THE ENGINEERING AND MINING JOURNAL AND COAL

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

VOL. XXXVIII. DECEMBER 6. No. 23.

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

☞ **Articles, communications, reports, documents, books—all things whatsoever belonging to the Editorial Department, should be thus addressed: MANAGING EDITOR ENGINEERING AND MINING JOURNAL, P.O. BOX 1833, New York City.**

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P.O. Box 1465, New York. Articles written by Mr. RAYMOND will be signed thus * ; and only for articles so signed is he responsible.

SUBSCRIPTION PRICE, including postage, for the United States and Canada, $4 per annum ; $2.25 for six months ; all other countries, including postage, $5.50 = 22s. = 28 francs = 22 marks. All payments must be made in advance.

FILE COVERS will be sent by mail for $1.25 or delivered at office for $1 each.

Advertising Rates.—See page vii.

Mr. C. A. Green is our accredited representative for New York.

Mr. A. R. Brown, Jr., is our accredited representative for Boston and the Eastern States. Office, Room 1, Simmons Building, 33 Water street, Boston.

Mr. J. Viennot, 150 South Fourth street, Philadelphia, is our accredited representative for Pennsylvania, Maryland, and Delaware.

Mr. O. D. Cotton, Columbus, O., is our accredited representative for Ohio, Illinois, Missouri, Iowa, Michigan, Indiana, and the Southern States.

Mr. O. J. Frost, care Boston & Colorado Smelting Company, Argo, Colo., is our accredited representative for Denver and vicinity.

REMITTANCES should always be made by Post-Office Orders or Bank Drafts on New York, made payable to THE SCIENTIFIC PUBLISHING COMPANY.

THE SCIENTIFIC PUBLISHING CO., Publishers.

R. P. ROTHWELL, Pres. HENRY M. GEER, Sec. and General Manager,
P.O. Box 1833. 27 Park Place, New York.

CONTENTS.

MR. E. N. RIOTTE, manager of the New York Metallurgical Works of this city, left for Central America this week on a professional trip.

MR. J. PIERREPONT EDWARDS, British Consul in this city, notifies us that the date for the reception of applications for space in the International Inventions Exhibition, to be held at London next year, has been extended to January 1st.

THE Drum Lummon mine, in Montana, was bought from THOMAS CRUSE, through the Joint Stock Association, Limited, of London, by the Montana Company, Limited, a company floated in London, on the report of Mr. JOHN DARLINGTON, a mining engineer well known in England. Great things were expected of the mine, which had handsomely paid Mr. CRUSE, who was working it with a very limited plant and crude appliances. A 50-stamp mill was put up, the old 5-stamp mill increased to 15 stamps, an elaborate compressor-plant added, and a tunnel driven to tap the lode. From April, 1883, to the end of the year, the old mill crushed 987 tons, yielding per ton $65.59, and continued to work alone until April, 1884, the yield per ton being $53.10, $51.29, and $49 during the first three months of that year. Then the large Cruse mill began to eat ore, and the average yield dropped off to $13.14, $14.53, $14.18, $13.69, $9.34, and $11.86 during the successive months, the quantities of ore and old tailings worked running up to 3200 tons gross in September. These returns were so greatly at variance with those that they had been led to expect from earlier reports that two of the directors went to Montana and subsequently called in Mr. HAMILTON SMITH, Jr., to go over that part of the ground sampled by Mr. DARLINGTON, give an opinion concerning the manner in which the mines had been laid out, and advise as to the future course to be adopted in regard to the mine. Mr. SMITH found that, in one part of the mine, where the average of the assays of the English engineer was $144.18, he got only $15.33 ; and at other individual points, the discrepancies were so great that they stood $295.66 and $289.20 for the one and $3.48 and $2.57 for the other engineer. It is just to say that Mr. DARLINGTON declined to value the reserves from the assays of the samples he made, basing his calculations only on the average yield of the ore previously extracted. The writers of the prospectus, however, did supply the deficiency, estimating the net profit of working 28,000 tons of quartz annually at $24 a ton. Mr. SMITH speaks well of the mill and of the works generally, although he pronounces the compressor to be too large for the purposes of the company. He insists, however, that too little prospecting was done, and advises that the old mill be closed down, and that better methods be adopted in the purchase of supplies.

Mr. SMITH'S report naturally produced a sensation in London, and a large indignation meeting was held in London, during the course of which the directors freely acknowledged that they had made mistakes, and that the management had been wasteful, although not incompetent. Experts were rather roughly handled, and it was finally decided to appoint an investigating committee. The history of the company, we believe, illustrates very well how necessary it is that the examination of those English engineers not thoroughly familiar with our mines and of the conditions affecting them should be confirmed by American experts. The latter are only too often consulted when the proceedings begin to look like a *post-mortem*.

WE print elsewhere a thoughtful letter on the outlook for copper, by Mr. S. RAUNHEIM, which, from what we know of the details upon which the figures are based, is as closely correct as it is possible to make it at this early date, from the data now at hand. These are necessarily fragmentary; but in a general way, it may be said that they are so only so far as the smaller producers are concerned. Of course, exact figures will only be available when the complete returns are at hand, and we understand that Mr. ALBERT WILLIAMS, Jr., Chief of the Department of Statistics and Technology of the United States Geological Survey, fully appreciating the importance of an early publication of the figures, is making special efforts to present his report as soon as possible. We shall, as usual, submit our preliminary estimate in the third week of January While these more elaborate returns may somewhat modify the figures presented by Mr. RAUNHEIM, we heartily concur in his general conclusions. The situation here statistically is undoubtedly a sound one, and that is the view we have heard expressed by all those whom we know to be in a position to speak with authority. So far as the next year is concerned, it will depend very largely on the extent to which the threatened increase of output of some of the leading mines is counterbalanced by the closing down of the weaker ones. Leaving aside Arizona, New Mexico, and scattered producers, with whom it does not so much depend upon the price as upon the reserves of high grade-ore, always an uncertain element, we must count particularly with the Lake region and the Butte District. The main dependence of both is on large quantities of low-grade ore, and it becomes more a question of plant and appliances on the one hand, and of ability to make ends meet on the other. In Montana, the Anaconda, Montana, and Parrot companies are, or will be in the next month or two, running at a much larger capacity. On the other hand, the shipments of rich ore will probably fall off. On the Lake, the Calumet & Hecla will early next year be crushing at the rate of 3300 tons of rock a day, equivalent to a product of at least 50,000,000 pounds a year, or even more, if no rock from the South End ground is crushed. But the product of the smaller mines will undoubtedly fall off. Some that have contributed fair quantities to this year's product have already stopped, others will follow, and present indications point to 10,000,000 pounds as the maximum increase in 1885, provided no accidents happen. It is not too much to say, therefore, that the rush in the increase of copper production is over, and that a slower and more conservative development may be looked forward to. The immediate future has, therefore, so far as we can gauge its uncertainties, nothing in it that need frighten us here, nor alarm the English market. We insist on this particularly, because we have reason to believe that some very wild stories are now on

their way to the other side concerning this year's make and the prospective increase in 1885.

The fact that the Lake companies began this week to sell to consumers here at 12 cents a pound has, we think, carried the metal to a point where, in conjunction with Chili Bars in London at £50, the process of weeding out the weak will begin in earnest, not only here but the world over. We have before insisted that it is folly on the part of those who can not lay down Lake copper at 12 cents, good Arizona brands at 11½ cents, and Montana metal at 11 cents in New York, all marketing expenses paid, to go on producing. In a month, the balance-sheets of the year's business will be made out, and shareholders can judge for themselves whether or not they mean to throw good money after bad. It may be argued that those who have weathered the storm thus far, of which, as we ourselves urge, the worst has passed, have now only a short pull before them to get out of their troubles. We believe, however, that, even under the circumstances, it is wiser to close down for the winter at least, because there appears to be no good prospect of an improvement in general business during the next few months, the winter being, as is well known, a dull season in the copper trade.

THE SILVER DOLLAR.

Secretary MCCULLOCH and President ARTHUR recommend the immemediate suspension of the coinage of silver dollars and the issue of silver certificates. According to the Secretary's report, there is no surplus gold in the Treasury, the reserve that prudence requires having, indeed, been trenched upon; and there is no plethora of any kind except one of silver dollars, for which there is no demand. The coinage of silver dollars had reached, October 31st, 1884, the amount of $184,730,829; the amount in actual circulation was $41,326,736; the amount in the Treasury was (including $4,169,128.89 of silver bullion not yet coined) $147,573,-221.89. Against this, there are in circulation (apart from the amount in the Treasury, which need not be counted) $100,741,561 of silver certificates. These certificates are merely the representatives of so many dollars in the Treasury, which are really private property, held by the government for the owners. The net "plethora" of silver dollars, therefore, or the amount neither in actual circulation nor in representative circulation through the silver certificates, is $46,831,660.89, including the uncoined bullion above mentioned.

That under these circumstances it may be necessary, as a measure both of general financial prudence and in the interest of bimetalism itself, to suspend for a while the coinage of the silver dollar, is very likely. As we are not bimetalists, we can, with equanimity, leave the statesmen of that school to work themselves out of the scrape for which they are responsible. We may call their attention, in passing, to one point only, that if they had been willing to give the "Dollar of the Fathers" a value corresponding to the circumstances in which the sons are obliged to live and carry on business, the more immediate and pressing evils that now threaten would have been avoided, and, moreover, the consumption of silver in the coinage would have been just so much greater, to the incidental benefit of the silver producers. But a silver dollar of full value would not have been more welcome as actual currency than the present coin. The simple fact, which comes home to every man's pocket, is, that the dollar is an inconvenient coin to carry, and that a paper representative of it will always be preferred.

This brings us to our main question, Why should the Secretary regard the issue of the silver certificates as an additional evil, and recommend their suppression as well as that of small bank-notes and greenbacks, in order to force the people to carry silver dollars for all sums under $5? He does not vouchsafe his reasons for this opinion, and in the absence of reasons, we can not see its force. It seems to us that the circulation of silver certificates is practically the circulation of silver dollars, in a most convenient, safe, and popular form. The inconvenience and expense to the government of holding the actual coins is more than compensated by the gain through the annual loss and destruction of the paper certificates. It would, of course, be cheaper to issue greenbacks, based on "the faith of the nation;" but we can not conceive of Secretary MCCULLOCH as the advocate of such a measure, or understand why he should not welcome and encourage in every possible way the use of a paper currency such as the silver certificates constitute, free from all the risks of public credit—a real old-fashioned "hard-money," Democratic, purely representative paper currency, every note of which is not merely a promise to pay, but, so to speak, a warehouse certificate. The Secretary would not recommend legislation to force the actual delivery of goods instead of bills of lading or warehouse certificates, every time ownership changed hands. Why should he wish us all to become porters of cumbrous silver dollars, not only to our great daily inconvenience, but also at great annual loss from abrasion of the coin, and great expense for its transportation?

This question has nothing to do with the depreciated value of the silver dollar, or with the amount of silver dollars already coined or to be coined hereafter. The Secretary has not proposed to withdraw and melt up the coins now on hand. His proposal to coin no more for the present stands on its own foundation on the grounds he gives for it. But, supposing that this coinage had been suspended, what harm would there be in the continued issue of the certificates, until (to take the extreme case) every silver dollar of the nearly $185,000,000 coined since March, 1878, were locked up in the vaults of the Treasury, and a silver certificate representing it were circulating in its stead?

To us, it seems that such a condition of affairs would be a most healthy one; and if the Secretary, to bring it about, had recommended the suppression of small notes, and the substitution of silver certificates, we could have understood his position, which now we confess to be inexplicable.

The unpopularity and hence the impracticability of the withdrawal of small notes from circulation is a matter, not of prophecy alone, but of history. Mr. MCCULLOCH can not have forgotten the attempt of a Democratic legislature of the State of New York, in the time and under the policy of President JACKSON, to do this very thing with the notes of the State banks. The first result was an influx of small notes from New England, to supply the popular demand; and when the circulation of these was forbidden by another law, the law was utterly disregarded, and the party that had fathered it was defeated on this leading issue in the next election, when WILLIAM H. SEWARD, an advocate of the small votes, and hence known throughout the canvass as "Little Bill SEWARD," was elected governor of the State.

The proposal of the Secretary relating to the silver certificates and the small notes is thus seen to be compounded of two parts, one of which is not necessary, and the other not feasible, while the object sought by both is undesirable.

CORRESPONDENCE.

[Communications will be noticed only when accompanied with the full name and address of the writer. Unless specially desired, only initials will be printed. We invite criticism and comment by the readers of the ENGINEERING AND MINING JOURNAL. Replies not intended for publication should be addressed to the Editor of the ENGINEERING AND MINING JOURNAL in blank, stamped, and sealed envelopes. We do not hold ourselves responsible for the opinions of our correspondents.]

Cost of Producing Copper at the Calumet & Hecla Mine.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Owing to great depression in the price of Calumet & Hecla stock, and the omitting of dividends, stockholders in this company have of late felt an increased desire to know about the cost of copper and something about the costs of production in the different departments of the work.

The present price of copper being the world's price, the tariff question is obsolete, and no harm can come from these inquiries. The Calumet & Hecla Company has never, so far as I know, published any information on these points for the use of stockholders; which is contrary to the practice of all other Lake copper companies, which annually publish reports giving a statement of the past year's business. Many of these reports are in great detail, and are eminently satisfactory and instructive to stockholders. Calumet & Hecla stockholders have been under the necessity of taking for granted that their money has been properly used, and every thing done for the best.

It is doubtless true that the larger portion of this stock is held in few hands, who have the management of the company's affairs; yet there are minority holders, and it is a principle in joint-stock companies, that the holder of the fewest shares has as many rights in the company as the holder of the greatest number of shares, except in the matter of casting votes.

To say that the company's books are open to the inspection of stockholders does not cover the case fairly, because many small stockholders are never in Boston, and if there, and permitted to do so, would not feel at liberty to occupy the company's office and books to make up a satisfactory statement. If this company would cease to make itself an exception to all other Lake companies, and would publish a full annual statement, it would give a large number of stockholders great satisfaction, and relieve them from the present necessity of taking so much for granted. The desire to know set me to figuring, and I have made careful compilations for purposes of comparison from the Alantic Mining Company's reports for five years, 1879 and 1883 inclusive; from the Quincy Mining Company's reports for three years, 1881-82-83; and from the Allouez Mining Company's reports for three years, 1881-82-83, that being the period covered by the present management. I have figured on the Calumet & Hecla for five years, 1879 and 1883 inclusive, so as to get a fair range, and make my approximate figures very nearly correct. The results of these compiled figures are given below.

The laws of Michigan require mining companies annually to file in the State offices certain statements relating to their business; from these sworn statements on file, I get Calumet & Hecla figures, so far as they go. They state the production of ingot copper to be for—

	Tons.	Lbs.
1879	13,135	1243
1880	15,837	1237
1881	15,680	781
1882	16,026	1589
1883	16,562	1045
Total	77,242	1897

Equal to 154,485.897 pounds.

As the reports filed do not give the prices sold for, I will adopt the prices received per pound by the Atlantic Mining Company for ingot copper during these years.

These were, for 1879, 16·3 cents; for 1880, 19·51 cents; for 1881, 17·12 cents; for 1882, 17·56 cents; for 1883, 15 cents. These amounts of copper, and these prices, give $26,428,584.41 as received by the Calumet & Hecla for copper during the five years in question. The treasurer's

books only would show the exact amount received; but it is fair to suppose it did as well as its neighbor. The prices used are below the average quotations for the years named.

Its filed statements show the following statements of accounts:

In 1879, the sum invested in real estate was	$1,756,314 10
" " " " personal property and estate was	1,741,562.22
" " " " bills receivable was	3,877,353.59
" " debts payable, unsecured, were	462,681.87
In 1883, the sum invested in real estate was	4,388,128.16
" " " " personal property and estate was	2,942,989.62
" " " " bills receivable was	2,604,129.46
" " debts payable unsecured were	785,600.07

These figures show an increase—

In real estate of	$2,631,814.06
In personal property and estate of	1,201,427.40
In unsecured debts of	322,918.20

And a decrease in—

Bills receivable, due the company, of	1,273,324.13

From the total earnings, there were:

Divided in dividends in the five years	10,100,000.00
Leaving from the sales of copper	16,328,384.41
Realized from bills receivable	1,273,224.13
Realized from increase of debt	322,918.20
Total receipts	$17,924,526.74

Which were expended during the five years in carrying on the work.

In the following table, these costs are divided, as is usual with neighboring mines, into mine or lake costs, including mining, milling, and all other lake costs not otherwise classified; into smelting, which includes smelting, transportation, insurance, selling, Eastern office, and all other costs in this connection; into real estate, including purchase of lands, machinery, and building; and, in the case of the Calumet & Hecla, I have made an account of personal property and estate to correspond with the returns filed in the State office; this account is covered, in the case of the other mines, by the real estate and mining accounts, and probably to these accounts the personal property account of the Calumet & Hecla properly belongs, and should be placed there in order to get the accounts strictly parallel, but, as the items of the account are lacking, it is allowed to stand separately.

In the absence of any official statement, I have adopted for the smelting, marketing, and Eastern cost division, the average of such costs as shown by the compilations from the Atlantic, Allouez, and Quincy, namely, 2·197 cents a pound of ingot copper produced. That portion belonging to mining costs is got by subtraction. In the absence of official statements, it is assumed that the Calumet & Hecla stamp rock has yielded during the past five years 4·8 per cent of ingot copper, which is equal to 96 pounds per ton of rock. Though this is perhaps not strictly correct, it is believed to be very near the mark. With this yield, the copper produced would require the stamping of 1,609,228 tons of rock, equal to 321,845 tons a year.

Name of Mine.	Pounds of ingot copper produced.	Tons of rock stamped.	Average tons stamped per year.	Average per cent stamped of the total rock mined.
Calumet & Hecla, 5 years	154,485,897	1,609,228	321.845	99·00
Quincy, 3 years	16,934.356	297,296	99.099	81·74
Allouez, 3 years	4,639,158	265,982	88,661	80·90
Atlantic, 5 years	12,604,212	884.684	176,937	99·50

Name of Mine.	Subdivisions of expense.	Amounts expended in subdivisions.	Amounts expended in subdivisions per ton of rock stamped.	Pounds of copper per ton of rock stamped.	Per cent of copper in rock stamped.	Costs in *cents* per pound of copper, in subdivisions of expense.
Calumet & Hecla, 5 years	Mining	$10,697,230.13	$6.64·74	96·000	4·800	6·923
	Smelting	3,394,055.15	2.10·91			2·197
	Real estate	2,631,814.06	1.63·54			1·700
	Personal estate	1,201,427.40	0.74·65			0·770
	Totals	$17,924,526.74	$11.13·84			11·590
Quincy, 3 years	Mining	1,158,714.31	3.89·75	56·960	2·848	2·028
	Smelting	342,866.13	1.15·32			
	Real estate	151,883.86	0 51 08			
	Totals	$1,653,464.30	$5 56·16			
Allouez, 3 years	Mining	691,960.14	2.60·15	17·441	0·872	2·433
	Smelting	113,192.18	0.42·55			
	Real estate	110,238.88	0.41·44			
	Totals	$915,391.20	$3.44·15			
Atlantic, 5 years	Mining	444,304.79	1.63·25	14·247	0·712	2·147
	Smelting	270,723.21	0.30 60			
	Real estate	53,671.53	0.06·06			
	Totals	$768,699.53	$1.99·91			

To compare the Calumet & Hecla with the Quincy, the vein-rock of the latter drills easier and stamps easier, but does not blast so freely as that of the Calumet & Hecla, while the large percentage of waste rock and the irregularities of the ore-bodies in the mine put the Quincy at a disadvantage in the necessary cost of working.

The Atlantic vein-rock drills more easily, stamps more easily, and blasts with about the same facility as the Calumet & Hecla, and is about on a par with it in the percentage of waste rock. On the whole, the Atlantic has some advantage over the Calumet & Hecla in the necessary cost of working.

The Allouez, like the Calumet & Hecla, works a conglomerate bed, which is more easily drilled and stamped, but has no advantage in blasting. When we consider the irregularity of the ore-bodies and the large percentage of waste rock at the Allouez, this mine is at an evident disadvantage in the necessary cost of working, when compared with the Calumet & Hecla. Notwithstanding these natural conditions, controlling necessary cost, we find, in the above table, the mining, milling, and other lake costs not named under other heads, to be per ton of rock stamped:

At Calumet & Hecla	$6.64·74
Quincy	3.89·75
Allouez	2.60·15
Atlantic	1 63·25

Had the Calumet & Hecla worked as cheaply as the Quincy, this item would have been 4·06 cents per pound of copper; if at Allouez figures, 2·71 cents per pound of copper; if at Atlantic figures, 1·7 cents per pound of copper, against 6·92 cents per pound, as shown in the table for Calumet & Hecla.

These comparative figures show the Calumet & Hecla to have a very great possible capacity for dividends at present prices of copper. Should it work under this heading of "mining" as cheaply as the Allouez does, it would make a saving of $17.28 a share on a production of twenty thousand tons of copper a year; which might be added to the dividends. The table shows Calumet & Hecla copper to have cost 11·59 cents a pound for the average of five years; of this, 2·47 cents were for real and personal estate, which for the future may be very greatly reduced, in consideration of the valuable real estate and ample plant of hoisting and stamping machinery now in possession of the company, and paid for. The 2·197 cents for smelting and costs classified therewith may be considered more permanent, as it is the average of the other three mines.

Should the Calumet & Hecla, in its efforts now making toward greater economy in working, reach the past average of the other three mines named, in the total cost per ton of rock stamped, it would produce copper at a total cost of 3·82 cents a pound. This would beat the world, and stockholders in the Calumet & Hecla who are well posted in regard to the mines believe it can and should beat all other mines in the cost of producing copper, even the Rio Tinto at its five-cent rate.

It is believed that, if this company would follow the custom of other Lake companies, and publish annually a detailed statement of the previous year's business, for the use and criticism of stockholders and miners, it would have a tendency to promote the end desired—cheaper production.

MINER.

The Casting of Copper Roofing.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of November 29th, we notice that you published a letter on the subject of Copper Roofing that was addressed by us to the *Industrial World*. In writing this article, there was an error made in the figures named by us, which was not discovered until too late to correct it. In view of this, we desire to say that our estimate of the cost of putting on 10-ounce copper, under the patent referred to, was 15 cents per square foot, over and above the cost of the material. This *included* the cost of tinning on both sides, namely, 5 cents a square foot, or plain copper would cost 10 cents a square foot, which would make it 31 cents total cost for putting on 10-ounce copper a square foot, instead of 36 cents, as stated by us. We have no doubt that many of your readers may consider that 10 cents a square foot for putting on 10-ounce copper, exclusive of the cost of the material, is a high figure; but when it is taken into consideration that the sheets are to be locked, and the ends of the sheets are to be soldered, to make the length of the roll required, and that provision must also be made for fixing the sheets at frequent points, and securing the same by bolts and nuts, which must be of copper—as iron would corrode the copper by galvanic action—the price named by us we believe to be as nearly correct as possible, as a sheet of copper laid 24 inches wide loses four and a half inches in width by the patent process referred to. We do not think it would be reasonable to expect 10-ounce copper, put on in the usual manner of putting on tin roofing, to make a durable job. A standing seam would be rigid and strong enough to drag the whole roof backward and forward by expansion and contraction, which would soon loosen the nails holding the cleats, and the roof would be liable, under such circumstances, to blow off. On further inquiry, we find that some of the few buildings in Philadelphia that are covered with copper have lately been repaired, by cutting away portions of the sheet copper, and using roofing tin instead.

Yours very truly,

MERCHANT & CO.

PHILADELPHIA, Dec. 1.

The Future of Copper.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The recent decline of quotations of Chili Bars in London to £50, and the reduced quotation of Lake copper here to 12 cents a pound, were not unexpected to parties closely watching the copper market. It is but natural that our prices should come down to the level of the world's market prices, and this end has been reached. At present, prices here and in Europe show only slight differences, hardly perceptible. This state of the market has lately produced a comparatively larger demand for the different brands, both for home consumption and for export, with Arizona copper at 11¼ cents and Montana copper at 11½ cents. It is my object to prove that this demand is justified, and may possibly further increase. In carefully collecting all the statistics on the copper production, I find that the production for 1884 does not exceed that of the last year by such large quantities as to justify a further decline in copper prices.

This year's production will be altogether not over 125 million pounds of fine copper, an increase of about 25 million pounds over 1883, resulting almost entirely from the increased Montana output. In my letter of August 16th, published in your issue of the same date, I estimated Montana's production at 20,000 tons fine copper for the year 1884, and now it comes very near that figure. In fact, estimates based on the first eleven months make it 38 million pounds of fine copper.

This production was swelled by a stock on hand, on the 1st of January, 1884, of certainly not less than 20 million pounds of copper of all the different brands, which had, moreover, to be disposed of.

The returns of the English Board of Trade give the imports into Liver-

pool and Swansea during the first ten months of 1884 at 14,645 English tons of fine copper, equal to 33 million pounds. Assuming that it will continue at the same rate for the remaining two months of the year, we must add 5½ million pounds, making the total 38½ million pounds. The shipments from here to France, Germany, and other countries are certainly not less than 25 million pounds, carrying the total to 63½ million pounds. The 25 millions to France, etc., include those sales of copper on hand that can not be shipped during December, and which will therefore leave next year as early and as fast as possible.

After deducting these 63½ million pounds for export from the 125 million pounds produced, plus the 20 million pounds of last year's stock on hand, there remain about 80 million pounds disposed of and used in this country, which shows not only that our home consumption has not increased for 1884, but also that our entire overproduction has gone abroad.

Apparently the managers of our prominent copper-producing companies have done well. Formerly, the disposal of the copper was badly conducted by most of them. They lacked experience, and ignored, in fact, the first principles of the copper trade. Not satisfied with the results obtained by a high tariff, they increased the output of copper, not taking into account the facts that the development of consumption is slower than the growth of production; and that larger quantities thrown on the domestic market would be more than counterbalanced by lower prices, thus reducing or wiping out expected profits. Experience being the best teacher, it seems that they have profited by severe lessons.

We enter the year 1885 with a healthy and sound condition of the copper market. There will not be any surplus stock to carry over as a dead-weight on next year's production. But I say more: we have already sold ahead in Europe quite a considerable amount of our expected output for 1885. It is stated, for instance, that the Anaconda mine, of Montana, has sold 16,000 tons of matte to English smelters, to be produced next year. A similar statement is made of some other Montana copper companies, and of one of the largest Arizona concerns.

On the other hand, several companies contemplate an additional increase of their production, in order to reduce general costs. So far, only the Calumet & Hecla, the Montana Copper, and the Parrot companies have enlarged their plants. They expect to produce altogether from 10 to 15 million pounds more in 1885 than in 1884, which, provided it can really be done, would not count for very much, should Europe import in 1885 the same quantities that it took in 1884.

In my letter of November 22d, published in the ENGINEERING AND MINING JOURNAL, I have already demonstrated how bad is the policy of increasing production before an increasing consumption should make it advisable and—profitable. Should the producers, however, be wise enough to refrain from carrying out the proposed increased output, I think that it is not improbable that the price of copper may advance, and that sooner than expected. At all events, I believe that there need not be any apprehension that there will be a further decline in the price of copper, even should the present general depression of business last.

S. RAUNHEIM.

Columbite and Tantalite with the Tin Ore of the Black Hills.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In regard to the occurrence of the comparatively rare and closely related minerals, columbite and tantalite, in the Black Hills of Dakota, and particularly at the Etta tin mine, it should be said that their occurence in association or admixture with the cassiterite or tin-stone is exceptional. The great bulk of the tin ore is without the tantalic compounds, which are only occasionally seen. These compounds are interesting to science, and have been noticed for this reason; but they have no commercial importance, and do not affect the value of the tin ore. They have not been at any time mistaken for tin ore by any specialist who has examined the ores or the mine. The appearance of the mineral is quite different from the tin ore. The tantalite or the columbite, or both, have a velvety-black color and luster, and yield a black-brown streak or powder very different from the characteristic powder of cassiterite. This difference is well known at the mines. These minerals do not interfere with the practical working of the tin ores. This explanation is necessary, inasmuch as, according to the metal circular of one of the leading London tin houses, the impression has been produced abroad that the reported tin ore turns out to be only tantalite.

This is a mistake. The tin ore is a well-known substance by this time, even among the prospectors who, perhaps, never saw tin ore before the Etta discovery. The specimen that Professor Schaeffer analyzed was sent to him through the post-office by Mr. Thompson, the superintendent of the Etta mine, last spring—*not as tin ore*, but as a mineral different from the tin ore, the nature of which the superintendent desired to know. This was done without my knowledge, and while I had the various minerals from the tin region under examination before my return there from New York in the summer. The few fragments of the black heavy minerals other than tin-stone that I obtained last year before the mine was opened, were not sufficiently defined in crystallization to justify conclusions respecting their nature, and it was deemed best to wait until I should return to the mine and secure better material before having analyses made. Water-worn fragments from some of the stream deposits of similar minerals differed considerably in their specific gravity and apparent composition, and while the presence of wolfram was originally suggested, it was pointed out, in this JOURNAL, that the mineral in question was harder than wolfram, and had a lower specific gravity. The absence of wolfram from the tin ore-bearing greisen was also stated, and this has been confirmed by the investigations this summer. But though wolfram has not been found at the Etta mine, tungsten compounds occur in the region.

The tin ore of the Etta mine, as well as in other lodes, is remarkably clean and free from any hurtful ingredient. The arsenical compound, resembling leucopyrite, does not occur in the greisen rock with the bulk of the ore, and will not affect it. It occurs sparingly in one place only, and can be separated by hand. It also appears to be stanniferous. There are other localities that will be noted hereafter.

Even if there should be traces of columbite or of tantalite in the black tin concentrations, it would not be hurtful to the tin. The mineral is decomposed, in part at least, by fusion with potassium cyanide, with the separation of globules of tin. In the numerous fire-assays that have been made of the black tin concentrations from the Etta, the tin buttons not only show a satisfactory percentage of metal, but are remarkably clean and pure tin. Neither tantalite nor columbite has been found to interfere with the reduction of the metal. So also the black tin obtained at the New York Metallurgical-Works by Mr. Riotte from large consignments of the ore from the Etta has been smelted without difficulty. Samples of the raw black tin concentrates assayed 61·8 of metallic tin, and a roasted sample yielded 70·5 per cent.

The metal circular before referred to also states, what is undoubtedly true, that samples from Dakota represented as tin-stone have been seen in England, in which not a trace of tin was discovered. In the earlier efforts to find new localities of tin ore, after the true nature of the Etta ore had been shown, the country was overrun by prospectors, most of whom had no knowledge of tin ores. Locations were made right and left on ledges of granite, in which ordinary black tourmaline could be seen. The whole summit of Harney Peak was thus located and recorded, and extravagant estimates were made of the astounding quantites of tin ore standing in cliffs a thousand feet high. Again, brown garnets and staurotide are frequently mistaken for tin ore by the uneducated eye.

All this is to be expected in a newly found tin-bearing region; but it does not impair the value of the true tin-bearing lodes, of which many are already known and are now developing by the Harney Peak Tin Mining Company, which owns the Etta mine. It is not my purpose at present to report the results of the summer's work. The minerals collected for examination in the laboratory are still on the road; but hundreds of commercial assays made on the spot leave no room to doubt the extreme richness and value of the tin ores of the region.

MILL ROCK, Dec. 3, 1884. WILLIAM P. BLAKE.

NATURAL GAS.*

By William Metcalf.

The natural gas of Western Pennsylvania is a product so remarkable that it is worthy of repeated, serious, and thoughtful discussion. The gas-wells are all situated on a straight line running northeast and southwest through every one of them. An observer standing on a hill-top in Alleghany township, Westmoreland County, say about three miles southeast of the confluence of the Alleghany and Kiskiminetas rivers, can see on a dark night, on the northwestern horizon, the reflection of the lights from the Butler County wells; to the north, the lights from wells in the direction of Kittanning; to the northeast, the Leechburg and Apollo wells; to the southeast, the Murraysville wells; and to the southwest, the lights of the Tarentum wells. Off in Washington County, and down toward Steubenville, there are other wells; while at Hulton, in Pittsburg in the East End, at Soho, at Brownstown, at Sligo, and in Bayardstown, there are wells upon wells, roarers, gushers of salt water and gushers of fresh water, and dry holes, but all contain more or less of gas. These wells are all on the same straight, forty-five degree line. This may puzzle mathematicians and makers of geometries, but we all know that science is nowhere when it butts against facts. It is bad for science, but we have the facts. Some of these wells give out their gas at an enormous pressure; a gauge on a six-inch pipe, situated some miles from the well, registered on last Saturday 120 pounds per square inch, and the noise of the rushing gas indicated that the gauge was about right. Have we a right to expect a long continuance of these high pressures? is a proper and earnest question, often asked by those who contemplate the expense of changing their plant so that they can use the gas. The able report of our Gas Committee read last May, and the able action of our gas companies, would lead us to answer, "No." The report shows that the great roarers only roar for a few years at most: and the charges of the gas companies show that they know enough to get their investment and their profits while the roaring lasts. Are we then to be without gas in a few years? Most decidedly no. It is a well-attested fact that the town of Fredonia, New York, has been lighted by the same gas-well for more than forty years; and we are told that the Chinese have been using certain gas-wells for four thousand years, and that they are still good wells.

But a better comparison is in oil. A few years ago, no oil well was counted that was not a gusher; a mad rage for gushers sent the wildcatters all over the country, and gushers were struck without number; there was a great hurrah over each new one, and a scramble for more; our creeks contained mill-ponds of oil, our river was hidden under a coat of oil, the fish died of oil, our boilers foamed with oil, our noses abhorred the smell, and our stomachs rebelled against the taste of oil. Wise old men held up their hands in horror at the waste, and knowing ones speculated; the prophets said it would soon all be gone, and the conservatives held on to their cannel coal lands and smiled quietly at the thought of their coming day. But cool heads and strong hands were at work, system and order soon gathered the oil into pipe-lines and stopped the waste; the little wells were cared for and pumped regularly, until now we have millions upon millions of barrels safely stored; the pipe line certificates are as good as grain receipts; all civilization has the cheapest and best light and lubricator ever made; gushers scarcely make a ripple in the market, and the oil business is safe, stable, wealth-producing, and enduring. So it must be with the gas. The few roarers will be replaced by the hundreds upon hundreds of little wells that will be as permanent as the wells of the Chinese, and the quantity gained will be millions of cubic feet more per day than we dream of now. The craze for roarers has taken the place of the gusher frenzy; men everywhere, on the 45 degree line, are boring; that there is no pipe line near, no mill, no factory, matters not; each drills on full of hope; he puts his hundreds down into a hole, he strikes the true belt, he is on the line, he has a roarer. Up goes his pipe, up goes his flame, up go his thousands, and up goes his hat. This is the lunatic's time, and he must have his day; after that, comes the engineer's time, and for that we must be prepared. Leaving out, for the present, chemistry and thermo-dynamics, heat-units, etc., etc., let us look at a few

*Read before the Engineers' Society of Western Pennsylvania.

facts that we know. This natural gas can not be highly superheated, because it dissociates and fills every thing with a deposit of hard, fixed carbon.

The piece of coke shown here was deposited on the bridge wall of a furnace, in a few days' working. Several pieces of similar coke were piled on a clear, hot fire, and in about an hour they were red-hot, but showed no signs of combustion. A blower was then put up before the grate, after fresh coal had been put over the coke, and was left there for half an hour until the coal was all burned off and the fire was white hot. At the end of that time, there was no appearance of the coke having been reduced. A further experiment to-day gave the following results: A piece of coke weighing four pounds and six ounces was put in the fire at nine o'clock. It was at once brought up to white heat by using the blower. Again at noon it was covered with fresh coal and subjected to the blower. At three o'clock, it was taken from the fire and allowed to cool. No white ash was formed on it; it retained its form, somewhat shrunken, and lost in weight after six hours' firing just 25 per cent.

It is very difficult to mix it properly with sufficient air for complete combustion, as it requires from seven to eight times its own volume of air.

There are three ways of getting at this combustion. The first is on the blow-pipe principle, with a strong blast of cold air and a heavy pressure of gas; this is a favorite and a stupid way. The second is what might be called the blow-pipe regenerative plan, by the use of a strong flow of gas, and a steam or other blast, driven through the air-flues of a regenerative furnace. This produces a furious fire that is pretty to look at, good to stand away from, and that must be difficult to work with, besides being very destructive. The third is the regenerative plan pure and simple. It is got at by relieving the gas from pressure, increasing its volume, splitting it up so that air can get to it, and then mixing it with a sufficient quantity of air, as hot as it can be made. The slower and lazier the movements of the gas and air, the better, and the result is a beautiful, soft, intense heat that gives us the greatest amount of work with the least wear and tear. These methods are paralleled in using coal, by the reverberatory style, the blast style, and the regenerative gas style. Except for the necessary use of blast-furnaces, the regenerative gas system is incomparably ahead of the others, in both efficiency and economy.

Notwithstanding the doubts of the so-called conservative men, it is a fact that 2240 pounds of muck-bar can be made in this way with 15 bushels of slack; and the record of a whole year's run, including the drowning out by floods, and the balling up of large quantities of very thin steel scraps, shows that by the most adverse figuring the cost of fuel per 2240 pounds of product could not be made up to quite 60 cents, and the natural gas men positively refused to include that furnace in an offer to furnish gas for the fuel bill, because they were getting more than twice that sum from the iron mills for their puddling-furnaces. If, then, by the indirect and expensive process of splitting up solid coal in a gas-producer, into a gas of the average composition of 70 per cent nitrogen, 10 per cent carbonic acid, and 20 per cent carbonic oxide, we can obtain the great economies which we have already secured, we ought certainly to be able to do much better with natural gas which is all combustible. To change a regenerative furnace over to the use of natural gas is a very simple matter; it is only necessary to use one fifth of the volume required of producer gas, to relieve it of pressure, split it up, and mix it with five times as much air per volume as the producer gas required. This air is obtained in a continuous regenerative furnace by supplying the one fifth volume of natural gas to the gas ports and using the ordinary supply of air; the equation then reads: Producer gas (one fifth combustible) + air, one fifth natural gas (all combustible) + air. Practice shows that that equation is wrong, and the expression should be: Producer-gas +air, less than one fifth natural gas + air; because there is a large gain in effective heat due to the absence of the four fifths of non-combustible gases that the producer makes, and which have to be kept up to the temperature of the furnace. In the Siemens regenerative furnace, the natural gas is applied cold into the ports, and all of the chambers are used for heating the air. This looks like a perfect arrangement, and it comes very near it in our present state of knowledge; but it is conceivable, if not possible, that an absorbent of nitrogen might be discovered that would allow us to have a supply of pure oxygen to apply to our natural gas; that would make combustion perfect.

The different modes of burning this gas may all be seen in operation in the city. On the South Side, boilers are fired on the continuous regenerative plan, and the working is very beautiful. The men in charge will tell you that the combustion is perfect, and in proof of it will open a side-door near the rear of the boiler to let you see for yourself. If then you happen to have your eyes in your head, and observe that the moment the door is opened and more air is admitted, a new volume of white flame is formed that curls gracefully off into the flues, it will not be necessary to offend your polite host by casting doubts on the perfection of his combustion.

Up the Alleghany River, you may see the blow-pipe plan applied to boilers in all of its hideous perfection. It is the joint invention of some gas fiend and some impecunious boiler-maker. It may be relied upon to rip up a set of boilers every year and to waste far more heat than it utilizes. Intermediate between these extremes, there are numbers of different appliances in use. The users are generally very kind in showing them, and each is undoubtedly the best in use. A walk through the town then will be productive of much valuable information.

Now we must consider what interest this society has in the matter. It would be superfluous to repeat the causes of Pittsburg's growth and supremacy in the past. We know the story, and we know that, as other coal-fields have been explored, each new region has announced the immediate downfall of Pittsburg; and while we have laughed at such vain boasting, we know that we have many powerful competitors outside of the limits of Western Pennsylvania, and that we dare not be wasteful, nor depend too much upon the rule of thumb any more.

But just at the time when our people are beginning to be anxious, nature turns out another great boon from her bounteous lap, in the shape of the best and handiest, and what ought to be the cheapest fuel in the world; and if the members of this society do not join hands with every worker in the town, and proceed to make this the greatest and most prosperous manufacturing center in the world, tariff or no tariff, then we deserve to have this gas mixed with thirteen volumes of air, so that the whole concern may be blown into everlasting oblivion. Then again the chance of getting rid of our horrid soot and smoke is too good to be lost, and the gain to health, comfort, and universal happiness is hardly calculable. In addition, it will prove to be an illuminant superior to any thing we have now. It will be cheaper than manufactured gas, and cheaper and handier, if not brighter, than the electric light. It burns beautifully in a Siemens regenerative lamp, and will undoubtedly be very much improved by experience.

Our first interest is to learn to use this gas economically and without pressure. There is no economy in the gas companies, in either pressure or price. One gas man was asked why he did not sell his gas at so much per pound, per hour, per square inch of orifice? He replied that that was the only way to sell it, and if the party would buy it that way, he would bring him a proposition in forty-eight hours. He was told to do so, and departed. In two or three days, he returned with his old style of prices, moderated just enough to induce his customer to take hold, and said nothing about the orifice business. When he was reminded that he had promised another sort of bid, he said: "Yes, I know I did, but I couldn't figure it out." There is a chance for some of our mathematical friends to do some figuring.

The roarers now supply our mills through six-inch and eight-inch pipes. The time will come when these mains will be used through the country to gather the supplies from the little permanent wells, and from twenty-four to thirty-six or even forty-eight inches will be the measure of the diameter of the city mains. Probably large gasometers will be built, and exhaust-fans will be used to coax our subtile benefactor from his hiding-places in the holes and crannies of the rocks. Having once tasted of the benefits of this gas, we shall surely never give it up. Now, it is a pertinent question to ask, If such great economy is to be had in the use of regenerative gas furnaces, particularly in puddling, why have not our iron manufacturers adopted them? The answer is, It is the fault of the engineers, or the want of engineers. Some of the iron manufacturers have tried them to their cost. In some cases, the designers have made ridiculous changes from successful forms, just to show their inventive genius, and the changes have proved disastrous. Cases could be cited where thousands of dollars were lost from this cause. In other cases, the designs were all right, but the furnaces were turned over to the puddlers, and they soon condemned them because they did not understand them. It will not do to blame the puddlers; for men do not hire out a large surplus of brains at three dollars a day, when their time is fully occupied in distressing labor. This point was aptly illustrated by our lamented friend Holley, who made an engagement, at a handsome salary, to give all of his time to the great Bessemer Company. When he invented the movable shell for basic converters, the company claimed the United States patent; but he at once sent in his resignation and exclaimed indignantly to a friend, that he "had sold his time, but he had not sold his brains." The resignation was not accepted, and fifty thousand dollars were paid to his family for the patent. The very least use in the world that a manufactory has for an engineer is in the designing and constructing of plant; that is important work, of course, but the true work of the manufacturing engineer is to go down to that plant, and stay with it day and night, until he has patiently and pleasantly instructed every body in its use. This, too, is one of the pleasantest occupations of an engineer, if he only has a little patience, and the courage to admit having made a blunder the moment he sees it. He can then command the willing help and sympathy of all the hands about him. It is true that he is the best engineer who makes the fewest mistakes; but he is only a fool who never makes a blunder.

The old cry, that ignorant and stubborn workmen by their obstinacy, and timid capitalists by their meanness, obstruct improvements, is all bosh. Capitalists expect designers and inventors to show that their designs and inventions are improvements, and in that they are wise. The men who have to work the improvements expect to be instructed in every detail of their working, and in that they are equally wise. In an experience of nearly twenty-seven years in our foundries and mills, I have been taught some startling and humiliating lessons by members of the horny-handed fraternity, and have been led to the conclusion that there is often a good hard brain guiding a good hard hand. The sum of it all is, that it is wise for a man to be very quiet in both office and mill, unless he knows precisely what he is about; and if he does know what he is doing, he will have no lack of able and intelligent assistance.

ON THE PERMEABILITY OF SILVER FOR OXYGEN GAS.—Some years ago, says the *American Chemical Journal*, Sainte-Claire Deville and Troost showed that hydrogen gas is capable of passing through platinum and iron at a red heat. Recently the latter of these investigators has shown that silver acts in a similar way toward oxygen.

A tube of pure silver of 0·01 m. diameter and with walls 0·001 m. thick was inclosed in a somewhat larger platinum cylinder, and the whole heated in the vapor of boiling cadmium. On exhausting the silver tube with a Sprengel pump, and passing oxygen into the space around it, the gas was found to enter at a rate corresponding to 1·700 lit. per hour for each square meter of surface exposed. On passing air instead of oxygen into the outer chamber, oxygen with only a trace of nitrogen was found in the interior, but the rate of transfusion was diminished nearly one half. By using a tube of slightly thinner walls, the gas entered much more rapidly. Instead of exhausting the tube, the author found it necessary only to pass slowly through it a stream of some other gas, such as carbon dioxide, although this lessened considerably the rate of transfusion. The oxygen was replaced by other gases, such as carbon dioxide, carbon monoxide, and nitrogen, but they passed through the walls of the tube with extreme slowness. The author states in conclusion that this property of silver may some time be utilized to extract oxygen directly from the atmosphere. For this purpose, it would be necessary to expose a large surface by using coils of tubes with thin walls; and to use either an exhaust-pump or a stream of carbon dioxide, which could be absorbed by an alkali, leaving pure oxygen.

STEEL FOR TIN PLATES.

A correspondent of the *Ironmonger* who has paid a visit to nearly every tin-plate works in South Wales, the principal seat of this industry, says that the trade has nearly passed through a very complete revolution caused by the introduction of steel bars. It has been found that steel bars made by the Siemens-Martin process are fully equal to, or rather better than, the best charcoal bars made by the old process of refining iron scrap with charcoal refineries, while the price is altogether out of all proportion in favor of the steel. There are makers still using both charcoal and coke iron, but they are anxiously watching the progress of their formidable rival, and will undoubtedly find themselves obliged to abandon the manufacture of iron bars. A considerably greater number of plates can be made from a ton of steel bars than from a ton of coke-iron bars, and in consequence of the greater closeness of grain and beautiful surface of the black steel plates before tinning, considerably less tin is required to make a steel plate look equal to one of iron. Beyond strengthening some of the rolling-mills, no alteration of plant is required to work steel. At present, the Siemens-Martin steel is used for bars known as charcoal bars, and the Bessemer for bars known as coke bars. The only difference seems to be a want of reliability and uniformity in the Bessemer bars, which will probably be remedied, as they sometimes come in too hard for working in the mills, and the plates will not always stand the bending test both ways. On this point, there is scarcely full knowledge, and it is the opinion of some that it will take years to fully appreciate all that can be done with steel. With reference to the alleged poisonous nature of some plates, there does not appear to be the slightest ground for supposing that the tin can be adulterated in any way without detection; and the minute black specks sometimes complained of are due to a variety of causes, which may be traced back to a few microscopical portions of manganese being left in the steel ingot. The presence of lead would be at once detected, in however small a quantity. It has been suggested that possibly terne plates may have been accidentally used for canning meat. These, being coated with a mixture of lead and tin, can be safely used for packing dry goods; but if used for wet goods or acids, would be highly dangerous. It has been pointed out that the air acting on the contents of a tin of fish might cause the formation of oxide of tin, and it appear safer to remove the contents as soon as opened to a china jar, rather than use them from the opened tin itself. Palm-oil is universally used as a flux in the tinning houses. Some patent oils and a few compositions having resin as a basis, have been tried, but have not made any great progress, and palm-oil still holds its own. The introduction of the "Morewood" rolls in the tinning-pots has quite revolutionized the system, as the coating is much more equal, while much less tin is wasted than by the old listing-pot, so that all plates may be said to be coated by this process now. By regulating the speed of the rolls, the maker can arrange the amount of tin to be deposited on each plate to an almost exact nicety.

THE JOHN COCKERILL COMPANY.

Another fall, says *Engineering*, has brought with it another report from the directors of the John Cockerill Company. The results disclosed in regard to the working operations of the past year are scarcely so satisfactory as those attained for the preceding twelve months. Nevertheless, the shareholders do not appear to have much reason to complain. The company's order-book was filled during the last twelve months upon relatively less advantageous terms than in 1882–83; at the same time, the Council of Administration deemed it advisable to take orders so as to work on from day to day and afford employment to the staff that it is desirable that the company should retain. In spite of every obstacle, the company realized a gross profit of 3,117,099 francs in 1883–84, the production which resulted in this profit representing a value of 38,616,715 francs. In 1882–83, the directors obtained a profit of 4,786,048 francs, with a production of 42,678,252 francs. After making sundry statutory redemptions, and after adding dividends on investments and sundry miscellaneous receipts, the definitive balance at the credit of the profit and loss account for 1883–84, was 3,110,772 francs, as compared with a corresponding balance of 3,746,267 francs in 1882–83. From the balance of 3,110,772 francs, representing the definitive profits of 1883–84, the Council of Administration further deducted 1,081,463 francs for depreciation of plant and tools. The allowance made to provide for the depreciation of plant was at the rate of 3 per cent on their cost price, and that to provide for the depreciation of tools was at the rate of 7½ per cent on their cost price. After allowing for sundry interests and commissions, general expenses, etc., a final balance of 1,402,607 francs remained available for dividend of 1,160,221 francs, or 70 francs per share, upon the share capital of the company, and leaving 242,386 francs to be carried to the credit of 1884–85.

The production of the company's collieries was maintained last year at about the same level as in 1882–83, the output having been 389,000 tons, giving an average of 1410 tons per working day. A higher average would probably have been attained if the directors had not been under the necessity of restricting working operations during the second half of the company's financial year, in consequence of the depression prevailing in business generally. The management succeeded in reducing the cost price of the coal raised by the company last year to an appreciable extent; but, on the other hand, the continued weakening of market prices considerably reduced the profits realized. The general condition of the collieries of the company is regarded as satisfactory, and the directors do not anticipate any difficulty in providing for all the requirements of the company's works whenever a revival in business takes place. The company made last year 141,640 tons of coke; but this production was not sufficient to provide for the current consumption of the works, and it was, accordingly, necessary to continue to make purchases of coke last year. The selling price of coke declined 20 per cent during the last twelve months, as compared with preceding years. The cost of production was reduced, however, to a corresponding extent, and better results are anticipated in the future. The company's mines produced last year 108,440 tons of ore, showing an increase of about 8000 tons, as compared with 1882–83. The sales of ores effected by the company last year were 24,500 tons, as compared with 39,000 tons in 1882–83. The current quotations for ore showed great weakness last year, and it will be seen that the company's blast-furnaces consumed the greater part of the product. The company's three old blast-furnaces, which have been in operation for more than fifteen years, continued to work well in 1883–84, and produced during the year 44,700 tons of pig of various grades, or 2400 tons more than in 1882–83. The profit realized from the blast-furnaces, although still satisfactory, was affected to some extent by the downward tendency of quotations. The iron-works of the company produced last year 26,818 metric tons of iron and plates of various descriptions, and the profit realized showed an improvement of about 18 per cent as compared with 1882–83. A new rolling-mill, erected by the company for the production of boiler-plate, worked satisfactorily last year. Steel rails were also produced last year upon advantageous terms. As regards the company's steel-works, properly so called, they have fully realized the anticipations indulged in respecting them. The production last year was 85,500 tons of steel and 92,500 tons of steel ingots, this result being attained notwithstanding the general slackening in business, and notwithstanding, also, the increased competition with which the company has had to contend. By the adoption of the most improved systems, the company succeeded in producing steel rails last year at figures not hitherto attained. The production of rails, tires, and small articles of steel amounted last year to 81,700 tons, or 1200 tons more than in 1882–83. In consequence, however, of the low prices realized, the profit acquired in this department of the company's operations was sensibly lower last year than in 1882–83. At the close of the financial year, the company's steel rail mills had still sufficient orders on hand to insure them employment for 4½ months in advance. The preference given by certain railroad companies for Martin steel has induced the Council of Administration to increase the company's means for producing this description of steel rails, and a second open-hearth furnace has been brought into operation. The company has begun of late the manufacture of steel cannon, and experiments conducted by the Belgian minister of war satisfactorily established the excellence of the guns turned out by the company, which is now executing an order received from the government of Morocco for a complete battery of steel guns. The company's construction workshops were not fully employed last year. The company's shipbuilding yards were also only partially occupied in 1883–84. The directors are now building a steamer of a new type for the company's flotilla. This vessel will be capable of carrying a cargo of 2100 tons, and it will be completed in December. A second vessel of a similar type is to be proceeded with. It may be interesting to add, in conclusion, that the directors, feeling the necessity of finding new outlets for the company beyond Europe, have been endeavoring during the last few months to develop the operations of the concern in Africa and the extreme East, as well as in Australia.

A LARGE STEEL TUBE.—Sir Joseph Whitworth & Co., Manchester, have completed for one of the 110-ton guns now building for the government a steel tube that is the largest that has ever been made for ordinary purposes. The length of the tube is 42 feet 6 inches, the outside diameter 27 inches, and it is made of fluid-pressed steel forged hollow, with a hole through 14¾ inches diameter. The weight of the tube, as delivered by Sir Joseph Whitworth & Co., is 26 tons; but if it had been made in a solid casting, it would have exceeded 40 tons.

COLLIERY EXPLOSION FUNDS.—During the week, a very important meeting, says the *Engineer*, has been held at Barnsley, to consider the desirability or otherwise of distributing a sum of about £30,000 surplus, arising from the Oaks Colliery Explosion Fund raised in 1866, for the relief and support of 658 persons who were rendered destitute by the deaths of 365 men and boys who were killed in that explosion. As this was the largest fund ever raised in relation to such an accident, a few facts relative to its working can not fail to be read with interest. The committee, in making its appeal at the time the fund was organized, estimated that no less a sum than £75,000 would be required to meet all the claims. This clear sum was come to by the working of the Lundhill Colliery Relief Fund formed in 1857 for the support of 92 widows, 3 orphans, and 217 fatherless children; when 20 widows and 52 children were on the fund, only £1043 2s. 4d. remained in hand. The total amount raised by the Oaks Fund Committee was £48,747; nearly £15,000 was subscribed by noblemen, and £5593 in sums of not less than £50 each. The claimants thrown on the fund at the first were made up of 68 men, 248 women, and 374 children. At the close of 1871, the committee had expended no less a sum than £21,354 14s. 8d., of which £17,809 18s. 8d. was given as general relief, £892 10s. in marriage portions to widows who had at that time again engaged in matrimony. The balance in hand at that time was £34,067 13s. 11d. Between the dates of the explosion and the end of 1871, 99 widows had ceased to be claimants on the fund; of these, 88 had remarried. At that period, 30 men, 101 women, and 226 children were still on the funds. In the course of the next five years, namely, from January, 1876, to the end of 1880, a great change had naturally come over the fund. At that period, there were only 2 men, 34 women, and 13 children, there having been a decrease of 171 recipients in the four years. Of the 25 females who ceased to be dependent upon the fund in the five years, 6 had married, 12 died, and 7 ceased to be claimants; 2 married stone-masons, 1 a quarryman, 1 a railroad porter, 1 a weaver, and 1 a farm laborer. The receipts for the five years amounted to £6284 3s. 1d., and the expenditures £7239 17s., 3d. The excess of expenditure over receipts was £955 14s. 2d., reducing the balance in hand to £28,444 15s. 3d. From 1872 to 1875, the position was of course again altered. The revenue for the four years ended December, 1875, was £5584 6s. 8d., and the expenditure £10,251 11s. 2d. There was, however, a balance in hand of £34,067 13s. 11d. Of the 189 widows left by the explosion, 98 remarried from 1867 to 1874, namely, 2 in the first-named year, 34 in 1868, 25 in 1869, 20 in 1870, and 17 in the four following years. Two were married at the age of 19 years, and 47 between the ages of 21 and 29. No fewer than 12 widows were married at 30, and 37 between the ages of 32 and 52 years. At the present time, there are only 21 persons dependent on the fund, and as the accumulated interest had reached £2957, the committee agreed to vote a sum of £1500 to the West Riding Miners' Permanent Relief Fund, £500 to the Barnsley Benkett Hospital and Dispensary, £200 to the Ripon Industrial Home, and £100 to the Bradford Industrial Home, where most of the girls were trained as domestic servants.

EXPERIMENTS ON THE COMPOSITION AND DESTRUCTIVE DISTILLATION OF COAL.

From a very elaborate and exhaustive paper read by Mr. William Foster before the Institution of Civil Engineers, the following excellent abstract appears in the Transactions of the Mining Institute of Scotland:

The author, in referring to the composition of coal and to the published lists of analyses of all the principal coal-seams of the kingdom, remarks that few of these analyses are given in quite complete form; for instance, the weight of the oxygen and nitrogen is given, as a rule, collectively and not individually. Until of late, this was of little moment; but since the recent great development of the extraction of the by-products, notably of ammonia, it has become important to know exactly the amount of nitrogen contained in any sample of coal, and it is very desirable to have carefully worked out data under this head. Examples of such analyses are given in tables appended. In addition to the quantitative determination of all the important elementary constituents of each of six samples of coal, a number of observations have been made on the disposition of the elementary constituents of each sample, when it is submitted to the process of destructive distillation in a close vessel. With this view, complete analyses of the samples of coke have been made. The specimens of coal thus analyzed represent all the best-known types found in different parts of the United Kingdom, and have been taken from widely separated districts, with the view of making the results as representative as possible; and they are tabulated in the order of their gas-producing qualities, beginning with Scotch cannel and ending with Welsh anthracite. The most approved methods have been employed in the determination of each of the elements, a description of each process being given. Referring to the sulphur in coal, these experiments show that the popular belief that the resulting coke contains a greater percentage of sulphur than the parent coal is a mistake; it is often considerably less. The author notes that the behavior of the sulphur in coal may be considered from two stand-points: one, that of the gas engineer; the other, that of the iron-master. The former deals particularly with the sulphur in its various combinations found in the crude coal-gas, and has no special interest in knowing what amount of sulphur remains in the coke; the reverse of these conditions interests the iron-master, as he endeavors to obtain coke as free from sulphur as possible. A most noteworthy feature in connection with the behavior of sulphur in coal is shown in the analysis of samples No. 3 and 4. No. 3 coal, which contains an exceptionally small percentage of sulphur (0·35), produces a gas containing one and a half times more sulphur than No. 4 coal, although the percentage of sulphur in the latter is more than double that in the former. When coal is submitted to destructive distillation in a close vessel, the disposition of its nitrogen may be considered under four heads: from 11 to 18 per cent of the total nitrogen takes the form of ammonia gas or its compounds; from 0·2 to 1·5 per cent being found as cyanogen gas; from 21 to 36 per cent is unaccounted for, and is believed to be in the crude coal-gas as free nitrogen; and from 48 to 66 per cent remains behind in the coke. In looking over the tables, the small proportion of nitrogen that is evolved as ammonia is noticeable. This is in the highest case 17·8, and in the lowest 11·1 per cent. Very curiously, the specimen of coal that contains the lowest percentage of nitrogen (1·28 per cent) yields as much ammonia as any of the other samples, although some of them are much richer in nitrogen. The author proceeds to show the great advantages of steam in the extraction of the ammonia, and shows the practicability of obtaining 140 pounds of ammonium sulphate from a ton of coke by the judicious use of steam. Appended to the paper, there are four tables giving the ultimate results of the analysis of the six samples of coal previously referred to.

QUICKSILVER AS A PREVENTIVE OF PHYLLOXERA.

John S. Hittell, of San Francisco, sent the following important letter to the press of that city recently. The remedy is a simple one, and may lead to a welcome increase in the consumption of the metal:

John A. Bauer authorizes me to make the important announcement that he has found a sure and cheap preventive of the ravages of the phylloxera. His remedy is half an ounce of quicksilver, mixed in particles too small to be distinguished under an ordinary microscope, with an equal weight of pulverized clay, in the soil of the hole in which the vine is planted. The cost for the mercury, at the present price, is a little more than a cent for each vine, or, as the vineyards are set out in California, from $7 to $10 an acre. The record of Mr. Bauer's experiments, conducted with many different substances for the last ten years, would fill a large book, but only three of them will be mentioned here:

Experiment No. 1.—A series of boxes containing soil mixed with mercury in different proportions were prepared, and then vine roots covered with phylloxera were placed in the boxes to ascertain how much mercury was necessary to kill the insect. The inference was, that half an ounce to the vine was sufficient.

Experiment No. 2.—Two dozen vines two years old dying with phylloxera in the vineyard of H. Hagen, near Napa City, were dug up in 1882, and after a dose of Bauer's mixture had been placed in each hole, the same vines were replanted, just as they were, without any attempt to cleanse the roots. These vines, under that treatment, revived, regained their health, and are now growing vigorously, while the adjacent vines, which were in the same condition two years ago and were not treated, have died.

Experiment No. 3.—In 1882, some cuttings taken from Zinfandel vines suffering from phylloxera were set out in holes, each of which contained a pound of quicksilver in Bauer's mixture, and now all are growing vigorously. The inference is, that the metal, while destroying the insect, does not hurt the vines.

The suggestion for the use of mercury came from the fact, long known to entomologists, that a globule of that metal, in a case of mounted butterflies, will protect them against depredating bugs. It is also well known that mercurial treatment (mercury in a fatty vehicle) and bichloride of mercury (corrosive sublimate) are extremely destructive to insects.

Mr. Bauer made some experiments with the corrosive sublimate, but satisfied himself that it would not serve his purpose. When mixed in solution with the soil, it is immediately decomposed by the greater affinity of the chloride for lime and other earthy materials.

It is supposed that a dose of the mixture will protect the vine for at least twenty years; but proof upon that point can be furnished by time alone.

The clay that is selected as the cheapest vehicle for keeping the metal in its proper place (bringing it into contact with a greater surface of root, and preventing it from sinking down into the ground, as it would if left in large globules) should be free from grit, and may be mixed with the metal in a revolving barrel.

The remedy is simple; it can be prepared, assayed for general purposes, and applied without danger or technical skill; its efficiency can be tested without much delay or expense by any one who has phylloxera and a microscope; and this statement of the discovery will, I imagine, immediately command the confidence of scientific men, who will perceive in it an ingenious application of old knowledge to a comparatively new want. They will probably be surprised that the application of mercury, in this form, to phylloxera, should have escaped the long search of famous entomologists, microscopists, and chemists, under commission by European governments, to be captured by the private enterprise of a chemist and pharmacist on the shores of the Pacific.

Charles Kohler and H. Hagen, prominent vineyardists of California, authorize me to say that they attach much value to the discovery.

Mr. Bauer's confidence in his discovery induced him to purchase a large tract of land west of Oak Knoll, in Napa Valley, for the purpose of planting a vineyard, and last winter he began by setting out 20,000 European vines, after dosing every hole with his mixture. He will add to it year by year.

As to the treatment of old vineyards, damaged seriously by phylloxera, Ms. Bauer is making some experiments, the result of which will be made public hereafter.

In this brief communication, there is no space for the discussion of the relative merits of the American grafting stock, the only other efficient phylloxera remedy; but I venture to anticipate that, after thorough investigation, Bauer's mixture will be found to be not only cheaper and simpler, but generally far better.

SUDDEN OUTBURSTS OF FIRE-DAMP.—The outbursts of fire-damp in some of the Belgian mines are often very violent. The other day, says Mr. G. André in the *Colliery Guardian*, in driving a heading in coal, one of these outbursts occurred. Such was the force of the pent-up gas that it blew out, from the face of the work, about 150 tons of coal, many large pieces being projected to a considerable distance from the face. No explosion occurred; but three out of the four men employed in the heading were suffocated before they could make their escape. One of these was stunned, if not killed on the spot, by a block of coal that struck him on the head. These powerful outbursts may be oftener the cause of disastrous explosions than one is commonly inclined to believe.

A PROSPEROUS GUYANA GOLD MINE.—The annual report of the directors of the Saint-Elie Company, of Guyana, for the year ended June 30th, 1884, shows the product of the placers worked to have been 594 kilograms of gold, which yielded 1,977,699 francs, at a cost of 989,170 francs, including duties, 138,360 francs. The company has a quarter interest in the neighboring Dieu Merci Company, whose operations resulted in a loss to the Saint-Elie Company of 14,515 francs. After the payment of expenses for prospecting for quartz veins and other outlays, a net profit of 754,376 francs remained, of which 600,000 francs were paid to the shareholders, or 75 francs a share, the capital being divided into 8000 shares. Thus far, the shareholders have received 466·46 francs a share, and there is an accumulated reserve fund of 654,908 francs. The Saint-Elie mine is therefore a fairly prosperous one.

THE ELECTRIC RAILROAD AT THE ZANKERODE COLLIERY.—Mr. Robert Thomas Moore, a prominent Scotch mining engineer, recently visited some Saxon collieries, and in the course of an account of his trip gives the following description of the underground electric railroad at the Zankerode Colliery, at Plauen, near Dresden. At this colliery, there is one of Siemens & Halske's electric locomotives drawing coals along a level road about 700 yards long. On the surface, there is a dynamo, which is driven by belting from a small vertical engine placed with the cylinders inverted, the pulleys being about 3 to 1. The engine is run at about 200 revolutions per minute, and the dynamo at about 600 per minute. From the latter, the electricity is conveyed down the pit shaft, which is 120 fathoms deep, by means of copper wires ¼ inch in diameter, and in the road it is led along two rails like a T iron fastened to the roof of the mine. The road, which is a cross-cut mine to get over a fault, has a double line of rails in it, and is arched with brick throughout its length. The conductors are fastened to porcelain insulators fixed in the brickwork. There is a dynamo in the locomotive, which is connected by gearing to the wheels of the latter. Each pole of the dynamo communicates with one of the conductors on the roof by means of a covered wire, one end of which is fastened to a carriage running on the rail, and the other to a pole of the dynamo. When the dynamo at the pit-head is made to revolve, the current passes down the shaft by one of the wires and along the conductor until it reaches the carriage; then down the wire to the pole of the dynamo on the locomotive, and in passing through the dynamo to get to the other pole, and thence to the return, causes it to revolve, and the motion is conducted by gearing to the wheels of the locomotive. The "race" consisted of 15 tubs, each containing 10 cwts. of coal, and weighing 15 cwts. when loaded. The locomotive was put behind the race, and ran the whole length of the drift in four minutes, or at the rate of about seven miles an hour. It was making 25 runs a day, and drawing about 200 tons in that period. The author was told that the following was the proportion of useful effect of the arrangement: Steam-engine, 10 horse-power; dynamo, 5 horse-power; locomotive, 3 horse-power; thus showing that 30 per cent of the power of the steam-engine was got out of the locomotive. About £900 was the cost of the whole erection at the colliery, and the system has been in operation for nearly two years, the visitors being informed that the engine worked very satisfactorily and gave no trouble. The working expenses were said to be very low. As the cost of repairs was almost *nil*, the chief expenses consisted in the wages of the engineman on the surface and on the locomotive. It certainly seemed to be a very simple and compact arrangement, and to work very well indeed, and there did not appear to be much that could go out of order in it.

ELECTROLYTIC SEPARATION OF COPPER AT SESTRI-LEVANTE.

The *Electrical Review* of this city translates from *La Lumière Electrique* an article from which we take the following:

The establishment is situated in the valley of the Bargonasco; on the left bank of the torrent of that name, is a confluent of the Petronia, which enters the sea near Sestri-Levante. A road of about seven kilometers connects the works with the railroad station of Sestri-Levante. The water necessary for the motive power is furnished by the Bargonasco; and there has been constructed, in order to insure a fall of 60 meters' hight, a canal that, following the sinuosities of the mountain, is 1300 meters long, of which 300 meters are in tunnels. This canal conducts the water to the turbines that drive the dynamos, producing there an effective force of about 300 horse-power. At present, only three turbines are in use, of 175 horse-power in all, and of this amount only a portion is used for the dynamo, the ventilator, the grinding-mill, the pumps, etc. The ores are furnished by the mines of Libiola, Galinaria, Monteloreto, and Bargone, and partly by the mines of Montecatini, but only the richest of the ores from the latter mine are used. The ores vary in richness according to their place of origin, containing from fifteen per cent to fifty per cent of copper.

The twenty dynamo-electric machines are arranged in two batteries of ten machines each. Each dynamo is connected with twelve vats, arranged in tension. Each vat is charged with fifteen anodes and sixteen cathodes, placed at five centimeters apart. The dynamo—Siemens & Halske's model, C 18—gives a current of 240 ampères, with a difference of potential of fifteen volts, when the resistance of the exterior circuit is 0·0625 ohm and the speed of rotation 950 revolutions a minute. The 12 by 240 = 2880 ampères of current that traverse the bath correspond approximately to a deposit of eighty-two kilograms of copper per twenty-four hours per machine.

In taking a general view of the process, we may divide the treatment into three operations:

1. The preliminary smelting of the ore into ingots, which is the sole part of the process necessitating the use of combustibles, whose consumption varies as the ore is rich or poor, fusible or refractory; and in any case, it represents only a small fraction of the fuel that would be necessary to employ to extract the same quantity of copper with the usual metallurgical methods, the maximum fuel required being fifteen per cent.

2. Electrolysis demands considerable motive power, consequently cheap hydraulic power must be had; therefore this process is only applicable in places where water supply is abundant. At present, 3000 horse-power can be depended upon from this source.

3. The secondary chemical operations for the utilization of the waste products do not form any specialty of this method of procedure, and may be varied according to special surrounding circumstances.

THE GOLD MINES OF VENEZUELA.

A comprehensive report, prepared by Vice-Consul Reddan, stationed at Caracas, has been issued by the British Foreign Office. Mr. Reddan states that the gold-fields of Guayana, which are presumed to extend almost continuously from the Orinoco to the confines of British Guayana and Brazil, and from the great mountain range of the Imataca, which runs into the Atlantic Ocean, to far beyond the western boundary of the territory, which is the river Caroni, cover an extent of ground considerably larger than Great Britain or Ireland, and of which little is known, as they have never been properly explored, much less surveyed. The gold resources of the territory are constantly multiplied by the discovery of new localities, much as the Cicapra District, whose placers are yielding large quantities of gold, imperfectly worked as they are; and many former discoveries, which at the outset failed to meet the high hopes formed of them, are beginning to attract with greater zest the parties who long since considered them to be worthless. The most notable lodes discovered, when Mr. Reddan visited the mining district in 1883, were El Callao, Chili, Nucupay, Panamá, and Peru. Many others—such as the Tigre, Hansa, and Union—gave great promise of discovering more lodes later on. Many of the companies have experienced great and severe losses. This, however, is not to be attributed entirely to the poverty of the mines, but rather to various other causes, such as in many cases the properties being under the control of managers who never saw a mine before, and consequently knew nothing whatever of managing them; and also the very great cost of labor, transport, and fuel. In no year since the formation of companies, has there been more interest manifested in the mines of Guayana; and now that they are becoming more widely known and appreciated, they are getting more favorable chances to develop themselves. The number of companies formed for the purpose of acquiring and working the concessions granted by the government since the year 1860 to December 31st, 1883, has been forty-two, representing nominal capital to the extent of £12,328,000. Of these forty-two companies, sixteen were Venezuelan, representing capital to the amount of £1,818,000; seventeen English, with nominal capital of £5,948,000; five American, with £4,368,000; three French, with £432,000 nominal capital; and one German, with £32,000. Deducting the sum of £1,590,000, the capital of six companies, which, though offered to the public, met with no response and did not proceed to work, there remains the large amount of £10,738,000 for the other thirty-six companies, which have all considerable interests in the mining territory. Of these thirty-six companies, twenty-nine introduced machinery for the purpose of working the mines. Twenty companies produced gold to the amount of 1,045,836 ounces of standard gold. The total amount of gold produced from the territory and shipped from Ciudad Bolivar from the year 1866, when the returns of gold began to be kept, to December 31st, 1883 (18 years), was 1,323,275⅘ ounces, which, at the rate of £3 17s. 6d. an ounce, gives the large sum of £5,137,686 12s. 7d.; and if to this amount be added 500,000 ounces more, as representing the amount of gold taken from the gold-bearing region previous to 1866, and the amount carried away clandestinely during those eighteen years by private parties, as also stolen, we shall have, as a fair estimate, the amount of 1,823,275⅘ ounces, at the rate of £3 17s. 6d. an ounce, £6,887,686 12s. 7d., rather below than above the figure, however, as the total product of this small part of this immense region for the time it has been worked. If we now take the present value of the properties or concessions and plant of the thirty-six companies above mentioned, which may have spent of the £10,738,000 nominal capital represented by them perhaps the one third, with the dividends paid to date, it will be found that the gold-bearing territory of Guayana has pretty fairly paid for itself. This is principally due to the great riches of El Callao. The amount of English capital employed in the mining districts is £3,948,000, to which must be added six shares of the El Callao, which, at the rate these shares are selling at to-day, £60,000, represents £360,000, making the total amount of capital £4,308,000. This large sum is represented by the value of the mining concessions and the costly plant at present upon the properties. Besides the value of the mines, there is also a large amount of capital in business houses owned and managed by British subjects. Again, the greater part of the population employed in and about the mines and in the mining district are British subjects from Great Britain and Ireland, and all the West India islands, including British Guayana, of which there are from 8000 to 9000; and the influence exercised by such a large number speaking the same tongue, gives the territory more the appearance of an English colony than a part of the Spanish-speaking republic of Venezuela. The managers, officials, clerks, and skilled mechanics of the various mining companies are from different parts of Great Britain; the laborers, miners, shop-keepers, and a considerable number of carpenters, tailors, shoemakers, masons, and domestic servants, are from the colonies, principally Trinidad, Barbadoes, Dominica, Jamaica, and Demerara. Those persons who have come from England directly, as managers, clerks, engineers, and skilled mechanics, having special contracts with the companies, are, as a rule, well housed and fed, and, in case of sickness, have a doctor to attend them. They are well paid, and, all considered, are as well off as any of those who leave their country for the purpose of bettering their condition abroad. The above, however, does not refer to the colored British subjects from the colonies, whose condition, though not by any means as good as that of the others, is nevertheless, circumstances well considered, far better than that of those British subjects engaged at work on the Panama Canal. The mining industry suffers much at present from two great wants, namely, labor and fuel, and as the mines increase in number, the wants are intensified. The scarcity of labor is almost wholly due now to the great difficulties and cost of the journey from the ports to the mines; and once having a ready and sure means of overcoming this, it is certain that immigration, which, notwithstanding the present obstacles, is considerable, would set in much more rapidly.

AMERICAN ELECTRICAL EXHIBITION.—The opening of the American Electrical Exhibition in Boston has been again postponed until December 8th, at the request of many large exhibitors who desire further time to prepare their exhibits.

PROMOTING METALLURGY AND ENGINEERING IN RUSSIA.—For the purpose of fostering the native metallurgical and engineering industries in Russia, the state has since 1876 offered premiums on the manufacture of such articles as steel rails, locomotives, railroad wagons, etc. The sums received by manufacturers since 1879 are given as follows: 1880, 2,929,051 roubles; 1881, 2,039,515; 1882, 1,034,787; 1883, 748,487; while for 1884 the amount is estimated at 1,950,000. On rails completely manufactured in Russia before May 14th, 1885, the government offers a premium of 35 copecks per pood (about ¾ cent per pound). On rails manufactured only in part in Russia, 20 copecks per pood are offered until May 14th, and 15 copecks after that date. The aggregate output of the rolling-mills during 1885 is expected to reach 5,070,000 poods (91,440 net tons).

THE COST OF LIGHTING A FACTORY WITH THE INCANDESCENT LAMPS.—The incandescent system of lighting must be able, if it would be generally employed, to compete with gas in cost. Hence it may not prove uninteresting to explain what it has accomplished when practically compared in cost with gas by persons having no interest in either the one or the other. A large manufacturing firm at Olneyville, Rhode Island, recently tested two Weston dynamo machines, one of one hundred lights' capacity and the other of fifty lights. The test was made during an entire year, from April 15th, 1883, to April 15th, 1884—3397 hours, an average of 11 hours each working day—the object being to discover whether incandescent lighting or gas was the cheaper. The following figures were given by the firm as the result of their experience: Number of lamps in the two circuits, 170; number of lamps broken in 3400 hours, 133; average life of lamps, 2207 hours. The cost of operating for the entire year was as follows:

133 lamps broken, at $1.50 each	$199.50
Cost of power	500.00
Cost of attendance	468.00
Cost of brushes, oil, and other supplies	52.00
Interest, 6 per cent on $4100	246.00
Total	$1,465.50

They compare this with what they had previously paid for gas as hereunder:

Cost of gas, 170 seven-foot burners, 3397 hours, 4,042,430 feet of gas, at $2 a thousand	$8,048.86

In Providence, where they say gas may be had for $1.75 per thousand, this cost would have been reduced to $7074.26. This shows, as they say, that their Weston incandescent lamps cost them only one quarter of a cent per lamp per hour, which is equivalent to gas at 37 cents per thousand feet.

AN EARLY DISCOVERY OF PHOSPHOR-BRONZE.—Mr. F. Maxwell-Lyte has written the following letter to the editor of *Iron:* Apropos of this compound, described by Mr. P. F. Nursey, in his interesting paper on modern bronzes, recently read before the Society of Engineers, and published in your issue of October 10th, I beg to send you a curious anecdote that may interest some of your readers. About the month of March, 1875, a man, whose name, I think, was Gautier, called on me in my laboratory in Paris, where I was then living, to show me an experiment, whereby he professed to be able to transform common brass into a sort of bronze possessing very valuable properties. This was by fusion in a covered crucible and adding to it a powder, as well as some siliceous sand and powdered charcoal, stirring all well into the fused metal. The

experiment was quite successful, and as he told me the powder was quite cheap and common, and easily procured, I urged him to patent his discovery, offering, for a participation in the profits, to even bear half the expenses; but nothing would induce him to listen to any proposal of the kind. He only descanted on the worthlessness of patents, the way in which people would use his invention unauthorizedly, and things of that kind. He left in this mind, and a few days afterward returned, hoping that he would find me decided to buy his invention for a round sum, in order to be able to deal with it as I chose. When he left, he inadvertently left a small portion of the powder in the paper, which I had the curiosity to analyze. I found it to be mainly composed of calcium phosphate, and, in fact, it possessed the composition of bone-ash, which I concluded it to be. When Gautier returned, I told him so, but he said I was wrong. I at last got out of him that the powder was calcined stag's horn. I again urged him to patent his invention, but he still resolutely refused, and left, and I never saw him after, and as I felt in no way justified in dealing myself with the discovery, the matter was soon forgotten. About two years afterward, the man died, and his widow came to me, and again offered the invention. In the interval, however, the phosphor-bronze invention had been published by Dr. Künzel, and I was obliged to tell her she had been forestalled, though her husband's invention was evidently nothing less than this, although phosphor-bronze usually contains tin, not zinc. Still, with the latter metal a very good effect is produced. She was, of course, grievously disappointed, and left, and I never saw her after. I learned that Gautier was an ordinary workman in one of the artistic bronze factories of Paris, and that his invention had been the result of purest accident, as many valuable discoveries often are.

INDIA INK.—A Chinaman named Chen-Ki-Souen has written a monograph on the famous Chinese ink, commonly known as India ink, from a translation of which the *Oil and Colorman's Journal* prints the following abstract. The Chinese writer describes every stage of the preparation of India ink with great accuracy and elaborate detail. The author states that a kind of pigment ink was discovered somewhere between 2697 and 2597 B.C. It was employed for writing on silk with a bamboo rod. Afterward, an ink was prepared from a certain stone, which is still known in China as Che-hei. It was not until about 260 B.C. that they began to make an ink from soot or lamp-black. The soot was obtained by burning gum lac and pine wood. This ink was made first in round balls and very soon supplanted the stone ink. For a considerable period, the province of Kiang-Si appears to have had a monopoly of ink-making. Under the dynasty of Tang, 613 to 915 A.D, there was a special officer, called an inspector, who had charge of its manufacture. He had to furnish the Chinese court with a certain quantity of this ink annually. Some of the factories seem to have been "royal Chinese" factories. The emperor Hinan Tsong (713–756 A.D.) founded two universities to which he sent three hundred and thirty-six balls of ink four times a year. The most celebrated factory in China is that of Li-Ting-Kovei, who lived in the latter part of the reign of Tang, and made an excellent article. He made his ink in the shape of a sword or staff, or in round cakes. The test of its authenticity consisted in breaking up the rod, and putting the pieces in water; if it remained intact at the end of a month, it was genuine Li-Ting-Kovei. Since the death of this celebrated manufacturer, there seems to have been no perceptible advance made in the making of India ink. In the manufacture of lamp-black, nearly every thing is used that will burn. Besides pine wood, we may mention petroleum, plant-oils, perfumed rice-flour, pomegranate bark, rhinoceros horns, pearls, and musk. Nor does fraud seem to have been entirely wanting. According to the best Chinese authorities, the best India ink smells like musk, and the addition of musk not only serves to give poor goods the resemblance of finer ones, but also actually makes them more serviceable. The binding agent is the most important ingredient next to the lamp-back. In former times, glue made from the horns of the rhinoceros and of deer was employed; now only ordinary glue and isinglass are used. Good Chinese ink improves with age, and should not be used until a few years after it is made, but must be entirely protected from moisture. In using, it should only be rubbed backward and forward, as, for some unexplained reason, rubbing it around and around hardens it.

FURNACE, MILL AND FACTORY.

The Poronai road, in the Kokkaido, the northern province of the empire of Japan, was built by American engineers, and is stocked with locomotives purchased in the United States. It runs from Fermiya, in Otaru harbor, through Sapporo, the seat of the provincial government of Sapporo Ken, to the Poronai coal mines, a distance of a little over 56 miles. It has five large bridges and six tunnels. One of the wooden bridges has lately been removed and replaced by one of iron, and another is about to undergo the same process. These iron bridges were purchased from Cofrode & Saylor, of Philadelphia. The locomotives came from H. K. Porter & Co., of Pittsburg, Pa. Another has been ordered from the same firm, as the business of the road is rapidly increasing. It was finished in 1882, and its entire management is in the hands of Japanese.

The Baltimore (Md.) Rivet and Spike-Works have made an assignment to Charles I. Fisher for the benefit of their creditors.

With the exception of the breakers and the rolls, furnished by the Farrel foundry, the Fort Scott Foundry and Machine-Works supplied all the machinery for the new Parrot concentrator in Butte, Montana.

H. K. Porter & Co. are at work on another locomotive for the railroad in the island of Yesso, Japan. It will be completed in January, and its gauge will be 3 feet 6 inches. Its name will be Shidzuka. This will be the sixth locomotive that H. K. Porter & Co. have made for this road. They have recently been favored with two other inquiries for locomotives for use abroad, namely, one for Japan and one for China. Messrs. Porter & Co. are also at work on a 30-inch locomotive for use at a silver mine in Mexico, and will complete it in December.

Proposals for the illumination of the city of Rio de Janeiro by gas will be received up to three P.M., of February 28th, 1885, at the Brazilian Legation, at Washington, D. C., and at the Brazilian Consulate General in New York. Specifications and general conditions will be furnished an application at the same places.

The locomotive El Gobernado, built at the railroad works at Sacramento, Cal., has been sent down to the Tehachipi Pass. This is said to be the largest locomotive in the world. Its weight is considerably more than 100 tons, and it has ten large drivers, five on a side. It was named after Governor Stanford. Its length was so great that it projected through the doors at both ends of its stall at the round-house.

Long & Co.'s iron mill at McKee's Rocks, Pa., has closed.

The Cleveland, Ohio, Non-Explosive Lamp-Works, which made an assignment in September, was reopened December 3d, as the lamp and brass-works of W. J. Gordon, who bought the concern without the debts of Walton, the assignee, for $20,500. The assignee of the Cleveland Non-Explosive Lamp-Works will declare the first dividend on March 1st. The debts of the concern are $195,000, and the assets the amount paid by W. J. Gordon for the works, together with about $10,000 of good debts.

Some large orders for railroad supplies have been placed with manufacturers at Pittsburg, Pa., and bids for others have been asked for.

A co-operative company has bought four acres of land in Wampum, Pa, and will proceed to erect a wire mill at that place. The capital stock is $50,000, and the mill will furnish employment to a large number of laborers.

The Keystone Bridge Company (Pa.) has two big contracts on hand. One is a bridge for the Baltimore & Ohio Railroad Company, to span the Susquehanna at Port Deposit, Maryland, and the other for a 4000-foot bridge across the Ohio River at Henderson, Ky., for the Louisville & Nashville Railroad Company.

The puddling and horseshoeing departments of Shoenberger & Co.'s rolling-mills, at Pittsburg, Pa., which have been closed for some time, resumed operations November 28th. Chase, Cook & Co.'s mills at the same place, after being shut down several weeks, started up again December 1st.

All departments of the Sharon Iron-Works have shut down.

The mills of the Trumbull Iron Company, at Girard, Ohio, have closed down on account of a lack of orders.

The Elba Iron-Works, Pittsburg, Pa., have started up after a partial shut-down of four months.

The Spang Steel and Iron Company (Pa.) will soon have the natural gas introduced. The plant is at present turning out extra large plate steel.

Witherow & Co.'s works, New Castle, Pa., have orders amounting to $450,000. The latest is for stoves for the Lochiel furnace; amount, $30,000.

Two slate mills at Fairhaven, Vt., have shut down, and others are running on three-quarter time. Two mills at Hydeville, Vt., have also closed. The price of slate has been reduced by a number of mills from 24 cents a foot to 16 cents. The slate costs about six cents at the mill, and the planing about as much more, which leaves about four cents margin for milling. This margin is considered by many mill-owners too small for profit. Most of the proprietors fear an overproduction, and it is to avoid this that they are shutting down or working on three-quarter time.

The Fall River Iron-Works, which have been shut down for the past month because of dull trade, started up on full-time December 1st.

The Fishback rolling-mill, at Pottsville, Pa., some departments of which have been idle and others working only three days a week, resumed work December 3d on full-time, orders for bridge and architectural iron having been received to keep it running for some time. The mill employs one thousand hands.

It is probable that the McQueen Locomotive Company, at Schenectady, New York, will begin operations in the spring.

The Saucon Iron Company's property, consisting of two blast-furnaces, railroad cars, mine leases, and other appurtenances, is to be purchased by the Thomas Iron Company. The terms of sale are all agreed upon, and the transfer is to be made soon. The price covers the mortgages on the works. The Saucon furnaces have been closed for eight months. The Thomas Iron Company has six furnaces in blast now and three out of blast. The Saucon furnaces are to be overhauled and started as soon as practicable.

The Cleveland rolling-mill (Ohio), which has not before run on full-time since 1876, is doing so now, except in a single department.

The Northwestern Car and Manufacturing Company, of Stillwater, Minn., which failed last spring, has resolved to reorganize under the name of the Northwestern Thresher Manufacturing Company. The creditors are to purchase all the assets of the company, and the capital stock will be $7.000,000.

Hendricks Brothers' copper rolling-mills at Belleville, New Jersey, have shut down. The cause given is a stoppage of orders.

The application of A. B. Hart, for a receiver for the Harrison Wire-Works, of St. Louis, Mo., was withdrawn December 2d, the court having intimated that a receiver would not be appointed because Kidder, Peabody & Co. had withdrawn their attachment suits against Edward Harrison and others.

The Edgar Thomson Steel Works, at Pittsburg, Pa., employing 5000 men, close down the latter part of next week, and will remain idle until after the holidays, unless there is an unexpected rush of orders.

The Schuylkill Haven rolling-mill above Port Clinton, Pa., employing over 100 men, which has been idle since last August, resumed work December 2d.

Russell & Co., Massillon, Ohio, manufacturers of agricultural machinery, have resumed work.

The North Chicago Rolling-Mills, Chicago, Ill., which shut down two weeks ago, will resume operations December 8th, and will continue until February at least. This will give employment to 3000 men.

LABOR AND WAGES.

The Buckthorne Wire Fence Company, New Jersey, made a reduction of 10 per cent December 1st.

Seventy operatives employed by the Canadian Cutlery Company, at Montreal, Canada, have gone on strike against being paid by piece-work, as in Sheffield, England, except at higher rates. All the hands were brought from Sheffield on the opening of the manufactory a year ago, and were previously paid by day-work.

The wages of all employés of the Pittsburg, Cincinnati & St. Louis Railroad Company will be reduced 10 per cent December 1st.

The heads of all the departments of the Michigan Central Railroad have been notified to reduce their working force ten per cent, on account of a decrease in traffic receipts.

The Mineral Mining and Railroad Company, Pennsylvania, employing 1200 miners, has reduced wages from seven to ten per cent.

A reduction in wages of ten per cent will go into effect at the American Iron-Works, Pittsburg, Pa., December 8th.

A reduction of from ten to fifteen per cent in the wages among the quarrymen and laborers at the Rhode Island Granite-Works, at Westerly, R. I., went into effect December 1st, and a large number of cutters have been laid off.

In Birmingham, Conn., the employés in the rolling department of Peck, Stow & Wilcox have been notified of a ten per cent reduction.

The miners in all the mines in the Cumberland District, Md., went to work December 1st, notwithstanding the reduction. A strike is not probable.

The 10 per cent reduction in wages, recently ordered by the Connellsville Coke Producers' syndicate, went into effect December 1st, and was accepted. About 8000 men are affected by the reduction.

The William Anson Wood Mower and Reaper Company, at Youngstown, Ohio, has notified its employés that their wages will be reduced 20 per cent. The workmen in Booth, Miller & Co.'s foundry, same place, have received notice of a cut of 10 per cent. in their wages. These reductions will go into effect at once, and will be accepted.

At Pittsburg, Pa., the iron mills of Oliver Brothers & Phillips, and the Black Diamond Steel-Works, operated by Park Brothers & Co., are running as usual, the workmen having accepted the reduction in their wages.

The 200 employés of the Westinghouse Machine Company have been notified of a reduction of 10 per cent in their wages.

At the machine-shops of the Glendon Iron Company, Easton, Pa., notices were posted announcing that there would be a reduction in wages soon, as well as a discharging of men. The notices advised all the men to better themselves if possible.

All of Stewart & Co.'s wire mills at Easton, Pa., which have been idle for some time, started up again December 1st. Though the men complained of the reduced wages offered them last week, no one refused to go to work. About 200 men were given employment at the barbed wire-works, at the same place, the working time being reduced to nine hours.

Advices from Philadelphia state that the reduction in the wages of the iron-workers went into effect December 1st, but no strike is anticipated. Under the new scale, puddlers who received $2.85 a day will have about $2.69. Helpers are reduced from $1 60 to about $1.50. Heaters, who under the old rates had $20 a week, will get $16. Roughers and rollers, who averaged about $10 a week, will now have trouble in making $8.

The working forces of the Bessemer steel mill, of the Bethlehem Iron Company, at Bethlehem, Pa., were reduced December 1st. Nearly 150 workmen were discharged.

The laborers at the Crescent Steel-Works at Pittsburg, Pa., have accepted a reduction from $1.25 to $1 a day.

The miners of the Wabash Coal Company, at Springfield, Illinois, have struck against a reduction to 2½ cents, the same as other companies in that region have been paying.

Brown, Bonnell & Co, have given notice in their mill that, after December 1st, all men employed by the day would hereafter quit at half-past four P.M., instead of five P.M., as has been the rule for some time. This in effect will reduce their wages the amount of the time deducted.

The employés at the Lucy blast-furnace, Carnegie Brothers & Co., at Pittsburg, Pa., the largest in this district, have been notified of a 12½ per cent reduction in wages, to go into effect on December 8th.

Reports received from Columbus, Ohio, show that nearly $3000 have been distributed among the needy striking miners, and that large sums are received daily. The situation remains the same. The syndicate mine at Carbon Hill is now worked daily by a force of fifty Hungarians. The average pay of the miners in the employ of the syndicate for the last month, as taken from their books, was $73.50. The contest between Mr. Rend and the syndicate and Hocking Valley Railroad interests promises to be a hard-fought legal battle. If the whole affair is not settled before the Legislature meets, it is more than likely that a committee of investigation will visit the valley, after which an examination of the books may be made. John McBride, the President of the State Miners' Association, is a representative from Stark County in the General Assembly.

From Pittsburg, Pa., it is reported that there are evidences that the quiet manner in which the river coal miners of this district accepted what appeared to be defeat, and returned to work at lower wages than have been paid for five years, was only a change of base; and that, as soon as they are intrenched in their new position, they will resume offensive operations.

RAILROAD NEWS.

Officials of the Pennsylvania Railroad Company state that action will soon be taken in regard to a retrenchment of operating expenses, but as yet no plan has been submitted to the directors. The reductions in the working forces of the lines include 664 track-men, 225 shop-men, 74 train-men, 83 station-men and laborers, and 60 clerks, a total of over 1100 men discharged, and saving the company $42,000 per month.

The monthly statement of the Norfolk & Western Railroad Company for the month of October shows gross earnings, $288,495; expenses, $132,727; net earnings, $155,768; and for the year, $963,612.

The Philadelphia & Reading Railroad reports its net earnings for October at $1,343,260, against $2,051,260 for the previous October. For the eleven months of the year that have passed, the net earnings were $11,781,620, against $13,002,565 for the same time in the previous year.

The Dinsmore suit to annul the lease of the Central Railroad of New Jersey to the Reading was decided December 1st against Mr. Dinsmore. The validity of the lease is therefore confirmed. The Jersey Central dividend was not paid because Reading did not furnish the money. Under the terms of the lease, the Reading has sixty days wherein to pay before the lease can be canceled.

The Rochester & Pittsburg, Lake Erie & Western, and Buffalo, New York & Philadelphia railroads, the three greatest coal-carriers centering in Buffalo, have held a meeting through their representatives, and agreed upon a permanent rate of coal freight, which will be an advance over the present price. The new rate, it is understood, goes into effect on January 1st.

COAL TRADE NOTES.

CHINA.

ISLAND OF FORMOSA.

A correspondent of the New York *Tribune*, writing from Tam Sui, Formosa, says that, if the French take and colonize Formosa, they will have such a possession as they have nowhere else in the world. It is an island of great possibilities of development. It is rich in soil, nearly all of it, and has a mild, equable climate that is not unhealthy. Coal is known to be here and there in the mountains in great quantities, and there are supposed to be large deposits of gold, silver, and other minerals, precious and useful, awaiting intelligent development. Formosa lies directly opposite the southern provinces of China, from which it is divided by a channel perhaps 120 miles wide at its broadest point and eighty miles at the narrowest; that is, the strait between Tam Sui and the nearest land in the Fo Kien province. The entire length of the island is 210 miles, and its extreme width seventy. Of the commerce of the island, it is said that the Ke Lung coal has proved to be a profitable article of export; for although it is, on the lowest levels yet reached, of inferior quality, it has to do for short voyages where no better is attainable. Since it has come into use, it has largely superseded that brought from Australia. There were 14,029 tons of it exported in 1878, and 46,178 tons in 1881. With good machinery and civilized methods of working, it is thought the yearly output of the mines might be raised to 150,000 tons. Fifty-one British vessels loaded with coal cleared at Ke Lung in 1881, and eighty-seven at Tam Sui.

ILLINOIS.

At Toronto, a small town a short distance southwest of Hillsboro', an eight-foot vein of fine coal has been reached. The company has good machinery, and will soon be ready to put their coal in the St. Louis and Chicago markets.

MARYLAND.

Preparations are making for resuming operations at the Big Vein mine of the New Central Coal Company, at Lonaconing. The mine has been closed for several months past.

OHIO.

Agents of what is now the Ohio & Western Company, the remains of Lee's Standard Syndicate, the first organized in the valley, are at Nelsonville, arranging for the reopening of the company's mines and furnaces at New Floodwood. Mitchell and Orbiston have been shut down for two years. If successful, the movement will give employment to from 1000 to 1500 men.

NATURAL GAS.

The natural gas-well at Findlay is said to have a flow of 400,000 cubic feet in twenty-four hours. Several large companies are prospecting in this neighborhood.

PENNSYLVANIA.

Lawrence Barrett, a prominent mine contractor, was instantly killed at L. A. Riley & Co.'s colliery, near Centralia, December 2d, at noon. Eight tons of top coal and rock fell, completely burying him.

The meetings of the Mining Institute of Pennsylvania are to be revived.

ANTHRACITE.

A tunnel is driving at Pinedale colliery, on the land of Mr. Gowen, near Middleport, to reach the basin south of that on which the slope was sunk. It has already reached a distance of over two hundred yards, and it is expected that the vein will be reached soon. As there are already a breaker and other improvements on the ground, there will be no delay in shipping coal. It is thought that the colliery will be leased by a Philadelphia firm.

The forty-foot colliery at Wilkes-Barre, owned and operated by J. H. Swoyer, was destroyed by fire November 27th, together with the breaker, 500 tons of coal, and all the valuable machinery about the mines. The cause of the fire is unknown. Five hundred persons will be thrown out of employment.

An accident occurred November 29th to the machinery in the Stanton shaft, at Wilkes-Barre, causing a stoppage of the pumps. The water in the shaft has reached such a hight that work was suspended December 2d.

A number of important improvements for the preparation of coal have been made at the new Garfield breaker, in the Shamokin District, ever since it was put in operation a few months ago, among which are a set of patent slate-pickers that separate the coal from the slate.

An extensive cave-in took place at Stockton, November 29th, at slope five, operated by Linderman, Skeer & Co. Four hundred miners and laborers are thrown out of employment. The most injury was done at No. 1 gangway, the railroad track from this outlet being completely blocked. It can not be ascertained how far the fall extends, but communication is cut off from five workings. The watercourse from slope No. 2 to No. 5 is stopped up, and the water has risen to a hight of four feet. The railroad tracks near the slopes have settled five inches. They are repairing.

BITUMINOUS.

An explosion of fire-damp occurred in the Monongahela & Peters Creek Coal Company's mine, near Coal Bluff, December 3d, fatally injuring two miners.

A dispatch to the New York *Herald* announces that proceedings have been instituted before Justice Holmes, at Uniontown, by Mine Inspector Stinner against James Cole, the boss of the mine of the Youngstown Coal and Coke Company, in which the recent frightful disaster occurred, by which fourteen persons were killed and several wounded, on October 27th. The information is of unusual interest, it being the first of the kind ever made in the history of bituminous mining in Pennsylvania, and will attract special attention in all the coal mining region of the country. The information charges Cole with neglect to circulate around the headings and cross-headings sufficient air to dilute and render harmless the noxious gases generated there, which caused the standing gas that was in the mine or headings at the time of and prior to the explosion, and that Cole did not employ a competent person to examine the mine. The coroner's jury on the inquest held over the victims returned a verdict that their death resulted from an "explosion of gas and vitiated air," and made no endeavor to cast any blame on the management or persons having the mine in charge. Inspector Stinner, however, after carefully examining into the cause of the explosion, concluded that it resulted from gross carelessness and a disregard of the mining laws of Pennsylvania. As the inspector of the district in which the disaster occurred he consequently ordered the above proceedings, in order that punishment might be meted out to the guilty James Cole. The mining boss had not been arrested up to a late hour to-night. The families of those killed by the explosion are generally in very destitute circumstances. They considered that something was due them from the company. Mine Inspector Stinner is severe in his denunciation of the existing mining laws in the State, so far as they refer to the ventilating and working of mines. He says that, under the laws, an inspector can not enter the mines when he feels so disposed. "Unless," he said, "there is a radical change, we may look for even greater calamities. If I had been permitted to examine the Youngstown mine, as I desired to do, I venture to say that those unfortunate miners who were slain would be living, and their families would not be enduring suffering and anguish."

COKE.

The idle ovens have again increased to 4513, as against 4382 at the date of our last report, says the Connellsville *Courier*. Shipments have increased from 500 to 550 per day, by a sudden increased demand coming principally from the East and the Mahoning and Chenango valleys. At the same time, however, shipments West have fallen off. A number of the works are crippled by lack of sufficient water. The recent and long-continued drought has left them in worse condition as to water than the region ever before knew.

There is a rumor that the Pennsville ovens are to be fired up once more. They have been standing idle for a long time.

NATURAL GAS.

It is believed that a company will be formed with capital to successfully put in operation the project of bringing natural gas from Butler County to Youngstown, Ohio. Estimates show that a main could be laid over the proposed route of forty miles at a cost of six thousand dollars a mile.

The Canonsburg Iron Company has begun the drilling of another well on the belt.

Major Howard Morton has devised a new heating arrangement for the utilization of natural gas, which it is expected will admit of the heating of a large house with no greater consumption of gas than is now required for a single fire.

The Westinghouse Company is progressing rapidly with the line to Pittsburg. The plan has been altered to include a 20-inch pipe from Herr's Island to Hoboken, where it will connect with two 12-inch pipes, one from Tarentum and one from Murraysville. It is intended also to put a 10-inch line down from the Bull Creek or Tarentum wells. It is possible this work will not be all complete before the 1st of January. Two weeks hence, it is expected Sharpsburg will be reached. The Spang Steel and Iron Company and Tibby Brothers' glass-house will utilize the fuel at the earliest opportunity. There is a large number of establishments on the Allegheny River on the line of the main that will use the gas as quickly as possible. The Westinghouse Gas Company is supplying gas for domestic use at Pittsburg, at 15 cents per thousand cubic feet, which is 5 cents less than the recently reduced figure of the Consolidated Company. With proper appliances for consumption, this is as economical fuel as bituminous coal. If the competition is maintained, the rate will finally reach 10 cents, and every householder will be induced to introduce the gas. It is calculated that not less than 200,000,000 feet a day will be necessary, which will be equal to a gross income of $20,000, or perhaps not less than $5,000,000 a year. This amount will about equal the entire capital of the gas companies every year. The only difficulties in the way of the general application of the new fuel consist in the imperfection of the appliances and the laying of additional mains.

VIRGINIA.

The output for October of the Southwest Virginia Improvement Company's mines at Po ahontas amounted to 35,895 tons.

Shipments from the collieries recently opened on the Bluestone extension of the Norfolk & Western Railroad have begun. William Bury & Cooper began the shipment of coal from the Mill Creek coal mine the first of November, and have shipped about 160 tons a day. Goodwell & Freeman are ready to ship from their Caswell Fork coal mine as soon as the railroad reaches it, which will be about December 1st.

GENERAL MINING NEWS.

ARIZONA.

COCHISE COUNTY—TOMBSTONE DISTRICT.

Reports from this district state that there are three or four small mines worked and some chloridizing is done. The Grand Central Company has about 200 men in its mines, and the Head Center employs about 25 men in its mines. The total number of men now engaged in mining in this district is about 400. Those engaged in the collateral branches, milling, smelting, leaching, etc., are about 200. The uniform price paid miners per day is $3.

CONTENTION.—No work is doing. The company is awaiting the decision of the Grand Central regarding the putting in of pumps. Something definite on this point will probably be agreed upon between now and the 1st of January next.

GIRARD MINE AND MILLING COMPANY.—The property was sold a year ago by the sheriff, and purchased in the interest of Hamilton Disston, of Philadelphia, and W. C. Parsons, of San Francisco. The time for redemption having expired, a sheriff's deed has been made to them. The property is idle.

TOMBSTONE MINING AND MILLING COMPANY.—The works are now in full operation, after the five months' shut-down. The furnace blew in September 19th, and the concentrating mill recommenced October 1st. The amalgamating mill started October 10th, the first ore sent from the mines after reopening being October 6th. The aggregate product of furnace and mill to November 1st was: Gold, 321·14 ounces; silver, 54,374·03 ounces; lead, 215,142 pounds. The run of the furnace previous to October 1st is considered as about an offset for the ten days lost by the mill in that month, and therefore the aggregate output is called the product for October, 1884. At the mines at Tombstone, 75 men, and at the mills and furnace about 85 men are employed.

GRAHAM COUNTY.

The extension of the Arizona Copper Company's railroad system, leading up Chase Creek to the mines, commonly called the Coronado Railroad, is now nearly completed, and cars will be running upon it by the middle of December. In addition to the large saving to be effected by the Detroit Copper Company in bringing in its coke and merchandise and the carrying out of bullion, the Arizona Copper Company will be enabled to begin regular shipments of copper ore from Modoc and Detroit claims, and also iron ore for flux from the Norfolk. On the whole these improvements will enable both companies to save a great amount of labor.

PIMA COUNTY.

BLUE JAY.—The new mill is nearly ready for operations, and the mine shows up richer as it is developed. The stopes are thoroughly opened and will be able to keep the new mill continually supplied with ore to run day and night.

QUIJOTOA DISTRICT.

The machinery of the old Consolidated Virginia mill, of 80 stamps, is removing to this district.

ARKANSAS.

A correspondent of the Chicago *Mining Review* writes that the silver and gold mining interest in Montgomery and Polk counties is at the present time in a very encouraging condition, and that ore will soon be shipped in paying quantities.

CALIFORNIA.

MONO COUNTY—BODIE DISTRICT.

Reports for the week ended November 24th:

BODIE CONSOLIDATED.—During the past week, 16 tons of ore were worked at the mill. Twelve per cent is lost in the tailings.

BULWER CONSOLIDATED.—Work has been resumed in the Ralston north drift, 385 level. The vein is 2½ feet wide, of low-grade quartz.

STANDARD CONSOLIDATED.—Extracted and shipped to the mill 540 tons of ore and 700 tons of tailings. Received from the ore 480 ounces of crude bullion and from the tailings 300 ounces, which will be melted and shipped next week. There is no change to note in the appearance of the stopes since last report. The supply of tailings near the mill, which have been worked since last spring, is nearly exhausted.

NEVADA COUNTY.

The Cornucopia and Secret Treasure locations have consolidated as one claim. A ten-stamp mill is to be erected.

GOLD RUN DITCH AND MINING COMPANY.—The Supreme Court has rendered a decision in the matter of the appeal of the People *vs.* the Gold Run Ditch and Mining Company from the decision of Judge Temple. The action of the lower court is affirmed, and a judgment for a perpetual injunction against the defendants is sustained.

PLUMAS COUNTY—GREENVILLE DISTRICT.

CRESCENT.—The pumps have been taken out of this mine, and it is stated they will remain out until the legal difficulties in which the property is involved are settled.

GREEN MOUNTAIN.—The No. 6 tunnel is in the mountain 3240 feet. It is 17 feet from the face to the Sulphuret chute. Work is progressing smoothly. About seventy-five men are employed.

OPHIR CONSOLIDATED.—The drift that was driving along the hanging-wall of the ledge in the No. 3 tunnel has reached quartz. A shaft has been sunk in the mouth of the tunnel on the ledge.

SAN BERNARDINO COUNTY.

BONANZA KING.—In the third, fourth, and fifth levels, the stopes are looking well, and in the sixth and seventh levels, where the new development on the ore-bodies has been made during the past month, the ore-bodies are gaining in size. In the seventh level winze, the ore is over four feet in width. The main shaft is down below the seventh level between 40 and 50 feet, and good progress is made.

OCCIDENTAL.—The shaft is down about 100 feet, and penetrates large deposits of rich ore. This mine will soon be the scene of extensive operations.

SUE.—A large amount of horn-silver is produced.

SISKIYOU COUNTY.

Leaching-works have been started near Daggett, on a small scale, and so far the experiments have been successful. The works are to be increased soon. One thousand tons of Humbug ore have been purchased.

COLORADO.

CLEAR CREEK COUNTY.

CORRY.—The mill is temporarily closed. The process of dry concentration has proved a success, but, owing to some company difficulties, the mill will remain idle until satisfactory business arrangements are made.

HOOSAC.—This company, whose property is located near Idaho Springs, has filed notice of the dissolution of the corporation.

MARK TWAIN.—Concentration-works are to be erected next spring, and all the ore from the St. Elmo tunnel brought into the market.

SUMMIT.—Work has begun on a cross-cut tunnel to intersect the mine. This tunnel will cut the 300-foot shaft at a distance of 175 feet, and about 300 feet vertically.

CUSTER COUNTY.

BASSICK.—The company is not employing as large a force as it has for some time past, nearly 200 men having been let out during the past six weeks. Work on the mill progresses with a reduced force of men. The ore-body, which had pinched previously, was found again and is extensive, and about as rich as ever.

BULL-DOMINGO.—The work on the main shaft has been suspended for a time and levels are running. At present, ore is taken out through the winze and 450 foot level. Lately, the output has been a high grade of galena.

DOLORES COUNTY.

The Rico reduction-works have closed for the season. During the winter, the works will be overhauled and necessary improvements made for the spring operations. The manager claims that 90 per cent of the silver in the ores treated was saved, and that the operations have been entirely successful.

FREMONT COUNTY.

ROCKY MOUNTAIN MINE DEVELOPING COMPANY.—We take the following from the report of Mr. George H. Arlett on a six days' test run of the company's copper smelter at Cañon City. For the purpose of this test, there were about 100 tons of ore in the raw state from the company's Green Mountain mine, and 80 tons from the Sedalia mine, the latter being a carbonate with some oxide of copper and iron, containing by analysis: Silica, 23·05 per cent; iron, 20·06 per cent; copper, 13·0 per cent; lime, 2·0 per cent; and magnesia, 8·75 per cent. The Green Mountain ore is a sulphuret of copper and iron, with other sulphurets in a quartz and mica gangue. An analysis of a selected sample before roasting produced the following result: Silica, 15·02 per cent; iron, 25 per cent; copper, 15·14 per cent; zinc, 4·8 per cent; and alumina, 3·3 per cent. After roasting for four weeks in the open air, to drive off the excess of sulphur, a working sample was taken of the entire mass and analyzed with the following result: Silica, 20 per cent; iron, 27·25 per cent; copper, 10·30 per cent; lime, 11·50 per cent; and sulphur, 14·20 per cent. This is an easy ore to roast, and can be roasted down to 4 or 5 per cent of sulphur, if desired. The furnace was blown in Friday, July 10th, 1884, with nine men to the shift, two of whom will not be needed in future, when the slag-yard is leveled off; and in two hours from lighting the fires, the full charge was on and slag running freely from the tap-holes. Mr. Arlett had calculated the charge to make a 45 per cent matte, but found it was running 60 per cent and upward. This excess was traced to an escape—up the stack—of the fine dusty ore that covered the roast-heaps, which contained most of the sulphur, and its loss caused an increased percentage of both iron and copper in the matte, and also the forming of basic accretions in the crucible, which, however, was readily overcome by a change in the charge, after which every thing run smoothly and satisfactorily until Tuesday noon, when an increase in the proportion of fine ore occasioned a similar loss up the stack and corresponding accretions, formations that were again overcome by another change in the charge. The roasted ore from the Green Mountain mine gave out on Wednesday, at two o'clock P.M., and the run was finished Friday, July 10th, at ten o'clock A.M., on Sedalia ore alone, making blister copper, during which time the per cent of copper in the slag increased to 1·25 per cent and 3 per cent at the blow-out. While making matte, no slag contained more than 1·25 per cent, and the average was less than 0·5 per cent of copper. The average consumption of fuel (coke) during the run was 100 pounds of coke to 500 pounds of ore, and 100 pounds of fluxes, scraps, etc. Very little lime was used, the main additions being slag, copper scraps, and waste from the tap-holes. In making this run, there was the disadvantage of having a new plant, new ores, and a crew of new men, who were, without exception, strangers to the process, to which may be added a mistake in roasting the Green Mountain ore too long, which occasioned an increased consumption of fuel and the forming of accretions in the crucible before mentioned. Owing to the constant watchfulness made necessary by the inexperience of the men, and the fact that the matte was removed as soon as made, it is impossible to make a thorough report by analysis; but the fact that the Green Mountain ore is an easy roasting and docile smelting ore is established beyond a question.

GILPIN COUNTY.

CALIFORNIA.—The company has closed down its stamp-mill in Black Hawk, until spring. At the mine, a number of miners have been discharged. The company during the winter months will bend its energies to deeper development of the main shaft of the property, thereby opening up new and unexplored ground.

HINSDALE COUNTY.

CROOKES MINING AND SMELTING COMPANY.—The Ulé mine and concentrator have shut down. The cause is probably the lack of funds to carry on the extensive development of the mine, and the failure of water supply to keep the concentrator running, due to the sudden cold that froze the streams.

JEFFERSON COUNTY.

CRESWELL.—The company intends to erect machinery early in the spring, and push the development of its mines. The mines are situated about ten miles southeast of Idaho Springs.

LAKE COUNTY.

The Leadville *Herald* reports the following:

Several mines have reduced the wages of their laborers from $3 to $2. O. H. Harker, manager of the Henriett, explains that this action, which is only temporary, was induced by the depression in lead and silver.

Large quantities of iron carrying thirty per cent and over excess of iron and from ten to twenty ounces in silver are marketed.

An effort is making to have our smelters supplied with coke from Crested Butte. The strike at El Moro, it is anticipated, will soon be adjusted.

CHRYSOLITE.—The company's lease on the Kearney mill expired December 1st. A clean-up has been made, the result of which will determine the success of the enterprise. Should it be demonstrated that the profit will warrant it, a new lease will be executed, and work continued.

FOREPAUGH.—The mine has closed down on account of the difficulty and expense in handling the water.

IRON.—The lessees of the Bull's Eye, one of the company's properties, have struck a large body of ore that carries in the neighborhood of 60 per cent in lead.

KAISERINE.—The output will be increased as soon as improvements in progress are completed. At present, it is about 25 tons a day.

MONITOR, NO. 2.—At a distance of six feet from the surface on Iron Hill, the lessees of this mine have opened a pocket of ore consisting of hard carbonates and galena.

SMUGGLER CONSOLIDATED.—Two suits against this company are pending in the courts.

LARIMER COUNTY.

Over sixty men have been discharged at the stone quarries that are operated by the Union Pacific Railroad, at Stout. The cause of the discharge is attributed to the fact that they are getting out more rock than they can use.

PARK COUNTY.

SOVEREIGN.—The company is prosecuting its development-work on a grand scale. It has two miles on the vein, which can be clearly traced from the top down. There are several tunnels and shafts. The pay-streak is from 22 to 50 inches wide, and the ore is quartz with copper and iron pyrites, said to run from $30 to $40 in gold and some silver. Some telluride has been found. The workings are so directed that all the ore can be passed out of the lower tunnel after completion of the work as planned.

PITKIN COUNTY.

EMMA.—It is said that one sixth interest in this mine has just been sold for $40,000.

PUEBLO COUNTY.

The smelters at Pueblo have been compelled to blow out some of their furnaces on account of the scarcity of coal and coke, and the steel-works at the same place to bank their fires for the same reason.

NEW ENGLAND SMELTING COMPANY.—The machinery has started for a trial run. Every thing worked satisfactorily. The smelter is not yet ready to begin operations, enough ore not having yet been received.

RIO GRANDE COUNTY.

IOWA & COLORADO.—The company's property has been sold at trustee's sale in Del Norte, and was bought in by A. E. Martin of Anamosa, Iowa, in trust for the bondholders, at $67,838 15, being the amount of all their bonds with interest to date of sale, and costs and expenses of sale. The bondholders will probably at once organize a new company and put the property in shape for working.

SUMMIT COUNTY.

Reports from Breckenridge state that mining prospects during the coming winter are decidedly flattering. Several Upper Blue properties will be worked besides the Governor; several properties between the Swan and French will be worked; and it is reported that a number of properties on the range, Nigger and Gibson will be kept at work, so that the number of men employed in this vicinity during the winter will be larger than during any previous winter campaign.

KEYSTONE BULLION.—The company's smelter buildings are rapidly fitting for treatment of milling ore. Crushers are to be erected and concentrators put in place. It is expected the works will be ready to open in about two weeks.

DAKOTA.

CALEDONIA.—The report for the week ended November 23d shows that the shaft has advanced 15 feet, making a total depth of 135 feet. The ground continues hard, and we have encountered an additional flow of water the past week. The annual assessment-work on the outside claims is this day completed.

FATHER DE SMET.—The superintendent writes, under date of November 18th: Inclosed find express company's receipt for bar No. 196, containing 1104·60 ounces of gold, the result of the run of mill for the first half of November. At the mine, every thing is in fine condition and running along well. The different ore-bodies show very little change in quality, and, outside of the Eureka cut ore, are looking well. There, however, we have a large amount of very low-grade ore to contend with, but have been able to keep up a pretty fair average. Any improvement in this ore-body would make the outlook very encouraging for the future of the mine, and the chances certainly seem good for ultimately cutting better ore here. No new developments have been made in the east cross-cut, second level. The report for the week ended November 22d showed ore extracted from first, second, and third levels, 1820 tons. Ore milled, 1790 tons.

IDAHO.

EUREKA.—The concentrating machinery of this mine at Bullion has been put into running order.

MINNIE MOORE.—All accounts against this mine have been balanced, and the English syndicate that purchased the property last spring is now in full control of it. The management is also in much better shape to meet all demands than at any previous time since the purchase.

MEXICO.

The Mexican *Financier* reports the following:

Five or six companies are preparing to start operations at Tlalpujahua by the first of next year.

Among the richest mines, is a group of three or four claims, all in one lot, owned by Mr. Henry E. Dennie, formerly of New York, and now of the City of Mexico, who purchased them only a short while ago, and is now taking out very rich gold and silver ore, of which there is enough to supply a 40-stamp mill. He is about to go to Chicago, to buy the necessary machinery to treat his free-milling ores, which should produce him a clear profit of from 50 to 75 per cent. These mines have been worked from the surface down, but a tunnel is well advanced, say 440 feet, which will cut the veins at a greater depth, and lessen the cost of extraction in a great degree.

On the south slope of the same mountain, is the property of the National Mining Company. It is about to cut the Temascales veins, which are rich in both gold and silver and contain free-milling ore.

The Santa Rosa group is producing good sulphurets of silver, some assaying 200 ounces per ton. The company is putting up a new wheel at its milling works, which will increase the monthly products. It is reported that Col. H. D. Mackay, who is now in New York, has made arrangements for a 40-stamp mill for the Azteca group of mines.

At the Sirena group of gold and silver mines, good ore is extracted, and the owners are preparing to start a ten-stamp mill.

GUADALUPE.—Mr. H. O. Hofman has taken charge as metallurgist of the smelting-works of this company, a private corporation in which a few Philadelphia capitalists are interested. The company, whose mines are located about 100 miles south of Laredo, near Villadama, has a Fraser & Chalmers water-jacket furnace for smelting lead ores.

MONTANA.

SILVER BOW COUNTY.

A movement is on foot, says the Butte *Miner*, looking to the organization of a large smelting company that shall have for its purpose the reduction of custom ores from this and outside districts. As yet the project is in embryo, but will soon be something tangible.

ALICE.—In the Magna Charta, a strike has been made. In the west drift of the 600-foot level, on the north vein, a ledge having a pay-streak three feet in width, assaying 74 ounces, has been encountered.

ANACONDA.—The St. Lawrence mine, owned by this company, is looking well. There appears to be no visible decrease in the ore output. About fifty tons of first-class ore are hoisted daily, together with a large quantity of second and third-class rock.

BELL.—A body of ore assaying 40 per cent in copper and 100 ounces in silver has been struck.

CLARK'S CONCENTRATOR.—At the concentrator, Meaderville, every thing is running satisfactorily. About sixty tons of ore are put through daily, which is piled up in readiness for the smelter, work on which is rapidly approaching completion.

MONTANA COPPER.—The Montana Copper Company is putting in two Frue vanner concentrating machines, in addition to its already large works.

MONTANA.—The Montana Mining and Smelting Company has recently bonded the Butterfly and Atlana lodes at Basin for $25,000. A bonus of $1000 was paid, and the bond is to run one year.

PARROT.—The company has recently completed the erection of a long tramway, which will be the means of saving a large amount of labor in the handling of ores destined for the different departments of the smelter and concentrator. Things in and about the works present an animated appearance.

POSER.—The shaft has attained a depth of 160 feet, and from this point levels on a body of ore 12 feet in width are now running to the east and west. Shipments to the mill are made of about 150 tons a month of assorted rock, assaying about 60 ounces in silver.

SWANSEA.—In this mine, directly east of the Colusa, a body of high-grade ore has recently been uncovered. Arrangements are making for shipments to the Bell smelter.

MICHIGAN.

COPPER MINES.

MASS.—The mill has been shut down for the winter.

BELT.—Orders have been received from London to unwater the mine on the Great Western part of the property, and the work has begun.

SILVER MINES.

MILWAUKEE & LAKE SUPERIOR.—The company is negotiating with parties who contemplate leasing the company's silver properties, in the Iron River District. In case they come to terms, the lessees will put up the necessary reduction-works, and push matters.

NEVADA.

ESMERALDA COUNTY.

THANKSGIVING.—It is stated that Col. A. C. Ellis, of Carson, has purchased this mine at Aurora for $10,000.

EUREKA COUNTY.

ALBION VS. RICHMOND.—This suit was to come up December 5th.

RICHMOND.—The report of the directors to be submitted at the half-yearly meeting, in London, states that the works were closed down from July 5th to August 17th, so that smelting was carried on for only 20 weeks with the usual furnaces, supplemented by an extra furnace on June 12th, to clean up prior to shutting down. During the time these furnaces were at work, they reduced 3389 tons of Richmond ore, 2763 tons of purchased ore, and 693 tons of accretions, etc., together 6845 tons, the average yield per ton being $50.81 (Eureka assay value). No. 4 (refinery) furnace smelted in addition 325 tons of Richmond, 1391 tons of purchased ore, and 3880 tons of accretions; the total quantity smelted in the half-year was 12,081 tons, yielding 6446 ounces of gold, 183,709 ounces of silver, and 1129 tons of lead. The furnaces have been at work continuously for nearly three years, and while shut down, they were put into efficient working order, and all machinery overhauled and repaired. A table is given that shows the quantity of ore smelted weekly by the general furnaces, and the gross estimated value of the bullion (gold, silver, and lead) at Eureka assay value, exclusive of the quantity smelted by the refinery furnace. March 4th, one furnace, 267 tons of ore = $13,000; March 11th, one furnace, 240 tons of ore = $11,000; March 18th, one furnace, 312 tons of ore = $12,000; March 25th, one furnace, 281 tons of ore = $10,000; April 1st, one furnace, 244 tons of ore = $9000; April 8th, one furnace, 267 tons of ore = $12,000; April 15th, one furnace, 280 tons of ore = $13,000; April 22d, one furnace, 291 tons of ore = $10,000; April 29th, one furnace, 270 tons of ore = $11,000; May 6th, one furnace, 317 tons of ore = $12,000; May 13th, one furnace, 306 tons of ore = $14,000; May 20th, one furnace, 325 tons of ore, = $15,000; May 27th, one furnace, 302 tons of ore = $15,000; June 3d, one furnace, 287 tons of ore = $15,000; June 10th, one furnace, 274 tons of ore = $15,000; June 17th, two furnaces, 443 tons of ore = $20,000; June 24th, two furnaces, 647 tons of ore = $40,000; July 1st, two furnaces, 667 tons of ore = $43,000; July 8th (four days), 473 tons of ore = $42,000; July 15th to August 19th, furnaces shut down; August 26th, one furnace, 286 tons of ore = $12,000; total, 6779 tons of ore = $344,000. The refinery was working up to July 22d, when it was also shut down and put into thorough repair, and re-started on August 17th. The table given shows the returns of the refinery, and the gross estimated value of the doré bars (gold and silver), also at Eureka assay value, exclusive of the value of the lead: March 4th, $13,000; March 11th, $12,000; March 18th, $14,000; March 25th, $12,000; April 1st, $11,000; April 8th, $15,000; April 15th, $15,000; April 22d, $14,000; April 29th, $15,000; May 6th, $13,000; May 13th, $15,000; May 20th, $16,000; May 27th, $17,000; June 3d, $15,000; June 10th, $16 000; June 17th, $20,000; June 24th, $35,000; July 1st, $38,000; July 8th, $35,000; July 15th, $41,000; July 22d, $42,000; July 29th to August 19th, refinery shut down; August 26th, $14,000 = $438,000. The body of ore found on the 300 level in July, 1883, has been yielding satisfactory results, and during the half-year a further body of ore has been discovered on the same level. A few tons of ore have been extracted from the Williamsburg mine, but nothing of importance has been developed there as yet. Mr. Probert is dealing successfully with the "speiss," a large quantity of which has been treated by his process. The application of the Albion Company to have the damages claimed by them assessed (referred to in the last report) came before the court at Eureka in July, and the jury assessed the amount at $13,250, the claim being $608,000. The Albion Company, is, however, reported to be taking steps to obtain a new trial. The price of lead has continued extremely low, and the stock in hand has still further increased: the market at last, however, shows signs of recovering from the long depression, the price having recently risen from 3½ to 3¾ cents a pound, and the directors have reason to expect that a further improvement will take place in the spring. Notwithstanding the low price of lead, the suspension of the works for several weeks, and the unusually heavy expenses of the half-year, the net profit for the six months will probably be about £15,000; and the directors have decided to declare a dividend of 5s. a share, the warrants for which will be posted in the course of a few days. The yearly accounts and balance-sheet will be made up to the end of February next, as usual, and presented to the shareholders as soon after that date as possible.

STOREY COUNTY—COMSTOCK LODE.

The amount of ore daily extracted from the upper workings of the Overman mine is gradually increasing. The former output, 50 tons, has now increased to 64 tons daily, which is shipped to the Vivian mill for crushing.

The Yellow Jacket is shipping daily 22 cars, carrying 176 tons of ore, to the Carson River. Work has been resumed in the Crown Point and the Belcher, which will add from 160 to 180 tons to the daily shipment of milling ore.

The Hale & Norcross and the Ophir are also making daily shipments; and when the Chollar resumes work, there will be a daily train of 90 ore-cars, carrying 720 tons to the mills on the Carson River, for crushing.

A portion of the machinery taken from shaft No. 4, formerly in use by the Sutro Tunnel Company, has been purchased by J. M. Moss, and is shipped to Kinkead Mining District, to be used in a quartz mill in course of construction at that place.

NEW MEXICO.

CARLISLE.—The new reduction-works of this company, for reducing the concentrates and tailings, will be completed and in operation by the middle of December.

NEW YORK.

KINGSBURG BLUE STONE COMPANY.—This company, working extensive quarries near Sandy Hill, on the Hudson, has discharged all its employés, numbering nearly two hundred men, and has suspended work.

UTAH.

B. B. Van Duesen, of Salt Lake City, advertises that he has been authorized to purchase lead-silver ores for Western shipment, and asks the chance to bid on all such ores in that market or in places tributary to that market.

VIRGINIA.

A lime-kiln has been started up at Eagle Rock, on the James River, 200 miles above Richmond, by Maine capitalists. The venture is an experiment entered into by Messrs. A. F. Crockett & Co. and Barry Brothers, of Rockland, Me., in company with Messrs. Warner Moore, William H. and James W. Allison, of Richmond. There have been lime-kilns in that section heretofore; but nothing permanent has ever been established, and the point aimed at is to reach interior markets in the South that can not profitably be reached with lime shipped from Rockland, Me.

FINANCIAL.

NEW YORK, Friday Evening, Dec. 5.

The week under review shows a moderate amount of business and no great fluctuation in prices. There is very little of interest to note in the mining market. The demand for the better class of stocks continues, and the price of these stocks shows an upward tendency. The sales this week amounted to 48,945 shares, as against 35,031 shares for the preceding week, showing an increase of sales of 13,914 shares.

Sutro Tunnel has again received considerable attention, and shares amounting to 16,300 changed hands. The price has been steady at from 12@13c. Consolidated California & Virginia's price has remained unchanged; the sales amounted to 7100 shares. Eureka, Hale & Norcross, and Navajo were sold at high figures.

Standard Consolidated has sold still lower. The price ranged between 20 and 32c., assessment unpaid, and between 58 and 62c., assessment paid; the sales amounting to 3075 shares. The price of Consolidated Pacific has been steady, and closed at 94c. Bodie Consolidated and Bulwer show a small business. Plymouth Consolidated is gradually growing in favor; the sales this week amounted to 1250 shares, and the price ranged from $15@$15.75. Quicksilver Preferred was sold at from $33@$34, and Common at from $5.50@$6.25.

Amie Consolidated has been the leading Colorado stock. A few sales were made of Chrysolite, Iron Silver, Little Chief, and others.

The interest in Horn-Silver continues, and the price of the stock, which so suddenly took a downward course a few weeks ago, is now gradually returning to the old figures—the highest this week being $5.75. Silver King and Alice appear again on the list. The former company has resumed the payment of dividends.

The stockholders of the Harshaw Mining Company are notified by the receiver to hand in their certificates of stock. They will receive in return a receiver's certificate, on which a first distribution payment, at the rate of fifty cents a share, will be made on the 17th of December.

A complete summary of the market will be found elsewhere.

MEETINGS.

Bull-Domingo Mining Company, No. 45 William street, New York City, a special meeting of stockholders December 6th, at one o'clock P.M.

Passaic Zinc Company, Jersey City, N. J., meeting for the purpose of electing five directors, January 6th, from twelve M. to one o'clock P.M.

Royal Consolidated Silver Mining and Milling Company, No. 30 Broad street, Room 68, New York City, annual meeting of stockholders and election of trustees, December 10th, at three o'clock P.M.

Universal Coal Saving Company, No. 56 Broadway, Room 16, New York City, annual meeting of stockholders and election of trustees, December 13th, at twelve o'clock M.

Tom Moore Mining Company, No. 22 Spruce street, New York City, annual meeting of stockholders, January 9th, from twelve M. to three o'clock P.M.

DIVIDENDS.

Delaware & Hudson Canal Company has declared a quarterly dividend of one and three quarter per cent on the capital stock, payable December 10th.

Lehigh Valley Coal Company announces that on December 31st it will pay off the $500,000 mortgage loan of the Snowshoe Land Association, interest ceasing on that date. It offers the bondholders the right to exchange their bonds at par for five per cent bonds of the Lehigh Valley Coal Company running until 1910.

Mayflower Gravel Mining Company, of California, has declared a stock dividend of 37 479-1000 shares for every 100 shares of the capital stock outstanding, payable immediately.

Paradise Valley Mining Company, of California, has declared dividend No. 6, of ten cents a share, payable November 28th.

Plymouth Consolidated Gold Mining Company, of California, has declared dividend, No. 19, of $50,000, making a total to date of $950,000.

Richmond Mining Company, of Nevada, has declared a dividend of five shillings a share.

PIPE LINE CERTIFICATES.

Messrs. Watson & Gibson, petroleum brokers, No. 49 Broadway, report for the week as follows:

During the past week, until this morning, the oil market has been very firm, with 80½c. for the highest and 76⅝c. the lowest. The cause of this may have been in part due to manipulation, but also largely to the declining production of Thorn Creek, which this morning was down to 5890 barrels. The sharp break to-day to 72½c. was due to the report that the McBride well, about three quarters of a mile in advance of developments, was likely to be a big well. This caused a general stampede. The market is easily moved either way. The field outside the possibilities of the McBride extension is bullish in every direction. Stocks were reduced again last month, and the export and domestic trade is reported as good.

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

		Opening.	Highest.	Lowest.	Closing.	Sales.
Nov.	29....	$0.79	$0.79⅜	$0.77⅝	$0.78⅝	6,452,000
Dec.	1....	.79⅛	.79¾	.76⅝	.76⅞	6,523,000
	2....	.77½	.80½	.77½	.78⅞	6,494 000
	3....	.79	.79	.77¼	.78⅝	4,910,000
	4....	.78⅝	.78⅝	.77⅝	.78	3,213,000
	5....	.78	.78⅝	.71⅞	.72⅛	10,4.0,000
Total sales .						38,062,000

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS. Nov. 28.	Nov. 29.	Dec. 1.	Dec. 2.	Dec. 3.	Dec. 4.
Albion						
Alpha						
Alta	.35		.25	.30	.25	.30
Argenta						
Bechtel						
Belcher	.65			.60	.65	.55
Belle Isle						
Best & Belcher	1.12½		1.00	1.12½	1.12½	1.00
Bodie	2.62½		2.50	2.50	2.50	2.62½
Bullion						
Bulwer						
California						
Challar	2.00		2.50	2.75	2.75	2.62½
Con. Pacific	.95			.95		.95
Con. Virginia	.10		.15	.10	.10	.10
Crown Point	.85		.75			.75
Day						
Elko Cons						
Eureka Cons	2.75				2.50	2.50
Exchequer						
Gould & Curry	1.25		1.12½	1.25	1.37½	1.25
Grand Prize						
Hale & Norcross	3.12½		3.00	3.25	3.00	2.87½
Independence						
Martin White						
Mexican	.50		.50	.55	.50	.40
Mono						
Mount Diablo	3.87½			3.87½		3.87½
Navajo	3.00		2.75	3.00	3.00	3.00
Northern Belle						
North Belle Isle						
Ophir	.55		.50	.55	.50	.35
Overman						
Potosi	1.00		1.00	1.12½	1.00	1.00
Savage	.95		.95	1.12½	1.00	.95
Scorpion						
Sierra Nevada	1.00		1.00	1.12½	1.12½	.95
Silver King						
Tip-Top						
Union Cons	.55		.45	.50	.50	.35
Utah	.80		.70	.80	.80	.70
Wales Cons						
Yellow Jacket	1.12½		1.12½	1.12½		1.12½

Boston Copper and Silver Stocks.

[From our Special Correspondent.]

BOSTON, Dec. 4.

This has been an extremely dull week in mining stocks, and there are no indications of improvement at present. The copper stocks have ruled fairly steady, with the exception of Calumet & Hecla, which has declined from $150@$146. The decline is attributed to the report of another fire at the mine; but how much damage has been done does not yet appear, and holders of stock, having learned somewhat by former experience, do not seem to be disposed to force their stock on a dull market, and in consequence the price is quite steady at $146 bid. Less than one hundred shares are reported as sold for the week. Quincy advanced on small sales to $32, and closed at $31½ bid. The November product was 450 tons, which is about the same as was mined in November the past two years. There is a little more activity in Franklin at $6½@$7, and the stock is wanted at $6¾ bid, with but little offered at $7. Atlantic sold at $6½, a decline of $1 from the last reported sale, August 27th. The rest of the list is inactive.

In silver stocks, the market is dull and prices show but little change. At the Mining Exchange, Bowman Silver continues to be more or less dealt in; but the announcement of another assessment of five cents a share caused a decline from 10@7c. The reports from the mine are said to be favorable, and it is hoped that, with the payment of this assessment, the mine will be placed on a paying basis. Dunkin, dull at 18@20c. Consolidated Pacific, steady at 90@93c. The water meters are firm at 40c. for New England, and 60c. bid for Standard.

BULLION MARKET.

NEW YORK, Friday Evening, Dec. 5.

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
Nov. 29	49⅞	108	Dec. 3	49⅞	107⅞
Dec. 1	49⅞	107⅞	4	49⅞	108
2	49⅞	107⅞	5	49¾	107⅞

Foreign Bank Statements.—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate of discount, and it remains at 5 per cent. During the week, the bank gained £261,000 bullion; but the proportion of its reserve to its liabilities was reduced from 39⅞ to 38 3/16, against 42¼ per cent at this date last year. The weekly statement of the Bank of France shows a loss of 1,250,000 francs gold and a gain of 475,000 francs silver.

METALS.

NEW YORK, Friday Evening, Dec. 5.

Copper.—Early in the week, the Lake companies reduced their price to 12 cents a pound, and Lake copper is now quoted at 12@12⅛c. This movement is said to be the result of the recent sales at low prices of the other brands of copper, which we now quote at 11@11⅛c. It is said that the former figure has been shaded for an ordinary brand.

London cables £50 2s. 6d. for Chili Bars, and £56 10s. for Best Selected.

Tin.—This metal has been quiet.

Lead.—Early in the week, one of the principal holders advanced his price to 3·50c., and about 200 tons of Common have been disposed of at that figure in fair-sized lots. In addition to this, about the same quantity of Refined has been placed at the same figure for January delivery. The market is flat; consumers have no faith in the higher prices, and do not move. On the other hand, the market is not overstocked, and offers at 3·50c. are by no means numerous.

Messrs. Everett & Post telegraph to us as follows from Chicago:

There is a somewhat better feeling, due to growing inquiry, especially for future delivery, prices being 3·25@3·30c. The fuel troubles are affecting the supply of bullion temporarily, and consequently there is little lead. Offerings are only moderate.

Spelter.—Spelter is offered at 3·85c. at La Salle, Ill., equivalent to 4⅛c. here for Common Domestic, sales having been made earlier in the week at 4·25c. We quote 4⅛@4·20c. Sheet zinc is very low, being procurable at 4⅝@4¾c.

Antimony.—The market is quiet.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Dec. 5.

American Pig.—During the past few days, some very heavy blocks of a standard brand of Lehigh iron have been sold at private terms. From elaborate returns, *Bradstreet's* says that the shipments of pig-iron manufactured in the Southern States to the cities of Philadelphia (some to Pittsburg), Wilmington, Del.; Elizabeth, N. J.; New York; New Haven, Stamford, and Bridgeport, Conn.; Providence, and Boston, since January 1st, 1884, by States have been as follows:

Coke pig, tons in 1884		*Charcoal pig, tons in* 1884.	
Virginia	47,709	Virginia	5,300
Alabama	5,630	Alabama	2,490
Georgia	3,360	Tennessee	200
Tennessee	3,825	Maryland	3,447
Maryland	1,500	Kentucky	1,800
Kentucky	350		13,737
	62,374		

Total shipments east of Southern pig-iron, 1884, tons 76,111

Bradstreet's adds:

Advices from our correspondents at the cities named above, to which Southern iron coming east of Ohio and north of Maryland has been consigned, based on inquiry among memebers of the trade, indicate that, during ten and a half months in 1884, there have been received at New England points about 15,000 tons, at Philadelphia about 20,000 tons, and at Pittsburg about 6000 tons, which suggests that about 35,000 tons have come into New York and New Jersey.

We quote nominally for standard brands: $19@

$20 for No. 1 Foundry; $17.50 @ $18.50 for No. 2; and $16@$17.50 for Gray Forge. Outside irons are from 50c. to $1 lower. Bessemer pig is dull, nominally $19, and Spiegeleisen is quiet at $26@$26.50 for 20 per cent, and $21.50@$22 for 10 to 12 per cent.

Scotch Pig.—The market continues dull and weak.

We quote ex ship and to arrive: Langloan, $21.50; Summerlee, $20.75; Dalmellington, $20; Gartsherrie, $21; Eglinton, $19.25@$19.50; and Glengarnock, $20@$20.50.

At the Metal Exchange, the following cable quotations have been received: Coltness, 58s.; Langloan, 57s. 6d.; Summerlee, 53s. 6d.; Gartsherrie, 54s. 9d.; Glengarnock, at Ardrossan, 49s. 9d.; Dalmellington, 48s.; and Eglinton, 44s. Warrants, 42s. 8d.

Steel Rails.—The situation has by no means improved. One of the mills claims to have placed 9000 tons at $29, but $27 is the more general quotation.

Old Rails.—The market is quiet at $16@$16.50.

Philadelphia. Dec. 5.

[From our Special Correspondent.]

Pig-Iron.—Things are beginning to converge to a trade focus in pig-iron. Large and small buyers have been staying out of the market for weeks, and, for that matter, for months past. Within two or three days, some of them have been negotiating, and the market at present is decidedly more active, and trade prospects more inviting. Makers have been obliged at last to break away from old prices and make new figures, the result of which is, that some large lots of iron have been bought. Cold-short irons are worth from $13.75@$15; neutral irons, $16@$16.50; nominal asking price, $17. No. 2 Foundry irons, $16.75 @$17.50; No. 1 Foundry, $18@$19. These are about the ruling prices, but it is hard to get at actual sale figures. In a general way, the market is weakening. The prospects are, for a little more business all around.

Foreign Irons.—No business of importance has been transacted. Bessemer is nominally $18.50@$19. Spiegeleisen, $26 for 20 per cent; $22 for 10 to 12 per cent.

Muck-Bars.—A few small sales of Muck-Bars were made at $28.50.

Merchant Iron.—There is an improvement in business for forward delivery, and prices range from 1·50c. for Common, to 1·70@1·80c. for Refined. The lower rate of wages is generally accepted. Buyers are disposed to purchase with more confidence, but there is still a great deal of idle capacity, and no prospect for its early re-employment.

Nails.—Nails range from $1.90@$2.10. Sales of small lots are reported. Some capacity has been restricted in the interior, and stocks in several hands are inconveniently large. Building activity continues of unusual proportions for the season.

Plate and Tank.—Sales of small lots of plate are made at 2·10@2·15c. Shell is 2·75c. Business light.

Structural Iron.—Small orders have been placed and large orders are expected, but for some unknown reason the expected business is not done. Angles, 2 @2·10c.; Beams and Channels, 3·25@3·50c.

Wrought Pipes and Tubes.—A small amount of business is still coming to hand. Quotations are 45 per cent on Butt-Welded Black, 30 per cent on Galvanized; Lap-Welded Black, 60@65; and Galvanized, 40@45 per cent. Boiler Tubes, 60 per cent off.

Steel Blooms.—No sales have been made, and prices are steady.

Sheet-Iron.—Three sheet mills have discontinued production in this section, but there is no perceptible improvement in demand or prices.

Steel Rails.—There have been no large sales, and for the present, negotiations seem to be at a standstill. Inside figures are said to be $27.50 at mill, which is the asking price, but $27 would probably be accepted for large lots, spring delivery. Small lots, $28.

Old Rails.—Quotations are $17.50 for foreign rails. Spot lots are offered at $18. Double-Heads are to be had at $20. There have been no new movements in scrap-iron.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 5.

Anthracite.

The market has during the week been very quiet, and anthracite coal circles have again been agitated and disturbed by disquieting rumors concerning an alleged breach between the coal companies. The best reply to these unwarranted stories is, that to-day the companies have agreed to suspend mining during the week from the 22d to the 29th of this month.

Of course, where there is so much smoke, there is a little glimmering fire, and it would be foolish and idle to deny that there has been considerable discussion and parleying among the companies during the past week. Wall Street had it that the Reading Company peremptorily declined to stop for the future, and all sorts of sinister designs were attributed to that company. There are those who argue that the Reading Company has reached a point financially that would make it the notoriously hard fighter that embarrassed railroads usually are; and that it is in a position where it can and will claim to have a more powerful voice in the councils of the coal trade, because any departure from the present policy that its managers might see fit to adopt would practically bring ruin to those other companies that are now fairly prosperous under the operations of the restriction policy. It is urged that the Reading Company has made sacrifices enough, and that others must begin to share the burdens, and that its interests have suffered, while notably the Delaware, Lackawanna & Western has gone on steadily increasing output, so that its tonnage stands now practically the same as it did last year, while the other members of the combination all show a heavy decline. This unfair business, as some assert it to be, the Reading is said to be determined to stop at any cost, even that of severing its connection with the combination. On the other hand, it is stated that the Lackawanna Company has for years been spending money freely to increase its capacity for business, and that it would be unjust to ask it to forego the rewards of its investments.

We can not, in carefully looking over the field, understand how the managers of the Reading or any other company can afford to do so rash and so unbusiness-like a thing as to jeopardize the enormous interests in their trust by deliberately plunging into a war to the knife. They have no right as business men and as officers to wreck their companies to right real or fancied ills, or, even worse, to indulge personal feelings of animosity or distrust. These grave matters have been treated too flippantly by too many of those who are in power. We do not, howeve, believe that there is any serious danger of any rupture. To us, the rumors and the movements of the past week mean only that some of the companies are maneuvering for position in the coming discussions of the allotment plan. All agree that the present system can not be carried on further without disastrous results, and the indications thus far are, that the Pennsylvania Railroad will join the combination on a fair basis.

Bituminous.

The men in the Cumberland District have almost all of them gone back to work at the reduced price for mining. Business is dull and without any improvement.

Philadelphia. Dec. 5.

[From our Special Correspondent.]

Stocks at Port Richmond, 161,000 tons. A further accumulation is inevitable. Last Saturday, the Reading made the largest shipment ever known, 47,000 tons in all, of which 20,000 came to Port Richmond. The average shipments to Port Richmond are 8000 tons a day, and about 20,000 tons a day to all points. This extra pressure was put on in order to make the total as large as possible up to the end of November, which is the end of the Reading's fiscal year. Vessels are scarce this week, but there has been no change in freights, which are firmly held at $1.15 to Boston. No definite action has yet been taken in regard to stoppage; but it seems to be pretty generally understood that the shut-down will take place December 22d; opinions differ whether it will be for one or two weeks, although the majority say two weeks. A new combination will certainly be formed next year, and the Reading will certainly go into it, and the interests of the Reading will not suffer by this.

There is a great deal of talk as to what the Reading will do. A statement is made, that the company is dissatisfied with the allotment of anthracite business to the Lehigh Valley, and to the Lackawana, Delaware & Hudson, and that the company will stand alone next year. One reason given for this belief is, that the Pennsylvania Company is capturing a great deal of the business heretofore controlled by the Reading, and that the company will be obliged to work its collieries for all the traffic that can be had. The company is scaling down wages from 5 to 40 per cent—is discharging hands, reducing labor-time, and in every way endeavoring to restrict expenses. Prominent stockholders in the Reading say that the story of its probable withdrawal from the combination is false; that there is no change contemplated; and that there is no thought of a return to the old restricted plan by which each company was limited to the production of a specified amount of coal in a certain time. Of course, the interests of the Reading lie in the largest possible production of coal, since it has water and rail facilities for reaching almost unlimited markets. But it is not likely that the friendly feeling that has been growing up between the different companies for years will be broken. No change in the price of coal will be made this month. The old Henry Breaker, near Port Bowkley, in Luzerne County, is pulling down. The Wilkes-Barre Coal Company is sinking a new slope, to strike the Holman vein. The Buck Mountain Coal Company has begun shipping coal from its new breaker. The forty-foot breaker, near Kingston, is rebuilding. The Dorrance colliery, at Wilkes-Barre, is shipping 100 tons a day. Ex-President Gowen is making an effort to secure the presidency of the Reading, and as there seems to be no opposition, he will probably be successful. The 'prentice hands that have been experimenting since his retirement have not done their work in a way to induce stockholders to continue them in control, although they have done the best they could. The local demand continues of moderate proportions, and stove sizes are rather scarce, while all other sizes are abundant. The manufacturing demand is declining in this State, but it is said there are prospects of an improvement in demand in outside markets, where there are some prospects of an improvement in manufacturing activity.

The shipments of soft coal from the Clearfield region for the week just reported were 58,042 tons, against 57,769 for the corresponding week last year. Total shipments from the region, to date, 2,891,061 tons, an increase of 264,598 tons over the amount to the same date last year. The Cumberland shipments for the same week were 46,317 tons, an increase of 10,827 tons, as compared with the same week last year. Total shipments this year, to date, 1,751,590 tons, as against 1,550,426 tons for the same time last year—an increase of 201,166 tons.

Boston. Dec. 4.

[From our Special Correspondent.]

The anthracite market has been rather dull, as might be expected under the conditions previously reported. Neither the state of the weather nor the condition of dealers' stocks calls for much ordering on the retailers' part. The market continues firm. There is a scarcity of stove coal, and spot lots at New York readily bring $4. It is said that good individual coal and also company coal will bring $4, particularly if quick dispatch be guaranteed. Much the same conditions exists as to egg coal. With broken coal for this market, it is matter of conditions largely. Some of the companies are burdened with a great stock of broken, which they would like to move, and would name very low figures, especially for a large lot. Other companies are less anxious sellers of broken, as they have rebroken considerable of this size into stove. Low prices are named on chestnut and pea, which are in large stock.

We quote f. o. b. prices as follows:

At New York, Stove, $4@$4.15; Broken and Egg, $3.50@$3.65; Pea, $2.40; individual coals, $3.90 for Stove, $3.25@$3.50 for Broken and Egg. At Philadelphia, $3.90@$4 for Stove, $2.20 for Pea, $3.30@$3.50 for Broken and Egg. Special coals, $4.85@$5 for Broken, $5.35@$5.50 for Stove.

There is next to nothing done in the bituminous branch of the market. Old contracts are about all

NEW YORK MINING STOCKS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Nov. 29.		Dec. 1.		Dec. 2.		Dec. 3.		Dec. 4.		Dec. 5.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice, Mon.	.....	.....	2 45	.....	.....	.....	2 40	.....	2.40	.....	.....	.....	900
Amie Con., Co.	.04	.....	.04	.....	.....	.....	04	.....	.04	.....	.....	.....	600
Argenta	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bassick, Co.	3.25	3.00	.....	.....	.....	.....	.....	.....	3.50	.....	4.00	.....	535
Belle Isle, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bodie Cons., Ca.	.....	.....	2.80	.....	2.80	.....	2.70	.....	2.75	.....	.....	.....	750
Breece, Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bulwer, Ca.	.....	.....	.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	25
California, Ne.	.....	.....	.06	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,000
Cal. & Hecla, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Castle Creek	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chollar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Co.	.....	.....	.....	.....	.80	.....	.....	.....	.80	.....	.....	.....	200
Cons. Cal. & Va.	.45	.....	.....	.....	.44	.....	.45	.....	.45	.....	.43	.....	7,100
Cons. Va., Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin, Co.	.....	.....	.....	.....	.....	.....	.....	.....	.23	.....	.....	.....	500
Eureka Cons., Ne.	.....	.....	2.75	.....	.....	.....	2 85	.....	2.80	.....	.....	.....	450
Father de Smet, Dk.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Findley, Ga.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Stripe, Ca.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gould & Curry, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand Prize, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Green Mountain, Ca.	.....	.....	.....	.....	.....	.....	.80	.....	.....	.....	.....	.....	100
Hale & Norcross, Ne.	.....	.....	3.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Hall-Anderson, N. S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Homestake, Dk.	9.88	9 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Horn-Silver, Ut.	5.75	4.70	5.13	4.70	5.00	4.75	5.13	4.95	5.00	4.90	5.00	4.75	6,525
Independence, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Silver, Co.	.....	.....	.72	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Leadville C., Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Chief, Co.	.....	.....	.....	.....	.....	.....	.25	.....	.25	.....	.....	.....	700
Little Pittsburg, Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Martin White, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moulton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.90	.....	500
Navajo, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	2.90	.....	.....	.....	100
Northern Belle	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Belle Isle, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.20	.....	500
Ontario, Ut.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18.00	.....	50
Plymouth	15.63	15.50	.....	.....	15 63	15.50	15.63	15.50	15 75	15.63	15.13	15.00	1,250
Quicksilver Pref., Ca.	34.00	33.00	33.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	400
" Com., Ca.	5.75	5.50	6.25	.....	6.25	.....	.....	.....	5.88	5.75	.....	.....	1,000
Robinson Cons., Co.	.41	.....	.41	.38	.....	.....	.....	.....	.....	.....	.....	.....	400
Savage, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sierra Nevada, Ne.	.....	.....	1.10	.....	.....	.....	1.20	.....	1 25	.....	.....	.....	500
Silver King, Ar.	.....	.....	.....	.....	.....	.....	5.50	.....	5 00	.....	.....	.....	115
Spring Valley, Ca.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Standard, Ca.	.35	.20	.65	.58	.....	.....	.60	.32	.62	.60	.....	.....	3,075
Stormont, Ut.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tip Top, Ar.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vizina, Ar.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yellow Jacket	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Nov. 29.		Dec. 1.		Dec. 2.		Dec. 3.		Dec. 4.		Dec. 5.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Albion	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.10	.....	500
American Flag	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barcelona, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bechtel Con., G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belvidere	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & B'cher, G. S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Big Pittsburg, S. L.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bradshaw, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bull-Domingo, S.L.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cal., B. H., G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.80	.75	200
Central Ariz'na, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Climax, Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado Central.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.65	.....	200
Cons. Imperial	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pacific	.93	.....	.90	.....	.90	.85	.....	.....	.....	.....	.82	.50	2,300
Decatur	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Durango, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eastern Oregon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Goodshaw, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Harlem M. & M. Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hortense, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lacrosse, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mariposa Pref., G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Com., G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexican, G. S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mono	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Standard, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Horn-Silv'r, S L.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ori'nt'l & Miller, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Red Elephant, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ruby, of Arizona.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Cliff, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sonora Con.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Bodie, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Bulwer, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Hite	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Pacific	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State Line, 1 & 4, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Nos. 2 & 3, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel	.13	.12	.13	.12	.....	.....	.....	.13	.....	.13	.....	.12	16,300
Taylor Plumas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unadilla, S	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union Cons., G. S.	.....	.....	.....	1.00	.....	.94	.....	.....	.....	1.05	.....	.....	670
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Tables giving dividends and assessments will be printed the first week of each month. Dividend shares sold, 28,775. Non-dividend shares sold, 20,170.

filled and out of the way, and the new season is yet to come. Plenty of time is afforded the trade in which to outline the business for 1885. It is very generally admitted that contract business will come on later than usual in this market. Dealers are letting matters take their own course, and we hear of no effort to scare up trade. If this course on the part of the dealers is continued, trade will undoubtedly be late for a number of seasons. The experience of the season now closing is not favorable to early buying. The large consumers bought early, believing the advantage to be all on their side. Instead of this being the case, freights went down, and later in the season a single cargo might be bought at a lower price than was paid on the contract for ten thousand tons or more. Then there is the inducement to hold off this year, in view of the prospect of a warm contest between the leading producers; and buyers will be disposed to wait and see how low prices will go. "Lastly," the general depression in business will tend to delay matters, as, owing to the dullness in manufacturing circles, this year's stocks of coal will hold on unusually late. Many leading mills have from four to six weeks' greater stock of coal on hand than is usual at this time. The railroads alone have consumed the usual quantity. Until the result of their cut-down is determined, the Cumberland people have very good reason for not hurrying things.

The small cargo business now done on stray orders is on a basis of $3.55@$3.70 delivered.

There is a little firmer feeling in freights. Our lowest figures are in case of quick dispatch. We quote: New York, $1@$1.10; Philadelphia, $1.15 @$1.25; Baltimore, $1.20@$1.25; Newport News, $1.15@$1.20; Richmond, $1.25; Cape Breton, $1.55@$1.60; Bay of Fundy, $1.30@$1.40.

There is a fair retail trade at previously reported figures. No advance is anticipated at present. The ordinary price for Stove coal is $5.50 a ton, although $5.75 is frequently obtained. We quote:

White ash, furnace and egg	$5.25@	5.50
" " stove and nut	5.50@	5.75
Red ash, egg		6.00
" " stove		6.25
Lorberry, egg and stove	$6.50@	6.75
Franklin, egg and stove		7.50
Lehigh, furnace, egg, and stove	$5.50@	5.75
" nut		5.75

Wharf prices, $4.50 for Broken, $4.85 for Stove.

Buffalo. Dec. 4.

[From our Special Correspondent.]

We have had some "delightfully" cold weather for several days, and coal dealers have felt happy in consequence. This is about the only news to relate in connection with the coal trade, excepting that lake shipments are certainly over for the season, and that railroad transportation is uncertain for the want of cars, and many orders are delayed in consequence. Prices of hard and soft coal and coke remain unchanged, and the present schedule will continue in force to the close of the year and perhaps far into the coming 1885.

Last Thursday, November 27th, the storm abated, and four propellers loaded with coal left this port for Chicago and Milwaukee, and one for Toledo. Since then, four propellers, the Tacoma, Packer, Arabia, and Jewett, left for Chicago with cargoes of coal aggregating 6330 net tons, at one dollar per ton freight. These were the last vessels for the season, as it is now quite hazardous to leave port.

Receipts of coal by lake the past week, none. From opening of navigation to December 1st, only 830 tons.

Receipts of coal by canal for the fourth week in November, 2590 tons; shipments for the same period, 136 tons. Receipts for the month of November, 23,794 tons; shipments for the same period, 2946 tons. Receipts for the season of 1884, 154,345 tons, as compared with 127,700 tons in 1883—a gain this year of 26,645 tons. Shipments for the season of 1884, 31,958 tons, as compared with 28,218 tons in 1883—a gain this year of 3740 tons.

Shipments of coal by lake for the month of November, 93,430 tons; for the season to December 1st, 1,363,610 tons, as compared with 1,253,940 tons in 1883, and 1,022,810 tons in 1882—a gain this year, as compared with 1883, of 109,670 tons.

Freight rates I furnished you with in my communication of the 26th ultimo.

The receipts of coal by the Lake Shore & Michigan Southern Railroad for the month of November, 3861 tons; namely, 2553 tons for Buffalo, and 1308 tons for other points. In the fourth week in November, 834 tons; namely, 588 tons for Buffalo, and 246 tons for other points.

The Erie and other State canals were officially closed December 1st. As far as the weather was concerned, all the boats on them had ample opportunities for reaching tide-water and other destinations.

Very few persons apparently have the remotest notion of the number of vessels in service on lakes Ontario, Erie, Huron, Superior, and Michigan. They know in a general way that there are a good many; but beyond that, they could not come within one thousand of the right figures, if they were asked the question. The latest vessel registers, and they are very complete, show that there are 1070 American sailing vessels (including barges), and 328 Canadian sailing vessels. There are, besides, 840 American steam vessels of all classes, and 382 Canadian; making a total of 2565 steam and sail craft. These figures do not include the St. Lawrence River barges. Careful estimates place the average tonnage of these vessels at 350 tons, which would make the total tonnage of the lakes, exclusive of the river barges, 897,750 tons This is not a high estimate, in my opinion.

No receipts of coal are reported at Duluth, Minn., for the week ended November 30th.

STATISTICS OF COAL PRODUCTION.

Comparative Statement of the Production of Bituminous Coal for the week ended November 29th, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated.

	1884. Week.	1884. Year.	1883. Week.	1883. Year.
Cumberland Region, Md.				
Tons of 2240 lbs	71,009	2,672,063	50,330	2,333,123
Barclay Region, Pa.				
Barclay RR., tons of 2240 lbs	5,112	269,343	7,452	305,708
Broad Top Region, Pa.				
Huntington & Broad Top RR., of 2240 lbs	2,567	181,186	4,722	180,642
East Broad Top	.....	.....	1,041	40,181
Clearfield Region, Pa.				
Snow Shoe	3,661	167,331	6,212	235,179
Karthaus (Keating)	1,121	50,974	.....	.....
Tyrone & Clearfield	58,212	2,879,808	59,194	2,607,391
Alleghany Region, Pa				
Gallitzin & Mountain	8,136	370,093	12,869	417,104
Pittsburg Region, Pa.				
West Penn RR.	5,964	261,184	12,058	361,208
SouthwestPenn. RR.	2,450	115,294	2,983	112,294
Pennsylvania RR	2,874	253,871	9,906	578,803
Westmoreland Region, Pa.				
Pennsylvania RR.	24,438	1,207,541	40,016	1,282,431
Monongahela Region, Pa.				
Pennsylvania RR.	5,342	146,404	.....	.....
Total	190,886	8,575,092	206,783	8,454,064
Increase	.....	121,028	.....	.....

FREIGHTS.

Coastwise Freights.

Per ton of 2240 *lbs.*

Representing the latest actual charters to December 5th.

PORTS.	From Philadelphia.	From Baltimore.	From Elizabethport, Port Johnston, South Amboy, Hoboken, and Weehawken.
Alexandria	.75@.80		
Annapolis			
Albany			
Baltimore	.58§		
Bangor			
Bath, Me	1.20@1.25	1.25	
Beverly	1.25		
Boston, Mass	1.20@1.25	1.20@1.50	
Bristol			
Bridgeport, Conn.		1.05	
Brooklyn		1.05	
Buffalo, N. Y.			
Cambridge, Mass.	1.25‡		
Cambridgeport	1.25‡		
Charleston, S. C.	.75	.70	
Charlestown	1.25		
Chelsea	1.20@1.25		
City Point			
Com. Pt., Mass.	1.35		
E. Boston	1.20@1.25		
East Cambridge	1.25‡		
E. Gr'nwich, R. I.			
Fall River	1.00		
Galveston	2.00	2.00	
Gardiner, Me			
Georgetown, D. C.	.75@.80		
Gloucester	1.25@1.30		
Hartford			
Hackensack			
Hudson			
Lynn	1.30@1.50		
Marblehead			
Medford			
Millville, N. J.			
Milton			
Newark, N. J.		1.25	
New Bedford	1.00@1.05	1 15	
Newburyport			
New Haven		1.05	
New London		1.15	
New Orleans	1.90		
New-Berne			
Newport	1.20		
New York	.85§	1.00	
Norfolk, Va	.55@.60		
Norwich			
Norwalk, Conn			
Pawtucket			
Philadelphia			
Portland, Me	.90*	1.25	
Portsmouth, Va.	.55		
Portsmouth, N.H.		1.30	
Providence	1.00@1.10	1.15	
Quincy Point			
Richmond, Va.	.70@.75		
Rockland, Me			
Rockport			
Roxbury, Mass.	1.25‡		
Saco			
Sag Harbor			
Salem, Mass.	1.25@1.40		
Saugus			
Savannah	.90	.90@1.00	
Somerset		1.15	
Staten Island		.90	
Trenton			
Troy			
Wareham			
Washington	.75@.80		
Weymouth			
Williamsbg, N.Y.		1.05	
Wilmington, Del.			
Wilmington, N.C.		.90@1.00	
St. Thomas, W. I.			

* And discharging. † And discharging and towing. ‡ 3c. Per bridge extra. § Alongside. ‖ And towing up and down. ¶ And towing. ** Below bridge.

Vessels scarce.

GEORGE W. JONES & Co.

BALTIMORE.

Comparative Statement of the Transportation of Coke over the Pennsylvania Railroad for the week ended November 29th, and year from January 1st:

Tons of 2000 pounds.

	1884. Week.	1884. Year.	1883. Week.	1883. Year.
Gallitzin & Mountain (Alleghany Region)	2,702	124,779	2,223	73,845
West Penn. RR.	.....	24,865	4,191	106,734
Southwest Penn. Rr	30,315	1,908,014	43,263	1,940,541
Penn. & Westmoreland Region, Pa. RR	3,075	180,483	4,270	202,068
Monongahela, Penn. RR.	1,352	67,146	.....	.....
Pittsburg Region, Pa. Rr	.....	136	1,961	19,253
Snow Shoe (Clearfield Region)	312	21,183	347	17,181
Total	37,756	2,326,606	56,255	2,359,622
Decrease	.....	33,016	.....	.....

Comparative statement of the production of anthracite coal for the week ended November 29th, and year from January 1st:

TONS OF 2240 LBS.	1884. Week.	1884. Year.	1883. Week.	1883. Year.
Wyoming Region.				
D. & H. Canal Co.	110,102	3,585,687	106 743	3,839,175
D. L. & W. RR. Co.	114,403	4,704,263	167,063	4,671,671
Penna. Coal Co.	31,964	1,206,461	28,709	1,391,606
L. V. RR. Co.	31,990	1,275.319	26,775	1,296,322
P. & N. Y. RR. Co.	5,768	206,553	3,979	200,878
C. RR. of N. J.	*	*	*	1,202,078
Penn. Canal Co.	11.513	428,135	7,826	486,128
North & West Br. RR.	20,588	754,030	10,985	469,852
	326.328	12,160,448	292,080	13,557,110
Lehigh Region.				
L. V. RR. Co.	130,353	4.259,367	102,713	4,664.512
C. RR. of N. J.	*	*	*	1,126,889
S. H. & W. B. RR.	1,485	137,434	929	37,481
	131,838	4,396,801	103,642	5,828,922
Schuylkill Region.				
P. & R. RR. Co.	†	10.034,292	.....	8,769,206
Shamokin & Lykens Val.	*	*	*	950,363
	.....	10,034,292	.....	9,719,569
Sullivan Region.				
St Line & Sul. RR. Co.	2.432	69,825	1,114	63,664
Total	460,598	26,661,366	396,836	29,169,265
Increase	.....	.....	.....	.....
Decrease	.....	2.507,899	.....	.....

* Included in tonnage of the Philadelphia & Reading Railroad.

† Reports not received.

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

Total same time in 1879.....24,467,939 tons
" " " 1880.....21,924,560 "
" " " 1881.....26,106,763 "
" " " 1882.....26,980,664 "

The increase in shipments of Cumberland Coal over the Cumberland Branch and Cumberland & Pennsylvania railroads amounts to 201,166 tons, as compared with the corresponding period of 1883.

Belvidere-Delaware Railroad Report for the week ended November 29th:

	Week.	Year 1884.	Year 1883.
Coal for shipment at Coal Port (Trenton)	6,788	112,459	121,852
Coal for shipment at South Amboy	25,293	610,894	547,310
Coal for distribution	25,581	761,204	765,334
Coal for company's use	5,639	172,326	148,279
Total	63,301	1,656,883	1,582,775
Increase	.....	74,108	.....
Decrease	.....	.....	.....