purpose having been put in. The tests made at Denver of the tailings were quite satisfactory almost all the gold being recovered.

Placer County.

(From our Special Correspondent.)

Mayflower Gravel Mining Company, Forrest Hill.—The listing of the stock at the Pacific Exchange in San Francisco, has attracted attention to the mine and some reason is sought for the step taken which, if other listed stocks are taken as a criterion, tends to remove the property outside the line of honest and capable management. The shares are mostly held by Frenchmen and to date the property has done well for the shareholders. The gravel averages \$3.50 per ton when washed through 24-ft. sluices, and \$5 to \$5.50 when worked at the mill. The latest return averaged \$14.50 per ton. Shipments of bullion have been regular during the last few months, and in one year the mine yielded \$363,000.

San Bernardino County.

(From our Special Correspondent.)

San Jacinto Tin Mine Company, Temescal.—Particulars regarding the action of the directors of the company in London have come to hand. The increase in the capital stock to £550,000, the new issue being 200,000 shares at 5s. each; is con-

sidered here as a wise measure, and it is generally conceded that the English company, with the inaptitude in handling mining properties that seems destructive of English corporations, expended money by no means warranted by the outlook in the mine. True, the report of the latest expert is satisfactory and encouraging, but if further deposits of ore are found it will be in no wise a justification for the elaborate scale upon which work at the mine was commenced. Allusion has previously been made to the report of the expert, Mr. Varcoe. In the lengthy report submitted by him to the company in England he states that the vein has not been lost, only the workers have reached the bottom of the deposit of ore. The lode in which the ore is found is a true fissure vein, and according to all experiences there is no reason a small deposit of tin should not be found at greater depth; indeed, he says, "I think it will, but as the mine stands at present there is very little ore in sight." The formation is stated to be the same as in other places where the deposits have been found, and, in the opinion of Mr. Varcoe, a depth of 20 fathoms will prove the mine. He remained at the mine 10 days and in concluding says, "You cannot test a vertical vein satisfactorily with a drill. You may be near a large quantity of tin and yet miss it. I would propose to drive 150 fathoms and sink 120 ft."

Shasta County.

(From our Special Correspondent.)

Sierra Buttes Mining Company.—It is claimed that since the company purchased the Uncle Sam mine, one of the best properties in Sierra County, a net profit of \$148,000 has been disbursed to stockholders. The ore in the Sierra Buttes is generally low grade but is found in large quantities.

COLORADO.

Commissioner Bodine, of the State Bureau of Labor Statistics, publishes a report in which are found the following items of interest to the mining men:

In the coal mining industry, this State ranks first of the Rocky Mountain group. There are 77 producing coal mines now in operation in Colorado. The total output in 1891 was 3,358,496 tons, valued at \$10,075,488. The estimated output for 1892 is 3,927,000 tons. Six thousand one hundred and sixty-four people derive a livelihood from the coal mines of the State. There are 140,933 acres of coal lands in the State. The combined area of coal lands covers 18,000 square miles. The wages disbursed among 6,164 employes average annually \$4,905,159, according to figures based on estimates from employers and employes. The schedule of wages paid varies in different mines according to employment, and range from \$12 to \$24 per week. The miners proper average from \$2.60 to \$3 per day, while a few exceptions exceed the latter sum. In many counties the miners are paid under the tonnage system, namely a stipulated sum for each "long ton" mined. In some counties, 65 and 75 cts. per ton is paid; in others, 50 cts. The average hours of employment are from eight to ten hours. The following comparison with other coal-producing states of the Rocky Mountain group, in 1891, demonstrates the superiority of Colorado in annual production:

Colorado, 3,358,496 tons; Wyoming, 2,488,947 tons; Montana, 363,301 tons; New Mexico, 486,983 tons; Utah, 236,601 tons.

There are 16,962 men engaged in metalliferous mining in Colorado. The number of metal-producing mines is 895. The statistics of production for 1891, which are the latest available in this respect, show an increase in the output of every metal in Colorado. From 1870 to May, 1892, there have been 14,624 mineral claims surveyed for patents. From July 1, 1891, to June 30, 1892, there were 972 original surveys—863 for lodes, 19 for placers and 18 for mill sites. The amended surveys for the same period were 54 lodes and 2 placers according to figures furnished the commissioner by the surveyor general.

A recapitulation of the total number of men engaged in all kinds of mining, including the coal mines, is 23,126. The total number of mines of all kinds combined reaches a total of 972.

Clear Creek County.

Barnum Tunnel Gold Mining and Development Company, Idaho Springs.—At a recent meeting at the office of Adams & Hyde, 59 Liberty St., New York, December 7th, 1892, the following officers and directors were elected for the ensuing year: President, Augustus R. Adams, New York; first vice-president, I. N. Smith, Idaho Springs, Colo.; second vice-president, F. H. Beers, Denver, Colo. Secretary and treasurer, J. F. Beers, New York. The directors are A. R. Adams, I. N. Smith, J. F. Beers, F. H. Beers and George Hutchins.

Custer County.

Bull Domingo.—The Bull Domingo mine closed down on the 1st, throwing about 50 men out of employment.

Ouray County.

Following are the latest items of Ouray mining news taken from the local papers:

A new body of ore has been discovered in the Humboldt, which has spurred the large force at work on that property to renewed activity. The Guston is shipping about 8 cars of ore a day and will so continue as long as the Silverton railroad remains free from snow blockade. Virginus has

165 men employed for the winter, and shipments from that producer remain unchanged. The American-Nettie and all of Ouray's steady producers are sending out ore every day, and the winter's output will be larger, if anything, than last season.

Pitkin County.

The Aspen "Times" publishes the following review of mining operations in that camp for November: The Aspen Mining and Smelting Company sent forth 3,858 tons from its leases last month. There are 135 men working on leases, and though they are principally prospecting and working in ore now, they are doing from 10 to 75 ft. of development work a month, according to the nature of the ground. The company is employing about 15 men, chiefly trammers. More would be employed had it not been for the recent tie-up at Midland yard. This occasioned the mine great trouble and confusion. The storing places for ore are all full, and the men have hardly elbow-room to work. The company's year closed November 30th, and Manager Bulkeley will have his annual report ready for submission to the company by the 8th or 10th of this month. During the year the mine has shipped 37,400 tons of ore, and has done 11,400 ft. of development work, amounting to over two miles; 8,118 ft. of this have been by leasers.

The strike affected the Bushwhacker's output very greatly. Settlements were made for but 400 tons, but 200 tons on the tracks between the mine and the sampler being the product up to about that of the month previous. The average returns for the ore for which settlements were made was 39 3-10 oz. The force of 50 men is busy on development work. No ore will be broken till the sampler catches up with the work that accumulated during the strike.

The Aspen mine shipped 3,600 tons last month. Under the new management, 25 men have been laid off, leaving 245 on the payroll. They began on November 21st to work 10-hour shifts on the tramway. The force will probably be reduced still further, though not to any great extent. J. G. Newman, former shift boss, has assumed the superintendency left vacant by Mr. Lone, and Elmer Parkinson takes Mr. Newman's place.

Clear Creek County.—Donaldson.—Development work is being pushed rapidly on this mine, says the Idaho Springs "News." The zero level will be connected with the Apex shaft by the end of December. Nos. 2 and 3 levels will be driven ahead, and connections made during the winter, which will increase the already large reserves in this mine. When the mill will be started in the spring considerable ore will be exposed and ready to take out for treatment in the mill.

Mollie Gibson Consolidated Mining and Milling Company.—The Aspen "Times" of the 4th inst. says: "A lot of ore in sacks, worth between \$50,000 and \$60,000, from the Mollie Gibson, left Aspen for the valley a day or so ago with the usual force of guards."

San Miguel County.

Shipments of ore and concentrates from Telluride for the week ending November 25th: Smuggler-Union, 418 tons; Sheridan Consolidated, 231 tons; Hector Mining Company, 22 tons; Montana, 11 tons. Total, 693 tons. Since January 1st, 31,494 tons.

Sheridan & Mendota Consolidated Mining and Milling Company.—At the tunnel ore house some needed additions have been made, says the Telluride "Journal." In addition to this, all along the line of the surface tramway, wherever it has been deemed advisable snow sheds have been erected over the track of the incline. At the mouth of No. 2 level and top of the main shaft has been erected a new engine house and the new Jackson hoister is being put in place. The present cage in the shaft will be taken out and a new double decked cage will be substituted. This will enable two cars to be hoisted or lowered instead of one, as heretofore. Between 400 and 500 men are now employed by the company, about 300 of whom are at the tunnel, while the rest are at the shaft house at No. 2 level."

FLORIDA.

The mammoth dredge which has been in course of construction for several months at the yard of the Merrill-Stevens Engineering Co., at Jacksonville, Fla., was successfully launched on the 22d November. The dredge is intended for the San Francisco Dredging Co. The dimensions are as follows: Length, 125 ft., beam 35 ft., and depth 10 ft. It will be fitted with a 20-in. centrifugal pump, which will be driven by a 300 H. P. engine, besides auxiliary donkey boilers, and will be fitted up with its own electric plant for working incandescent and are lights which will be used for night work.

GEORGIA.

Floyd County.

(From our Special Correspondent.)

In a recent correspondence I mentioned the Cave Springs bauxite district which at that time, I had not examined; but I have since done so and find that so far as known at present this district is not as extensive as either Van's Valley or Dikes. In fact, prospect work has only been performed on 120 acres in all, or on three 40-acre tracts on which the bauxite deposits can be traced from northeast to southwest, being three-quarters of a

mile in length and one-quarter wide. On the tract where the bauxite was first exposed, which is the most northerly of the three, several test holes have been sunk to a depth of about 3 ft., showing solid bauxite at the bottom of each. The area covered by this deposit so far as a judgment can be pronounced from the test holes and surrounding surface indications is about half an acre. The deposit, which is known as Culbertson's, has the appearance of being a pocket, but of course its extent is unknown at present. The same may be said of the next deposit to the southwest, known as the Gordon. But the Penny to the southwest of the Gordon, has been developed more extensively and about 300 tons have been mined and shipped. So far as I could ascertain, this district as at present prospected, is confined to these three deposits, but as no thorough prospecting for this mineral has been carried on, it is quite possible that other deposits will be exposed in the future as has been the case in the other districts of this bauxite belt. On the Culbertson property my attention was attracted by a white clay evidently a variety of kaolin which has been encountered in many places about 3 ft. below the surface, in a valley of about 30 acres in extent, and lying parallel with the bauxite deposit to the east, and still further to the eastward are some good surface indications of manganese, but no work has been done to determine the extent or quality. In this neighborhood though, shipments have been made at irregular intervals from seven distinct deposits of manganese. On the Cooper manganese bank an extensive plant including double log washer and jigs have been erected, and ore mined and shipped, although the works are idle at present.

I am informed that some years since a small plant was erected and manganese ore crushed and shipped direct to Liverpool, but the enterprise was abandoned because of the lack of capital of the founders to carry on the work successfully, and such has never since been attempted. To the southwest of this point for several miles surface indications of manganese ore are encountered and some prospecting has been done, but not sufficient to disclose the extent or quality of the deposits. From one point about 15 miles to the southwest one carload of manganese was shipped a few years since, but shipments were not continued, nor was development work sufficient to base any estimate of the extent of the mine performed.

IDAHO.

Alturas County.

Vienna Mining Company.—The mill at Red Wing is now idle. The run just made has demonstrated that the ore could be worked up to quite a high percentage; but the financial results are anything but satisfactory, notwithstanding the high grade of the ore. Most of the men employed at the Solace mine and at the Vienna mill have, therefore been laid off, only a small force being retained to drive a 1,300-ft. tunnel on contract.

Custer County.

Yankee Fork.—This property has a vein 5 ft. wide, dipping into the mountain at an angle of 35°. On this an incline 200 ft. long and a crosscut 100 ft. from the outside on the vein a distance of 105 ft. to the shaft, and then continued on until there is a level 250 ft. long. Since then the incline has been run down 100 ft. further and a raise made 70 ft. off to one side of the shaft. All these cuttings, aggregating over 500 ft. were through good ore. The vein is encased between porphyry hanging wall and trap rock footing, and is even in size where so far exposed. Ore enough has been taken out in this work to keep it going, and during the past summer 487 tons were sent to the Dickens-Custer mill at Custer and milled. The average value of this ore was \$83 per ton, one-fourth the value being in gold and three-fourth in silver. The ore at the bottom of the present workings is better than that near the surface. During the past summer the owner built 8 miles of road, allowing a hauling of ore from the mine to the mill, a distance of 11 miles. The ore is free milling. There is talk of erecting a mill near the mine for reducing these ores. The mine is closed for the winter, but work will be pushed vigorously in the spring.

Idaho County.

(From our Special Correspondent.)

On Big Creek, 20 miles south of Elk City, two men have been working the past summer with rockers, and the result of their working has been an average of \$10 each per day in gold.

Twenty-five miles southeast of Elk City on the Salmon River, is located Dixie. Here Messrs. Long, Foster and Williams have located three ledges, two of which are free milling gold. Eight miles southwest of Elk City Messrs. Frink and Ruser have located three ledges. The vein is 4 ft. wide and assays 80 oz. of silver and \$20 gold to the ton. All through this section gold ledges have been located the past summer and the work done on them proves them to be valuable. Previous to this year most of the work was devoted to panning and rocking and placer working of all kinds, but now that the ledges from which the gold comes have been discovered, time and money will be spent in erecting suitable machinery to develop them.

Owyhee County.

De Lamar Mining Company, Limited.—During October everything connected with the mill worked

in its usual steady manner; on the last day we shut down for a partial clean-up, and to overlook some of the machinery. On November 1st we resumed work. The following table shows some of the work performed during the month: Number of wet tons crushed, 2,615 tons; number of dry tons crushed, 2,355 tons; deduct all expenses for the month, including proportions of new machinery, \$37,302; estimated profit for the month, \$40,898.42. The above covers all items of interest. The weather is still fine. The wood contracts are nearly all completed. Everything connected with the property is in good working order. The report of Mr. Plummer is fully equal to any he has lately issued.

IOWA.

An Associated Press dispatch states that Dr. Charles R. Keyes, assistant state geologist, has just discovered nickel ore near Keokuk.

KANSAS.

Cherokee County.

During the week ending Dec. 3d, the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 2,682,870; rough ore, pounds sold, 2,373,370; zinc ore, pounds sold, 1,149,180; lead ore, pounds sold, 293,600. Sales aggregated a total value of \$17,721.

KENTUCKY.

A press dispatch announces that a company of Pittsburg, Pa., men are prospecting for oil in Kentucky. They have over 2,000 farms leased, aggregating 500,000 acres. The company expects to out-ride the Pennsylvania field in a few years. Those interested are George H. Demick, J. B. Boyer, L. S. Gormley, and Mr. Giles, of Giles & Gibson, who own a good deal of oil territory. The company has been leased in Lloyd, Logan, Johnson, Martin and other counties in Kentucky.

MICHIGAN.

Gold.

Michigan Gold Mining Company.—At this gold prospect there are four men being employed in developing a small vein of quartz running parallel with the main lode, between Nos. 4 and 5 shafts, and being to the south of them. The rock contains iron pyrites, copper ore, and there is free gold to be seen in many of the specimens. The richer pieces are being crushed in a mortar and the ordinary mill rock is being stocked awaiting further developments. The trouble has been in this mine that only narrow chimneys carried the precious metal, whereas other portions of the vein were entirely barren. It is said the south vein, now being developed, carries gold bearing minerals throughout but as yet it is too small to be profitable. Hopes are entertained that it may increase in size as it is sunk upon.

Copper.

The coal operators of the Hoeking Valley have, it is said, decided to organize a company to buy and sell the entire output of the valley. The object is to reduce the cost of handling the coal and meet competition in the market.

Mr. Fitzgerald, president of the Arnold Copper Mining Company, says, according to the Boston "Transcript," that the report that the mine is going to close down is untrue. The mine will continue to run with night and day shifts all winter. The last assessment provided for steady and continuous work. The financial condition of the company is in good shape with money enough in the treasury to run the mine until May at the present rates of working. Superintendent Moyle, in a late letter, writes that the shaft is down 375 ft. Drifting on the second level has progressed 48 ft. He states that the farther west drifting is carried the richer the lode looks. The first level is developing well, especially west. This level is down about 180 ft. and the second about 115 ft. deeper. Sinking of the shaft will be resumed shortly. The last 12 to 14 ft. drifted at the second level is through a rich lode, showing rich horns of copper. Superintendent Moyle reports this lode as looking as rich as anything seen since they have begun mining.

Atlantic Mining Company.—The yield of the Atlantic mine for November was 208 tons of mineral, against 199½ tons in October and 208 tons in November, 1891. For 11 months the product has been 2,291½ tons, against 2,332½ tons last year, a decrease of 41 tons. It is understood that the Atlantic Copper Mining Company has earned about \$1 per share this year, the improved quality of rock offsetting in part the low price of the metal. Still, it is thought that no dividend will be paid, for the reason that the company contemplates the removal of its mill, the addition of two heads of stamps and the construction of about nine miles of railroad from the mine to the mill in the immediate future, and it is not believed that the surplus of \$300,000 more or less, will much more than suffice to meet this heavy outlay.

Calumet & Hecla.—The Torch Lake "Miner" states that the lode in the south end of the South Hecla or Black Hills portion of the Calumet & Hecla property is showing some chance for the better. Some 200 or 300 ft. above the bottom of the No. 12 shaft, the belt, which was from 1 to 1½ ft. wide, is now fully 7 ft. wide and showing encouraging signs.

Carp Lake.—Messrs. R. B. Turnbull and H. H.

Reeves, of Cleveland, have completed their exploratory work at this mine in the Porcupine Mountain district. Their work consisted of sinking a pit 24 ft. deep when they reached amygdaloid. They also explored the bluff.

Central.—The output of the Central during November was 95 tons, but the company expect to produce from 100 to 105 tons during the present month.

Kearsarge Mining Company.—A week or two ago a new run of copper ground was struck in Kearsarge, which gives promise of proving extensive and profitable.

Peninsular Mining Company.—The order has been given to stop the pumps of the Peninsular copper mine, which have been run at a cost of \$60 a day in order to keep the mine free from water. This mine was a producer last spring, yielding 90 tons of mineral in March and 60 tons in April. There is no record of later products.

Red Jacket Mining Company.—Sinking on the Red Jacket shaft has been resumed.

Tamarack Mining Company.—The 17th level of this mine will soon be ready to produce ore.

Tamarack Mining Company.—The dip of the lode is fast carrying the working portions of the mine from the vertical shaft, a distance of something more than 1,000 ft. now being necessary for trammers to traverse in order to get the rock from the stopes to the shaft. It is quite probable that the shafts will soon be started on an incline conforming to the dip of the vein so as to reduce the already long tram. The rock will probably be lifted on the incline in cars to the vertical portion of the shaft, and thence hoisted upon cages.

Iron—Gogebie Range.

Colby.—Capt. Richard Uren has recently invented a new safety catch to be used on mine skips or cages, elevator, etc. Two wire ropes extend from the bottom of the shaft where they are anchored to the top passing over sheaves; to the ends of these ropes will be attached weights of about the weight of the loaded skip or elevator. The weights are in the form of nests, the heaviest on top and graduated down. The two ropes pass along the two sides of the skip through eccentric grips, so arranged that if the hoisting rope breaks at any time either in lowering or hoisting, or by any oversight on the part of the engineers the skip goes faster than a certain speed, the grips on the cage through which the ropes pass close up, bringing the weight of the skip onto these two ropes and stopping it. The nest of graduated weights at the top will be so arranged, being taken up in succession, as to avert their force gradually and thus avoid bringing the skip to a sudden stop. The management of the Colby iron mine has the matter under advisement of attaching this new safety catch to all their skips.

Iron—Marquette Range.

Lucky Star Iron Company.—At this property the work of exploring has been temporarily suspended awaiting the securing of another diamond drill, the former one having become worn out. The drill has already passed through 100 ft. of hematite.

Iron—Menominee Range.

Aragon.—The Aragon mine at Norway has been sold to the Schlesinger Bros., of Milwaukee. The agreement between them and the Aragon Mining Company, represented by Angus Smith has been made and the new company took possession December 1st. The Schlesingers took \$1,000,000 for the mine, a small portion in cash and the balance will come out of the proceeds of the output of the mine. The Aragon Mining Company has been working the mine under a lease and the purchasers will work it under a sub-lease from the Aragon Mining Company. The Schlesingers will organize a new company to operate the mine under the name of the Aragon Iron Mining Company. The Aragon Mining Company was formed five years ago, with Angus Smith as President and Treasurer, and A. W. Wilkins as Secretary. The company at once began the work of opening up the mine, but for over two years the work was almost fruitless. Quicksand was encountered and many of the stockholders were greatly discouraged with the outlook. They had sunk a great deal of money and were getting no apparent return. Finally toward the end of the second year they had worked through the quicksand and struck a good quality of ore, and the mine at once took its place among the big producing properties of Northern Michigan. Last year the output of the mine was 200,000 tons. It has not been worked at its full capacity this year. It is the opinion of mining experts that, if worked for all it is worth, it will easily produce 400,000 tons a year. It shipped 166,000 tons this year. The ore which has been taken out of the mine is of a superior quality. It is said to be equal if not superior to the grade taken from any of the mines of the Northern Peninsula. The mine during the past year has been producing three grades of ore, east steel, east steel No. 2 and Grenada. The east steel is guaranteed to run 66% of metallic iron and not more than .010 or .012 phosphorus. The Grenada is also a very good grade of iron, although it contains more phosphorus. The mine in the hands of the Schlesinger syndicate, it is claimed, will be worked for all it is worth and next year the output will be almost double.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

Joplin, Dec. 5th.

The lead and zinc mining belt was favored with fine weather for mining operations during the past week and there was a heavy output of ore. Prices of zinc ore remained strong at \$22.50 to \$24 per ton, and the buyers were in the market for everything in sight. Lead ore remained at \$20 per thousand.

Following are the sales from the different camps: Joplin mines, 1,795,560 lbs. zinc ore and 219,200 lbs. lead; value, \$24,584. Webb City mines 1,601,790 lbs. zinc ore and 50,750 lbs. lead; value, \$19,550. Carterville mines, 1,857,360. Zincite mines, 98,360 lbs. lead; value, \$23,296. Zincite mines, 147,990 lbs. zinc ore and 5,700 lbs. lead; value, \$1,746. Lehigh mines, 107,640 lbs. zinc ore and 1,890 lbs. lead; value, \$1,295. Oronogo mines, 77,480 lbs. lead; value, \$1,529. Alba mines, 90,500 lbs. zinc ore; value, \$1,040. Carthage mines, 202,455 lbs. zinc ore; value, \$2,379. Wentworth mines, 2,630 lbs. lead ore; value, \$52. Galena Kans. mines, 1,188,210 lbs. zinc ore and 318,230 lbs. lead; value, \$18,721. District's total value, \$93,942. Aurora Lawrence County mines, 156,000 lbs. zinc ore, 665,720 lbs. silicate and 317,600 lbs. lead; value, \$11,479. Lead and zinc belts total value, \$105,421. A special report from the Aurora mines shows a great activity in the mines there during last week and considerable mining property changed hands. Springfield, Mo., capitalists purchased the Annie Rooney mine for \$5,000, and Chicago parties purchased an 80-acre tract for \$12,000. Arrangements have been made to sink some deep drill holes on the Good Luck Company land to prove up the continuity of the ore deposits downward; the deepest development up to the present time has proved the ore deposits to continue downward. A party of Chicago capitalists arrived in Joplin to-day and are investigating a 1,000-acre tract of undeveloped land with a view of purchase and then developing.

MONTANA.

Jefferson County.

Elkhorn Mining Company, Limited.—The mill has worked regularly during the month of October. A new dust chamber has been put in the battery room. It will be used in connection with one-half of the stamps, and effect a more complete saving of the fine dust. We are replacing our cams and tappets with steel castings. Table of mill of some of the work performed in October: Raised from the mines, 1,433 tons. Current expenses, including salaries, labor, supplies, etc., \$24,256; balance, being profit for October, 1892, \$34,981. The report of the manager is distinctly encouraging.

Levis and Clarke County.

Montana Rubies and Sapphires.—Extracts from a letter dated October 25th, 1892, from the manager at the mines in Montana: "On the 22d October we turned the water through the new flume, and inverted siphons on to Eldorado Bar, and yesterday we began wathing on old dumps and on new ground with such water as we have. Our flume is excellent, and the best structure of the kind in Montana, the most substantial and best proportioned. The grades prove true in use, and there is no leakage. The siphons are excellent, and prove to be substantial and right. There is no work to be compared with it in Montana. I do not hope for much production this fall on account of the lateness of the season, but I will try and give you something. Will work certain areas, and keep the results separately to test the value of the ground, both in gold and sapphires."

Madison County.

Junction.—Mr. Henry Elling will replace the National Roller quartz mill which he has heretofore been using, by a Bryan mill which he expects to have running within 30 days.

Meagher County.

Queen of the Hills.—The work of development has been progressing steadily. The tunnel, in 1,000 ft., showed a large body of rich ore 600 ft. of its distance. In order to determine its extent another tunnel was started 100 ft. below, and recently a crosscut from the shaft cut the vein, which carries an average of 300 oz. per ton. There are now said to be some 3,000 tons of ore on the dump. A strike has been made by a crosscut run from the bottom of the shaft 60 ft. Before striking the main ore shoot rich bunches of ore were encountered, and a few days previous to the vein being cut the water came in very rapidly. This favorable indication proved that the working was in the right direction and the ore body was cut as stated. The upper tunnel is in 250 ft., the Parker tunnel from which the shaft was sunk is in 1,000 ft., and has a vertical depth on the vein of 200 ft. Between the two tunnels there are upraises every 50 ft. All the workings are in ore. A crosscut is now being run west from the main tunnel to cut the O'Brien vein, the ore shoot on which is distinct for 600 ft. on the surface as shown by different prospect shafts and tunnels. They expect to reach the vein in 60 days. This will add greatly to the ore reserves.

Silver Bow County.

Anaconda Mining Company.—The High Ore mine, belonging to the Chambers syndicate and being operated by the Anaconda company, has sus-

pending work pending the retimbering of the shaft from the 600-ft. station to the surface. About 300 men have been employed in and around the mine, nearly all of whom are out of work. The High Ore has been yielding from 12 to 15 carloads of ore per day, which in all probability will be made up from the St. Lawrence, Anaconda, Wake Up Jim and Green Mountain, the only Anaconda properties now in operation. From shipments of 150 carloads per day a reduction of 80 has been made, which makes a total daily tonnage of 2,000 tons.

NEVADA.

Elko County.

North Belle Isle Mining Company.—The following is the latest official weekly letter: "The east intermediate crosscut above the south 300-ft. level extended 14-ft., still showing small seams of ruby ore. South intermediate above the south 400 ft. level extended 5 ft., and connected with the stope. The stopes are not looking quite so well as at last report. The assessment work on the outside claims has been completed."

Eureka County.

(From our Special Correspondent.)

Eureka & Palisade Railroad Company, Eureka.—During the month of November this company received for transportation to Salt Lake and other points 1,498 tons of ore, as follows: Eureka District, from the Diamond mine, 600 tons; Eureka Consolidated mine, 299 tons, Jackson mine, 146 tons; Richmond mine, 128 tons; Hamburg mine, 33 tons; Prentiss mine, 15 tons; Dunderberg mine, 15 tons; McGeary mine, 11 tons; R. J. & Co., 6 tons, and Bowman mine, 6 tons. Total Eureka District, 1,349 tons. From the Sada Lindsay mine, Union District, 17 tons. White Pine County, from the Bay State mine, 37 tons. White Pine District, from Rocco Cragnaza, 50 tons; C. A. Mathewson, 22 tons; Al. Paul, 12 tons and Zoanni Brother, 11 tons. The foregoing shows a falling off in the ore shipments by railroad of about one-third of the usual product, and is the result of the late storms, which impeded haulage from the mines.

Ruby Mining Company, Limited.—Orders have been received by the Eureka secretary of the company to take full charge of all of the company's property and suspend all operations that were of an expense to the company.

Storey County—Comstock Lode.

Belcher Mining Company.—The latest official weekly letter says: During the past week the north drift on the 400 ft. level was advanced to a total length of 224 ft. north of the raise. The face is in hard porphyry, and work has been suspended until better ventilation can be obtained. The raise from the west cross-cut on the same level is up 56 ft. When up 39 ft. it passed through a soft formation composed of clay, porphyry and low-grade quartz, containing a little water. The top is now in dry ground, composed of soft porphyry, with seams of low-grade ore. The west cross-cut from the north drift on the 350-ft. level is out 26 ft. The face is in porphyry. The south drift from the raise on this level is now out 49 ft. The face is in clay, mixed with porphyry and bunches of quartz assaying from \$2 to \$12 per ton. The stopes present no change over last report, except that on the 15th floor going south the pay is more mixed with porphyry and clay than before. During the week 427 tons of ore were shipped to the Brunswick mill for reduction. The average battery assay of the ore was \$35.60 per ton.

Challenge Consolidated and Confidence Mining Companies.—The joint west crosscut No. 7 from the northwest drift on the surface level is out 70 ft. The face shows quartz having no value. The joint west crosscut No. 3 from the main north drift on the 100-ft. level is out 90 ft. The face is in quartz of no value. The west crosscut No. 4 on the same level is out 46 ft. The face shows quartz having no value.

Consolidated California & Virginia Mining Company. The latest official weekly letter says: The amount of ore shipped from the Consolidated California and Virginia mine to the Morgan mill was 963 tons, and the average assay value of the car samples was \$30.57 per ton, against \$23.32 per ton for the previous week. The quantity of ore milled was 980 tons and the average assay value of the battery samples was \$25.90 per ton, against \$23.02 per ton for the previous week. During the week bullion valued at \$16,946.73 was shipped to the Carson Mint. On the 1100-ft. level of the mine the west crosscut from the north lateral drift, 315 ft. north from the shaft station, has been advanced 30 ft.; total length, 434 ft.; cutting through clay 1 ft. thick and passing into a mixed formation of porphyry and quartz, which gives assays of \$2 to \$4 a ton.

Crown Point Mining Company.—The latest official weekly letter says: "There is no change of importance to report of the west stope on the 160-ft. level. We are still following the pay streak south on the third and fourth floors, where it maintains its width and character. Have stopped work in the south stope on the 160-ft. level, the rock having become too low in grade to warrant its extraction. Have started a west crosscut on the 400-ft. level from the southwest drift at a point about 150 ft. south of the shaft. It is out 26 ft. and the face is in a mixture of porphyry and clay."

Justice Mining Company.—The latest official weekly letter says: "The south drift from the north stope, on the 822-ft. level, has been advanced 5 ft., making its total length 55 ft. The face shows between 4 and 5 ft. of pay that will average about \$25

per ton. The raise on this level, 150 ft. south of the north stope, is up 66 ft., having been advanced 6 ft. during the week. The top is in low-grade quartz. We are taking out about 4 tons of ore per day that will mill about \$25 per ton.

Mexican Mining Company.—The latest official weekly letter says: "The Mexican mill is now working the ore, which they commenced shipping on the 23d from the ore house, in which some 400 tons had been accumulated during the past few months. In the Mexican mine the drift run north from the crosscut run east from the bottom of the winze, sunk 101 ft. below the sill floor of the 1,465 level, near the south line of the mine, has been advanced 23 ft.; total length 326 ft.; continuing in a porphyry formation with lines of low grade quartz."

Ophir Mining Company.—The latest official weekly letter says, "An upraise started on the sill floor on the north side of the crosscut run east from the drift run south from the Mexican into the Ophir ground, 101 ft. below the sill floor of the 1,465 level, has been carried up 14 ft.; have extracted therefrom and raised to the surface 11 tons of ore, the average assay value of which is \$31.50 per ton."

Overman Mining Company.—The latest official weekly letter says that "318 tons and 500 lbs. of ore were extracted from the 1,100 and 1,200 levels. The car samples average \$21.30 per ton. Shipped to Vivian mill 272 tons and 1,330 lbs. of ore. Battery assays average \$17.54 per ton." On November 22d the Overman mine made a shipment of two bars of bullion, valued at \$6,509.63.

Segregated Belcher Mining Company.—The latest official weekly letter says: "The west crosscut from the south lateral drift, on the 1,300-ft. level, has been advanced 12 ft., making its total length 62 ft. The face is in soft porphyry, with small seams of low grade quartz running through it."

(From our Special Correspondent.)

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

Mine.	Tons hoisted.	Av. car s. per day.	Tons milled.	Av. battery assay.	Bullion product, for week.	Bullion shipped.
Belcher	427	\$	35.60			12,250
Col. New York	184	35.				
Con. Cal. & Va.	963	30.57	980	29.99		16,946.76
Justice	30	25.				
Occidental						5,615.15
Ophir	11	31.50				
Overman	218	21.35	7	17.54		
Potosi	553		630	26.45		399 lbs.
Savage	594	29.39	525	18.05	6,851.25	

1. 4 Cars. 2 Net amount received from sale of concentrates. 3 Mexican Mill now running on accumulated ore. 4 Crude bullion.

White Pine County.

(From our Special Correspondent.)

The ore shipments for the month of November were as follows: Rocco Cragnaza, 50 tons; C. A. Mathewson, 22 tons; Al. Paul, 12 tons, and Zoanni Brothers, 11 tons.

Newark District.—From the Bay State mine, 37 tons.

In addition to the foregoing Thos. Cornell shipped 60 tons from White Pine District, which, owing to a bond on his mine, is lying at the E. & P. R. R. depot at Eureka awaiting transportation.

NEW MEXICO.

Grant County.

The mining case between Skillicorn & Snyder and Bell & Stephens of Pinos Altos, which has been in the courts for more than two years, has been decided in favor of Skillicorn & Snyder. The case was originally tried here and was appealed to the Supreme Court of the Territory on error. A new trial was ordered and a change of venue was obtained. The case involved the title to a rich vein at Pinos Altos. The litigants own adjoining mines at Pinos Altos, and at a depth of about 300 ft. the veins apparently come together. The suit was brought to decide the question of ownership of the vein below the apparent point of juncture. The property is one of the most valuable at Pinos Altos.

Pyramid Silver Mining Company.—A strike is reported at this property at Pyramid. The ore was found by cross-cutting from the second level, and is as rich as any ever discovered there. George C. Buel, vice-president of the company, was at Pyramid last week examining the property. Most of the stock in the company is owned in Rochester and Ithaca, N. Y.

Sierra County.

The Silver City correspondent of the New York "Sun" says that the report of the Eastern experts who were sent to examine the zinc deposits recently discovered near Hillsborough is unfavorable. The ore is not so high grade as was reported, and the mines cannot be worked profitably. No zinc mines have ever been worked at a profit in New Mexico except those at Hanover. They are now idle.

Lady Franklin.—It is reported that work will soon be resumed on the Lady Franklin mine at Kingston. This mine is owned by a London syndicate, and has been idle for a long time. The Kingston smelter, which was started up a fortnight ago, is running on

ore from the Iron King group of mines. There is a large body of ore in sight, and a long run is expected.

PENNSYLVANIA.

Coal.

The Philadelphia & Reading Railroad Company is now making surveys for a branch road through and around Clark Valley, in the western end of Schuylkill county, to connect with the new Williams Valley road.

The collapse of old mine workings, caused by the robbing of pillars, resulted in a cave-in at Lost Creek on the 4th inst. about 300 by 200 ft. in area and 25 ft. deep. Four tracks of the Lehigh Valley Railroad were engulfed and the Lost Creek store was damaged.

The Eagle Hill Colliery, at Pottsville, Pa., which was threatened with a disastrous fire on the 6th inst., is working again. Batteries were built at the foot of the air way in which the fire started, thus cutting it off from the mine proper. Water and culm were then turned in and the flames extinguished.

A press despatch from Shamokin says that orders have been issued to turn Carbon Run Creek into the Philadelphia and Reading company's Sterling mines, which are now on fire. It will take some time to flood the workings and many weeks to pump the water out. The fire may communicate with the Henry Clay and old George Falls workings.

The opening of the railroad into the wild region back of Harvey Lake promises to develop a section of country of large resources. The railroad was built primarily as an outlet for the lumber which is being cut for a distance of about 30 miles into Sullivan County. But an unlooked for source of wealth has been discovered in the shape of semi-bituminous coal. Prospectors who have traveled the mountains recently say that in several places along Bowman's Creek streaks of coal may be seen. In one place a vein 18 in. thick was uncovered and plans are being made to develop it. On Lutch Mountain, coal has been found near the surface and the owner of the land is now digging from the mountain side and hauling it away on wagons. He sells it at his "mine" for \$1 a load. A number of practical coal men from the Wyoming Valley have come up to Noxen recently and gone out through the Sullivan County region to examine the rock formations. No information, however, can be obtained from them.

Honey Brook.—In reference to the sensational reports published in the daily newspapers to the effect that Honey Brook mine No. 3 had caved in, ruining village property, and that the cave-in would increase the ferocity of the flames and probably endanger mines 1 and 5, an official of the company is quoted as saying: "The Honey Brook No. 3 slope mine fire has been confined to an old rock breast, where a stream of 1,500 gallons of water is kept continually on the fire and no further spread of the fire is expected. The slope caved in but no surface settling occurred. As there were but three men in the slope previous to the fire, there will be no loss of time or coal, as the place was practically abandoned before the fire broke out. The cave in was the very thing wanted as it would have a tendency to smother it. It was the intention of the company to work hard to extinguish what fire was there, but if it never was put not much harm would be done."

Saltburg Coal Company.—Equity proceedings were begun against this company at Philadelphia on the 26th inst., by O. W. Shipman to recover a large sum of money which he claims they secured from him by fraudulent representations. In September, 1889, he made a contract to receive at a stated price for each size all the output of the Foster and Fairbank's mines for five years, from Jan. 1, 1890. The contract provided that should wages be advanced by the company Shipman would pay an advance in proportion to the increased cost of mining. In June, 1890, notice was given to Shipman that an advance of 5 cents per ton on all grades of coal had been granted the miners. This, he claims, he paid in good faith, his account from June, 1890, to September, 1891, amounting to \$183,713.22. Shipman now claims to have discovered that the only advance granted the miners was 5 cents per ton on lump coal at the Fairbank mine, and he, therefore, desires to recover the amount so overcharged.

Thuron Coal Company.—It is reported from Pottsville that the Thuron coal tract in Norwegian township, situated about two miles from that city, was sold on the 29th ult. to the Huron Coal Company, a party of Scranton capitalists, for \$105,000. There are 140 acres in the tract, and all of the coal veins in the southern basin of the anthracite coal region underlie it. From examinations made by experts it is said that at least 5,000,000 tons of red ash coal alone are in the tract, not taking into consideration the white ash veins, which are said to carry 15,000,000 tons.

SOUTH CAROLINA.

(From our Special Correspondent.)

The Phosphate Commission has issued its annual report, which contains many points of interest. The production of the state during the past year is much more than that of any previous year, being largely due to throwing open the Coosaw territory. The revenue to the State, however, has fallen off as the law provides that the royalty is not to be paid until the rock has been shipped and marketed, and by reason of the low prices now prevailing the miners are unwilling to dispose of their product and are storing it, between 80,000 and 100,000 tons being held over.

Reference is made to the condition of the market as affected by the Florida rock; while admitting that the Florida rock is of higher grade and can be more cheaply mined, it is pointed out that it is hampered by higher freight rates and the lack of shipping facilities. Quoting from the report:

"... we have every reason to believe that the Florida miners are selling below the cost of production, nevertheless their rock is displacing ours and forcing the price down until the margin of profit has grown very small, and with some of the companies may have disappeared altogether. . . . It is almost certain that this Florida competition will prove very formidable and may necessitate concessions to our miners on the part of the State."

"We are not at present prepared to recommend any reduction in the royalty, but it may become absolutely necessary before long. Owing to the great injury which results to the machinery by rust in a salt atmosphere when not in use, and also to the fact that there is an amount of capital invested in plants which are not worth moving and of no use in any other business, the miners must continue their operations as long as they can pay expenses. The community of interest between the miners and the State is such that the State may be compelled ere long to lower the royalty or see the mining stop altogether."

"We deem it our duty to deal with the legislation with perfect frankness, so as to give them a clear understanding of the situation. The outlook is certainly far from encouraging, but we hope that as soon as the Florida miners shall have unloaded their rock on the market, prices will so far advance as to enable our own miners to continue their business at profit."

SOUTH DAKOTA.

Lawrence County.

(From our Special Correspondent.)

Thomas H. White has bought two other large properties since my last letter was written, making about 60 acres more added to the group of mines now owned by the syndicate.

The Bullion Mining Company will commence to pump out their shaft on December 4th, preparatory to the further development of their extensive property. It is said they will shortly erect a large hoisting plant.

It is reported on the street to-day that the Richmond Siting Bull Mining Company will resume operations in the near future. They have men now working on their properties. If the report prove true, this will give employment to a large force of men.

Dr. F. R. Carpenter has a force of 60 men at work on the Two Bears mine, formerly known as the Oro Fino, in Strawberry Gulch. The shaft is down nearly 300 ft. They have encountered a large body of good grade ore.

The Seabury Mining Company, which property is situated in the Carbonate Camp, eight miles west of Deadwood, has received the Diamond drill ordered some weeks since. It is of the Sullivan make, with hydraulic feed of a capacity of 1,000 ft. The bore is two inches. This drill will penetrate the lower contacts known to exist in the property, the value and thickness of which are not known. Mr. Malony, the president and superintendent of the company has great faith in the future of this mine. The last shipment of ore to the D. & D. Smelter, yielded \$38 per ton in gold besides several ounces of silver.

Wells, Fargo & Co. has shipped to-day under a heavy guard of men armed with shotguns and Winchester rifles several large gold bricks. The exact amount was not learned, but was estimated at about \$200,000. The Golden Reward Mining Co. are now among the heaviest gold producers we have in Lawrence County, and this company was well represented in the amount of gold shipped to-day, as well as the Homestake Caledonia & Deadwood Terra. Why the latter company has failed to pay the usual dividend latterly is a mystery to many who are well posted.

The Hawkeye Gold Mining Company, the property of which is situated near the famous Homestake, and like the latter is free milling gold ore. It has its mill about completed. There has been quite a delay in getting the machinery for the plant, which will be of a capacity of 120 to 150 tons daily.

Clinton Mining Company.—This company has just finished a large amount of development work and has closed down the mine for the winter. The workings started last summer from the Leopard shaft, running on the Leopard tunnel to the south 150 ft. and crossing two shoots of ore. The Jessie Lee shaft was sunk 98 ft., connecting with the Leopard tunnel. The shoots referred to were 23 ft. wide and 4 ft. thick and 8 ft. wide and 3 ft. thick, the ore assaying \$16 to \$24 in gold, on an average. The large B. & M. railway cut, which is 47 ft. deep and 700 ft. long, opened three chutes of ore that averaged \$18 per ton. In the Ashland shaft at 146 ft., the ore zone was 5 ft. thick. From this a drift was run eastward. At 10 ft. a small body of ore was struck, running \$10.50 per ton, and at 17 ft. a blue and gray ore was opened which runs very high.

Tornado and Double Standard.—After January 1st it is said an assessment of 25 cents per share will be levied upon the stock of the Double Standard and Tornado companies, amounting in aggregate to \$125,000. The properties, which are under the management, with Harris Franklin as president, have developed large bodies of high grade ore, having sufficient in sight to justify building a reduction works, and this will be done as soon as weather

will permit in the spring. The works will be located near the Golden Reward plant, and will be of 100 tons daily capacity. It is not as yet determined what process will be adopted. The companies have a number of processes under consideration, the matter lying, however, between chlorination and smelting. Some of the ore contains a large percentage of silver, and this cannot be successfully handled by the chlorination process. The various processes are being thoroughly tested upon the ores from these two properties.

TENNESSEE.

Anderson County.

Black Diamond Company.—The threatened trouble at Coal Creek, by reason of the strike of the Black Diamond Company's miners, has been averted by a compromise, and the 800 men returned to work on the 3d inst.

UTAH.

Cache County.

Dickert & Meyers Sulphur Co.—The sulphur works at Cove Creek are in operation, about 40 men are employed about the works. The mines are in excellent condition for continuous production. A system of storage reservoirs holding 2,000,000 gallons of water has been put in, and 6-in. pipe laid about one mile with a fall of 1,000 ft. to carry the water to the sulphur beds to use in hydraulic lifting the surface earth away. This will greatly reduce the cost of mining, since there is a large lot of earth overlying the sulphur, which in the past required being dug and carted away.

Juab County.

Eureka-Hill and Bullion-Beck Mining Companies.—In the case of the Eureka Hill Mining Company vs. the Bullion-Beck & Champion Mining Company, Referee Merritt's report has been confirmed by Judge Zaue. The action was one of trespass, and in the complaint it was alleged that the defendants had extracted 1,000 tons of ore from the plaintiff's property, which said ore was worth the total sum of \$100,000. The referee found that the amount of ore thus extracted was 175 tons, and that its value, with interest added, was \$11,321, for which sum judgment was rendered in favor of the plaintiffs.

Medea Consolidated Mining Company.—This company, owning the northern extension of the Mammoth, has been working very quietly this season, and yet it is accomplishing considerable. They had a tunnel started in on the vein, and have sunk 50 ft. through black manganese and decomposed quartz, assaying as high as 16 oz. silver, with a trace of gold. The company propose to sink at least 150 ft.

Salt Lake Co.

Asphalt.—Foreign demand has greatly encouraged Messrs. Culmer and Jennings, and they will at once proceed to erect large asphalt refining works. This structure will be three stories high, 45 ft. wide, and have a depth of 111 ft. The machinery to be used in refining asphalt will consist of two 60-horse boilers, one 100-horse engine, eight crushers and six pulverizers, and will have a capacity to turn out 200 tons of mastic pavement daily. The process will be to refine the asphalt and mould it into 45-pound blocks, which is the size adopted as most convenient for handling in shipping. After the asphalt has been put up into cakes or blocks, all that is required to prepare it for use is to mash the cakes and put the crushed particles into the mixers, where it is heated up to the proper temperature and applied on the street or wherever needed.

The Culmer-Jennings company's mine is located near Coal Creek, and is on a large vein that can be traced 42,500 ft. on the surface. It is known as the Wasatch mine. The Culmer-Jennings company are working a force of thirty-five men on the mine, and expect that their orders will require a large increase of their present force.

Summit County.

Ontario Silver Mining Company.—The following information comes from the Park City Record: "It will be remembered that R. C. Chambers went East last week. Our informant says that his mission is to hold a general consultation looking to a large increase in the output of the Ontario mine. This means that not only will the quantity of shipping ore now being mined be increased, but also an addition made to the company's present milling capacity. Our informant says he knows positively that such an increase has been under contemplation for some time and that Mr. Chambers has been summoned for consultation to that end."

Washington County.

The Dixie group of copper mines that are being worked by Messrs. Wooly, Lund & Judd are situated 18 miles southwest of St. George and are yielding large quantities of good ore, running from 20 to 65% in copper, with silver running from 10 to 35 oz. to the ton.

FOREIGN MINING NEWS.

AUSTRALIA.

"Industries" announces that a discovery of platinum and iridium has been made in the Mudgee district of New South Wales.

BRITISH GUIANA.

The monthly shipment of gold from British Guiana, despatched on the steamer Eden, to England, on the 3d November, amounted to 4,638 oz. valued at \$82,534. This brings the total for the year to 104,888 oz. valued at \$1,886,937.

CHILE.

Copiapo Mining Company, Limited.—The directors have submitted the audited accounts for the year ending June 30th last: The profit and loss account shows a credit balance for that year of £18,277 8s. 11d.; to which has to be added the balance brought forward from last account, £1,848 18s. 6d.; making a total of credit of profit and loss account on June 30th, 1892, of £20,126 7s. 5d.; from which has to be deducted the interim dividend of 2s. per share, paid on June 21st, 1892, £10,000; leaving an available balance of £10,126 7s. 5d. The directors recommend the payment of a final dividend, for the year ended June 30th last, of 2s. per share, payable on December 12th, making in all 4s. for that year (equivalent to 10%); thus absorbing £10,000 of the balance, and leaving £126 7s. 5d. to be carried forward. The result of the operations has not come up to the expectations of the directors, but this arose from causes which could not possibly have been foreseen; as, for instance, a total suspension of work for about six weeks, when all the able-bodied workmen were drafted into the army, and a continuous decline in the price of copper during the twelve months. The directors have to announce, with very great regret, that Mr. Powditch, who has acted as the company's chief superintendent for a period extending over some 40 years, has, in consequence of age, tendered his resignation; such long and faithful service the directors feel ought not to pass unrecognized. At the meeting, a proposal will therefore be submitted for the consideration of the shareholders. The estate has given a profit for the year of £2,316 2s., which is £433 4s. 11d. less than that shown in the previous balance-sheet.

MEXICO.
Jalisco.

The Silver Mines of La Luz, Limited.—The directors regret that they have been unable to communicate with the shareholders earlier as to the position of affairs at the mines, and the cause of the delay in the erection of the mill and machinery. In Mr. Hilton's reports they had his assurance that the mill would be up and running before the end of July, when the result of the first trial crushing should have been known. In consequence of the inexplicable delay arrangements were made with Mr. Bernard W. Flatt, C. E., to proceed to the mines and report to the board the position of affairs, and the real cause of the mill not being erected and running. Mr. Flatt arrived at Guadalajara on October 10th. After conferring with Senor Camarena, the company's solicitor, he proceeded to the mines. Two cables have since been received from him, in which he states the mill and buildings were partially erected, and could be finished and running within two months from the work being re-started. In addition he states: "Property is really a splendid one. Plenty of ore if mill were ready to keep it running."

SICILY.

A cablegram from Girgenti announces that the fire in the sulphur mines of Lucia, near there, which have been smoldering for years, but have been confined to the remoter galleries, broke through the barriers on the 3d inst. and filled the mine with smoke. Five of the miners were choked by the fumes and ten others were injured. The fire has again been isolated by new barriers and work has been resumed.

SOUTH AFRICA.

MacArthur-Forrest Process.—Arrangements have been concluded for the erection of extensive cyanide works by the Heriot, and Henry Nourse, and the City and Suburban Companies.

The De Beers Consolidated Mines.—The report of the directors of this company for the 15 months ended 30th June, 1892, has just been issued. Hitherto the financial year of this company has terminated on 31st March, but as this date was inconvenient in many respects it was altered to the 30th June. Thus the present report deals with 15 months' working instead of 12 as usual. During these 15 months 3,338,553 loads of blue ground were hauled, and 3,239,134 loads washed and the remaining stock of blue ground at Dutoitspan and Bultfontein, 454,278 loads, were also washed. The total yield was 3,035,481 carats of diamonds which brought on the market £3,931,542. The total expenditure was £2,794,234 including interest on debentures and obligations so that the profit was £1,137,308. At the commencement of the 15 months the balance brought forward was £717,829, and the balance carried over on the 30th June last was £377,532. The amount paid as dividend for the 15 months was £1,382,134. The capital on which this dividend was paid is £3,948,955. During the period a reserve fund of £650,000 has been formed and invested in British Consols, in order both to add to the stability of the company and to prevent violent fluctuations in the diamond market.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see pages 574 and 576.]

New York, Friday Evening, Dec. 9, 1892.

At the close to-day a better feeling prevailed in the mining market than has been the case for some time past. There was more inquiry for mining stocks generally, and the public showed more inclination to buy.

The feature of the week was the trading in Phœ-

nix of Arizona. The stock advanced steadily from 51c@65c. During the week 39,600 shares changed hands. Mr. E. C. Chamberlin, president of the Phoenix Mining Company, writes that everything at the mine is progressing very satisfactorily. The mill is all set up, excepting for a few minor details, and it will be started up probably within a week.

The Comstocks were devoid of features. There were sales of 4,900 shares of Comstock Tunnel stock at 9c. Of the scrip 1,700 changed hands at \$14. Consolidated California & Virginia shows sales of 300 shares at \$2.50@2.75. Other sales were as follows: 200 shares of Gould & Curry at 90c., 100 shares of Hale & Norcross at \$1.70, 100 shares of Savage at \$1.35, 100 shares of Sierra Nevada at \$1.25, 200 shares of Yellow Jacket at 70@95c., 200 shares of Best & Belcher at \$1.50@1.55, 200 shares of Julia at 15c., 100 shares of Mexican at \$1.45, and 200 shares of Union Consolidated at \$1.20@1.25.

The only Tuscarora stock dealt in was North Belle Isle, of which 400 shares were sold at 4@5c., assessment unpaid.

Of the California stocks Bodie Consolidated shows sales of 400 shares, at 20@22c., and Bulwer Consolidated of 200 shares, at 18c. Shipments for November from the Standard Consolidated Mining Company's mine amounted to \$20,100; expenses for the same time were \$14,150, leaving a net profit for the month of \$5,950. Brunswick Consolidated was dealt in to the extent of 1,500 shares, at 9@13c. A letter from the superintendent of the Brunswick Consolidated Mining Company, dated November 30th, says:

"The drifts show good ore that will pay for milling; some of it is very high grade in gold and sulphurets, especially in the West drift and in the shaft. The total depth of the shaft is now 684½ ft. The total length of the West drift is 128 ft.; of the East drift 116 ft. I have about 60 tons of pay ore in the bins." A telegram dated December 7th says: "The mine has improved greatly. Both of the drifts are in good ore, as is also the shaft in the bottom."

Of the Colorado stocks the most active as well as the most popular was Leadville Consolidated, of which 7,600 shares were sold at 17@19c. A letter from the superintendent, dated Leadville, December 2d, says: "The output for November was about 175 gross tons of ore that will average very well in silver. The rough estimate of the gross value is from \$7,000 to \$7,500. It is very gratifying to me to make such a report."

There were sales of 1,100 shares of Chrysolite at 17@18c. Father de Smet shows sales of 700 shares at 23@24c. Transactions in Ontario aggregate 100 shares at \$15@20. At the close sales were made at the Stock Exchange at \$15.

Horn Silver was in good demand during the week. Sales amounted to 1,720 shares at \$3.40@3.45. The contract for the output of the Horn Silver Mining Company, of Utah, for the year 1893 has been awarded to the Germania Smelting Company, of Salt Lake City. By this company's bid the product will be taken at the rate of \$24.10 per ton for freight and working charges on the low grade ore and \$25 per ton on the higher grades, or an average rate of \$24.55 per ton for the entire product. The contract rate for the present year for freight and working charges is \$34.65, showing a difference for next year in favor of the Horn Silver Company of over \$10 per ton. The monthly output of the Horn Silver is estimated at 2,000 tons. P. F. Farnsworth, the superintendent of the mine, writes: "Am highly gratified at the outcome of the bidding. It will result in assuring dividends for a long time to come."

BOSTON.

Dec. 8.

(From our Special Correspondent.)

The market this week has ruled very dull for copper stocks and prices have had a tendency to a lower level.

Boston & Montana advanced in the early dealing, touching at one time \$35½ followed by a decline to \$33½ with only a slight rally to \$34.

Butte & Boston has been rather quiet, the price dropping from \$12½@11½ on moderate transactions.

Calumet & Hecla sold at \$290, same as last week, but Tamarack recovered from the scare of reduced dividends and advanced to \$162. This was, however, lost, and the price dropped to \$156.

The reports from Tamarack, Jr., this week indicate an improvement in the south drift, the vein of which has widened out to about half the width of the drift. The stock has been in moderate request at \$25, with a few sales at \$26.

Osceola—The dealings have been smaller than last week, and the price has dropped from 37½ to 36½, at which it is in fair demand.

Quincy sold at \$144@145, mostly at the latter figure.

Kearsarge—Very little has been done in this stock the past week, and it shows a decline from \$13½@12.

Centennial has held steady at \$7½@8, with very few shares changing hands.

Franklin sold in a small way at \$13½ to \$14, a slight decline from last week.

Atlantic dropped to \$10 on the report that the company would not pay its customary dividend of \$1 this year, reserving its earnings to meet the cost of a new stamp mill.

Wolverine sold at \$1¼@1¼. Allouez at 95c. to \$1 and Arnold steady at \$1¼.

Bonanza appeared at 27½c., Catalpa at 19c. and Napa Quicksilver at \$6.

3 P. M.—Boston & Montana was slightly firmer

this afternoon and sold at \$34½. The balance of the list was unchanged.

Colorado Springs.

Dec. 1.

(Monthly report by Sherwood Aldrich.)

The mining stock market of this city has been active throughout November. The trading has been confined mainly to Mollie Gibson, Argentum, Juniata, Anaconda, Lemhi, Pharmacist and Cleopatra, the low-priced and more speculative stock receiving little attention. It is probable that over 500,000 shares of mining stock changed hands in the city during the month; more, perhaps, than in any other city of the United States during the same period. Neither the result of the elections nor the Thanksgiving holiday affected trading unfavorably, and as a rule the market maintained a healthy tone throughout, developing no boom prices, but closing a little below, rather than above, actual values.

Mollie Gibson opened at \$9 75 at the first of the month, but has declined steadily, till at the close it is selling at \$8.70. This decline cannot be attributed to any loss of value in the mine, but is probably caused only by an excess of selling orders above buying orders for the stock. The monthly dividend of 15c. per share is as regular as the arrival of the 15th day of each month, and there is no intimation that there will be a falling off in the dividend for many years to come.

Argentum Juniata opened at 72c., and also suffered a decline, dropping to 61c. at the close. The mine remains flooded, and no news is known concerning it.

Anaconda closes at 14c., a decline of 2c. from the first of the month. The voluntary contribution of 5c. per share to pay debts, which was asked for by the directors, is being paid with surprising promptness, and there is now little doubt that the necessary 80% of stock will contribute.

The Lemhi placer mine's stock, whose reorganization was referred to in the journal of a recent issue, has been in active demand. The stock opened at 14½c., but closed at 18c. bid, with few sellers.

Pharmacist, the only Cripple Creek stock now paying a dividend, sells at 26c. The third monthly dividend of 1c. per share has just been declared, payable on December 15th. The company's high-grade ore holds out remarkably well, an average of all the shipments to date showing a value of over \$200 per ton. Pharmacist promises to become, with greater development, a bonanza mine. The stock shows a rise of about 4c. this month, and is growing stronger as each dividend is declared and paid.

San Francisco.

Dec. 2.

(From our Special Correspondent.)

The fluctuations of mining stocks have not been wide during the week past, but trading has been more brisk as the reports in circulation regarding the outlook in several of the mines have been industriously circulated. Belcher that for some weeks has attracted so much attention, showed to-day quite a decline on the week's trading; white Potosi, the leading middle Comstocker, has made a decided advance, and continues in active demand. The north end Comstocks, also, have sold more freely after several weeks' comparative neglect.

Of the north end Comstocks Consolidated California & Virginia sold to-day at \$2.75 with light sales. Mexican sold for \$1 65; Ophir for \$2 70; Sierra Nevada for \$1.20, and Union Con. for \$1.20. The figures are a mere trifle stronger than on the same day a week previous.

In the middle group Potosi has been in fair demand throughout the week, but yesterday and to-day the sales have been heavy. The opening price to-day was \$1.90 but later there was a sharp advance to \$2.10 and at the close was held for a five cent advance. In all 6,000 shares changed hands in the two Boards. The raise from the 1,100 level in the mine to the 1,000 level has made connection, and crosscutting east in bunches of ore having commenced, this stock is one of great expectations. Best & Belcher sold quiet for \$1 50; Chollar, for 90c.; Hale & Norcross for \$1.65, and Savage for \$1.35.

Of the South End and Gold Hill stocks Belcher, while still selling freely, has temporarily given place in the mind of the speculative public to Justice. Quite a good showing is being made in the upper levels of the mine, and yesterday an advance in the price of the stock of nearly 200% took place. Last week the stock went begging at 20 cents, but yesterday scored to 60 cents and to-day ran the gamut of values from 50 cents, the opening rate, down to 23 cents, and then advanced during the afternoon session to 40 cents, being held at the close for 55 cents. In all 70,000 shares were sold to-day. Belcher sold this morning for \$1.65 and closed strong at \$1.70 with fair sales recorded. Alta sold for 35 cents; Bullion for 55 cents; Challenge Consolidated for 50 cents; Consolidated New York for 53 cents; Crown Point for \$1; Exchequer for 30 cents; Kentuck Consolidated for 20 cents; Lady Washington for 15 cents; Occidental for 40 cents, and Silver Hill for 15 cents.

Not one solitary sale was recorded to-day in any of the outside stocks. Bodie was quoted at 15 cents, Bulwer 20 and Mono 20 cents, all asked.

In the Tuscaroras, Belle Isle, Commonwealth, Del Monte and Navajo were held for 5 cents, and W. Belle Isle and Nevada Queen for 10 cents.

Eureka Con. at \$2.00, and Mt. Diablo at \$1.75 failed to find purchasers.

SAN FRANCISCO, December 9th (By Telegraph).—The opening quotations to-day are as follows: Best & Belcher, \$1.55; Bodie, 20c.; Belle Isle, 15c.; Bulwer, 15c.; Chollar, 85c.; Consolidated California & Virginia, \$2.65; Eureka Consolidated, \$2; Gould &

Curry, 75c.; Hale & Norcross, \$1.45; Mexican, \$1.55; Mono, 20c.; North Belle Isle, 5c.; Navajo, 15c.; Ophir, \$2.55; Savage, \$1.20; Union Consolidated, \$1.20; Yellow Jacket, 70c.

ASSESSMENTS.

COMPANY.	No.	When levied.	D't'nt' in office.	Day of sale.	Am't per share.
Belle Isle, Nev.....	16	Nov. 5	Dec. 12	Jan. 4	.10
Hullion, Nev.....	40	Oct. 20	Nov. 25	Dec. 14	.25
Carra, Cal.....	6	Sept. 28	Nov. 23	Dec. 28	1.00
California, Cal.....	6	Nov. 15	Dec. 20	Jan. 7	.01
Commonwealth, Nev.....	10	Nov. 23	Dec. 28	Jan. 24	.10
Con. Imperial, Nev.....	34	Nov. 22	Dec. 29	Jan. 19	.03
Con. New York, Nev.....	9	Nov. 2	Dec. 5	Dec. 28	.10
Eclipse, S. Dak.....	7	Nov. 18	Jan. 3	Jan. 23	.001½
El Leopoldo, Mex.....	1	Nov. 11	Dec. 14	Jan. 2	.10
Exchequer, Nev.....	34	Oct. 14	Nov. 30	Dec. 20	.10
Gold Fiat, Cal.....	3	Oct. 14	Nov. 2	Dec. 13	.03
Gould & Curry, Nev.....	70	Nov. 22	Dec. 25	Jan. 20	.25
Inland Creek, Cal.....	3	Nov. 4	Dec. 14	Jan. 6	.10
Lone Star, Cal.....	5	Oct. 13	Nov. 22	Dec. 12	.00½
Mikado, S. Dak.....	4	Oct. 29	Dec. 17	Dec. 17	.001½
Navajo, Nev.....	23	Nov. 5	Dec. 9	Dec. 30	.10
North Gould & Curry, Nev.....	14	Nov. 21	Dec. 24	Jan. 16	.10
North Belle I., Nev.....	21	Nov. 14	Dec. 20	Jan. 17	.01
Occidental, Con., Nev.....	11	Oct. 25	Nov. 30	Dec. 21	.25
Ruby Flat, S. Dak.....	8	Oct. 22	Nov. 2	Dec. 15	.02½
Russell, Cal.....	8	Nov. 14	Dec. 19	Jan. 16	.01
Sierra Nevada, Nev.....	105	Nov. 5	Dec. 14	Jan. 3	.25
Silver Lick Con., Nev.....	23	Nov. 5	Dec. 9	Dec. 30	.10
South Eureka, Cal.....	1	Nov. 2	Dec. 9	Dec. 31	.02
Teresa, Mex.....	1	Oct. 25	Nov. 29	Dec. 16	.10
Therakoff, Cal.....	9	Oct. 11	Nov. 11	Dec. 20	.02
Trent, S. Dak.....	4	Oct. 29	Dec. 15	Jan. 5	.001

METAL MARKET.

NEW YORK, Friday Evening, Dec. 9, 1892
Prices of Silver per Ounce Troy.

Dec.	Sterling Exchange.	London Pence.	N. Y. Cents.	Value of sil. in \$1.	Dec.	Sterling Exchange.	London Pence.	N. Y. Cent.	Value of sil. in \$1.
3	1.87½	39	85	.650	7	1.87½	38½	82½	.636
5	1.87½	38½	84½	.618	8	1.87½	38½	82½	.638
6	1.87½	38½	84½	.612	9	1.88	38½	83½	.613

The failure of the monetary conference committee to agree on the Rothschild plan made buyers timid and disinclined to buy except for cash. This occasioned a sharp fall in silver, as the market became unsettled; but the week closes with better prices, and partially restores confidence. Shipments this week have been nearly a million ounces.

Gold and Silver Exports and Imports at New York for Week Ending December 3d, 1892, and for Years from January 1st, 1892, 1891.

Week.	Gold.		Silver.		Excess of Exports.
	Exports.	Imports.	Exports.	Imports.	
1892 ...	\$1,637,200	\$240,523	\$750,950	\$10,108	\$2,167,519
1891 ...	61,768,600	8,294,848	20,660,410	2,917,083	71,187,177
1891	75,916,863	29,081,351	19,403,208	2,76,108	63,662,512

NOTES OF THE WEEK.

The plan proposed by the Editor of the ENGINEERING AND MINING JOURNAL has met with unqualified praise from those qualified to judge of it and it is hoped that, when brought before the conference, it will receive the attention which its merit warrants. The advantages its adoption would bring to all nations are so obvious that it is to be hoped it will be accepted.

President Williams of the Chemical National Bank says of it, "The plan proposed is thoroughly good; the ratio is equitable, and its adoption would not fail to benefit all concerned. It would lend added security to the debts of the silver countries which alone should insure its adoption. I am afraid, however, that we will see nothing so good until the millennium, for the adoption of such a comprehensive scheme requires a prospect of universal peace. Still if the plan were one enacted, it would do more than anything else to preserve peace.

Mr. John A. Stewart, president of the United States Trust Company says: "The plan is grand in every way, and its adoption could not fail to please the National Banks. The ratio proposed, that of Soether, is just and should commend itself to the Western silver advocates. The plan of an international clearing house is well conceived, and will meet with nothing but approval here. Win over the Western silver advocates and England to its adoption, and you have accomplished a universal good."

Mr. Zimmerman, of Zimmerman & Forshay, said the ratio is just what is wanted, and that he could see no defect inherent in the plan proposed.

Mr. Henry Clews says the plan is good and leaves nothing to be desired if its adoption can be secured.

As predicted in our issue of December 3d, the special committee of the Monetary Conference voted against the consideration of M. de Rothschild's plan for buying silver, and he has withdrawn it. It is learned that the delegates from the Latin Union voted against it because they could not commit their countries to increasing their silver currency unless international free coinage was established.

Sir Wm. Houldsworth, of England, presented a plan which received but little consideration. He proposed that a bimetallic union should be formed by nations willing to enter into such an agreement, and that nations preferring to retain a single gold standard should undertake to establish the following or a similar arrangement, viz.: That their mints should receive silver bullion in not less quantity than a fixed minimum against receipts, noting the quantity and value at a specified rate per ounce, to be determined by international agreement, the quantity so specified to be delivered by weight to bearer whenever demanded, and in no other manner or on any other account whatsoever, the receipts to circulate as money.

Neither has the Moritz Levy plan been favorably received. Sir C. Rivers Wilson called attention to the fact that, although England was on a gold basis, and must remain so, her commercial interests in India, did not allow the government to view with indifference the fluctuations in the price of silver. Concerning the failure of the Rothschild and Levy plans to meet approbation he said: "In order to avoid a misunderstanding I desire to state that Sir Charles Fremantle and myself are pure monometallists, and do not admit that any other system than a single gold standard is applicable in Great Britain. We have thus far studied only the Rothschild and Levy plans, and are willing to admit that the adoption of either or both would not be incompatible with our principles. But it is not enough that these schemes are defensible in principle. We ask ourselves whether either would have the least chance of meeting with a preponderance of support that would justify us in recommending the British government to consider it. The Rothschild plan has not received such support, and this is sufficient to decide us to abstain from a discussion of its details which we know will be fruitless.

"The Levy proposal would involve the withdrawal of the half sovereign, so it would be equally fruitless to discuss that plan since Great Britain is unwilling to submit to such inconvenience unless presented in conjunction with a plan offering advantages which all the Powers recognize. Another plan may, however, be formulated and approved by the Conference, and if it does not conflict with the principles we have laid down it will receive serious consideration from the British government."

Mr. McCreery of the United States then spoke in favor of the American plan, calling it a plain business proposal, continuing, he said:

"I believe the best aim of the Conference to be the general remonetization of silver and the unrestricted coinage of gold and silver into money of debt paying power, with a permanent international ratio of 15½, or 16 to 1, and I prefer the latter. This, in my opinion, is a system that would give unity and stability to the value of money, and would furnish the best remedy for the existing evils from which all civilized nations are suffering."

The failure of the Conference to settle upon a plan having its effect on the markets here and abroad.

It is cabled from London that owing to fears of a suspension of the Sherman act and some sudden change in the Indian policy, forward business in the silver market has ceased, and that the India Council is finding difficulty in allotting rupee bills. This fear has a good basis, as bills have been introduced in both the Senate and House repealing the Sherman act. The following comments have been made on the Conference by the foreign press. The London News says: "It is a foregone conclusion that the American bimetallic proposals will meet with no favor, and we are forced to suspect Mr. Currie of American tactics when he suggests a gold standard without gold." A Berlin paper says that "Dr. Ahrendt, the leading German bimetallicist, is going to Brussels to submit proposals to the Conference. While Herr Miquel, Minister of Finance, is in office, however, there is no chance of the government abandoning one iota of its monometallic policy."

"Meanwhile telegrams from Berlin state that the silver question may be raised in the Reichstag with a view to authorizing the delegates to go beyond the proposals submitted by Germany or the Paris Conference of 1881. The London Times says:

"Sir William Houldsworth's plan is the drollest yet proposed, and may serve to amuse certain delegates with the notion that they are making valuable contributions to economic science.

"Mr. McCreery's speech is chiefly remarkable for the frank admission that the United States will take the earliest opportunity to repeal the Sherman Act, or, in other words, abandon the experiment which Europe has been invited to undertake."

The report of Mr. Charles Foster, Secretary of the Treasury, for the fiscal year ending June 30th, 1892, states that the value of the gold deposited at the mints and assay offices during the fiscal year 1892 was \$66,476,975.98, of which \$61,131,460.04 were original deposits, and \$5,345,515.94 were redeposits.

Of the original deposits, \$31,961,546.11 were the products of our own mines; \$24,975,342.39 foreign gold coin and bullion; \$557,967.86 light weight domestic gold coin; and \$3,636,603.68 old material.

The deposits and purchases of silver aggregated 72,121,288.03 standard ounces of the coining value of \$83,922,930.01, including 640,461.19 standard ounces, of the coining value of \$745,263.92 redeposits.

Of the silver received, 63,130,608.86 standard ounces, of the coining value of \$73,461,072.08, were the product of our own mines; 2,113,077.89 standard ounces, of the coining value of \$2,464,672.45, were foreign silver bullion and coin; 5,563,907.71 standard ounces, of the coining value of \$6,509,274.43, were uncurrent domestic coins; 1,921.53 standard ounces

of the value of \$2,235.96, were trade dollars, and 636,290.85 standard ounces, of the coining value of \$740,411.17, consisted of old plate, jewelry, etc.

The coinage of the mints during the last fiscal year aggregated 113,556,124 pieces, valued at \$51,792,976.52. The number of silver dollars coined during the fiscal year from bullion purchased under the act of July 14, 1890, was 3,450,965, and from trade dollar bullion 4,878,473, a total of 8,329,467 silver dollars upon which the seigniorage or profit was \$930,487.41.

The purchases of silver during the year were made under the provisions of the act of July 14th, 1890, requiring the purchase of 4,500,000 ounces in each month. The total amount purchased was 54,335,748 fine ounces, costing \$51,106,608, the average cost being 94c. per ounce. The total amount of silver purchased under the act of July 14th, 1890, from August 13th, 1890, to November 1st, 1892, has been 120,479,951 fine ounces, costing \$116,783,590, an average cost of \$0.969 per ounce.

The price of silver fluctuated during the last fiscal year from \$1.02 to \$0.855 per fine ounce, a variation of 16½c. an ounce. Since July 1st, 1892, the price still further declined until on August 11th, 1892, it reached 83c. a fine ounce, the lowest price on record. The price on November 1st, 1892, was 86c. per fine ounce. The average price of silver during the year, based upon London quotations, was \$0.937 a fine ounce.

The net loss of gold by exports during the fiscal year was only \$142,654 against a loss in the preceding fiscal year of \$67,946.768. The net exports of silver were \$5,035,28, against a net import in the previous year of \$2,745,365, a difference of \$7,781,193.

The coinage of gold and silver by the various countries of the world aggregate, for the calendar year 1891, so far as reports have been received:

Gold	\$119,183,735
Silver	135,008,142

METALLIC STOCK OF THE UNITED STATES.

The stock of gold and silver in the United States, based upon official tabulation brought forward from year to year, was, on November 1st, 1892, approximately:

Gold	\$656,041,863
Silver	587,614,951

Total

According to the information gathered by the Bureau of the Mint, the value of the gold and silver used in the industrial arts in the United States during the last calendar year was, approximately:

Gold, \$19,700,000, and silver \$9,630,000; of which \$10,697,679 gold and \$7,289,073 silver were new bullion.

Domestic and Foreign Coin.

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

	Bid.	Asked.
Mexican dollars.....	\$.65½	\$.66½
Peruvian soles and Chilean pesos.....	.60	.62
Victoria sovereigns.....	4.86	4.91
Twenty francs.....	3.86	3.90
Twenty marks.....	4.74	4.78
Spanish 25 pesetas.....	4.78	4.81

Copper.—The market has been quiet, and shown some weakness; very little has been done and that at easier rates. We hear that second hand Lake copper has been sold at about 12½@12 25, while in contrast to this casting copper is rather firmly held at 11½, with very little obtainable. Arizona pig copper is unchanged. We hear that manufacturers are fully occupied, but evidently they have enough copper purchased to last for a time. The larger Lake companies are still holding for 12½c. The London market has eased off somewhat, and for the week a decline of 15s. is noted, G.M.B.'s closing at £47 5s. for spot and £47 15s. for three months. Refined and manufactured we quote, as follows: English tough, £50 10s.@£51; Best Selected, £52@£52 10s.; Strong Sheets, £59@£59 10s.; India Sheets, £54 10s.@£55 10s.; Yellow Metal Sheets, 5½d.

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

To	Copper Matte.	Lbs.	
S. S. City of Berlin.....	1,963 bags	221,528	\$10,060
" France.....	1,950 "	242,263	11,060
" Runic.....	1,973 "	197,900	9,000
" The Queena.....	2,127 "	242,280	10,800
To Havre.....	Copper Lbs.		
S. S. Gasconne.....	182 bbls	227,500	\$27,300
S. S. ".....	5 bars	869	104
To Rotterdam.....	Copper Lbs.		
S. S. Wirkudam.....	652 Pigs.	179,743	\$19,500
" Fundam.....	481 "	112,170	11,700
"	21 Bbls.	26,259	3,150

Tin.—Early this week the decline was marked principally in conjunction with lower prices for silver. Cables from the straits report that the shipments during the next two or three months will be very heavy, and the decline in silver makes the price laid down in Europe or here comparatively lower. Very few orders have been cabled over from here, as consumers, as well as importers, are rather afraid of a cancellation of the duty, and at the decline there have been heavy sellers. On the 8th the London market suddenly advanced about £1, but this did not have so much effect here, and only a part of the recovery abroad was expressed in the higher prices. Here there is a rather large accumulation of spot tin, a good deal of which is floating on the market. The closing prices are 19'85 for spot and December, 19'95 for January, and 19'95 for February.

From day to day London declined slightly until

on Wednesday, it reached about £90 for spot and futures. The following day there was a rather marked reaction and prices jumped up about £1 5s. There are rumors current that a corner in December tin is being engineered in London. The closing prices are £92 5s. for spot and £91 17s. 6d. for futures.

Lead continues rather dull and weak; there are still sellers of December, January and February delivery at 3 3/4, but the transactions have been rather small. We hear that some of the Western smelters have accumulated rather large quantities of lead ores. Closing prices are 3 7/8@77 1/2.

In London Spanish lead has declined to £9 17s. 6d. and English to £10, the lowest prices for a long time.

Chicago Lead Market.—The Post-Boynton-Strong Company telegraph us as follows: "The market has continued dull, holders generally asking \$3.55, but consumers have declined to purchase at the price."

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: "Our market during last week has been very quiet, with only sales of car lots at \$3.50 for common, whilst refined desilverized has been held about 3c. to 5c. higher."

Spelter is quiet but prices are maintained. We quote 4 4/25@45 for spot, while January, and February delivery might be had at a trifle less. The English market is reported somewhat better and in London ordinaries are quoted at £18 12d. 6s. and specials at £18 15s. @£17. 6s.

Antimony.—In this only a retail business has been done, in Cookson's at 11 1/2@%, in L. X. at 11 1/2@% and Hallett's at 10%@%.

Nickel is quiet at 52 1/2@55c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Dec. 9th, 1892.

Pig Iron Production.—The following table gives the number of furnaces in blast and the estimated production of pig iron in the United States during the week ending Saturday, December 3rd, 1892, and for the corresponding week ending Saturday, December 5th, 1891. Also the total estimated production from January 1st of each year to these dates. This table has been corrected by the official returns of the American Iron and Steel Association for the first six months of this year. The figures are in gross tons:

Pig Iron Production During Weeks Ending December 5th, 1891, and December 3d, 1892, and During Both Years to These Dates.

Fuel used.	Week ending		From Jan. '91.		From Jan. '92.	
	Dec. 5, '91.	Dec. 3, '92.	Tons.	F'cs.	Tons.	F'cs.
Anthracite..	87	34,860	69	31,000	1,709,970	1,599,796
Coke	162	142,870	133	130,000	5,253,550	6,321,700
Charcoal.....	57	12,460	42	9,500	520,227	490,025
Total.....	306	190,190	244	170,500	7,523,697	8,414,521

Prices here are as last week. Southern, ex-steamer, No. 1 F., \$15.26; No. 2 F., \$14.26; No. 3 F., \$13.76; Gray Forge, \$13.01; Northern, tide-water, No. 1X, \$15; No. 2X, \$14; No. 2 plain, \$13.50; Gray Forge, \$13. Southern irons are quoted, nominally, 26c. higher than Northern.

Spiegeleisen and Ferromanganese.—Ferro is dull at \$90. Spiegel, \$26.50 with no special movement.

Steel Rails.—The market is dull at \$30.

Rail Fastenings.—Prices rule as follows: Fish and angle plates, 1 5/8@1 6/8c. at mill; spikes, 1 9/10@2c.; bolts and square nuts, 2 4/10@2 7/10c.; hexagonal nuts, 2 7/10@2 8/10c., delivered.

Merchant Iron and Steel.—Prices stand: Mushet's special, 48c.; English tool steel, 15c. net; American tool steel, 6 1/2@7 1/2c.; special grades, 13@18c.; crucible machinery steel, 4 7/8c.; crucible spring, 3 7/8c.; open hearth machinery, 2 25c.; open hearth spring, 2 30c.; tire steel, 2 25c.; toe calks, 2 25@2 50c.; first quality sheet, 10c.; second quality sheet, 8c.

Structural Iron and Steel.—We quote: Beams, 2 3@2 55c., except for 20-in. beams which are 2 75c.; angles, 1 95@2 15c.; sheared plates, 1 90@2 10c.; tees, 2 30@2 60c.; channels, 2 35@2 50c.; universal plates, 2@2 10c.; bridge plates, 2@2 10c.; steel hoops, 1 90@8c. All on dock.

Buffalo. Dec. 8. (Special Report by Rogers, Brown & Co.)

As the season for inventory draws nearer the market becomes more quiet. Shipments still continue very heavy but all new orders are for car lots or 50 tons. Foundries appear to be exceptionally busy, with every indication that they will run full time after the holidays. Prices are inclined toward weakness owing to some irons being forced on the market with slack demand. We quote on the cash basis f. o. b. cars Buffalo: No. 1X foundry strong coke iron, Lake Superior ore, \$15.25; No. 2X foundry strong coke iron, Lake Superior ore, \$14.25; Ohio strong softener No. 1, \$15.25; Ohio strong softener No. 2, \$14.25; Jackson County Silvery No. 1, \$17.30; Jackson County Silvery No. 2, \$16.80; Lake Superior charcoal, \$17; Tennessee charcoal, \$18. Southern soft No. 1, \$14.40; Alabama car wheel, \$19; Hanging Rock charcoal, \$20.50.

Chicago.

Dec. 8.

(From Our Special Correspondent.)

The most important event in the iron trade in this vicinity and one which will not be without a certain amount of influence in finished iron circles, is the sale of the Calumet iron and steel plant to a number of Cleveland men connected with manufacturing interests in that city. The plant consists of a modern blast furnace and rolling mill with 38 puddling furnaces, six scrap and six heating furnaces and three trains of rolls, 9, 14 and 22 in. respectively. There is a nail factory with 132 nail machines and the steel works has four four-ton open-head furnaces. Conveniently situated on the Calumet River at Cummings, South Chicago, there are four ships built on purpose for unloading ships. The mills and plant generally are among the best equipped of their capacity in the country. The price paid was an absurdly low one,—\$500,000, the original cost of the land and dockage together with the completed works was \$2,000,000. The mills have been idle some fifteen months and the furnace was blown out last February. As a starter the rolling mill is to be overhauled and put into thorough repair and within the next 60 days the new proprietors expect to be turning out merchant bar iron. The capacity is 1,000 tons weekly and employment will be given to some 600 to 700 men.

Business in the iron, steel and associated trades has fallen off since the first of the month, and there is no anxiety to discount the future on the part of buyers of crude or finished iron. Values too though in the main unchanged manifest a disposition to sag.

Pig Iron.—In a small way for car loads up to 50 or 100 tons the demand for local coke iron has been fair, but the aggregate tonnage has been limited. A number of inquiries which had been pending for a week or two have fallen through on account of the belief which consumers entertain that prices are going lower. Of this, however, there is no indication at present on Northern iron. Lake Superior charcoal iron is in moderate demand in small quantities, mill sales of 50 and 100 tons at \$16.50@16.75. Several inquiries are in the market for larger amounts, and 1,000 ton lots for car wheel men are not uncommon. Some of the smaller Southern furnaces are pressing this market with low prices. The larger producers, however, are holding up, and at present refuse concessions. Consumers generally are beginning to restrict further purchases until after January. The outlook though fair is by no means encouraging.

Quotations per gross ton f. o. b. Chicago, are Lake Superior charcoal, \$16.07@17.25. Lake Superior coke, No. 1, \$14.25@14.75; No. 2, \$13.75@14; No. 3, \$13.25@13.75; Lake Superior Bessemer, \$15.50; Lake Superior Scotch, \$15@15.50; American Scotch, \$16.50@17; Southern coke, foundry No. 1, \$14.50; No. 2, \$13.10; No. 3, \$12.85; Southern coke soft, No. 1, \$13.85; No. 2, \$13.10; Ohio silveries, No. 1, \$17; No. 2, \$16.50; Ohio strong softeners, No. 1, \$17; No. 2, \$16.50; Tennessee charcoal, No. 1, \$17; No. 2, \$16.50; Southern standard car wheel, \$20@21.

Steel Billets and Bars.—The weakness which has developed in Pennsylvania is reflected here, and quotations on billets are \$24.75@25, and on rods \$33.50 in round lots for next year.

Structural Iron and Steel.—A large tonnage of elevated railroad structural work will be offered for bids soon. Several important projects, the plans for which are well under way, will materialize within a few weeks. Demand is seasonably good. Quotations, car lots, f. o. b. Chicago, are as follows: Angles, \$2@2.20; tees, \$2.35@2.45; universal plates, \$1.95@2; sheared plates, \$1.95@2; beams and channels, \$2.35@2.50.

Plates.—Warehouse business is of very fair proportions as all boiler shops are well employed. Competition by agents on all mill orders is brisk and prices suffer. Steel sheets, 10 to 14, \$2.30@2.40; iron sheets, 10 to 14, \$2.20@2.30; tank iron or steel, \$2.05@2.15; shell iron or steel, \$2.50@2.75; firebox steel, \$1.25@1.50; flange steel, \$2.75@3.00; boiler rivets, \$4.00@4.15; boiler tubes, all sizes 65% and firm.

Merchant Steel.—Orders for soft steels are getting scarcer each week, and the tonnage placed is now very light. We quote: Tool steel, \$6.50@6.75 and upward; tire steel, \$2.10@2.20; toe calk, \$2.30@2.40; Bessemer machinery, \$2.10@2.20; Bessemer bars, \$1.70@1.75; open hearth machinery, \$2.30@2.40; open hearth carriage spring, \$2.10@2.20; crucible spring, \$3.75@4.

Galvanized Sheet Iron.—Demand is rapidly falling off from consumers as well as the jobbing trade. The sales have been exceedingly large this season. Discounts remain unchanged at 70% and 10% off on Juniata and 70@15% and off on charcoal, and jobbing quantities at 70%@5% off on the former and 70% and 10% off on the latter.

Black Sheet Iron.—Orders are much smaller particularly on the lighter gauges. We still quote iron sheets at 2 85c. for No. 27, common; steel sheets are 3c. Jobbers quote 3@3 1/10c. for iron and 3 1/10@3 1/15c. for steel, same gauge.

Bar Iron.—Several specifications for cast iron, for delivery next year, are being figured on, and competition is keen. Consumers generally are buying very lightly. Regular mill quotations f. o. b. Chicago are 1 60@1 62 1/2c., according to location of mill, and some ask 1 65c. flat, but taking no business. Jobbing rates are 1 75@1 80c., with 10c. added for steel bars.

Nails.—Steel cut nails are in much less demand than wire nails, and mill price on both are practically the same, \$1.62 1/2 Chicago. There is, however, a difference of 5/16c. in jobbing quotations: Wire, \$1.75; cut, \$1.70, in less than car loads.

Steel Rails.—Inquiry at the various offices of the local and Eastern rail makers shows that not only are orders small and unimportant in character, but also that there is as yet no inquiry coming forward for next year. Mill price is unchanged, at \$31@32. Track repair material is in light demand at 1 70c. for iron or steel splice bars; spikes, \$2.07@2 15 for 100 lbs.; track bolts, hexagonal nuts, \$2.65; square, \$2.55.

Scrap.—With the exception of cast, demand is very light. The Calumet Iron Works will probably prove a boon to dealers when they start up next month No. 1 railroad, \$15.50; No. 1 forge, \$15.00; No. 1 mill, \$9.50; fish plates, \$16.50; axles, \$19; horseshoes, \$16; pipes and flues, \$7; cast borings, \$6; wrought turnings, \$8; axle turnings, \$9.50; machinery castings, \$10; stove plates, \$6.50; mixed steel, \$10.50; coil steel \$15; leaf steel, \$15.50; tires, \$14.50.

Old Material.—Locally there is little demand for iron rails and a nominal quotation would be \$18.50. Old steel rails are dull at \$12.50@14.50, according to condition and length. Car wheels are a drug on the market at \$14.50 and \$15 nominally.

Louisville. Dec. 8.

(Special Report by Hall Bros. & Co.)

The market has ruled quiet the past week. Inquiries have been out for lots ranging up to 500 tons for quick delivery. There has been a good demand for mottled, but the supply of this grade is light. Prices remain unchanged and the general market is strong.

Hot Blast Foundry Irons.—Southern coke No. 1, \$13.50@13.75; Southern coke No. 2, \$12.50@12.75; Southern coke No. 3, \$12@12.25; Southern charcoal No. 1, \$16@17; Southern charcoal No. 2, \$15.50@16.

Forge Irons.—Neutral coke, \$11.50@12.00; mottled, \$11@11.25.

Car Wheel and Malleable Irons.—Southern (standard brands), \$20@21; Southern (other brands), \$18.50@19.50; Lake Superior, \$19.50@20.50.

Philadelphia. Dec. 8.

(From our Special Correspondent.)

Pig Iron.—Dullness characterizes the iron market in nearly all branches. The disposition to buy freely of winter iron, which showed itself a month ago, has disappeared, and buyers are now waiting. The fact is kept in mind that production is heavy, and that a further accumulation is probable. Mill consumption for this month will be 25% less than usual. Foundry requirements are being covered in a very cautious way. No. 1 is held at \$15@15.75, with no pressure to sell. No. 2, \$14@14.75; mill brands, \$12.75@13.50. Bessemer has weakened to \$15.75.

Muck Bars.—Offers were made this week to furnish a good quality of bars at \$24.50. Buyers say this is low enough, but they don't want to do business at any price until they see farther.

Steel Billets.—A tumble in prices took place early this week, from \$25.50 to \$24.75, and rumor has it at less. To-day's quotations for Susquehanna points are \$24.25. Schuylkill Valley points, \$24.75. Manufacturers look solemn, and say there will be a grand surprise for buyers early in January. Buyers smile, and say they are ready for it.

Merchant Iron.—The orders for the past week have been for small retail lots only. The holiday suspension will not help prices. Stores are well supplied, and mills are ready to shade even more for a good sized order. Prices 1 60@1 75c.

Nails.—The six weeks restriction this month and next will help to clear out some of the surplus stocks, but it is doubtful whether prices will improve. There is very little business doing.

Skelp.—A good business is being done in skelp at 1 60 for grooved and inquiries are before the trade to day for large lots, but buyers expect impossible figures.

Wrought Iron Pipe.—The week's business sizes up well. Some large lots have been contracted for and it is known that there is a good deal of business to be disposed of in January. Butt black 55.

Sheet Iron.—All kinds continue in good demand especially light sheet at 2 75 to 3 50 for best refined. Two or three large buyers are sounding the trade on the nature of concessions, but prices are pretty firmly adhered to.

Plate and Tank.—The Cramp Ship Yard requirements will be for seventeen or eighteen thousand tons, if all requirements will be covered at one time, which is doubtful. Large buyers regard an upward tendency in plates as probable during the winter, and hence it is expected there will be some large contracts placed before long. At present business is not active and prices are weak.

Structural Material.—The only statement that could be obtained to day was that a very large volume of business is likely to be done early next year in bridge building and elevated railroad work angles, 1.85; beams, ties and channels, 2.10@2.20.

Steel Rails.—A large amount of railroad building has been recently projected, but as yet, no effort is made to buy rails. Neither is any inducement held out. Quotations \$30.

Old Rails.—Iron are offered at \$15, and steel at \$15.

Scrap.—No. 1 R. R. is offered at \$16. Stocks large and accumulating.

Pittsburg, Dec. 8.
(From our Special Correspondent)

Raw Iron and Steel.—The iron and steel trade has developed no particular new feature since the date of our last report. The approach of the end of the year tends to restrict purchases to immediate wants, and consumers who did not place orders during October for their requirements into the new year are showing great conservatism in making contracts for any material in excess of their present wants unless more satisfactory terms than those now in force can be secured. Since many of the leading producers have either sufficient orders on their books to carry them along into the new year, or have reduced their stock-pile to a favorable point, there is considered to be no advantage in stimulating business by concession in quoted rates. The furnace men point to the heavy consumption of all forms of iron and steel, that is now in progress, as emphasizing their position that the opening of the new year will find trade in a healthy condition. The key to the situation appears to be the present relative position of production and consumption, and both sides await the report of the condition of the furnaces at the close of November.

The future course of the market, therefore, appears to depend largely on the activity among the general pig iron consuming industries of the country and the rate at which the production of crude iron continues during the closing weeks of the old year. A leading Eastern dealer describes the situation as follows: "The market, taken as a whole, shows strength, although in a measure the strength is of a negative character; that is to say, holders won't shade prices, neither are they particularly anxious for business at quoted rates. The reason for this may be, first, that there is not a great deal of iron on hand, and for the second that the present schedule expires on the 31st, and sellers are unwilling to commit themselves to important engagements until they know for certain what it will cost to deliver. So far as regards pig iron, therefore, it is not to be wondered at that business is dull, although, in the meantime, the dullness proves nothing as to the general character or probable course of the market. To all intents and purposes it is a waiting market, and it is almost impossible to say for certain which side will have the advantage 60 days hence." As a general rule business, so far as relates to iron, is dull, as manufacturers and other dealers make it a rule to close their works for repairs and stock-taking on the first of January, the time occupied being two to four weeks, according to circumstances. One of the greatest drawbacks to trade at present is want of confidence. If any correct idea could be formed of what the tariff revision would amount to calculations could be made; at present we are all in the dark.

Bessemer pig iron weaker; prices show a slight decline, viz.: \$13.90@14.25; grey forge, \$12.50@12.75. Soft Steel Billets.—Mills are all busy and will be the balance of the year; prices the same as for some weeks past. Muck Bar.—Demand restricted, prices nominal. Steel rail market quiet, unchanged; nominal rates f.o.b., at works \$30. The inquiry for finished iron and steel is moderate, but the mills are not competing sharply for business and the tone is steady.

Coke Smelted Lake and Native Ore.

2,500 Tons Bessemer, December, January	\$14.00 cash.
2,000 Tons Bessemer, December	14.00 cash.
1,500 Tons Bessemer, January, February	13.90 cash.
1,500 Tons Grey Forge	12.50 cash.
1,000 Tons Grey Forge, December	12.50 cash.
1,100 Tons Bessemer, January, February	13.85 cash.
1,000 Tons Bessemer, December	13.90 cash.
500 Tons No. 2 Foundry	13.50 cash.
500 Tons Grey Forge	12.50 cash.
500 Tons Bessemer	14.00 cash.
500 Tons Bessemer, Standard	14.25 cash.
500 Tons off Bessemer	13.50 cash.
500 Tons Low Phosphorus	20.00 cash.
370 Tons No. 2 Foundry	13.50 cash.
300 Tons No. 1 Foundry	14.50 cash.
100 Tons No. 1 Silvering	16.25 cash.
100 Tons extra Mill	12.75 cash.
50 Tons No. 2 Foundry	13.75 cash.

Charcoal.

75 Tons Lake Superior	19.00 cash.
75 Tons Southern Charcoal	17.00 cash.
50 Tons Cold Blast	24.00 cash.
50 Tons No. 2 Foundry	19.00 cash.

Steel Blooms, Billets and Slabs.

3,000 Tons Steel Billets, Dec., Jan., Feb., March	23.00 cash.
1,500 Tons Billets, next 3 months	23.00 cash.
1,000 Tons Billets and Slabs, Jan., Feb., March	23.00 cash.
500 Tons Billets, Jan., Feb.	22.75 cash.
570 Tons Billets, Dec.	24.00 cash.

Muck Bar.

700 Tons Neutral	24.65 cash.
500 Tons Neutral, Dec.	24.75 cash.
500 Tons Neutral, Jan.	24.60 cash.

Skelp Iron.

700 Tons Sheared Iron	1.80 4 m.
650 Tons Wide Grooved	1.57 1/4 4 m.
5.0 Tons Narrow Grooved	1.60 4 m.

Skelp Steel.

55 1/2 Tons Wide Grooved	1.50 4 m.
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Spelter.

160 Tons Spelter, first three months, 1893	34.30 cash.
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Steel Wire Rod, five-gauge American.

700 Tons Five-Gauge American, at mill	31.00 cash.
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Sheet Bars.

600 Tons Sheet Bars, at mill	29.00 cash.
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Ferro-manganese.

100 Tons 80 per cent. Domestic	62.50 cash.
60 Tons 80 per cent. Foreign	61.85 cash.

Old Iron and Steel Rails.

1,000 Tons American T's	20.50 cash.
500 Tons " " Youngstown	20.50 cash.
500 Tons " " Youngstown	20.75 cash.
500 Tons Old Steel Rails mixed	15.35 cash.

Scrap Material.

300 Tons Cast Scrap, gross	11.85 cash.
250 Tons No. 1 R. R. W. Scrap, net	16.25 cash.
150 Tons Iron Axles, hammered, net	25.00 cash.
100 Tons Iron Axles, net	22.00 cash.
50 Tons Charcoal Scrap, gross	17.00 cash.
50 Tons Cast Borings, gross	7.50 cash.

COAL TRADE REVIEW.

New York, Friday Evening, Dec. 9.

Statement of shipments of anthracite coal (approximated) for the week ending December 3d, 1892, compared with the corresponding period last year:

Regions.	1892.		Difference.
	Dec. 3, 1892.	Dec. 5, 1891.	
Wyoming Region	Tons. 459,713	Tons. 466,698	Dec. 6,885
Lehigh Region	132,228	130,090	Inc. 2,138
Schuykill Region	285,323	292,090	Dec. 5,767
Total	877,264	888,788	Dec. 10,524
Total for year to date	38,069,991	37,550,811	Inc. 1,059,180

PRODUCTION OF BITUMINOUS COAL for week ending December 3d, and year from JANUARY 1st.

EASTERN AND NORTHERN SHIPMENTS.

	1892.		1891.
	Week.	Year.	
Phila. & Erie R. R.	1,969	88,280	150,066
Cumberland, Md.	76,055	3,542,567	3,864,566
Barclay, Pa.	1,172	68,123	181,952
Broad Top, Pa.	12,724	578,469	476,915
Clearfield, Pa.	83,311	3,692,594	3,717,651
Allegheny, Pa.	23,968	1,183,860	1,147,298
Beach Creek, Pa.	36,731	2,083,603	2,220,509
Pocahontas Flat Top	59,921	2,444,207	2,131,533
Kanawha, W. Va.	*94,753	2,476,044	2,250,060
Total	390,604	16,152,687	16,241,150

*Week ending November 30th.

WESTERN SHIPMENTS.

	1892.		1891.
	Week.	Year.	
Pittsburg, Pa.	29,071	1,171,264	1,171,368
Westmoreland, Pa.	41,683	1,685,299	1,811,410
Monongahela, Pa.	12,226	615,416	560,618
Total	82,980	3,471,979	3,543,396
Grand total	473,584	19,564,666	19,784,546

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending November 30th, 1892, and year from January 1st, in tons of 2,000 lbs. Week, 112,521 tons; year 4,493,350 tons; to corresponding date in 1891, 4,087,644 tons.

Anthracite.

The re-assembling of Congress has caused a postponement of the investigation of the combine, which has not been completed. There are several important witnesses to be examined yet, and much pertinent testimony to be adduced.

Up to this time it is questionable if a single vital fact has been gained by the Committee. It is certain that the responsibility for the combine has not been fixed upon the mining companies, the transportation companies, or the sales agents. This may be because they are all tarred with the same stick, no one of them being solely responsible for the advance of \$1.50 per ton on chestnut coal.

In the latter part of last winter coal that is now selling for \$4.50 was sold for \$3.00. This price was too low and we are free to say so, in consideration of the condition of the trade at that time. It may seem paradoxical to say that coal can be too cheap, but such was the fact. The producer of coal has rights as well as the transporter and the consumer. When by a foregathering of unusual conditions the price of coal at tide-water leaves miners and shippers with a profit that is as much too low as the present price is too high, they have a right to seek more remunerative rates. The chief difficulty is with the transportation, and when miners and transporters are the same people under different names the difficulty is increased.

The present combine is made up of companies that mine and transport their own coal. The sales agents stand in close connection with them and are, so far as concerns the sale of the product, acting under instructions. We say in all deference to the prominent gentlemen who have appeared before the committee that it is impossible for them to separate their interests from those of the sales agents, and that when they plead ignorance of how the prices are fixed they occupy a very absurd position. The essential point of the whole matter is whether the advance can be justified. At present it does not appear to us that it can, but, as we remarked last week, all of the testimony is not in, in fact, the most important witnesses have not yet been examined, and by the most important, we mean those whose information is not eclipsed by forgetfulness, or overshadowed by a desire not to know too much.

There has been a strange reluctance to tell the whole story, and this has created the suspicion that the story is not creditable to those concerned. There is in the public mind an impression that when great companies combine and the price of what they have to sell goes up they must be held to answer, *pro bono publico*. Take the combination at present under discussion. The five or six companies composing it control not less than 80% of the total output. When the agreement was made the price of coal was low. Let us allow that it was too low.

The price goes up. What is the first important question that most people wish answered? It is, "Was the combination illegal?" If it was then, it must be destroyed; if it was not the further question arises, "Is the advance justifiable?"

It seems to us that it should have been easy to decide whether or no the combination was illegal. The law on such matters is explicit, and he that runs may read. There has not been the diligence in investigating this question that is merited by its importance, and, so far as concerns the judicial decision, we are yet in darkness.

But allowing its legality, and this we are bound to do until, after proper investigation, it is found to be otherwise, the question as to the justness of the advance is not so easy of solution. All advances in the price of widely consumed materials are not robberies under the forms of law.

The trouble just now is that instead of explaining the advance in all its bearings and justifying it, if possible, the companies have been looking around the back gate like a boy who has his own private reasons for avoiding the maternal eye. The bulge in his pockets may not be chargeable to undue intimacy with the neighbor's orchard, but it is just as well to be sure.

The trade is in good condition at present, for people must keep warm and boilers must be fired up no matter whether coal is high or low. We pay the bills trusting with proverbial American philosophy in a general evening up some day or other.

There are reports of cutting of circular rates, even as much as 30c. per ton, and it is possible that they are true. Tide-water shipments may counteract the falling off of west-bound coal and allow for restricted production. At the present writing it appears that the close of the year will find from 1,250,000 to 1,500,000 tons in stock at tide-water and perhaps nearly as much more at inland points.

Bituminous.

The car famine continues to embarrass the trade. From other quarters come complaints of lack of cars, and there seems to be good reason for the opinion that the railroad companies have not sufficient facilities for handling shipments. At one time it was lack of engines, and now it is lack of cars. Something seems to happen to the cars on the way back, for they don't get back.

As we remarked last week the railroad managers do not seem to appreciate the situation fully. The importation of coal to tide water points would do away with some of their business, and if consumers cannot get domestic coal they will take what they can get. A word to the wise used to be sufficient, but in these days old maxims are not considered applicable. "What people want is coal, home coal if possible, foreign coal if need be. They prefer American coal because it is the best, but if they cannot get the best they will put up with inferior stuff, especially if the price is lower.

Boston.

Dec. 8.

(From our Special Correspondent.)

This has been another quiet week in the anthracite coal trade. Retailers do not seem to have got ready as yet to lay in new stocks, and in fact will not be able to buy much until next month. The retail trade has really been poor of late, and unless there is a decided improvement in it soon, retailers will not find it necessary to lay in fresh stocks. One very good feature to the market is the firmness with which prices are maintained. I hear of no concessions from the agents' list.

Quoted prices are f. o. b. New York: Stove, \$4.75; Egg, \$4.40; Free broken, \$4.00; Chestnut, \$4.65; Lykens Valley (at Philadelphia), Broken, \$4.85; Egg, \$5.45; Stove, \$6.00; Chestnut, \$5.00.

The demand for bituminous coal continues, but there is still difficulty experienced in getting the coal. Dealers here are pleased to see such a paper as the ENGINEERING AND MINING JOURNAL show up the Mystic Wharf nuisance, and say that it has probably stirred up the officials of the company some, as the supply of cars has been better this week than for many. The dealers here have not had much support in this matter from Boston journals, and thoroughly appreciate our favor of last week. As for prices, it may be said that they hold very firm. George's Creek on cars here is worth from \$3.60@3.65 per ton, and Clearfield \$3.25 per ton.

The freight rates are steady and unchanged, viz.: from New York to Boston, 55@60c.; from Philadelphia to Boston, 80@90c.; to Bath, 90c.; to Providence, 70c.; from Baltimore to Boston, 90c.; Newport News to Boston, 80c.; Sound points, 70@75c.

In a retail way as above stated there is but a moderate business doing, and very moderate at that. Retail prices in this market are: Stove, \$6.25; nut, \$6.25; egg, \$6.00; furnace, \$5.75; Franklin, \$7.50; Lehigh egg, \$6.25; Lehigh furnace, \$6.25. Wharf prices are 50c. less than the foregoing.

The receipts of coal at the port of Boston for the week ending December 3d were: 19,668 tons of anthracite and 8,302 tons of bituminous, against 48,452 tons of anthracite and 14,471 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 1,912,883 tons of anthracite and 786,293 tons of bituminous, against 1,925,353 tons of anthracite and 935,321 tons of bituminous for the same time last year.

Buffalo.

Dec. 8.

(From our Special Correspondent.)

The trade in bituminous coal is without new features other than the demand has nearly ceased from

vessel owners, as the close of navigation for the season of 1892 has arrived. Local requirements of manufacturers for bituminous coal keep steadily along and a good business is being done at the unchanged low quotations, with supply fully adequate to fill all orders given. There is no trouble now about lack of cars, and everything is working well at the mines, so that the close of the season finds the producers and dealers, as well as consumers, in a happy frame of mind.

Anthracite coal steady with small trade doing for local wants. Mild weather continues as a rule from day to day. Shippers by railroads are filling orders but there is no rush.

The Eastern adjunct of Depew, just outside our city limits, is growing rapidly. The shops are nearly completed and will be ready for occupancy before many weeks elapse. A large box car and gondola manufacturing plant is among the industries located at this point. Probably 30,000 people will be employed in the locality named by the spring of 1893.

From December 1st to 7th, 23,500 net tons of coal have been shipped westward by lake, distributed thus: 12,800 to Chicago, 4,900 to Milwaukee, 2,000 to Gladstone, 1,800 to Green Bay and 2,000 to Toledo.

Canals of the State of New York closed last Monday at midnight.

Mr. Ralph E. McWilliams has been appointed Western sales agent of the New York, Ontario & Western Railway Company, with headquarters in Buffalo. He will have charge of the sales and shipment of the Lackawanna Valley coal for this city and points west by rail and water.

The coal traffic through the Sault Ste. Marie canal from the opening to November 30th, this year was 2,904,266 net tons, as compared with 2,507,522 net tons in 1891, 2,176,585 net tons in 1890, and 1,629,197 net tons in 1889.

The following coal statistics were collated by Mr. William Thurstone, secretary of the Buffalo Merchants' Exchange, on December 1st, 1892: Railroad receipts and shipments of coal at Buffalo not reported by request. Receipts of coal by lake thus far this season none. Shipments of coal by lake westward for month of November, 469,248 net tons, as compared with 353,330 net tons in 1891, and 356,040 net tons in 1890; for the season to December 1st, 2,815,880 net tons, as compared with 2,306,330 net tons in 1891, and 2,146,910 net tons in 1890. The receipts of coal by canal for the month of November, 6,622 net tons, as compared with no net tons in 1891 and 9,812 net tons in 1890; total receipts for the season to December 1st, 53,451 net tons, as compared with 817 net tons in 1891 and 41,264 net tons in 1890. The shipments of coal by canal for the month of November, 3,637 net tons, as compared with 5,317 net tons in 1891, and 9,798 net tons in 1890; total shipments for the season, 29,214 net tons, as compared with 34,058 net tons in 1891, and 25,782 net tons in 1890. The aggregate shipments of coal by lake this year to December 1st, as compared with 1891, shows an increase of 419,500 net tons, and as compared with 1890 an increase of 668,970 net tons. The rate of freight on coal from Buffalo to points named by lake during the month of November were as follows: 75c. to Chicago, 70c. to Milwaukee, 35c. to Duluth and West Superior, 75c. to Green Bay, 40c. to Toledo, 25c. to Detroit, 90c. to Racine, 40c. to Saginaw, 35c. to Bay City and 50c. to Washburn, per net ton, free on and off. A year since the rate during November was 60c. to Chicago and Milwaukee, 25c. to Duluth and West Superior and 25c. to Detroit and Toledo.

Chicago.

Dec. 8.

(From our Special Correspondent.)

Although December 1st practically closed lake navigation, even for large steamers, several coal carrying boats have arrived this week, but are not yet unloaded. As the coal chutes at Buffalo have been closed for the season, these vessels will probably be the last to bring in coal this year. The mild weather has dropped the bottom out of the anthracite coal trade, and there is getting to be considerable anxiety on the part of certain of the shippers to move a portion of the stocks they have on hand. Some of them are offering indirect concessions to the retail dealers to draw the little coal they are selling from these shippers' yards. For instance, a small dealer will be told he can have pea coal at \$1.50 per ton for all he can sell in his trade, providing he will draw his other sizes from same yards. Another will offer Hocking, Indiana hock, Wilmington or other Illinois soft coal at 50c. less than circular prices, under the same conditions; while still another shipper appears to have for his country trade an absolutely indefinite amount of grate coal at \$5.85, but this same grate has a wonderful resemblance to small egg, range and chestnut in size as shipped to the dealer. It is also intimated that this particular shipper has the sizes of coal very badly mixed at his yards for wagon delivery, and dealers are very apt to get nut, range or small egg on grate orders. Trade is dull and with no prospect of improvement until colder weather sets in. The first part of December having passed without real cold weather, leads consumers to hope that there cannot be much more winter, and the best the dealers and shippers can hope for is cold, wet raw weather, which will, to a limited extent, help them out on their stocks next spring. We now look for considerable coal carried over. All rail coal is coming forward very freely, and some hustling has to be done to avoid demurrage charges. Bituminous coal is in better supply, and the mild

weather of the past few days is enabling shippers to catch up with their orders. The stringency of a week ago has been relieved. Hocking coal is going forward much more freely, and supply is now fully equal to demand. Still the call for outside coal from the territory usually reached from Milwaukee and Duluth is enormous, owing to the short stocks at both of those points. The miners themselves in the Peoria district have declared the strike off, the men returning to work at the contract price agreed upon last May. In the Wilmington district of the Northern Illinois coal field, business at this writing is limited only by car supply and mining capacity. On that account, from car supply, some of the mines are unable to make full time. Piedmont smithing coal is very scarce. One effect of the continued mild weather is the cancellation of orders from country dealers and some large consumers are also requesting the curtailment of shipments. Should this unseasonable weather continue we may have a plethora of soft coal such as we experienced last winter.

Coke is in moderately fair demand and is hardly up to the tonnage of November; this largely on account of slowing up work at some of the structural foundries. Crushed coke for domestic use is gaining many converts, but, like anything else newly introduced into fresh territory, the growth is slow but, nevertheless, sure, as this fuel is a splendid substitute for anthracite coal. Shippers view the prospect as most encouraging.

Quotations are: \$4.65 furnace; \$5.05 foundry; crushed, \$5.40 Connellsville; West Virginia, \$3.90 furnace, \$4.10 foundry; New River foundry, \$4.75; Walston, \$4.65 furnace, \$5 foundry.

Circular prices are at the following rates: Lehigh lump, \$6.50; large egg, \$5.85; small egg, range and chestnut, \$6.10. Retail prices per ton are: Large egg, \$7.25; small egg, range and chestnut, \$7.25.

Prices of bituminous per ton of 2,000 lbs. f. o. b. Chicago, are: Pittsburg, \$3.40; Hocking Valley, \$3.20; Youghiogheny, \$3.25; Illinois hock, \$1.90@2; Brazil hock, \$2.00@2.75.

Pittsburg.

Dec. 8.

(From our Special Correspondent.)

Coal.—There has been no particular change in the situation since our last. The strike still continues. Report says that men are leaving the ranks of the strikers and that the end is not far off. The amount of coal loaded in the pool is variously estimated; one of the best informed says it will reach 6,000,000 bushels. There are plenty of empties, enough to give the miners employment for several months to come. Capt. John H. Ward & Sons intend to mine coal with machinery. One of the firm said they expected to be ready to commence operations in two weeks.

A labor union paper says, editorially, that the strike is lost to the miners, and points out the utter uselessness of continuing the struggle when there is no hope of winning, and urges the men to return to work as quickly as possible and get their old places before new men are brought in to fill them.

The sudden death of Commander Joseph Walton, one of the largest coal shippers, has cast a gloom among business circles.

He was very wealthy, gave liberally to all worthy objects and was highly esteemed. He was a truly honest man.

The rate paid for mining in the Kanawha district ranges from 2@3c. per bushel, viz.: Bancroft & Carver, 2½c.; Raymond City, 2c.; Winfield, 2-in. screen, 2½c.; Black Diamond, 2½c.; Coalbury Cedar Grove, Belmont, Haney and Kanawha, 3½c.

Connellsville Coke.—The demand has fallen off, but only slightly, and production has been correspondingly reduced. The Pittsburg shipments shows a decrease of 200 cars for the week, and there is a falling off in Western shipments supposed to be only temporary and has little significance as to the future of the trade. Cars are still in short supply. Report says furnace coke is still being scaled 10@15c. per ton, but foundry and crushed holds up to market rates.

The output for the region was 66% of the capacity, and estimated at 120,974 tons. Shipments aggregated 115,598 tons, distributed as follows: To Pittsburg, 1,800 cars; points east of Pittsburg, 1,100; points west of Pittsburg, 3,182; total, 6,082 cars; showing a decrease of 418 from shipments of the previous week. Western shipments decreased 318 cars; Eastern shipments increased 100 cars, and Pittsburg shipments decreased 200 cars.

CHEMICALS AND MINERALS.

New York, Friday Evening, Dec. 9, 1892.

Heavy Chemicals.—As usual at this time of the year the market for heavy chemicals has been very quiet during the week. Practically nothing of interest has occurred since our last report. Caustic soda and carbonated soda ash have been without much activity. In alkali a better business was done for future delivery. Bleaching powder is steady but without new features.

Our quotations to-day are as follows: Caustic soda, 60%, 3-17½@3-27½c.; 70%, 2-95@3-12½c.; 74%, 2-97½@3-15c.; 76%, 3-12½@3-25c.; 77%, 3-12½@3-25c. Carbonated soda ash, 48%, 1-57½@1-60c.; 58%, 1-47½@1-52½c. Alkali, 48%, 1-50@1-55c.; 58%, 1-40@1-50c. Sal soda, English, 1@1-05c.; American, 95@1c.; on the spot shipments, in quantities, 97½@1c.; for English and 90@95c. for American; bleaching powder, 2-50@2-6c.

Acids.—The acid market is in as good condition to-

day as we have been reporting for some time past. Manufacturers state that the demand continues steady, and a good volume of business is doing. Prices are without change, and we quote: Acid, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, \$1.00@1.25, according to quality; muriatic, 18°, 90c.@1.10; 20°, \$1@1.25; 22°, \$1.25@1.50; nitric, 40°, \$4; 42°, \$4.50@4.75; sulphuric, 85c.@1.10; mixed acids, according to mixture; oxalic, \$6.50@7.25. Blue vitriol is quoted all the way from \$3.25@3.75; Glycerine for nitro-glycerine, 11¼@12¼c., according to quality and quantity.

Brimstone.—There is no change to report in the brimstone market, which continues quiet. Quotations for best unmixed seconds are as follows: On the spot, \$26; to arrive, now due, \$24; due January 1st, \$23; future shipments, \$21@21.50. For best unmixed thirds the price is from 75c. to \$1 less.

Fertilizing Chemicals.—The fertilizer market is in fairly good condition. Owing to the advance in cotton the inquiry from the South for double manure salts has been considerable. Owing to the results obtained by the use of sulphate of potash in orange trees in Florida the demand for this salt from that section has doubled and bid fair to keep up for next season. The short fish catch, the falling off in the killing of hogs in the West, and the greatly reduced yield of cotton seed meal due to the failure of the cotton crop in some sections and the diminished planting in the entire cotton belt, have combined to make the demand for such ammoniates as tankage and hood unprecedentedly large and prices have advanced rapidly. Our quotations this week are as follows: Sulphate of ammonia, \$2.90 @ \$2.95 for bone goods and \$2.95 @ \$3 for gas liquor. Dried blood, \$2.35@2.37½ per unit for high grade and \$2.25@2.30 for low grade; acidulated fish scrap, no stocks on hand; dried scrap, \$26.50; Azotine, \$2.30. Tankage, high grade, \$24.50; low grade, \$20@22, according to grade. Bone tankage, \$22.50@23.50; bone meal, \$23.50@25.50.

Double manure salts are unchanged. The price has been fixed by the syndicate's agents, and has not changed during the year. Quotations are as follows: \$1.13½ cwt., basis 48@50%, in 50 ton lots, on foreign weights and analysis. High grade sulphate, \$2.13 cwt. basis 90%, foreign weights and tests.

Phosphates.—Phosphate rock, Florida, 60@70%, is quoted from Punta Gorda at \$4.50 per ton of 2,240 lbs. Charleston rock is quoted at \$4.50@5 f. o. h. Charleston.

Kainit.—There is nothing of interest to report of Kainit. Prices continue as follows: \$8.75 for invoice weight and \$9 for actual weight. New York and Philadelphia; Southern ports \$1 higher.

Muriate of Potash.—There is no change in the position of this salt. Arrivals thus far this month aggregated 1,000 tons. New sales were 100 tons for future shipments. Prices are: For 50 tons or over, New York or Boston, \$1.81½; Philadelphia or Baltimore, \$1.84; Southern ports, \$1.86½.

Nitrate of Soda.—The nitrate market is strong. Quotations for goods on the spot are: \$2.15@2.17½.

Liverpool.

Nov. 30.

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

Trade generally in heavy chemicals is very quiet so far as prompt delivery is concerned, but at the same time there is a very fair inquiry for delivery over 1893.

Soda Ash continues scarce for the balance of this year and quotations are nominal as follows: Caustic ash, 48%, £5 6s. 3d. per ton upwards; 57 and 58%, £6 7s. 6d. per ton and upwards. Carh ash, 48%, £5 7s. 6d. per ton and upwards; 58%, £6 10s. Ammonia ash, 58%, £6 7s. 6d., all net cash.

For contracts over 1893 values are about 10@15s. per ton under spot quotations, according to market. Transactions are reported for forward delivery but on private terms and particulars are not allowed to transpire.

Soda crystals are in moderate demands at £3 3s. 9d. to £3 5s. per ton less 5% are nearest values.

Caustic soda is receiving little attention at present. Foremost markets quotations are nominal as follows: 60%; £9 2s. 6d. per ton; 70%, £10 5s. per ton; 74%, £11 5s. per ton; 76%, £12 2s. 6d. per ton and upward. All net cash. For parcels under 10 tons 5% per ton extra is charged. For Continental orders a concession of 10f from 10@15s. per ton on quotations named above, is made according to market. For contracts over 1893 about 10s.@20s. per ton, represent concessions which would be made, according to market.

Bleaching powder is steady at about £7 12s. 6d. to £7 15s. per ton, net cash, for hardwood casks, but there is little fresh business reported.

Chlorate of potash is easier, and quotations somewhat nominal at about 8¼d @8d. per lb. for December, and 7½d.@7¼d. for January, March, and 7d. April, December, 1893. In the absence of business it is not very easy to give quotations at the moment. Bicarb soda is firm at £6 15s. per ton, less 2¼% for one cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is in request and values very firm at £10 7s. 6d. @£10 8s. 9d. per ton, for good grey 24%, and £10 10s. @£10 11s. 3d. per ton for 25%, both in double bags less 2¼% f. o. b. here; with a tendency to higher figures.

Nitrate of soda is not active, but price steady at £9 5s. @£9 7s. 6d. per ton, less 2¼%, for double bags, f. o. b. here.

Carb. ammonia 3d. per lb. lump, 3¼d. per lb., powdered net cash.

NEW YORK MINING STOCKS QUOTATIONS. DIVIDEND-PAYING MINES. NON-DIVIDEND-PAYING MINES.

Main table of New York Mining Stocks Quotations, listing various mining companies and their stock prices for different dates from Dec. 3 to Dec. 9, 1892.

*Ex-dividend. †Dealt in New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 19,067 Non-dividend shares sold, 47,000. Total shares sold, 66,067

BOSTON MINING STOCK QUOTATIONS.

Main table of Boston Mining Stock Quotations, listing various mining companies and their stock prices for different dates from Dec. 2 to Dec. 8, 1892.

Dividend shares sold, 5,417. Non-dividend shares sold, 2,980. Total shares sold, 8,397.

DIVIDEND-PAYING MINES

Table of Dividend-Paying Mines, listing company names, capital stock, shares, and assessment details.

NON-DIVIDEND PAYING MINES

Table of Non-Dividend Paying Mines, listing company names, capital stock, shares, and assessment details.

DIVIDEND-PAYING MINES.

NON-DIVIDEND PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, Date and amount of last, etc. Lists various mining companies and their financial details.

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * 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 Cons. Virginia \$42,900,000. ** 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 \$150,000 before the reorganization in 1880. ‡‡ This company acquired the property of the Raymond & Ely Company which had paid \$3,075,000 in dividends. ††† Previous to this company's acquiring Northern Belle, that mine declared \$2,400,000 in dividends against \$425,000 in assessments.

STOCK MARKET QUOTATIONS

Table with columns: Baltimore, Md., Dec. 8, COMPANY, Bid, Asked. Lists various coal and gas companies.

Pittsburg, Pa.

Table with columns: COMPANY, H, L. Lists gas and coal companies.

St. Louis, Dec. 6.

Table with columns: Bid, Asked. Lists various commodities.

Colorado Springs, Colo., Dec. 5.

Table with columns: Bid, Asked. Lists various commodities.

Denver.

Table with columns: High, Low, Sales. Lists various commodities.

Deadwood.

Table with columns: Bid, Asked. Lists various commodities.

Foreign Quotations.

Table with columns: London, Nov. 20, Highest, Lowest. Lists various foreign commodities.

Paris, Nov. 24.

Table with columns: Francs. Lists various commodities.

San Francisco, Cal.

Table with columns: CLOSING QUOTATIONS, Dec. 2, Dec. 3, Dec. 4, Dec. 5, Dec. 6, Dec. 7, Dec. 8. Lists various commodities.

CURRENT PRICES.

Large table listing various chemical and industrial products with their prices.

Table listing various metals and minerals with their prices.

THE RARER METALS.

Table listing various rare metals and their prices.

At the solicitation of many of our subscribers, the Coal Stock table will be enlarged so as to embrace the more important railroad stocks and securities, Although unavoidably held out this week, it will appear in our next issue in its improved and enlarged form.