



of manganese, so that the quantity actually reduced was 81.3 per cent. The cinder contained 30.85 per cent of silica, 8.33 per cent of alumina, 43.02 per cent of lime, 6.30 per cent of magnesia, 0.41 per cent of iron, 3.28 per cent of manganese, and 2.85 per cent of sulphur. The oxygen ratio between the silica and all the bases was 10 to 11.42. On the 1st of May, the ore-charge was changed as follows: 40.1 per cent of Cartagena ore (22.59 per cent Fe, 27.08 per cent Mn), 26.3 per cent of Auxbach ore, and 33.6 per cent of Heinrich ore, making the charge carry 30.96 per cent of iron, 18.12 per cent of manganese, and 17.45 per cent of silica. With 39 per cent of lime, the furnace yielded pig containing 30.07 per cent of manganese, while the theoretical percentage was 34.7, showing that 86.7 per cent of the manganese in the ore-charge had been reduced. The cinder carried 4.3 per cent of manganese, the oxygen ratio being 10 to 12.41. The charge was then changed to Cartagena ore alone, but fearing that there would not be enough cinder, 10 per cent of blast-furnace cinder was added, making 45.13 per cent ferro-manganese with a 27 per cent lime charge. As the doubts concerning the quantity of cinder proved unfounded, the furnace was charged with Cartagena ore exclusively and with 28 per cent of lime. It made 45.98 per cent metal, showing, as the theoretical amount was 50.2 per cent, that 86.4 per cent of the manganese in the charge had been reduced, the cinder carrying 8.39 per cent of manganese, the oxygen ratio being 10 to 13.35.

## 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.]

## The Hecla Concentrator.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In justice to Prof. F. de Stwolinski and the Fort Scott Foundry and Machine-Works (A. W. Walburn, proprietor), I will simply reply to the letter of F. M. F. Cazin, of Ely, Vermont, in your issue of September 13th. The Hecla Consolidated Mining Company, of Glendale, is perfectly satisfied with its concentrating plant, constructed by Prof. F. de Stwolinski, and I regard the professor as one of the most practical concentrating men in this country.

Three questions I will ask Mr. F. M. F. Cazin: 1st. Have you ever seen the Hecla Consolidated Mining Company's concentrator in operation? 2d. Do you know any thing about the work it has done for three years? 3d. Do you know any as to the character of ores concentrated?

If not, I am ready (privately) to answer the last two questions. I am ready to entertain any proposition from Mr. F. M. F. Cazin that will reconstruct our present plant and reduce the loss, provided that Mr. Cazin's theory does not cost more than the results obtained when put in practical use; and further, that Mr. Cazin will give me a written guarantee, with good and satisfactory security, that will cover costs and delays in case his "improvement" does not improve our present system. What I want is the best concentrator in the land, not on paper, in theory, but in practical operation, giving results in dollars and cents. So far as the Hecla Consolidated Mining Company's concentrator is concerned, if you can not improve it, and show it in actual results, why seek to destroy what we have?

H. KNIPPENBERG,

General Manager

Hecla Consolidated Mining Company.

GLENDALE, BEAVERHEAD CO., MONT., Sept. 19, 1884.

## Chloridising-Roasting of Ore Low in Sulphurets.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of September 20th, page 191, in an article on amalgamating mills from the Census Report, by G. F. Becker and S. F. Emmons, I find the following paragraph. Referring to the chloridizing of silver ores, it reads: "There are some ores that contain so little sulphur that only an incomplete chloridation is obtained unless sulphur, either in the form of brimstone, or iron pyrites, or of copperas, is added before the ore is introduced into the furnace, sulphur in some form being necessary for the decomposition of the salt and the liberation of the chlorine." I am well aware that this was the universal belief in former years, and can well remember how firmly it was impressed upon my mind in my student days, that from 25 to 30 per cent of sulphides must be present to admit of good chloridation. It is now universally admitted (at least in the United States) that a very much smaller amount of sulphur will give equally good results; but my own experience has been, that ores absolutely free from sulphur in any form may be chloridized to perfection, and without any increased addition of salt, provided silica is present in considerable amount. In fact, the roasting of such surface ores proceeds much more rapidly than in the case of sulphide ores, as there is no sulphur to oxidize, and if a sufficiently high heat is employed, the chloridation of the silver is almost instantaneous, although I have never found the chlorine gas evolved in such quantities as with sulphurets. The roasting that I am referring to was done in Brückner's cylinders, where any desired heat can be attained, and the ore kept in the furnace until finished; but I wish to ask some brother metallurgist, who is familiar with continuous roasting, how such ores, free from sulphur, behave in a Howell cylinder, where the time for chloridation is limited, and more especially in the Stetefeldt, where the chemical changes must occur instantaneously. (I am referring to making experiments on such ore by withdrawing it immediately from the furnace, instead of leaving it for an hour in the shaft, as is usual.) I also wish to ask if any one can give me similar information regarding the results of the chloridizing-roasting of oxidized manganese ores, free from sulphur and containing little silica. Such ores occur in considerable quantities in this district, and I believe in one or two others, and I am sure that any detailed description of their

behavior under the above conditions, and when treated by themselves, without the admixture of any base ores, would be read with great interest by many others as well as myself, and, if I am not mistaken, will be found to completely overturn the opinions of the older German metallurgists.

EDWARD D. PETERS, JR.

BUTTE CITY, MONT., Sept. 26.

The Bell Copper and Silver Mining Company, Butte, Montana.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The undersigned, being a shareholder of the Bell Copper and Silver Mining Company, Butte City, Montana, noticed in the *Inter-Mountain* of Butte the sworn annual report of this company for 1884, from which it appears that the shares are not worth the value of the paper on which they are printed. I should be glad, if it were possible, to prove the contrary. The report, signed by the president and secretary, gives no assets, but states the liabilities to be "estimated about \$220,000, consisting of

First mortgage bonds .....	\$68,000
Second " " .....	145,000
Interest due on bonds .....	23,000 !!
Other indebtedness .....	22,000
Total .....	\$258,000

This shows a difference in the same statement of \$38,000 at the start. It speaks very poorly for the trustees, that they have to estimate the liabilities, and can not give them exactly. The nominal capital stock is four million dollars in 400,000 shares. Originally, they were sold at about \$1 a share. Afterward, the present management called them in at a rate of 25 new shares for 100 old ones. What became of the 75 shares per 100 left? They were not canceled, to be sure, as they appear in the published report for 1884. The second mortgage bonds were probably issued to refund the advances made by the new management; that is, Mr. King, the president, backed by Mr. Thomas L. Wallace. Now, it would be interesting to know positively whether the claims against the old management, for which the regenerating new management paid about 30 cents on the dollar to the creditors, have been recharged to the company at par. It can not be otherwise, as the claims paid to merchants, miners, carpenters, and furnace-men were hardly more than \$45,000. The assets are no doubt represented by the mine and smelting-works. The report does not show any thing else. The Bell mine was bought in March, 1880, at the ridiculously high figure of \$100,000—a figure not justified either by its value before it was acquired or afterward, notwithstanding the fact that copper was quoted at that time twenty-four and a half cents a pound, while it is to-day twelve cents. Mr. A. Wartenweiler, a prominent mining expert, now superintendent of the Lexington Company, estimated the value of the Bell mine in 1880 at \$25,000, and this at a time when there was in sight plenty of high-grade ore since taken out; and there can not be much ore left at the mine, as the manager has to buy ores of the Shakespeare mine to keep one furnace running at intervals. Hence, I think it is fair enough to estimate the value of the mine, including the little machinery there (with copper at 12 cents) at \$30,000 to-day. The smelting-works were built at an expense not exceeding from \$120,000 to \$140,000, and could be duplicated at present at an expense of not more than \$80,000, or even less. A forced sale would not bring one third of this figure. Add both figures—\$80,000 and \$30,000—and we have assets of \$110,000, against liabilities of \$258,000—a rather hopeless show for the *bona-fide* shareholders, but perhaps not so unfortunate to the managers, the owners of the second mortgage bonds.

The report shows plainly that, since the change of management, the company has worked with a loss of at least \$22,000. Why, then, continue, as, at the present low price of copper, the company is unable to produce copper without getting into debt more and more?

I should be very glad to be corrected by an official plain statement by the trustees. Let the *Inter-Mountain*, which has only lately done good work in bringing to light the condition of another company at Butte, investigate the financial condition of the Bell Company. It will be eminently to the interest of the mining business of the Butte District in general, and perhaps some light may be thrown on the trustees' manipulations finally benefiting the forsaken shareholders. I inclose my card, and remain, respectfully yours,

M.

NEW YORK, Oct. 2.

## The Census Report on Roasting-Furnaces.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The abstracts from the U. S. Census Report on Amalgamating Mills, published in the *JOURNAL*, are models of conciseness and terseness of style. They contain an immense amount of valuable information, and wherever any criticism is made, it is evidently done with the intention of being impartial, and the points are generally well taken. It is to be regretted that the same praise can not be bestowed as to the correctness of many details presented. Publications of this kind are exceedingly harmful, especially if they are indorsed by such eminent names as those of G. F. Becker, S. F. Emmons, and J. S. Curtis. At home, we know very well that the U. S. Census Reports are not infallible documents; but abroad, they may be looked upon in a different light. Professors of metallurgy who write text-books consider such documents reliable, and, rarely having an opportunity to observe for themselves, they copy errors and perpetuate them *ad infinitum*.

I take the liberty of criticising the article on Roasting-Furnaces that appeared in your issue of September 20th, and shall confine myself to pointing out its most glaring errors.

"*Manipulation in Roasting.*"—Here has been omitted an important practice that prevails in mills roasting base ores. The chlorination of the silver is generally not completed in furnaces belonging to the continuously working system, like the Stetefeldt and Howell, and the ore is left, in a red-hot state, piled up in heaps, on the cooling-floor for twelve or sixteen hours, before it is cooled by sprinkling with water. An increase in chlorination may be produced in this way varying between 5 and 40 per cent.

"*Tenor of Ore to be Roasted.*"—"There are some ores that contain so little sulphur that only an incomplete chloridation is obtained, unless sulphur, either in the form of brimstone, or iron pyrites, or of copperas,

is added before the ore is introduced into the furnace, sulphur in some form being necessary for the decomposition of the salt and the liberation of the chlorine." I am not aware that any of the mills in this country use copperas in roasting silver ores that are deficient in sulphur. Brimstone has only been used in an experimental way in the Stetefeldt furnace. The idea was suggested by the late Mr. Guido Kuestel. The brimstone was burnt outside of the furnace, and the sulphurous acid conducted into the shaft. If an ore free from sulphurets contains peroxide of manganese, it can be chloridized to a very high percentage without the addition of pyritic ores. The Northern Belle, Nevada, furnishes a prominent example.

"There are other ores, on the contrary, that contain so much sulphur in the form of sulphides that a long oxidizing-roasting is necessary before they can be prepared for chloridation." That this is by no means necessary will be demonstrated in further discussions below.

"Where there is a large amount of zinc in the ore, the chloridation is an imperfect one." This is the case only where an insufficient quantity of salt has been used in roasting, and the ore is cooled immediately after discharging from the furnace.

"Lead and copper contaminate the amalgam and bullion." Lead contaminates the amalgam and bullion if the ore is improperly roasted and amalgamated. An ore may contain ten per cent of lead, and produce bullion entirely free from that metal.

"The richer and baser the ore, the more salt is required." The richness of the ore has comparatively little to do with the consumption of salt.

"Oxidizing-Roasting."—"When ores contain much arsenic and antimony, much salt is saved by exposing them to a preliminary oxidizing-roasting. In roasting ores free from arsenic and antimony, there appears to be no advantage in delaying the addition of salt." Silver ores containing much arsenic and antimony are very rare; and milling ores without one of these elements hardly occur in the United States. A saving of salt by a preliminary oxidizing-roasting is mainly effected in treating ores that contain a high percentage of base metal sulphurets, especially zinc-blende.

"Sulphur Contents."—"The closeness with which it is necessary to keep a given sulphur content varies with the different furnaces. In the Stetefeldt, there is but little latitude, from 3 to 5 per cent sulphur being the limit." This is a statement so entirely contrary to facts that I doubt whether the Census reporter has ever seen a Stetefeldt furnace in operation. As it is not the practice in mills to make determinations of sulphur, I can only give estimates based upon the character of the ore. I have already referred to the case of the Northern Belle, where an ore has been successfully chloridized in the Stetefeldt furnace containing no sulphurets; but peroxide of manganese. This disposes of the lower limit of 3 per cent sulphur. Now, as to the higher limit of 5 per cent sulphur, the Census Report seems to be entirely misinformed about the character of ore treated in the Ontario mill, Utah, and in the Lexington mill, Montana, both using the Stetefeldt furnace. These ores contain principally mixtures of

Iron pyrites with . . . . .	53.3 per cent sulphur.
Copper pyrites with . . . . .	34.9 " "
Zinc blende with . . . . .	33.0 " "
Galena with . . . . .	13.4 " "

At the Ontario, zinc-blende and galena are predominant; at the Lexington, iron pyrites and zinc-blende. Ontario ore often carries from 30 to 35 per cent sulphurets, and its contents in sulphur could not be less than from 7 to 10 per cent. The percentage of sulphur in Lexington ore is on an average much higher. Several months ago, a body of ore was struck on the 500-foot level of the Lexington mine that, according to Mr. Wartenweiler, was almost free from quartz. Considering that iron pyrites and zinc-blende predominate in this ore, it could not have contained less than from 25 to 30 per cent sulphur. This ore was roasted in the Stetefeldt furnace by itself in quantities of about 30 tons per twenty-four hours. If the mill-work dropped from 92 to 85 and as low as 80 per cent, the fault was not with the principle of the furnace. Its draught being limited, the furnace was receiving more ore than it could properly roast. The Ontario furnaces would have handled this ore easily. By introducing more air into the shaft by the aid of steam-blasts, results were materially improved and became normal, showing that they merely depended on a sufficiency of draught.

"If this quantity (from 3 to 5 per cent sulphur) will not liberate chlorine enough to chloridize the silver, the ore must be reduced in grade by the admixture of poorer qualities." This sentence is unintelligible. Why should the ore be reduced in grade by the admixture of poorer qualities? And where does such a practice prevail? Five per cent sulphur would correspond with 9.3 per cent of iron pyrites, and such an amount of pyrites would be more than sufficient, or even desirable, to decompose the salt. In cases where ore does not chloridize well by itself on account of deficiency in sulphurets, I have found that the addition of from 1/2 to 2 per cent of iron pyrites is ample to obtain the desired effect, unless the ore should contain much calc-spar.

"Labor."—"In all their furnaces, except the reverberatory, a man can roast five tons per shift." This statement is not clear. Does the labor merely refer to the keeping of the fires, and watching the operation of the furnace; or does it include discharging the ore, cooling it, and preparing it for the pans? If the latter view is taken, the statement is overestimated; if the former, it is largely underestimated. The Stetefeldt furnace, for instance, requires one man in a shift to fire it and guide its operation, no matter whether it roasts 20 or 60 tons of ore in twenty-four hours.

"Power."—"The power used to drive the mechanical furnaces is estimated at about two horse-power for the Brückner, and one and one half horse-power for the White and Howell furnaces." If a Brückner furnace takes two horse-power to run it, it is difficult to comprehend why a Howell furnace should require one and one half horse-power only. The Brückner cylinder is lighter, shorter, and moves around a horizontal axis. The great length of the Howell furnace requires more bearings, and its inclined position must create considerable friction. The power consumed to run this furnace is generally underestimated, and rarely determined. According to Mr. Eckart's measurement, the 60-inch Howell cylinder at the Ontario mill took eight horse-power to run it. It may be interesting to note that this furnace has been taken out

of the Ontario mill to make room for a new system of dust-chambers for the old Stetefeldt furnace.

"Amount of Flue-Dust Caught."—"From the nature of the Stetefeldt furnace, a considerable amount of flue-dust passes into the dust-chambers. . . . As much as 10 per cent sometimes passes over." It is not clearly expressed whether this means the total amount of dust leaving the shaft, and settling mostly in the flue below the auxiliary fire-place, or whether it refers to the system of dust-chambers proper. If the latter is the case, the figure represents a fair average, not a maximum amount. Taking the former view, the statement is entirely wrong, as may be seen from my article on dust-chambers, published in the JOURNAL, July 28th, 1883.

"The draught in all these furnaces can be regulated by two dampers, one between the furnace and the dust-chambers, the other in the smoke-stack." This is not correct, generally speaking, and I do not see what benefit would be derived from a damper between the furnace and the dust-chambers. The older Stetefeldt furnaces had a swinging damper in the flue between the shaft and the auxiliary fire-place. It was discarded as useless long ago, and only one damper between the chimney and the end of the dust-chambers controls the draught.

"Different Kinds of Furnaces as Compared with Each Other."—"The Howell, of all mechanical furnaces, is the one that is most easily handled." This may be a matter of opinion, but is open to dispute. I can not see in what respect the Brückner or Stetefeldt are more difficult to handle than the Howell. As far as conducting the process of roasting is concerned, especially with ores that have a tendency to sinter, the Stetefeldt offers less difficulty than any other furnace.

"It is not an expensive furnace." This sentence must be taken in connection with a remark about the Stetefeldt furnace, it being stated that one of the principal drawbacks of the latter is its original cost. A Stetefeldt furnace of large capacity is by far cheaper to construct than a Howell furnace plant, provided both are constructed in the same substantial manner and of equal capacity. In that case, the weight of the iron work for a Stetefeldt furnace is much less. The plant for a Stetefeldt furnace of from 50 to 60 tons capacity would weigh as follows:

Feeding-machine . . . . .	Pounds
Plain castings . . . . .	2,800
Finished castings . . . . .	12,000
Forged work and buck-straps . . . . .	3,900
Bolts . . . . .	14,000
Rails . . . . .	4,300
	9,800
Total . . . . .	46,800

This includes all tools, 3 iron discharge-cars, plates and anchors for pulp retaining-wall, etc. A furnace of this description, provided with ample draught, would be equivalent in capacity to two 60-inch Howell furnaces for any class of ores. The weight of one 60-inch Howell cylinder with its bearing-wheels, chairs, sole-plates, gearing, and foundation-bolts, is 27,800 pounds, or 55,600 pounds for two; already 8800 pounds more than the total weight of the Stetefeldt furnace irons. To this must be added all the auxiliary plant, namely, discharge-hoppers, fire-place fronts, grate-bars, dust-chamber doors, anchor-bolts, buck-straps, rails, tools, and discharge-cars. At the lowest estimate, their weight would not be less for two Howell furnaces than the total plant for one Stetefeldt. As to other building material, two Howell furnaces would require more bricks and a larger building than one Stetefeldt. Where, then, does the cheapness of the Howell furnace come in? But even in comparing a Stetefeldt furnace with one 60-inch Howell cylinder, the difference in expense of construction would be in favor of the former. The Stetefeldt furnace also can be put up in a cheap way.

"And requires little power." This has already been discussed. "And few repairs." We advise "Census" to make a trip to Walker-ville, Montana, and count the discarded Howell cylinder sections, bearing-wheels, etc., that have accumulated on the premises of the Alice mills, and "Census" will change his opinion about the "few repairs" of the Howell furnace.

"Like all continuous furnaces, it requires the ore to be crushed fine." I have repeatedly drawn attention to the fact that fine crushing is not essential to the success of roasting in a continuous furnace. If we speak of fine crushing for mill-work, that means to use on battery a No. 60, No. 40, or No. 30 screen. Any thing beyond would be considered coarse. To illustrate the fallacy of the Census report, I give below another series of experiments, made recently at the Ontario mill. The results, arranged in tabular form, speak for themselves and require no explanation:

No. of screen used in crushing.	Per cent of salt used in roasting.	Value of roasted ore taken from		Per cent of silver extracted by chlorination-test with sodium hyposulphite. Ore from		Per cent of silver extracted by lixiviation with Russell's extra-solution. Ore from		Per cent of silver extracted from a charge of 2 tons by Russell's lixiviation process.
		Shaft.	Dust-chambers.	Shaft.	Dust-chambers.	Shaft.	Dust-chambers.	
30	9.0	58.4	73.0	92.0	92.0	95.2	94.1	96.2
20	12.5	89.2	108.0	92.0	93.1	97.0	97.1	97.0
16	12.0	76.8	91.1	91.0	93.0	96.0	96.5	97.0
16	18.0	63.2	78.4	88.0	93.0	95.2	97.0	97.5
16	16.0	58.3	72.3	89.0	94.7	93.5	95.6	95.0
16	7.5	82.2	105.5	79.7	89.0	88.4	91.0	91.1
16	8.0	60.0	93.0	82.0	88.0	88.5	90.3	91.0

"The Stetefeldt Furnace."—"Its principal drawbacks are its original cost." For large capacity, the Stetefeldt furnace is the cheapest in original cost, as demonstrated above.

"For it must be built of good brick and well anchored." The same has to be done with any other furnace to make it durable.

"And the fact that the ore worked in it must have nearly a fixed percentage of sulphur." The fallacy of this statement I have already discussed.

"And nearly a fixed value in silver to be well roasted. Very low and very high-grade ores can not, therefore, be worked to advantage." This

is the most remarkable objection to the Stetefeldt furnace I have ever seen in print. Why was this "nearly fixed value in silver" not stated? And what is considered a very low and a very high grade of ore? For the reasons stated, the class of ores that can be treated in the Stetefeldt furnace must be exceedingly limited. The terms "low grade" and "high grade" have, in fact, no absolute, but only a local, meaning. Ore containing 50 ounces of silver a ton, for instance, would be considered low grade at the Ontario, Utah, and at the Manhattan, Nevada, but high grade at Butte, Montana, and at the Northern Belle, Nevada. Before this Census report was published, the opinion generally prevailed that the Stetefeldt furnace was the most advantageous roaster for low-grade ores on account of its enormous capacity and its economy in fuel and labor. It seems the Census is in possession of statistics contrary to that opinion. We solicit their publication. From my own experience in chloridizing-roasting of silver ores, I will state that the Auburn mill, near Reno, where the so-called Reno rates were established, has successfully roasted ores in the Stetefeldt furnace, running between 30 ounces and 800 ounces in silver a ton. The Manhattan mill rarely treats any thing below 100 ounces, and generally has reduced very high-grade ores. When these mills were doing custom work for outside mines, ores of every conceivable character were successfully chloridized. The Lexington ore contains from 40 to 60 ounces silver a ton; that from the Ontario, from 60 to 150 ounces. In the Northern Belle mills, ores ranging between 30 and 100 ounces have been treated. On the whole, the Stetefeldt furnace has given more satisfaction than any other. It will not be improper to ask the question: Is this a fair sample of the work done by the United States Census? It must be presumed that it is, because the part I have criticised has been compiled by the best talent of the United States Geological Survey.

NEW YORK, October 1, 1884. C. A. STETEFELDT.

NEW PUBLICATIONS.

TESTING-MACHINES, THEIR HISTORY, CONSTRUCTION, AND USE. By ARTHUR V. ABBOTT. No. 74 Van Nostrand's Science Series. New York: D. Van Nostrand. 18mo, [v] + 190 pages. Price, 50 cents.

We have in a former issue printed Mr. Abbott's interesting and valuable paper on the Fairbanks testing-machine. The volume before us is an elaboration of the same general subject, giving a historical sketch of the development of machinery as applied to the testing of constructive materials, and a frank discussion of the merits of the different machines now in use in this country.

RECENT PROGRESS IN DYNAMO-ELECTRIC MACHINES, BEING A SUPPLEMENT TO "DYNAMO ELECTRIC MACHINERY." By Prof. SYLVANUS P. THOMPSON. No. 75 Van Nostrand's Science Series. New York: D. Van Nostrand. 18mo, [iv] + 113 pages. Price 50 cents.

This little volume, which is a supplement to an earlier more extensive work, is a reprint of an address before the Society of Arts by Professor Thompson, a leading electrician. It includes a description of the Edison-Hopkinson, the Weston, the Schuckert-Moodey, the Cabella, Thomson, Elphinston-Vincent, and Ferranti dynamos.

MODERN REPRODUCTIVE GRAPHIC PROCESSES. By J. S. PETTIT, First Lieutenant First U. S. Infantry. No. 76 Van Nostrand's Science Series. New York: D. Van Nostrand. 1884. 18mo, [vi] + 127 pages. (Index.) Price, 50 cents.

Lieutenant Pettit prepared his brief description of the different modern processes for reproducing drawings for elementary instruction in the Department of Drawing of the United States Military Academy. Engineers will appreciate his description of different methods of engineering electrotyping, stereotyping, photo-lithographing, chromo-lithographing, the wax process photographing and its modern modifications, and the blue paper process.

STADIA SURVEYING. By ARTHUR WINSLOW, Assistant Geologist Second Geological Survey of Pennsylvania. No. 77 Van Nostrand's Science Series. New York: D. Van Nostrand. 18mo, [iv] + 148 pages. Price, 50 cents.

Mr. Winslow's work, containing as it does, a complete exposition of the theory of stadia surveying, and a table of logarithmic sines and tangents, will be thoroughly appreciated by engineers.

A TREATISE ON PRACTICAL AND THEORETICAL VENTILATION. By EUGENE B. WILSON. New York: John Wiley & Sons. 1884. Sq. 8vo, vii+141 pages. (Index.) Price, \$1.25.

Mr. Wilson, who is in a position, through his connection with the Drifton Industrial School, to appreciate the needs of miners and mine bosses, has compiled the little work before us. It makes no pretensions to recognition as an authority of reference for engineers, but seeks rather to bring the somewhat complex questions of ventilation within the reach of miners and the lower mine officials. It is a task of some difficulty, and from a perusal of Mr. Wilson's work, we feel convinced that he has succeeded in bringing the subject he treats within the grasp of the circle of readers to which he appeals.

A TREATISE ON TOOTHED GEARING. By J. HOWARD CROMWELL, Ph.D. New York: John Wiley & Sons. 12mo, ix + 245 pages. (Index.) Price, \$2.

While fully appreciating the fact that the subject of gearing is one that has been treated often and from many different stand-points, Mr. Cromwell justly concludes from his own experience that there is room in technical literature for a book that will gather the scattered writings of others and supply many gaps that designers keenly feel. We have examined Mr. Cromwell's work with keen interest, and feel confident that it will meet the wants of many. We should turn to it with the expectation of quickly getting what we wanted, should we be called on at any occasion to look for suggestions, formula, or data in designing toothed gearing. We can cheerfully recommend it to beginners as well as to those whose practice is not constantly kept up.

WROUGHT-IRON AND STEEL IN CONSTRUCTION. By A. & P. ROBERTS & Co., Pencoyd Iron-Works, Philadelphia. New York: John Wiley & Sons. 12mo, vi+191 and 24 plates. Price, \$2.50.

Among the many pocket-books published by prominent rolling-mills, none is so worthy of the attention of designers of structures of iron and steel as that of Messrs. A. & P. Roberts & Co., of the Pencoyd Iron-Works. While it gives the weights and sections of the different angles, beams,

channels, and shapes rolled by the Pencoyd Works, it gives in a very handy form valuable data on the strength of structural iron and steel, on the safe loads of the different shapes, on the bending moments and deflections for beams of uniform sections, rules for beams bearing irregular loads, moments of inertia for various sections, safe loads for iron and steel struts, stresses on some simple forms of framed structures, working formulæ for shafting, etc.

PRUSSIAN MINERAL STATISTICS.

The Prussian Department of Mines has just issued, a little earlier than usual, its complete mineral statistics. We simply tabulate the footings, to show how far the inquiry of the government statisticians extends. Beginning with coal, lignite, etc., we have the following for 1882 and 1883:

	Bituminous coal.		Lignite.	
	1882.	1883.	1882.	1883.
Mines in course of development	14	21	6	6
On account of alterations	3	..	..	1
Hoisting waste rock only	..	..	1	..
Stopped for other reasons	..	..	4	7
Mines producing:				
Mineral mentioned as main product	382	374	419	424
Mineral mentioned as by-product	1	1	1	1
Total production, tons	47,097,376	50,611,018	10,798,091	11,826,630
Value, marks	232,724,491	2,532,856	29,570,722	31,759,552
Quantity used for own purposes, or				
wasted on dumps	2,960,988	3,300,000	907,213	962,397
Value thereof, marks	32,927,465	15,636,147	2,633,011	2,714,871
Marketable product, tons	44,136,388	47,310,928	9,890,878	10,864,233
Value, marks	218,797,026	239,686,709	26,937,711	29,044,681
Value per ton, marks	4.96	5.07	2.72	2.67
Number of persons employed, total	171,610	183,248	20,108	21,197
Under ground	135,970	144,170	10,508	10,838
Above ground, men	32,416	35,580	9,598	9,978
women	3,224	3,498	342	381

In a similar manner, full details are given concerning asphaltum, of which 20,411 tons were produced; petroleum, the wells yielding 2495 tons; rock-salt, of which two mines turned out 208,240 tons; kainite, which was produced to the extent of 230,071 tons; and other alkali salts, figuring up to 609,742 tons.

The iron and metalliferous mines had a record, from which we cull the following data:

	Mines producing.		Net output dressed ore.		All men employed.		Men below ground.	
	1882.	1883.	1882.	1883.	1882.	1883.	1882.	1883.
Iron ore	679	603	3,987,273	4,130,990	30,475	30,870	20,736	20,759
Zinc ore	115	111	693,369	676,796	12,750	13,475	6,976	7,601
Lead ore	121	112	155,803	148,071	18,562	16,865	10,130	9,405
Copper ore	84	91	558,850	604,406	12,787	14,079	10,066	12,171
Silver and gold ore	2	1	114	95	210	214	170	169
Cobalt ore	1	1	66	97	69	106	62	68
Nickel ore	7	5	14	14	..	..	..	..
Antimony ore	1	1	42	31	20	13	12	7
Arsenic ore	2	3	451	225	64	77	41	33
Manganese ore	23	18	4,130	3,270	238	197	70	77
Pryites	25	25	157,960	148,717	827	779	454	390

The work of the salines is accounted for in a like detailed manner; but what interest us particularly are the statistics of the production of the metallurgical works of the kingdom. The following is a summary of the pig-iron statistics, which, we may add, the labors of the German Iron Manufacturers' Association are now supplementing in some points. There has been a change in the manner of reporting the statistics and many details formerly given are now suppressed:

	Charcoal.		Coal or coke.	
	1882.	1883.	1882.	1883.
Number of works	23	21	79	81
Men employed	1,488	1,562	15,759	16,464
Women employed	4	9	892	946
Output as main product	31,623	33,370	2,208,408	2,290,584
Output as by-product	231	..	227,325	252,023
Total product	31,854	33,370	2,435,693	2,542,607
Total value, marks	3,633,309	3,820,422	146,149,242	139,248,837
Value per ton, marks	114.69	114.49	..	54.77
Materials used:				
Ore and cinder, tons	..	..	82,662	6,342,135
Other materials	..	..	4,795	1,933,798

The statistics of the spelter industry are particularly interesting, because Germany is the most dreaded of our competitors. We therefore reproduce the figures by districts:

	Silesia.		Total Prussia.	
	1882.	1883.	1882.	1883.
Number of works	24	22	31	30
Men employed	4,031	4,156	6,929	7,137
Women employed	1,243	1,272	1,280	1,291
Total product, tons	69,846	71,406	113,271	118,644
Ore used, tons	514,231	523,810	627,918	644,063

These figures clearly show the distribution of the enormous spelter industry of Germany. The average yield of the ores and materials worked is about 20 per cent, their percentage of metal of course being considerably higher.

We can now enter into details as to the production of lead, which footed up to 86,811 tons of pig-lead and 2739 tons of litharge in 1882, and was 84,809 tons of lead, and 3859 metric tons of litharge in 1883. Nor can we do more than note in passing that the copper produced has reached 18,205 tons in 1883, against 14,886 tons in 1882, of which the Mansfeld District is credited with 17,501 tons. Besides this, 545 tons of matte were made in 1883. The product of silver of Prussia was 161,519.82 kilograms in 1882 and 172,865 kilograms in 1883; the product of gold 101.59 kilograms; while the yield of nickel was 109 tons. Prussian acid-works turned out 222,761 tons of sulphuric acid.

Special returns are made in reference to the iron industry, which we summarize as follows; leaving out the details of the furnaces running on charcoal and mixed fuel, as of minor importance:

	1882.	1883.
	Number of furnaces	237
Furnaces in blast during year	197	194
Total time of running, weeks	9,080	8,881
Product:		
Foundry pig	120,252	163,048
For steel manufacture, including spiegel	1,000,570	912,174
Forge pig	1,307,485	1,460,731
Direct castings:		
Machinery	918	5,387
Pottery	6,982	7,368
Pipes	6,504	18,554
Other castings	14,885	..

## THE DISTRIBUTION OF SAN JUAN COUNTY ORES.—II.

By Theodore B. Comstock.

## THE MINERALOGY OF THE SIX RADIAL ZONES.

Before proceeding to the detailed description of the separate belts of mineral veins that have already been outlined, I desire to state clearly that my object is to impress strongly those distinctive features of each district that will be of the greatest practical value to investors. At the same time, it must be borne in mind that very much of this remarkable differentiation is due to local or superficial agencies, from which it follows that the ultimate development of the territory included in our review must show closer relations among all the deposits than might be inferred from our study of surface indications alone. The practical value of this truth is twofold, namely: First, it should inspire investors with a certain confidence in the results of deep explorations of the veins; and secondly, it indicates peremptorily the importance of employing competent geologists to unravel the special problems presented by individual mining enterprises. Assuming, as we may safely do for all purposes of this paper, that the main topographical peculiarities of each district, in so far as they are unique, have been caused by erosion in greater or less degree than has occurred in the other zones, it may be asserted generally that the greater the average altitude of the zone, the more will the veins depart from the normal type of the region, whatever that may prove to be. But this principle, in practice, must be offset by the equally patent truth that, other things being equal, the greatest local departures from the type will be in regions most affected by secondary action, as thermal springs, etc.

The differences in different localities will be here given; the beautiful unity of the whole system, notwithstanding this wonderful variety of manifestation, can only be noticed in passing. One very striking peculiarity, however, which only the student of mineralogy would detect, may be briefly discussed.

It is a very significant fact that, although we have a great variety of mineral species in our veins, some of them of the most complex composition, there are very few exceptions to the rule that the ores of silver, tellurium, bismuth, nickel, arsenic, antimony, etc., all belong to the same crystallographic system (orthorhombic); the gangue minerals, excepting quartz, are almost invariably members of a single system (triclinic); and the country-rock most commonly carries a triclinic feldspar. The ores of iron, zinc, lead, and copper (free from impurities) are liable to be crystallized in the isometric system, but not so when contaminated with other metals. There is a whole volume of science stowed away in these facts, which will be apparent to mineralogists, in part, but I must not dwell on the subject now.

Another interesting fact closely connected with the history of the region is the predominance of one or more of the metals in the minerals of each zone. This will become apparent as we proceed.

1. *The Arsenical (Engineer Mountain) Zone.*—The parent fissure of the Engineer Mountain area trends from the edge of the Red Peak crater, about N. 38 degrees E. (the Alabama mine, Poughkeepsie Gulch, and the Block Silver, Engineer Mountain, are almost exactly upon the line), passing near the Congress mine, thence west of the divide between Red and Cement creeks, crossing Poughkeepsie Gulch below the Maid of the Mist mine, thence nearly along the divide between Bear Creek and Hensen Creek, passing near the Palmetto, Dolly Varden, and Frank Hough mines. It should be observed that the peculiarities of this zone are most nearly allied to those of its opposite zone, the central line of which trends S. 35 degrees W. from Red Peak crater (see description of Zone No. 4 (antimonial) to follow). Other facts prove that the two belts have had a somewhat similar history, with an apparently synchronous origin to the fissures. Consequently, we may expect to find relations somewhat close existing between these two zones, and such is the case, more particularly near the crater area. Arsenic and antimony, from the stand-point of the metallurgist dealing with silver ores, are practically identical in quality, hence the present economical importance of such substitutions of one for the other as may occur in the two districts is not very great. I call the Engineer Mountain District the arsenical zone, because arsenic is more characteristic of the area than is antimony, although the latter is not wanting in many instances.

In the Congress mine, one of the dominant minerals is enargite, an orthorhombic copper sulpharsenide, associated with epigenite, of the same crystallographic system and similar composition, but containing as much iron as copper by volume. (Orthorhombic lead sulpharsenides, such as dufrenoyite, sartorite, and jordanite, probably exist, although I have not as yet distinguished them in crystalline form. Lead often occurs in the ores in about the proper proportion, without ocular evidence of its presence.) As we recede from the old crater, the arsenic appears to be less intimately associated with the copper and lead, which occur as simple sulphides (bornite and galenite [galena]). It is commonly supposed that ordinary copper pyrites (chalcopyrite) is the most abundant copper sulphide in this section. My own observations lead me to believe that bornite (variegated copper) is far more prevalent. Referring to what has already been said, it will be noticed that the former mineral is an exception to the rule enunciated above, as it is tetragonal, while the latter, applies properly, being isometric in crystallization. In the veins around Mineral Point, some of which are very rich in silver, arsenic seems to prevail. Polybasite (orthorhombic silver and copper sulph-antimonio-arsenide) occurs in the British Queen and some neighboring claims, disseminated in a very compact quartz. In some veins, a nearly allied arsenical stephanite (orthorhombic silver sulph-antimonide). "Ruby silver" (light red silver ore, or proustite, and dark-red silver ore, or pyrargyrite), belonging to the hexagonal system, and an exception to our rule, is of very limited occurrence. I have seen it in the Inez mine, on Engineer Mountain, and in a few other localities, but not abundantly. The determination of these minerals is not beyond doubt, as the crystalline form is generally obscure. Arsenopyrite (arsenical iron pyrites, or "mispickel," orthorhombic) occurs abundantly in many veins, and pyrite (isometric) is not much restricted. I have met ores that, from their composition, would seem to contain small proportions of wolfechite or of corynite (the former orthorhombic, the latter isometric, nickel sulph-arseno-antimonide), but never in such mixtures as to enable me to

be certain of the true mineral. Glauco-dote and glaucopyrite (both orthorhombic iron, copper, and cobalt sulph-arseno-antimonides) as well as rammelsbergite (orthorhombic nickel arsenide) have been indicated more or less distinctly also by blow-pipe reactions, but I have been unable as yet to collect any specimens, showing these minerals in unmistakable crystals. Nearly all the true silver minerals, and many others of similar appearance, are classed by the miner under the common head of "gray copper." As numerous very important discoveries may be thereby overlooked, it would be well for prospectors to have all such minerals determined by a mineralogist, whenever they are found in a new locality.

Zinc occurs abundantly as sphalerite (zinc-blende, isometric), and is particularly noticeable in the Red Cloud mine, near Mineral Point. My own observations, though not wholly satisfactory, because not specially directed to this question, incline me to the opinion that zinc is not characteristic of the veins carrying the highest percentages of silver, unless it occurs in a well-defined streak by itself. At all events, I have not found it associated with the true ores of the precious metals, but rather with those of other base metals, particularly with low-grade galenas; and in the arsenical zone, it is almost invariably mingled in the same streak with pyrite and galena. Good examples of this peculiarity are to be seen in the Excelsior, Red Cloud, and other veins. Bornite and, possibly, chalcopyrite are as frequently associated with galena in the same manner, but these minerals are not as abundant as in other districts.

Tellurium ores are supposed to exist in some portions of the arsenical zone. I have not detected them with certainty, though the metal occurs in veins of the adjoining bismuth zone, near the head of Poughkeepsie Gulch (Adelphi mine, etc.). A mineral that is abundant in the Frank Hough mine goes commonly by the name of a telluride (hessite?).

I have had an opportunity to make some blow-pipe tests of the ore from this mine, the results of which fully prove that there is not a trace of tellurium, but arsenic is extremely abundant. Enargite and galenite occur separately, but the bulk of the ore is made up of such lead sulph-arsenides (orthorhombic), as dufrenoyite, sartorite, and jordanite. I am inclined to believe, also, that I have detected a new mineral, which I will provisionally call boumarsenite. It is, I judge, analogous to boumonite, with which it is isomorphous, and seems to answer to the formula  $CuPbAs_2$ , in which arsenic has replaced the antimony of boumonite—or it may be a union of sartorite and enargite in about equal proportions. Further study is necessary to describe it fully. Judging from the foregoing facts, and the further one that this mine lies just where the tellurium would naturally absorb a large amount of gold, which I am informed this particular mineral does not yield largely, it seems more probable that this is more nearly allied to polybasite or a similar mineral, and that tellurium is not indigenous to the zone.

The reported discoveries of tin and platinum, and of nickel in workable quantity, were based upon the most absurd assumptions of persons wholly ignorant of the characters of these minerals. If any of these be present in more than mere traces, the fact is not now evident. Nickel and cobalt are the only new metals that are likely to be discovered in this zone, so far as one may opine from present developments, and there is more reason to look for these in another district.

The Old Lout mine is upon a vein a little west of the axis of the arsenical zone. Its position, strike, dip, and other peculiarities ally it so closely with this belt that I venture to predict the development of arsenical compounds in future explorations. At present, however, the ore is somewhat exceptional. Bismuth has almost wholly replaced the typical arsenic, and, to a less extent, this is the case in neighboring veins in Poughkeepsie Gulch. In this instance, wittichenite (copper and bismuth sulphide), with frequent beautiful crystals of aciculite (lead, copper, and bismuth sulphide), both of which are orthorhombic, are just now the prevalent minerals. Aciculite is most abundant. This is isomorphous with boumonite (and analogous to it), a mineral that is prominent in the opposite antimonial zone. I have been unable thus far to detect tellurium or antimony in the Old Lout ore. The Silver Link vein lies farther west, and interesting results may be expected from it.

To sum up, then, we may deduce the following rules for the guidance of prospectors and investors in this district.

a. The best veins are those trending nearest to the course N. 39° E., having a dip nearest to the vertical position, and bearing the greatest proportion of free gold. The limits of the trends of the main primary veins in the zone are N. 26 degrees E.—N. 50 degrees E., and much greater care will be necessary in inspecting the lodes as one approaches the margins of the districts. This principle will also apply to all the zones, more especially to those which, like Nos. 3, 4, 6, are quite wide. There is really less danger of meeting with poor veins at the margins of the arsenical zone than in any of the others, except No. 5, which is even narrower than this.

b. The occurrence of polybasite, or the popularly so-called "gray copper" minerals, is a good indication, especially if the streak of such ore be independent of the base ores.

c. The occurrence of large quantities of the minerals containing arsenic and antimony combined with copper, iron, and lead is an unfavorable indication, unless, perchance, the so-called "gray copper" minerals are also abundant in the same vein. This rule may admit of some variation in favor of such locations as are nearest the seat of extensive secondary action of hot springs, but it must be rigidly applied in other parts of the district.

d. Zinc-blende and iron pyrites will be found separate from the galena in the best veins, but copper pyrites mingled with galena in the same streak need not be regarded as an unfavorable indication.

e. The occurrence of minerals not mentioned in this paper may or may not be disadvantageous. If (1) they are of the orthorhombic system, they are more liable to be abundant in the vein and rich in silver; if (2) isometric, they will probably be less abundant and more base in character; and (3) if of some other crystalline form, the veins may usually be considered without regard to them.

As to gangues, little can be said, except to make the general statement that quartz is the best for this district. Barite (heavy-spar) is occasional, particularly near the crater area, and it usually occurs in the veins that have the most of the base minerals (that is, the least quantity of the precious metals).

SILVERTON, COLO., Sept. 15, 1884.



THE HARLOW VALVE-GEAR FOR DIRECT-ACTING PUMPS.

This valve-gear consists practically of but two moving parts, the auxiliary valve *P*, attached to and forming part of the piston-rod, and the main valve *V* moved by the plunger *F*. The left-hand cut is a section of the other through the line *X X*. *S* represents the main steam-pipe; *Ex* the exhaust; *L* the main steam-port to the lower end of the cylinder; and *U* that to the top. As represented in the cut, the main piston has reached the upper end of its stroke, the auxiliary valve *P* has connected the ports *B* and *C*, exhausting steam from that end of the cylinder. Steam enters through the port *D*, and thus reverses the main valve. When the main piston has reached the lower end of its stroke, the ports *A* and *C* communicate over the end of the auxiliary valve *P*, and the steam, entering through the port *D*, reverses the main valve for the up-stroke, thus obtaining a positive action of the main valve without the aid of tappets, springs, combined levers, cams, or similar connection. By the arrangement of the ports in the auxiliary cylinder, the plunger is prevented from pounding the heads by means of steam-cushions. If the main valve should be moved too far by its momentum, the cushions will return it to a fixed point at either end of its stroke, leaving the main steam-ports fully open. The main steam-ports are divided where they enter the cylinder, so that, when the piston nears the end of its stroke, a part of the steam is shut off, and the speed of the piston is reduced. When the stroke is reversed, only a portion of the steam enters the cylinder at first, thus giving a motion approximating to that obtained by a crank and fly-wheel. The water-valves are given time to seat without shock, and the piston is prevented from striking the heads. In connection with the valve-gear, it is claimed to make a steam-pump practically noiseless at any speed. The valve is the design of M. S. Harlow, of Hoboken, New Jersey.

DEVELOPING THE TONQUIN MINES.—A syndicate has been formed at Paris to develop the mines in Tonquin. The bonds of the new company find a ready sale.

LARGE CASTINGS IN SIEMENS STEEL.—For some time past, Messrs I. & W. Beardmore, Parkhead Iron and Steel Forge and Rolling-Mills, Glasgow, have been engaged in the production of some very large Siemens steel castings, chiefly for hydraulic rams and marine engine and propeller shafting. They have already turned out some dozens of ingots for such purposes, generally ranging in weight from 25 tons up to 34 tons. The largest of them have ranged up to 20 feet in length, with an average diameter of 3 feet 6 inches. These ingots have subsequently been hammered to the requisite size, and then machined to suit the purposes for which they were intended. We understand that such of these steel forgings as have been machined for use as hydraulic rams have been chiefly in fulfillment of orders from Sir William Armstrong & Co. The firm expects that it may shortly have to undertake to cast ingots weighing up to 60 tons for special forgings. It is evident that the facilities for producing heavy steel forgings at the Parkhead Works are of a very complete character.

COBALT-BRONZE.—Under this name, says *Iron*, we have a new alloy that has just been introduced to our notice by Messrs. Henry Wiggin & Son, of Birmingham, England, whose other new alloy, silveroid, we noticed about four months since. Cobalt-bronze, which is also the invention of Messrs. Wiggin, is a whiter but slightly more expensive metal than silveroid. It is, perhaps, the more interesting of the two, because there is introduced into its composition small quantities of the metal cobalt. The malleability of cobalt in a pure metallic form has long been understood, but we believe it was not until a few years ago that it was demonstrated by Messrs. Wiggin that it might be rolled into sheets, and wrought like other metals into articles of utility. Its high price, however, interfered with its production and militated against its use. This fact induced Messrs. Wiggin to endeavor to compound an alloy in which the sterling qualities of this valuable metal could be fully represented, and which, at little more than the cost of ordinary German silver, might possess in a large degree all the attributes of the pure metal itself. Possessing, as it is said to do, many of the qualities and every appearance of metallic cobalt, it is manufactured in several qualities, the higher grades being preferable, on account of their suitability for casting purposes, their close, steel-like surface, their susceptibility to a high polish, as well as their hardness, toughness, and great tensile strength.

A NEW METHOD OF PRESERVING COAL.

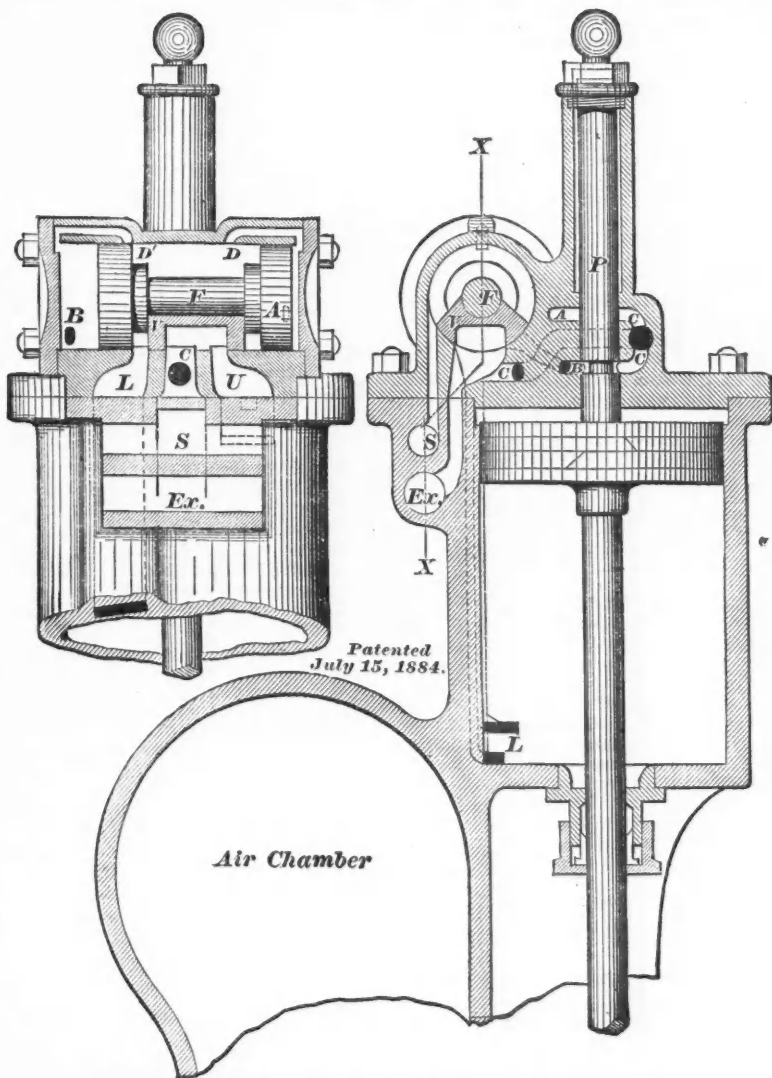
Wenzel Poech, of Karbitz, Austria, argues that if coal is placed in an atmosphere of steam, which excludes the atmospheric oxygen from the coal, the hygroscopic water will have no tendency to leave the pores of the coal, nor can a chemical action set in, even in presence of pyrites, the oxidation of which is, under other circumstances, essentially promoted by the presence of moisture. It is, therefore, not to be doubted that, by displacing the oxygen and keeping the coal moist, alteration and spontaneous combustion may be checked. A complete immersion would meet the requirements, but would only be practicable in rare cases. Irrigation alone would not be perfectly successful. Wenzel Poech excludes the air and produces a uniform wetting of the stored piles of coal, by admitting spent steam into the piles. For this purpose, a series of trenches is cut in the ground; they are so covered with beams and boards that narrow spaces remain, not large enough to permit the coal to fall through. The boards are simply laid on cross-pieces, are not fastened, and can be easily removed for the purpose of cleaning out the trenches. On the ground thus prepared, the coal to be stored is deposited in the usual way; the trenches are then connected with the exhaust-pipe of a steam-engine,

and the steam admitted; it passes through the interstices in the covering into the coal-pile, disseminates itself through the latter, displaces the air, and, in consequence of the condensation of the steam, moistens the coal uniformly. In order to effect a uniform distribution of the steam, it is necessary to cover the coal-pile with fine coal and cinders, as in the case of charcoal heaps; thereby strong draughts of air will also be prevented from passing through the pile and interfering with the equal distribution of the steam. In case of coal containing little pyrites, careful covering of the pile is not so necessary, but is of importance in case of coal rich in pyrites. The width of the mesh of the network of canals that exists in large depot grounds depends upon the size of the pieces of coal to be stored and the height of the pile; for medium-sized coal, the distance between the canals, with a height of pile equal to 3 m., is 3 m. The exhaust-steam of a steam-engine of 4 horse-power, which was worked for but six hours during the day, was entirely sufficient for the preservation of a depot of 20 car loads of coal.

In carrying out the process, it was repeatedly shown that the losses sustained in the unloading of the coal are far smaller than they are usually assumed to be, and that in this assumption a large portion of the waste produced by alteration was attributed to the destruction in dumping. In the loading of the coal preserved by steam, it was found invariably that only in the locality where the first unloading took place, and where the coal fell from greater heights, attrition took place; the rest of the coal was good, was well preserved, and could be loaded without re-sorting. The cost of construction of the trenches and their coverings—for which latter old and otherwise useless boards, timbers, and ties of the mine are utilized—for a dump for 100 car-loads of coal amounts at most to 30 fl. The cost of working is nothing, and the outlay consists only of the cost of preserving the trenches, and the interest and sinking fund on the capital invested.

Results relative to the use of this process have been obtained at the following works: Nostitz'scher Maria Antonia shaft, near Karbitz; Ferdinand shaft, near Teplitz; Bruno mine, in Weisskerchlitz, near Teplitz. At Maria Antonia shaft, Wenzel Poech was enabled to make the first experiments, and since then the process has been in full working order. At the Ferdinand shaft, belonging to the Austrian Coal Industry Association, confirmation of the described preservation method was quite accidentally found. Over a reservoir covered with debris, and into which exhaust-steam passed, coal had been deposited, which, on reloading, was found to be perfectly preserved. According to communications from mining engineer Hans Gutmann, further experiments were carried on with favorable results, and the working of the process on a larger scale was proposed. The director of the Bruno mine, Em. Baier, uses old gratings to cover the canal. He also subjected coal without covering with cinders for more than two months to exhaust-steam, and found it in no way altered.

QUICKSILVER FOR THE PHYLLOXERA.—It is claimed that Bauer has discovered the use of quicksilver to be a good preventive of phylloxera.



VALVE-GEAR OF HARLOW'S STEAM-PUMP.

## ON THE SEPARATE VENTILATION OF COAL-WORKINGS.\*

By — Von Steindel.

The mines of the Zwickau-Oberhohndorf Coal Mining Company, to which this communication refers, are provided with a Guibal fan of 9 meters in diameter. This would be sufficient for all purposes of ventilation, if the ground were sufficiently solid to allow of air-courses of large area being used. As it is, however, the drag on the air is so great that it is not considered desirable to diminish the strength of the main current by a complicated system of splittings and crossings; and therefore a method has been adopted for providing for the ventilation of all ends and workings not lying on the main air-course by a special supply of air sent down from the surface under pressure. For this purpose, air-compressors have been established at the two principal shafts, each of which, when making 40 strokes per minute, compresses 31 cubic meters of air at the ordinary pressure to 3 atmospheres above it. The delivery-pipes are united underground, so that either of the two compressors may command the work in case of the other being laid off.

The number of working-places requiring ventilation being large, forty-six in all, it was impossible to use the compressed air indirectly, that is, to drive fans or other blowing-machines, and the trials were confined to two methods, the first and simplest, by that of allowing the air to flow into the working at full pressure from the end of the delivery-pipe; and the second, that of using a jet-aspirator similar in principle to Körting's apparatus.

With the direct efflux, the following results were obtained :

Diameter of nozzle. Millimeters.	Volume of air at atmospheric pressure delivered at the absolute pressure in the main of		
	2 atmospheres. Cubic Meter.	3 atmospheres. Cubic Meter.	4 atmospheres. Cubic Meter.
1.5	0.116	0.162	0.216
2.0	0.162	0.204	0.277
3.0	0.273	0.439	0.558
4.0	0.477	0.620	0.816
5.0	0.612	0.920	1.224

The maximum volume of air, therefore, obtainable by this method does not exceed 43 cubic feet a minute, and the whole work of one compressor would be required for the ventilation of twenty-two working-places. The dispersal of fire-damp was very rapidly effected, but the noise of the escaping air was so great as to overcome all other sounds, especially the premonitory cracking of the roof before falling—a defect that rendered the use of such a method of ventilation exceedingly dangerous. The experiments with the aspirator were made by allowing the 1.5-millimeter jet of the apparatus (which is not described in detail) to flow into a zinc pipe 150 millimeters in diameter and 10 meters long. The results obtained were :

Absolute pressure in main.	Volume of air at atmospheric density. Cubic meters.	Velocity in meters per minute.
2 atmospheres	2.240	128.0
3 "	3.019	172.5
4 "	3.798	217.0

The air delivered is therefore at 2 atmospheres 19.3 times, at 3 atmospheres 18.6 times, and at 4 atmospheres 17.6 times that of the compressed air consumed. When pressure was increased from 2 to 3 atmospheres, the volume delivered increased 34.8 per cent, and from 2 to 4 atmospheres, 69.6 per cent. The velocity of the current was in all cases sufficient to effect the rapid dispersal of fire-damp. The next series of experiments was carried out with a simplified jet-apparatus. A gas-pipe of 17 millimeters, connected with the blast-main, and terminating in a conical nozzle of 1.5-millimeter aperture, was inserted in the 150-millimeter zinc pipe to a distance of 500 millimeters from one end. This gave much better results than the preceding, as will be seen in the following table :

Absolute pressure in main.	Air delivered at atmospheric volume. Cubic meters.	Velocity in meters per minute.
2 atmospheres	3.623	207
3 "	5.163	295
4 "	6.143	351

In the first case, the useful volume of air delivered is 31.2 times, in the second 31.8, and in the third 38.4 times that of the air expended. The fourth series of experiments was made by varying the size of blast nozzle from 1.5 to 2, 3, 4, and 5 millimeters, and the diameter of the zinc pipe from 150 to 210 and 310 millimeters, the length of the latter being in all cases 10 meters.

Diameter of nozzle. Millimeters.	Zinc pipe. Millimeters.	2 atmospheres.		3 atmospheres.		4 atmospheres.	
		Air delivered at atmospheric volume. Cub. met.	Velocity in meters per minute.	Air delivered at atmospheric volume. Cub. met.	Velocity in meters per minute.	Air delivered at atmospheric volume. Cub. met.	Velocity in meters per minute.
1.5	150	3.623	207	5.163	295	6.143	351
2.0	"	4.865	278	6.668	381	8.628	493
3.0	"	6.633	379	9.380	536	11.778	673
4.0	"	8.838	505	12.250	700	14.438	825
5.0	"	10.605	606	14.158	800	17.623	1,007
1.5	210	5.390	154	7.735	221	9.205	263
2.0	"	7.035	201	10.360	296	12.565	359
3.0	"	9.205	263	14.175	405	16.345	467
4.0	"	12.005	343	18.445	527	21.560	616
5.0	"	15.680	448	21.315	609	26.250	750
1.5	310	7.800	104	10.875	145	14.100	188
2.0	"	11.850	158	15.300	204	18.300	244
3.0	"	14.925	190	21.300	284	25.275	337
4.0	"	20.250	270	27.600	368	33.675	449
5.0	"	24.525	327	32.100	438	41.250	550

The results obtained in the preceding experiments showed that the method of ventilation by compressed air is as capable of being practically

\* Abstract of a paper in the *Jahrbuch für das Berg- und Hüttenwesen* (Freiburg), 1884, p. 78. From the Proceedings of the Institution of Civil Engineers of London, edited by James Forrest, Secretary.

applied on the large scale, but before adopting it, further experiments were made to determine the loss of effect due to the use of long lines and pipes between the points of aspiration and delivery of the air. For this purpose, experiments were made in three different kinds of workings, namely, a dip-heading 80 meters long, an inclined plane 120 meters, and a cross-cut gallery of 200 meters. In all cases, the maximum absolute pressures of four atmospheres was used, that being found to be the most advantageous for practical work. The results obtained showed that sufficient ventilation might be obtained, even at a distance of 200 meters from the jet. The loss of effect is, however, very considerable. Thus, with a 3-millimeter nozzle blowing in a 210-millimeter pipe 10 meters long, the air delivered per minute was 16.345 cubic meters; but when the length was increased to 80 meters, it was diminished to 10.895; at 120 meters, it was 8.680 cubic meters; and at 200 meters 5.600 cubic meters, or only about one third of the delivery of the 10-meter pipe. The loss of air upon the quantity actually drawn into the pipe is, however, comparatively small, even on the long length. In the case of the 200-meter length given above, the air delivered was 65.5 per cent of the combined volume of compressed air expended, and that at ordinary pressure drawn in by the jet. When, as is customary in the mines, rectangular wooden air-pipes of 285 by 420 millimeters internal section are substituted for the round zinc ones, the loss is considerably greater, the volume delivered being only 44.23 per cent of that aspirated. The wooden pipes are used in preference to those of zinc, as not being liable to be crushed when the thrust of the ground is heavy.

Further experiments were made on the long lines to see how far it was possible to divide the current so as to ventilate two or more points from one jet. These showed that it was possible to ventilate as many as four pipes from one blower, but the latter seemed to be rather too large a number, and that it was more advantageous not to divide the current more than once. In a final table, a list is given of the different workings where this method of ventilation was in use in May, 1883. These were forty-six in number, with more than 2000 meters of pipes of varying dimensions, the longest line being 285 meters. The total delivery is about 430 cubic meters per minute, the velocity varying from 37 to 390 meters per minute. The number of workmen supplied with air was 96. In cases of sudden outbursts of gas, the working-place may be rapidly cleared by removing the nozzle, and allowing the compressed air to flow from the full aperture of the pipe.

In a final note, the editor calls attention to a similar use of compressed air made by Weigel at Lugau in 1881.

THE MONSTER RIVAL TO THE "PORTER RHODES" DIAMOND.—The *Diamond Fields Advertiser* says: Some few months ago, an overseer, reputed to be in the employ of the Central Diamond Mining Company, Kimberley mine, managed by some means or other to pass through the searching-house with a 457 carat, purer in quality and whiter even than the memorable Porter Rhodes. He was not long in making his "find" known to four noted illicitists in camp, who joined together to become possessors of what they knew from long experience to be a thing of immense value, and each of them resolved to pay for the diamond the sum of £750, or altogether £3000, naturally a very magnificent amount in the eyes of perhaps an impecunious servant. These illicit diamond-buyers who secured the prize played at cards night and day to pass away the time, soothe their agitated nerves, and principally for the object of considering how the diamond could be smuggled out of Kimberley. The play at cards resulted in two of the four losing their interest altogether in it. The other two managed somehow to get it along with them, without molestation from nasty detectives, to Capetown, and there they sold it to a Capetown firm of illicit diamond-buyers for the sum of £19,000, a happy sale to both buyer and seller, considering its immense value. A member of this firm went to England with the gem, and when its exceeding purity and sparkling brilliance became known in Hatton Garden, a great deal of excitement arose, especially among those who were in the secret. Some well-known individuals, formerly of Kimberley, organized a syndicate of eight, who purchased the stone at the fabulous figure of £45,000, a ninth share of any increase in the price being still maintained—to this extent, that if the "beauty" realized more than the amount already named, a ninth part of that excess was to be paid to the colonial traders in stolen diamonds, who are in a large way of business in Capetown.

PHOSPHORUS IN CANNEL.—M. Carnot contributes to the *Comptes Rendus* a short account of his observations upon the origin and distribution of phosphorus in coal and cannel. The author recognizes the fact that the presence of phosphorus in coal ashes has long been noticed by MM. Le Chatelier and Durand-Laye, who have demonstrated the possible importance of this constituent in the metallurgical and other uses of coal and coke. The object of M. Carnot's researches has been to obtain more exact information of a quantitative kind on this subject. By careful examination of the organized coal of Commeny, M. Carnot has determined the proportions of phosphorus for four types of the vegetable constituents of the examples examined. Coal, unorganized, examined in bulk, does not contain much phosphorus, although the proportion varies in different localities. On the other hand, the cannel with which it is associated contains a much more considerable quantity of phosphorus. This difference was first observed with samples from Commeny; and the author procured specimens of coals and cannels from other deposits, in order to see if the same results held good. The following are the proportions determined by analysis: Lancashire cannel, 0.02862; Wigan cannel, 0.02246; Newcastle cannel, trace; Glasgow cannel, 0.00572; Virginia cannel, 0.02771; naphtha-schist of New South Wales, 0.01956; Autun boghead (free from fish-scales), trace; Frioul boghead (Austria), 0.06275. All these cannels, except the last two, belong to the Carboniferous deposits. Microscopic observations on thin plates of cannel show this substance to have been formed of accumulations of decomposed vegetable matter, of very diverse nature. There can, however, be detected in it, oftener than any thing else, a considerable number of spores, or pollen grains, generally very irregularly scattered. M. Carnot thinks that to this may be attributed the high but irregular proportion of phosphorus in cannel coal.



FURNACE, MILL, AND FACTORY.

Proposals for building ore-docks for the Michigan, Lake Shore & Western Railroad, at Ashland, Wis., have been opened in Milwaukee. The following offers for construction were submitted: Allen & Co., Marquette, Mich., \$290,000; Connelly & Co., Chicago, \$280,000; John H. Knight, Ashland, \$278,000; J. H. Gillette, Marquette, Mich., \$266,000; C. C. Smith, La Crosse, Wis., \$185,000. The structure will be 1460 feet long and forty feet above the water-line, and contain 234 ore-pockets. It is estimated that at least twenty vessels can be loaded in five hours. Work will at once be commenced and pushed vigorously. The contract calls for completion by July 1st, 1885.

The Thomas Iron Company has blown in one of its furnaces at Albutis, Pa., and is preparing to blow in the other.

The Pittsburg Forge and Iron Company is running double turn in all departments of the mill, and has just completed gas-furnaces for the guide and bar mill. The company will soon put an addition to its mill to work bridge iron.

The report of E. S. Brown, Receiver of the Northwestern Car and Manufacturing Company, of Stillwater, Mich., of which Senator Sabin was the principal owner, has been filed in court. Mr. Brown says that the business has been paying expenses of late. The total assets, it is understood, are \$5,500,000. The first total was \$7,000,000. This was cut down \$1,500,000 by the receiver, in order to make sure of coming out safely.

The Pennsylvania Salt Manufacturing Company's acid manufactory, at Natrona, Pa., was damaged by fire September 30th, to the extent of \$100,000. The company, which is the largest of the kind in the United States, has property there valued at \$500,000, and has twenty-seven acres under roof. The largest of the buildings was destroyed. It cost about \$65,000, and in it the process of making sulphuric acid from Spanish pyrites was employed.

The Glendon Iron Company, at Easton, Pa., has been idle for the past two months, on account of the general depression in the iron trade. It is now nearly ready to blow in its No. 5 furnace, and another furnace at the works is lining, and will be blown in as soon as every thing about it can be placed in running order. The Andover Iron Company, in Philipsburg, Pa., has blown out the last furnace it had in blast, and according to the present outlook, all the stacks at the works will be idle this winter.

At the Pittsburg forge and iron-works, all the heating furnaces are rebuilding, so as to introduce natural gas.

In order to raise funds for the liquidation of certain debts and mortgages, the Standard Vapor Fuel Iron and Steel Company has executed bonds aggregating \$150,000, and to secure the payment of the issue has transferred all its real estate, franchises, etc., to Edward A. Quintard, of this city, in trust.

A Birmingham, Ala., iron-worker has been awarded the contract for 140,000 iron chains to be used in the improvement of the Mississippi River between Memphis and Vicksburg. There were bidders from the principal Western cities.

Messrs. Fraser & Chalmers are building a Cornish pump for the Alice mine, Walkerville, Montana.

A rolling-mill in the Dupont powder yards at Wilmington, Del., blew up September 29th, with a terrible report. It is stated that no person was hurt, but that the roof of the mill was torn to fragments.

The Clayton Air-Compressor Works, located in Brooklyn, near the New York and Brooklyn Bridge, have recently shipped several car-loads of mining and tunneling machinery to the West, comprising the Clayton air-compressor, rock-drills, duplex water-pumps (for mining drainage), steam-boilers, pipe, drill steel, etc. Also a mining plant to a company in South America. Among the mines that have recently added the Clayton air-compressors to their plants, are the Big Bend Tunnel and Mining Company and the Fresno-Enterprise Company, of California, and the Copper Queen Mining Company and the Tombstone Mill and Mining Company, of Arizona. A number of orders for large sizes are booked, and prospects for fall business are reported to be excellent.

Work has been resumed in the Philadelphia & Reading Company's rolling-mill, at Reading, Pa., which has been lying idle for several months. The works employ several hundred hands.

The Malleable Iron-Works Company, St. Louis, Mo., filed an assignment September 26th, designating John T. Davis, of Samuel C. Davis & Co., as receiver. The assets are placed at \$111,000; the liabilities at \$65,000. The assets are listed as follows: Buildings and leasehold, \$27,000; machinery and fixtures, \$58,000; pig-iron and scrap-iron, \$8000; manufacturing product and product in process of manufacture, \$15,000; outstanding account, \$3000; total, \$111,000. The company was founded fourteen years ago. The parties who now compose the company purchased the site and works from the Campsprings Malleable Iron-Works, owned by George W. Shapleigh. There has never been any difficulty heretofore, but a comparatively small business was done until last November, when the contract with the Wrought-Iron Range Company was made. That necessitated heavy expenses for the intricate machinery.

It is said that P. L. Kimberly & Co. are making arrangements to erect a hoop-iron mill either at Sharon or Greenville, Ohio.

The Girard furnace, Youngstown, Ohio, which has been in blast for twenty months, has been shut down for the purpose of making extensive improvements. The stack will be raised ten feet and relined, and a new hot blast put in. A new battery of boilers will be added, and it is expected the furnace will not be ready to put in blast before December 1st.

The Atlantic Iron Mills, of Lawrence, Mass., will shut down for two weeks, beginning October 13th.

LABOR AND WAGES.

The Stove-Molders' Union, at Cincinnati, Ohio, at a protracted meeting September 25th, agreed to return to work immediately. The strike has been in existence for nearly a year.

The Sobo furnace, Moorhead, McClean & Co., at Pittsburg, Pa., has started up after being idle since March. The men were offered work at a reduction of ten per cent, which was accepted. The furnace employs the old men.

The Fairview Nail-Works and the Paxton Iron-Works, of Harrisburg, Pa., and the Duncannon Iron-Works, of Duncannon, have posted notices of a reduction of 10 per cent in wages, to take effect on Monday, October 6th. The Chesapeake Iron-Works, of Harrisburg, had previously posted a similar notice. The four establishments give employment to several thousand hands.

The striking coal miners of Fremont County, Colorado, numbering 400 men, in mass-meeting at Williamsburg, September 23d, resolved to continue the strike, as they have offered the operators every reasonable plan for adjusting the difficulties, which plans have been in every instance rejected. The strikers have been assured of financial aid in their struggle. The coal miners now in various parts of Southern Colorado number about one thousand men, and all say that they mean to remain out until their demands are acceded to.

The Federation Trade and Labor Union of the United States and Canada will hold its next session in Chicago, Ill., from October 7th to 10th.

The employes of the Dunbar (Pa.) Furnace Company have been informed that unless 10 per cent reduction in wages is accepted on October 1st, the furnace will be shut down. The men have decided not to accept the reduction.

The Canadian Pacific Railroad Company has decided to shorten the working hours at the workshops at Montreal. The work for the week will now end on Friday at five o'clock.

The employes of Oliver Brothers & Phillips, iron manufacturers, at Pittsburg, Pa., have been notified that a general reduction of wages of 12 1/2 per cent would go into effect on the 6th inst.

The New York City Italian Labor Bureau offers to furnish any number of strong laborers, at from 50 to 60 cents a day, to Cleveland manufacturers. The

Bureau agrees to stipulate that the laborers will serve from one to five years without demanding an increase.

The news from the coal miners' camps along the Monongahela River indicates that the days of the strike are numbered, and that the men who quit work last June will be compelled to return for smaller rates than they received when the strike was inaugurated. At a mass-meeting held September 29th in the fourth pool, the sentiment was strongly in favor of accepting the operators' terms. J. T. Neel and Louis Staib, two of the most extensive operators on the river, who have been running their mines with non-union men, shut down September 29th, having filled all their contracts.

The coal miners who struck a month ago at Des Moines, Iowa, for four cents, have been granted their demands and gone to work.

At the Vulcan Iron-Works, in Wilkes-Barre, Pa., a manufactory of locomotives and mining machinery, a reduction of 10 per cent in wages took effect October 1st.

The strike of the stove-molders at Pittsburg, Pa., is virtually over. The men have notified the manufacturers that they are willing to return to work at a 10 per cent reduction, and the matter is now under advisement, with the probability that the offer will be accepted.

RAILROAD NEWS.

At a stockholders' meeting of the Pittsburg, Chartiers & Youghiogheny Railroad, it was decided to increase the indebtedness of the company \$190,000. The object of this action is to complete some extensive improvements on the road.

Mr. J. W. Hopkins, Fuel Agent of the Chesapeake & Ohio Railroad Company, sends us the following report of the total output and distribution of coal and coke received from the mines on the line of the railroad (including fuel on the Lexington Division) for the month ended August 31st, in tons of 2000 pounds:

Kind of coal.	For August.		From Jan. 1 to Aug. 31.		Increase.	Decrease.
	1884.	1883.	1884.	1883.		
Cannel.....	3,688	1,770	33,464	19,704	.....	6,240
Gas.....	24,395	20,335	206,483	249,554	.....	43,071
Splint and Block..	11,836	9,671	58,437	67,567	.....	9,130
New River, etc....	26,952	30,452	282,142	270,236	11,906	.....
Coke.....	8,179	7,001	42,628	70,961	.....	28,333
Totals.....	75,050	69,429	603,154	678,022	11,906	.....

Distribution of above:	For 31 days.	
	1884.	1883.
Fuel for use of company.....	20,446	12,687
Shipped at Huntington, on Ohio River.....	1,461	800
Delivered on line of Elizabethtown, Lexington & Big Sandy Railroad and Kentucky Central Railroad.....	5,324	2,406
Delivered on line of Chesapeake & Ohio Railroad, excepting Richmond.....	10,358	16,164
Delivered at Clifton Forge to Richmond & Alleghany Railroad.....	12	207
Delivered at Staunton to Baltimore & Ohio Railroad.....	.....	.....
Delivered at Waynesboro' to Shenandoah Valley Railroad.....	.....	.....
Delivered at Charlottesville to Virginia Midland Railroad.....	20	16
Delivered at Richmond, Fredericksburg & Potomac Junction to Richmond, Fredericksburg & Potomac Railroad.....	3,987	3,194
Delivered at Richmond for consumption, including tugs, dredges, etc.....	545	108
Shipped at James River wharves.....	7,541	5,522
Delivered at Newport News for consumption, including tugs, dredges, etc.....	6,142	12,534
Shipped at Newport News wharves.....	621	270
Totals.....	75,050	69,429

The Norfolk & Western Railroad Company's statement for the month of August shows gross earnings, \$223,407.60; expenses, \$110,531.94; net earnings, \$112,875.66; total net earnings for the year, \$652,948.04.

A contract has been closed between the Lehigh Valley Railroad Company and the Pittsburg & Western Railroad Company for the purchase by the former of a half-interest in the track of the latter from a point at the mouth of Plum Creek Valley, on the Alleghany River, to Wood's Run, in Alleghany City, both roads to use the line in perpetuity. The Lehigh Valley Company has also purchased outright six acres of land on Smoky Island, in Alleghany, on the line of the Pittsburg & Western road, for depot and yard purposes. It will extend its line from Ashland, Pa., its present western terminus, through Huntington and Blairsville and the points named on the Alleghany River, and erect a bridge over the latter stream at that point. The new lines are to be completed within the present year. A line to tap the Connellsville coke region is also talked of, but the project has not yet assumed a definite shape.

COAL TRADE NOTES.

ALABAMA.

The output of the Coalburg Coal and Coke Company's mines is rapidly increasing. The company is shipping 300 tons a day, employing 60 free miners in addition to 160 convicts. The new coke-ovens are completed and giving entire satisfaction. Ten of them are now in operation, turning out about fifteen tons a day.

Pittsburg papers report that Mr. W. J. Smith, formerly of Saulsbery, Pa., has purchased 840 acres of coal land situated in Walker County, on the Georgia Pacific Railroad, 69 miles from Columbus, Mississippi, and has opened a slope on a seam of coal 3 1/2 feet thick. The coal is of a block form, the same as that of the Penn and Westmoreland coals. It is believed to be the same seam as the Pittsburg gas-coals. The slope is 90 feet deep from the surface to the coal, pitching at an angle of 25 degrees. The coal lies in a horizontal position, and is easily mined. The improvements are all new and of the best description, and the colliery can be opened up to ship 500 tons of coal daily. Shipments of coal began on the 19th of August. Mr. Smith has opened an office in New Orleans, for the purpose of introducing the coal in competition with Pittsburg coal.

COLORADO.

In the new workings at the coal-fields in Aspen, there is a six-foot vein of coal. The shaft is 100 feet deep. When the coal was first struck, it was thought to be anthracite, but grew sorter with depth, and is now the best coking coal. Five coke-ovens are erecting, costing at the fields \$1300 each. The expense of burning coke in pits equals the receipts of sales, but under the oven process the coke can be burned at a cost of \$3 a ton. The mine is opening in the usual manner, and coal can be mined by the miners at a contract price per ton. Twenty-five men are employed.

PARK COUNTY.

The coal mines are working a large force on full-time now, as orders have been received from the South Park officials to fill up the platforms along the line, in preparation for the cold season. By the time that is done, the demand will have increased so that the force will have steady work from now until spring.

ILLINOIS.

The Chicago & Fountain County Coal Company has been incorporated at Chicago, with a capital stock of \$100,000; incorporators, Norman G. Blackland, Warren F. Van Olinda, and Wellington B. Stone.

## MARYLAND.

Reports from Lonaconing for the week ended September 26th: Hoffman, full-time. Eckhart, Blaen Avon, and Borden Shaft, three-quarter time. New Hope and Borden, half-time. Alleghany, less than half-time. Ocean full-time. Midland, doing very little. Kconitz and Detmold mines, full-time. Jackson, Old and New Coney, about half-time. Pekin and Swanton, about half-time. Hampshire and Franklin, full-time. Phoenix, one day this week. Miller, one half-day this week.

The Potomac Coal Company, at Barton, has again got its mine in operation, putting out the usual amount of coal, 600 tons daily. The recent great flood along George's Creek did more damage to the property of this company than any other, compelling it to suspend work for twenty-six days, and to make repairs costing from six to seven thousand dollars. Every thing is again in shape, and steady work will be had, giving employment to 200 men. The price of mining is 50 cents a ton, run of mine.

## MONTANA.

The Helena Independent furnishes the following:

About one and a half miles from Toston station, up the Missouri River, the coal camp of Messrs. Maxwell, Schennick, Lloyd & Son, a claim of 640 acres, is situated. In various places, they have struck coal. At their present working, they are down about 160 feet, showing clean coal the entire distance, from 6½ to 8 feet wide. Thus far, they have only been running on the foot-wall, and have not yet risen to find the hanging-wall. McQuoin & Co. are located east, and with about the same development, and show up an equally strong vein of superior coal. Still farther north, Dedman & Brother are represented as having a good vein. On the opposite side of the river, Bayliss & McFarlane have a coal prospect, not yet developed to any extent.

## PENNSYLVANIA.

## ANTHRACITE.

The receivers of the Reading will purchase on and after October 15th, interest and coupons due October 1st, 1884, of the following: Divisional Coal Land, mortgage bond of Philadelphia & Reading Coal and Iron Company, guaranteed by the Reading Railroad Company, at the following rates: Swatara, 6 per cent; Houtz, Meyer & Kinnear, 5 per cent; Salem Coal Company, 4 per cent.

An explosion of gas occurred at the Philadelphia Coal Company's No. 2 colliery, near Lost Creek, September 30th, by which four miners were frightfully and fatally burned.

The mine inspectors' report for the month of August shows:

Pottsville District—Samuel Gay, Inspector: Accidents, 10; no fatal accidents in this district for the month. Total number of employes, 6638; average number of days employed, 24; number of tons of coal shipped, 199,565.14.

Shenandoah District—Robert Mauchline, Inspector: Accidents, 16; killed, 4; injured, 12. Total number of employes, 13,215; average number of days employed, 23½; number of tons of coal shipped, 522,234.14.

Shamokin District—James Ryan, Inspector: Accidents, 22; killed, 11; injured, 11. Total number of employes, 13,456; average number of days employed, 22½; number of tons of coal shipped, 506,393.18.

The old Lewis vein, in the Lykens Valley region, is worked by Mr. Charles Nuesse, of Pottsville. He has also opened up a number of the old-time red-ash veins in a section that has been comparatively undeveloped.

It is thought that James McAlarney's coal-works at Glen City will very shortly be in full operation, as negotiations are making for its lease.

The pumps have been put in motion at the Lehigh Valley Company's new Dorrance colliery, and as soon as the water is removed from the second opening or shaft of the colliery, more men will be employed and the works started up.

The Executive Committee of the Mine Commission appointed to revise the present mine laws of the State and suggest such others as may be deemed by it advisable, met at Shamokin, September 29th, to complete its work and prepare a report for presentation to the full Board of Commissioners.

## BITUMINOUS.

The Pittsburgh Chronicle-Telegraph reports that the boiler in the engine-room of the Millacco coal-shaft at Blairsville exploded September 28th, killing a number of men.

At a recent meeting of the Chartiers Block Coal Company, it was decided to create an indebtedness of \$100,000. The object of increasing the indebtedness is to complete some extensive improvements at the mines of the company in Fayette County. The coal company owns over 1700 acres of coal lands at that place, and intends to open up the coal-fields more extensively.

## NATURAL GAS.

A number of citizens of Bradford have oil-wells on their own property within the city from which they have tried to utilize the gas for lighting and heating. The gas company claiming the exclusive right to furnish gas to consumers in the city sought from the court an injunction to prevent them from using or disposing of their own gas. Judge O'mstead has filed a written opinion denying the injunction prayed for.

The Black Hill Gas Company, September 27th, struck a vein of gas with a pressure of 100 pounds at McKeesport, at a depth of only 275 feet.

At the Westinghouse well No. 4 recently, the tools got fast at a depth of 1375 feet, and the drillers have since been working hard to get them out, but without success. The flow at No. 1 has fallen off one half. To remedy the decrease, a torpedo was put in with some good effect. It is thought that the well was damaged by being redrilled, and the opinion is, that the limit has been reached at Homewood.

The old Bayard well, and the new well of W. D. Wood & Co., at Elrod's, have been abandoned. In Wood & Co.'s second well, gas was found at 1400 feet, but water was struck on going down 50 feet farther, in such quantities as to ruin the well.

The Massachusetts Gas Company, September 29th, struck the largest gas-well that has yet been developed in the Tarentum field. The vein was struck on Frederick Crist's farm at a depth of 1200 feet.

The work of drilling will be commenced soon on the John Henderson farm about one and a half miles from Springdale.

September 28th, a large gas-well was struck on the Soles farm, in Versailles township, near to McKeesport.

The McGugan gas-well, in Washington County, which has heretofore afforded a continuous and large supply of gas, suddenly ceased to furnish a supply for the South Side mills and many dwellings along the line of its pipes September 29th. It is supposed that a leak is the cause of the sudden ceasing of the flow of gas.

## UTAH.

It is stated that the Union Pacific Coal Company is about to retire from the retail trade in Salt Lake City. It appears to be the intention of the company to sell all its sheds, teams, etc., to some individual, and then supply that party with coal taken from its mines.

## WEST VIRGINIA.

The Elk Garden coal-works are running, although not to their full capacity. They are averaging from 1000 to 1500 tons daily. The new No. 2 mine is putting out about 500 tons a day. The mines at Armstrong station average from half to three-quarter time. The new mines at Fairfax Stone, the present terminus of the Virginia Central road, are not doing much.

## GENERAL MINING NEWS.

## ALASKA.

Mr. Robert Potts, chief engineer United States navy, who has just returned to Baltimore after an absence of two years in Alaska, in speaking of the mining industry of that country, says that the principal mines are situated around Juneau. All the work of this kind that has been done up to this time is placer mining, with the exception of one mine, and the miners make just a living, and that is all, the snow preventing them from working after October. The only metal worked or discovered so far is gold. There is on Douglass Island, about three miles from Juneau, a mine where they have been prospecting for about two years to see if it will pay to put up a stamp-mill. It is called the Treadwell mine. It is owned by a number of capitalists from San Francisco, and from all accounts will probably turn out large quantities of gold. It is thought that it will average something over \$8 a ton. A 120-ton stamp-mill has been lately shipped there. There are a great many other mining claims on the same island that are expected to turn out as well as the Treadwell mine. The mines around Sitka have in some cases been abandoned, and in others are claimed to be still valuable, and expected later to yield well when machinery is put up. There is, however, nothing to induce a poor man to go there, as he can not make a living. The only chance for money-making is the Douglass Island mines, owned by capitalists.

## ARIZONA.

## GRAHAM COUNTY.

ARIZONA COPPER COMPANY.—The enlargement of the Montezuma tunnel on the extension of the company's railroad to the Detroit mines is completed. This tunnel is 930 feet in length. At the different points in the Longfellow where work is done, every thing is looking well, and the usual quantities of ore are shipped to the smelters. It is stated that Hugo Arnolds, the superintendent of the company's smelters, has resigned his position.

## MOHAVE COUNTY.

PACIFIC COPPER MINING COMPANY.—A tunnel is running that will tap the ledge 145 feet below the croppings. This tunnel is in 119 feet. There is water in the cañon above the mine that can be piped to the works, so that the ore can be taken directly from the mine to the works in a car.

## PIMA COUNTY—QUIJOTOA DISTRICT.

George Ames, of San Francisco, is at Quijotoa for the purpose of examining the ground and giving specifications for the construction of a large tramway and also all other works pertaining to the ultimate use of Burrell drills in the development of the mines. On every one of the claims composing the Cholla lode, namely, the Cliff, Cholla, Wedge, Combination, and Accidental, running north and south along the western slope of the mountain, fine ore is taken out. The outcrop of the ledge, from the northwest end to a point about 600 feet south of the Accidental mine, is regular and strong. From a surface examination, it seems to vary from four to seven feet in width, and, at a place toward the south end, where a cut has been run and fine ore extracted, the vein is five feet wide. The lode, the entire length from the beginning at the northwest end of the point above referred to, namely, 600 feet south of the Accidental, is continuous. Future developments may prove that, at that southern point, these three lodes, the Peerless, Cholla, and Emerald, unite and concentrate in the shape of a half-moon, of which the Peerless and Crocker are the central figures with the Peer, Locomotive, and Mineral Bed at the north end, and that portion south of the Murray and Peacock forming the southern end of the half-circle.

## YAVAPAI COUNTY.

UNITED VERDE.—The most conflicting reports regarding this property are published. The Clifton Clarion states that the company has collapsed.

## CALIFORNIA.

## MONO COUNTY.

GREAT SIERRA CONSOLIDATED.—The company has decided to close for the season.

## BODIE DISTRICT.

Reports for the week ended September 22d: BODIE CONSOLIDATED.—At the mill, 190 tons of tailings were worked, the average assay value of which is \$6.50 a ton.

CONSOLIDATED PACIFIC.—In Pacific ledge No. 1 the ground is very hard and working badly. The ledge, however, is looking more promising than usual. Some small feeders are coming in that give ore of the value of \$30. Pacific ledge No. 2 has been advanced 7 feet; total distance, 60 feet. Every thing about the mine is running as usual.

MONO.—The men have cut out for and sunk the winze 6 feet below the 600 level of the Mono shaft during the past week. The ore from the winze is of low grade, assaying from 60 to 70 per cent in silver and from 30 to 40 per cent in gold. [Query?] No work has been done on the 550 (Lent shaft) level, the past week. The men are timbering the south drift, which will be extended into the Mono ground. Five men are employed.

NEW STANDARD.—The company is working 30 men at the mine and eight men at the mill.

NOONDAY.—A project is on the tapis for the erection of eight large tanks and other machinery necessary for the leaching of the tailings.

STANDARD CONSOLIDATED.—There were extracted and shipped to the mill 490 tons of ore and 680 tons of tailings. Received from the ore 623 ounces of crude bullion, and from the tailings 390 ounces, which will be shipped with the present week's run.

## PLUMAS COUNTY—GREENVILLE DISTRICT.

GREEN MOUNTAIN.—The two blind drifts run east from No. 1 rise in the Blake chute have been extended to the east line of the pay; and, with exception of No. 2 rise, which is pushed ahead as fast as possible between Nos. 2 and 3 drifts, and between No. 3 drift and No. 5 level, all work is confined to stopes. The rock continues very hard yet, but the quality of the quartz is first-class. The air-drills have been taken from the No. 3 blind drift, and after a few needed repairs, were started up in the face of No. 5 tunnel on the 16th inst., and work will be continued here steadily till the sulphuret chute is reached, a distance of about 300 feet. Every thing about the mill is running smoothly.

## SAN BERNARDINO COUNTY.

SILVER KING.—The underground timbering of this mine at Calico caught fire September 15th. The fire caught in the Cunningham shaft, and communicated to all parts of the mine. There being no water at hand, no attempt was made to smother the flames.

## SIERRA COUNTY.

PIONEER.—In the United States Circuit Court at San Francisco, September 19th, arguments were submitted before Judges Sawyer and Sabin in the case of the Pioneer Gold Mining Company vs. B. F. Baker. The case, which is an old one, involves the possession of certain mining lands situated in this county, and other mining property, in all valued at \$500,000.

RAINBOW.—The company is running ahead the lower tunnel at the mine near Alleghany. It will probably require two months yet to reach the ledge.

SIERRA BUTTES.—Arrangements are about completed for the placing of eight

more Frue concentrators in the mill. There are already eight of these concentrators in operation there.

## CANADA.

## PROVINCE OF NOVA SCOTIA.

**BLUENOSE.**—The property of this company is situated in the gold district of Montague, about nine miles from Dartmouth. It is on the same site as the old De Wolf mine, which was reopened by the Bluenose Company. After nine months of unsuccessful work, they cleared out the old shaft, eighty feet deep, and sunk it thirty-five feet farther, but it is only within the last three months that paying leads have been worked. Of these there are three, running parallel and nearly together, one about three inches, another six inches, and a third over eighteen inches wide. Another shaft has since been sunk, and is now about thirty feet deep, and in a third the lead has been struck a short distance from the second. There is an eight-stamp mill with a regular series of attachments, quicksilver plates, etc.

**COXHEATH COPPER MINING COMPANY.**—Boston papers report that a vein of good ore has been struck in the 190-foot level of shaft No. 2, and, together with the ore already in sight on the 140-foot level, the ability of the mine to permanently keep reduction-works supplied with pay-ore is considered settled. The company has adopted the same process for leaching all its ore under 6 per cent copper as is in profitable use at the Tharsis and Mason & Barry mines in Spain, whose product, in the form of precipitate, is sent to the same market at Swansea, Wales, as the product of the Coxheath mine will be shipped to. The company proposes to erect leaching-works, and is in the market for funds. Up to September 1st, 1884, there had been expended in the enterprise \$141,564.13. July 1st, 1883, the company authorized the issue of \$100,000 first mortgage bonds, bearing 8 per cent interest. Sixty thousand dollars of these bonds have been placed for cash at par, and the remaining \$40,000 are now to be placed. A stock bonus of 10 shares is to be given with each \$100 bonds. Besides the accrued interest on the bonds from July 1st, 1884, the company claims to be able to produce copper at a profit with copper at even a lower price than the present.

## CENTRAL AMERICA.

## HONDURAS.

Mr. W. O. Osgood, of Chicago, Ill., has secured a concession of seventy square miles from the government—mostly mineral ground—and is now in Chicago to ship machinery to the mines for the purpose of working them properly.

## COLORADO.

## CHAFFEE COUNTY.

Nathrop, at the junction of the Rio Grande and South Park railroads, is promised a smelter. Ground is to be broken before the close of the month.

## CLEAR CREEK COUNTY.

**CONQUEROR.**—This group, near Empire, has been sold for \$80,000 to the Pauline Ditch and Mining Company.

**JOHNSON.**—It is stated that the parties who are assorting the dump at the old Johnson mine, in East Argentine, are making \$17 a day to the man.

**MENDOTA.**—Sheehan & Co., lessees of this lode on Sherman Mountain, have recently made a good strike, having opened up a vein of solid ore twelve inches in thickness, carrying considerable gray copper.

**NEW YORK & COLORADO.**—The large stamp mill several miles above Empire, known as Big Chief, owned by this company, is now moving down to Empire, where a site has been purchased, known as the Old Salmon ranch.

## DOLORES COUNTY.

**PASADENA.**—Preparations have begun for the addition of a roaster to this smelting plant, it being found necessary to roast certain classes of ores. Work has begun.

## GILPIN COUNTY.

**RICHARDSON & MAGORA.**—Mining on both veins will be commenced at once, and the mill kept running steadily on mill-dirt. But 25 stamps will be started up at present. The result of this venture is anxiously looked forward to by many mine-owners in Russell District.

## GUNNISON COUNTY.

The Mingo Furnace Company failed to come to time on the proposition to erect and operate a smelter at Gunnison, and the Chamber of Commerce at that place has withdrawn the pledges given to secure it. Whereupon the Patrick & Shaw Company has proposed, says the *Review-Press*, to complete the smelter and successfully operate it for three months at a daily capacity of 25 tons, handling the various ores of the county, if the people of the city would give them \$8000 of the money proffered the Mingo Company. It says that the proposition was favorably received, and work on the smelter will begin immediately—and in six weeks it will be treating ore.

## LAKE COUNTY.

The Leadville *Herald* reports as follows: "Several of the Leadville smelters are thinking seriously of erecting desilverizing-works, to be operated when required, in conjunction with their smelting establishments. With the aid of refining and desilverizing departments, Leadville smelters and miners would be placed in a much more independent position toward the lead market. The bullion product of this district could then be desilverized, and the silver, which constitutes the principal value of our base bullion, marketed, and the lead could be stored until suitable prices prevailed. Under existing circumstances, this can not be done, as few companies have the capital required to hold the production of their smelters for any length of time, as the silver contents would soon run up into the millions of dollars. To store the base metal in the East, after desilverization has taken place, is impracticable, for the reason that from forty to fifty dollars have been added to the lead in freights, etc., requiring just so much more capital than if the lead was permitted to remain here.

There is, therefore, no danger of a decrease in the demand for lead ores for smelting purposes, should Leadville's base bullion product be separated on the ground.

More furnaces are in blast here now than there have been at any other one time for twelve months.

The ore product of the Leadville mines is gradually going into the hands of the Leadville smelters, and in a few months more very little ore will find its way out of this city, unless it is with the consent of Leadville smelting companies.

**ADAMS.**—The Clontarf and Brookland shafts have so far yielded about 8000 tons of ore, which returned above smelting charges \$165,000, or a little over twenty dollars a ton. Out of this sum, a very large amount was dissipated in litigation, the purchase of heavy pumping and hoisting machinery, and the development of the properties. Since their consolidation, and the introduction of systematic work, the former extravagant expenditures have ceased. The company employs about 65 men, and produces from 1200 to 1500 tons of ore a month, worth from \$24,000 to \$30,000, at an expense of from \$7000 to \$8000.

**A. Y.**—The carbonates produced by this mine contain from 9 to 24 ounces in silver to the ton and from 15 to 39 per cent in lead. The ore is obtained in the northern workings of the mine. The main north prospecting-level is continued through the limestone, and is now near the middle of the A. Y. claim.

**CARBONATE HILL.**—The Yankee Doodle mine shows but very little ore at present, and that of inferior quality. A force of nine men is retained in exploration-

work, with indifferent results. The property failed to pay working expenses last month, and the prospects are, that it will do no better this month. It is, however, under economical and competent management, and the new work in progress may at any time disclose new resources and again place it in the list of profitable producers.

**CATALPA AND CRESCENT.**—Work continues on these mines, with fair success. The Catalpa mine for September will ship about 100 tons of ore, and the output of the Crescent mine will probably reach fifty tons. The ore is obtained in following small streaks of mineral through the bodies of iron disclosed in the mines, and as a rule is of very fair grade. Some small seams of mineral are still disclosed in the eastern workings of the Catalpa mine, in the limestone, below the lower levels driven from the eastern shaft of the Catalpa.

**LA PLATA MINING AND SMELTING COMPANY.**—The directors have made the following report: The new organization took over the accounts from the 30th of June, 1883. When, therefore, the accounts were closed at that date, they covered a period of thirteen months. The quantity of ore received from the Oro La Plata mine during this period, as given in the manager's report, was 10,296 net tons, and 39,718 net tons were purchased from outside, making a total of 49,014 [?] tons. This quantity was smelted, together with 3098 tons from stock, making 52,112 tons of ore, valued at \$1,189,737, the bullion therefrom being 6560½ gross tons of the value of \$1,780,489, containing 1,261,670 ounces of silver and 3523 ounces of gold. The profit and loss account in the books at Leadville on the 30th of June, 1883, showed a credit balance of \$22,093 86. Oro La Plata mine: Development-works of considerable extent and importance have been carried out in the Oro La Plata mine during the year, the advantage of which will be felt for a long period. The cost of these works, namely, £2372 3s. 8d., has been provided for by the returns, and of this the amount of £1036 5s. has been written off the year's revenue account. Smelting-works: A sum of £3391 8s. 6d. has been expended on the overhauling of the smelting-works and the new arrangements described in the manager's report. That this money has been well laid out is shown by the saving in the smelting cost, and the fact that "the works are in good condition, and can compete with any works in Leadville." Financial position: The total indebtedness in America of the company on the 30th of June, 1884, was £7623 13s. 11d., against which there were assets at Leadville, including stocks and cash at bank, amounting to £23,236 14s. 11d., while, as already shown, during the period now under review a sum amounting to £5763 7s. 2d. has been laid out in such a manner as to greatly augment the permanent value and resources of the company's property. In addition to this, the directors have been enabled to redeem the pledge given to the debenture-holders as to the drawing of one fifth of the loan of £25,000 on the first of June last. Of this, the sum of £4000 has been paid off, £1000 being allowed to remain as a temporary loan to the company. Revenue account at Leadville: The monthly accounts received show that, when the smelting-works are in full swing, there is no difficulty in realizing the anticipated profit of £2000 a month. The closing down of the smelting-works in the fall of last year for sixty-six days, and again from the beginning of May to the middle of June referred to in the manager's report, was, of course, greatly detrimental to the year's profits. Giving these hinderances due weight, and bearing in mind the continued depression in the prices of lead and silver, coupled with the fierce competition in the purchase of ores, the directors believe that the proprietary will consider the results obtained as not unsatisfactory.

**LEADVILLE CONSOLIDATED.**—The mine, although disclosing no great resources, maintains a regular production, and the exhaustion of one ore-pocket has so far been regularly followed by the disclosure of a new one. The property, it is estimated, is earning about \$10,000 a month.

**O'DONOVAN ROSSA.**—The entire plant of mining machinery was recently sold for county taxes at a sacrifice.

**ROBERT E. LEE.**—The ore production is reduced to a minimum by the uncontrollable flow of water, which prevents the working of the lower levels.

**SHIELDS MILL.**—An opening is presented for an able mill-man, who can command the confidence of miners, in the operation of the Shields mill in Colorado Gulch. This establishment is provided with fifteen stamps, three Breckner roasting and chloridizing cylinders, combination amalgamating pans, and other necessary equipments for the successful and economical treatment of ore. The location of the mill is an eligible one, being situated within a mile of a dozen producing mines, whose nearest market is Leadville, seven miles distant. The product of these mines is smelted, the reduction charges being such as to preclude the shipment of ores containing values that pay handsomely for treatment under stamps. The mill can doubtless be rented at a nominal figure by responsible parties.

## PARK COUNTY.

**LAST CHANCE.**—Final arrangements are making for a concentrator to be erected at once at the Double Cabins in Horseshoe, for this mine. It is anticipated that the works will be of about thirty tons daily capacity; and as a site and lumber have already been secured, the completion of a mill of the size indicated will probably take not more than from sixty to ninety days.

## PITKIN COUNTY.

The Aspen smelter is credited with having shipped nineteen car-loads of bullion so far. The bullion goes to the Pennsylvania Lead Company, of Pittsburg.

**VALLEJO.**—The working force has been reduced, it is said, for the purpose of consolidating with the Spar Consolidated. Sixty thousand dollars have been taken out of this mine since its purchase by George H. Hewitt.

## PUEBLO COUNTY.

**PUEBLO.**—This refining and smelting company has only about 150 men now; but when the new furnaces are completed, the works will require more than 400. The company will again begin refining and also make lead pipe in a short time.

## SAN JUAN COUNTY.

Mr. Theodore B. Comstock reports the following: Shipments of ore have increased somewhat of late from Silverton. The weather is a mirable, and business is brisker than at any other time for a year past. Some rich gold ore has been taken from the Whale lode, Round Mountain, and similar rock has been struck in the J. W. Collins lode, not far from the Whale. There are some very good opportunities in this section for paying investments in gold properties. Goebel & Lane are working the gold ores in the vicinity of Ophir with a five-stamp mill. All the concentrators in the county are idle from lack of a steady supply of ore. Ore is shipped from the Ajax and Victoria, near Silverton.

**PRIDE OF THE WEST.**—D. Lockwood has taken a lease on the upper end of this mine, in Cunningham Gulch, adjoining the Philadelphia, where some very rich ore has been mined.

**SILVERTON PARK.**—This mine has recently been sold to a Chicago party, represented here by C. H. Rose, of Boston.

**SUNNYSIDE EXTENSION.**—The mine continues to yield free gold in considerable quantity. Other gold discoveries are reported from various localities.

## IDAHO.

**PHILADELPHIA MINING AND SMELTING COMPANY.**—The new double roasting-furnace is working so satisfactorily that a second one is building of the same pattern. When this is completed, 40 tons of ore can be put through in a day. At present, only 30 tons are smelted daily. The new jigging-works just erected at the North Star mine, on East Fork, are ready to start. When worked to their full capacity, they can concentrate 60 tons a day. They will hardly be run to their full capacity this year, however. But one blast-furnace is running at the Ketchum works at present, and it may be found necessary to shut this down for

a few days at a time, to give time for the roasting-furnaces to catch up to the smelting-furnace. With this exception, it is probable that at least one blast or smelting-furnace will be kept in operation summer and winter.

#### MEXICO.

Reports state that a very important mining sale has just been concluded at Magdalena. The Trinidad mine and land in Saburipi District and the Bronces, with coal lands in Ures District, have been sold to James T. Brown, of Brown Brothers & Co., bankers, London, for \$1,500,000 gold, to be paid on or before January 1st, 1886. There are no less than 14 miles of tunnels and drifts on this property, and it is the largest mine in Mexico. Work on it will be immediately commenced.

A cloud-burst occurred at Pachuca on the afternoon of the 27th of September, causing a terrible inundation. The amalgamating-works were destroyed, and considerable silver that was under treatment was lost. It is estimated that thirty persons were killed. A great deal of property was destroyed.

The rock-crushers and Cornish rolls are replacing the Chilian mills for preliminary work in many of the mines about Zacatecas; and the arrastras will hereafter be run by the same steam-power that operates the crushers and rolls, instead of by mules as previously.

**CONSOLIDATED MINING COMPANY.**—Efforts are making to increase the capital of this company, which is engaged in developing the mining district of Las Minas, near Perote, in the State of Vera Cruz. The mines worked by the company contain copper and gold principally.

#### MICHIGAN.

##### COPPER MINES.

The new smelting-works below Ripley are pushed vigorously and will be ready for smelting about the close of navigation. Two furnaces are already completed, and ground is broken for two more. A large dock has also been built in front of the works. From twenty-five to forty men have been employed at these new works for the past two months.

**ATLANTIC.**—The new stamp-head at the Atlantic mill is nearly finished. At the mine, they are putting new machines underground and getting ready for mining a sufficient quantity of rock to supply the extra demand. When the entire number of heads are at work, about 900 tons of rock will be treated daily.

##### GOLD MINES.

**PHILLIPS.**—A license to incorporate the Phillips Gold Mining Company, a Chicago company, which proposes to operate in this State, has been issued by the Secretary of the State of Illinois. The capital stock named is \$1,000,000, and the incorporators are John Phillips, H. R. Durkee, and Andrew J. Cooper.

##### IRON MINES.

**DOUGLASS.**—What promises to be a very valuable deposit of hematite has been recently found on the property of this iron company, which adjoins the lands of the Lillie (old Bessemer) mine immediately on the west. Considerable exploring had formerly been done on this property, a shaft was sunk to a considerable depth, but nothing outside of a belt of lean ore encountered. A diamond drill was placed in operation a few weeks ago near the east line, and at a point where it was supposed the trend of the Lillie mine vein should naturally be. At a depth from the surface of 75 feet, the drill struck hematite of fine quality, and has gone through 32 feet of it.

#### MONTANA.

##### JEFFERSON COUNTY.

Very many locations have been made in the vicinity of Radersburg, and more are making in every direction. Iron veins are numerous, and copper is common, but of low grade. The placer diggings are about all shut down, as the season is over. There are still very many pieces of valuable claims here which could be worked to profitable advantage did not the parties owning the water charge such exorbitant rates. As it is, the ground is untouched. A few of the claims have been worked this season and paid good yearly wages; that is, sufficient dust was taken out during the three months' operations to pay good wages for the entire year. If the mine-owners and water-owners could only come to some amicable understanding, a much greater yield of gold would be the result.

##### MEAGHER COUNTY.

**MAGINNIS.**—A large amount of machinery for this company's new mill has arrived at Maiden.

**MAIDEN REDUCTION COMPANY.**—The financial affairs of this enterprise seem to be in a bad condition. Reports are, that the people in and about Maiden recently gave a ball, the proceeds of which were used to pay the freight on the company's tanton smelter.

##### SILVER BOW COUNTY.

**ALICE.**—A space nearly 50 by 100 feet of the old croppings to the north of the shaft-house has been cleared away for the placing of the new Cornish pump, as soon as it shall arrive. It will be driven by a new Corliss engine, and its capacity is 500 gallons a minute. It is calculated that the new pump will answer all the requirements of the mine until a depth of 1500 feet is reached. Both the Alice and Magna Charta are looking well in all the levels, ore being extracted from all of them down to the 800-foot, although a large portion of the force is engaged on the pump grade above noted. The mills are running smoothly.

**ANACONDA.**—Two furnaces in the smelter have started up, and all will speedily be running. The first copper matte was produced on the 11th of September. The company is putting up a large and very substantial ore-house, to enable it more conveniently to ship its ore. The ore is to be run in cars from the shaft to the chutes, and there dumped. The ore will then run down into this house, and, by means of movable chutes, will be loaded in bulk on the cars. It will enable the company to handle, if necessary, a thousand tons a day.

**ELM ORLU.**—At this mine, located just east of the Poser and on the same vein, they are at present working on a 24-foot vein of ore low in silver, but carrying considerable manganese, the latter being in demand at the smelter for its valuable fluxing properties. About ten tons a day are shipped to the Colorado smelter.

**POSER.**—Sinking the shaft has been resumed; and important developments are expected when greater depth is attained. From the bottom of the shaft, 130 feet, levels have been run east and west over 100 feet, the vein in some instances widening out to an immense body. On the west end of the claim, a rich body of manganese ore has been struck, the prospecting of which is now prosecuted.

**RISEING STAR.**—The shaft is down 300 feet. A contract has been let for sinking 100 feet deeper. Some ore is extracted and milled.

**VOLUNTEER.**—This claim, lying west of the Anselmo, and located on the great copper belt, has recently been bonded for \$40,000 to Walker Brothers, of Salt Lake. The bond is made for ninety-five days, and prospecting will be prosecuted with vigor during that time. A pump has been put in place, and active operations begun.

#### NEVADA.

##### LINCOLN COUNTY.

**DAY.**—It is thought that the company will soon put a force of men to work on the Hillside mine.

##### STOREY COUNTY—COMSTOCK LODGE.

At the north end, says the *Virginia Enterprise*, they have not made much progress in sinking the deep winze below the 3300 level.

At the Ophir, they are making rapid progress, both in the west drift on the 500 level and in the south drift on the 1500 level.

In the old Bonanza mines, the main west drift on the 1750 level has been cleaned out and retimbered a distance of 350 feet from the C. & C. shaft, and a northwest drift is now pushing forward in a new and very promising ground.

The drifts on the 825 level of the Best & Belcher and Gould & Curry are making rapid progress in very favorable material.

In the Hale & Norcross, the main north drift on the 2300 level has been turned 20 degrees toward the west, owing to strong indications of water directly ahead to the north. The present course of the drift will gradually carry it into the ore-body, and it will eventually have the effect of a cross-cut.

A tunnel has been started near the old hoisting-works, at the level of a switch from the Virginia & Truckee Railroad, which will be pushed into the Savage to strike the same body of ore now mined by the Norcross folks on their 200 level. The indications are, that much good ore will be found in the Savage on this level.

At the Chollar and Potosi mines, nothing is doing on the 2800 level. The Combination shaft is down 2955 feet. There will probably soon be a change of management in these mines.

The Alpha folks appear to be upon the track of a bonanza. They have an immense body of quartz on the 600 level from which they obtain assays of from \$1 to \$12, and either from above or below this they may make into paying deposit.

All is going on about as usual among the Gold Hill mines, except that, owing to the decrease of water in the Carson River, they can not extract or mill as much ore as formerly. However, they are actively running exploring-drifts and opening up ore that may presently be taken out.

At the south end, the Alta and Benton folks are now pushing directly forward to tap their east vein, which will be reached in less than two weeks.

#### NEWFOUNDLAND.

A correspondent of the *Montreal Gazette*, writing from St. John's, says that for some time past the only copper mines worked with successful results have been those of Little Bay and Betts Cove, the former giving very satisfactory results and furnishing employment to about 1000 men. The low price of copper ore has deterred capitalists from opening new deposits, of which many are on hand. Tilt Cove mine, the first discovered, has not been worked to any extent for several years. Mr. C. F. Bennett, the proprietor, died last year, and the property has recently passed into the hands of capitalists who, it is reported, are about to recommence operations on a large scale and employ a considerable number of men. The mineral deposits at Tilt Cove are very large, and only require skillful and energetic working to render them productive. Favorable reports have lately been received from Lady Pond mine, owned by Mr. J. Wilson, of Nova Scotia. It is reported that the ore yields from 25 to 30 per cent of copper, and that the deposit is of large extent. Mr. Wilson has been engaged in thoroughly testing the claim, and he is now so well satisfied of its value that he is about to push mining operations energetically, and will employ a considerable number of hands during the coming winter.

#### NEW MEXICO.

##### SIERRA COUNTY.

At a meeting of the Sierra Grande, Sierra Bella, and Sierra Apache stockholders, held at the company's office at Lake Valley, September 19th, the annual report, which we published in the last number of the *ENGINEERING AND MINING JOURNAL* was presented, and the following board of directors elected: Sierra Grande—John L. Haines, Edward D. Cope, William J. Jenks, Ellis H. Yarnell, Samuel Alsop, Jr., J. P. Brosius, J. M. Eodlich, F. W. Taylor, G. G. Posey. Sierra Apache—John L. Haines, Edward D. Cope, William J. Jenks, Ellis H. Yarnell, Stuart Wood, F. M. Endlich, F. W. Taylor, J. P. Brosius, G. G. Posey.

##### UTAH.

During the week ended September 20th, there were shipped out of Utah 89 cars of mineral productions of the territory, consisting of 42 cars of bullion, 44 cars of ore, two cars of white lead and one car of common lead, weighing respectively, 1,051,205 pounds, 1,294,800 pounds, 41,732 pounds, and 20,022 pounds.

##### SALT LAKE COUNTY.

**DOMINION GOLD AND SILVER MINING COMPANY.**—The purposes for which this corporation is formed are the mining, milling, smelting, leaching, and the buying and selling of ores; the erection or purchase of reduction-works; and the purchase and sale of mines or mining claims; and to do such other matters and things as may properly pertain to a general mining business. The principal place of business is to be in Salt Lake City, and the capital stock is placed at \$1,000,000 divided into 100,000 shares of the par value of \$10. The company will purchase, hold, and operate the Lawrence and Garfield No. 5 mines, in Big Cottonwood Mining District. The corporate existence is fixed at fifty years. The officers and directors for the first term are Darius A. Lawrence, President; Charles E. Aumond, Vice-President; and George Thackrah, Secretary.

**HOT AIR SMELTING COMPANY.**—This company has been incorporated for the roasting and smelting of ores; the buying and selling of ores and their products; the purchase and sale of real estate when necessary to the carrying on of the business, and to do such other matters and things as may properly pertain to such a business. The principal place of business is to be at Sandy. The capital stock is fixed at \$110,000, divided into 110,000 shares of the par value of one dollar each. The corporation purchases and operates, holds and enjoys, for the period of five years, the right to use Holman's patent on a combined roasting and smelting furnace in full payment for 100,000 shares of the capital stock of the corporation. The corporation is to exist for fifty years. The names of the officers for the first year are Ezekiel Holman, President; William H. Rowe, Vice-President; William R. Scott, Secretary and Treasurer; and these, together with James P. Freeze, Robert Scott, and Niels Nielson, constitute the Board of Directors.

##### WASHINGTON COUNTY.

Silver Reef is improving, and better times are looked for this fall and winter than ever before.

##### WISCONSIN.

##### ASHLAND COUNTY.

**BAY FIELD SILVER AND COPPER MINING COMPANY.**—The company is meeting with encouraging results as it deepens its shafts and extends the drifts on the vein. The mineral is constantly improving, the last assay made showing a much larger percentage of silver than has been shown by previous ones. Two shifts are worked at the mine.

**NORTHERN BELLE GOLD AND SILVER MINING COMPANY.**—The report from the mine, which is located on the west half of the southwest quarter of section 22, township 45, north of range 4 west, on the Brunschweiler, is said to be favorable. A force is at work on the shafts, and the vein-matter is constantly improving. One shaft is down sixty feet on the vein, which is eleven feet wide at the bottom. Another shaft is down forty-five feet on the same vein, and four others are started, and the work is pushed as rapidly as possible.

**FINANCIAL.**

**Gold and Silver Stocks.**

New York, Friday Evening, Oct. 3.

The mining market has shown more activity during the past week than it has done for some time. The prices generally show an advance; but outside of this, there is nothing of special interest to report.

The dealings in the Comstock shares have been quite lively, with steady prices. A few sales of the Bodie stocks are recorded. Tuscarora and Leadville stocks were almost entirely neglected. With the latter, that is rather surprising, for the reports from the different mines in this district have been very encouraging. The total number of shares sold was 87,435, as against 42,995 last week, showing an increase of sales this week of 44,440. Below will be found a summary of the market.

The favorite stock of the Comstocks has been Consolidated Virginia, which shows sales amounting to 14,600 shares, with prices ranging from 32@40c. California has been actively dealt in, with sales amounting to 9500 shares, selling at from 23@26c. The price of Sierra Nevada has fluctuated greatly during the week; it sold at from \$1.30@1.60. A few sales of Savage are recorded at 20c., and a few of Ophir at from \$1.15@1.20. Suro Tunnel continues to sell at from 16@17c., and shows sales amounting to 10,400 shares. Union Consolidated has sold at irregular prices, the lowest during the week being \$1.10, and the highest \$1.25. Mexican was weak; it sold at from \$1.35@1.55. Of Hale & Norcross, a sale of 200 shares is recorded, the price ranging from \$2.80@3.

Very little business was done in Leadville shares. One sale of Chrysolite was made at 85c., a few of Little Pittsburg at from 23@24c., and of Little Chief at from 28@29c. Of Climax, 1400 shares were sold at from 1@2c., and 3400 shares of Amie, at from 5@6c. The most interesting feature of the Bodie stocks has been Consolidated Pacific, showing sales amounting to 7200 shares, the prices ranging from 59@70c. Bodie Consolidated shows a few sales at from \$2.20@2.25, and Standard Consolidated at from \$1.30@1.45. No sales of Mono or Goodshaw are reported.

Tuscarora stocks were quiet. Grand Prize records one sale of 200 shares at 20c. Belle Isle sold at from 53@58c. Navajo sold at from \$3.80@3.85. North Belle Isle, at from 21@30c.

In the miscellaneous list, Horn-Silver was the most prominent, the prices ranging from \$6@6.50. Basick shows a few sales at from \$4.50@5.25. Eureka Consolidated sold at from \$3.10@3.40; Gold Stripe at 2c. The prices of Green Mountain were irregular, ranging from \$1.50@1.85. One sale of Quicksilver Preferred is recorded at \$29; of Homestake at \$10, and one of Albion at 10c. Central Arizona sold at from 20@22c., American Flag at from 5@6c. Barcelona at from 12@14c. Harlem at 5c.

The well-known firm of Messrs. Lounsbury & Haggin, which has been connected with so many successful mining enterprises, has been dissolved through the withdrawal of Messrs. B. A. Haggin and William A. Paton. Business will be continued by the remaining partners, Messrs. R. P. Lounsbury and H. J. Macdonald, under the firm-name of Lounsbury & Co.

**MEETINGS.**

Cheever Gold and Silver Mining Company, No. 177 Broadway, New York City, annual meeting of stockholders October 9th, at noon.

Hampshire & Baltimore Coal Company, No. 18 Broadway (Wells Building), New York City, annual meeting of stockholders October 16th, from twelve to one o'clock P.M.

Philadelphia Iron and Steel Company, No. 939 North Delaware avenue, Philadelphia, Pa., annual meeting of stockholders October 9th, at half-past eleven o'clock A.M.

**DIVIDENDS.**

Cambria Iron Company, of Pennsylvania, has declared a dividend, payable this month.

Diamond Coal Land Company has declared a quarterly dividend, payable this month.

Nescopec Coal Company has declared a quarterly dividend, payable this month.

Paradise Valley Mining Company, of California, has declared its fourth dividend of ten cents a share.

Pennsylvania Steel Company has declared a dividend, payable this month.

Plymouth Consolidated Gold Mining Company, of California, has declared its regular monthly dividend (No. 17) of \$50,000, being fifty cents a share, payable on demand. Total dividends to date, \$850,000.

Pueblo Smelting and Refining Company, of Colorado, has declared its regular 2½ per cent quarterly dividend, payable October 1st.

Union Phosphate Mining and Land Company has declared a dividend of fifteen cents a share, payable on demand.

Westmoreland Coal Company, of Pennsylvania, has declared a dividend, payable this week.

**PIPE LINE CERTIFICATES.**

Messrs. Watson & Gibson, No. 49 Broadway, report that the petroleum market for the week has been very irregular and nervous, owing to the waiting for results of the drilling of the Johnson well, about 900 feet from the Phillips gusher at Baldrige. It is very important to know what will be the definite result of this well and a few others in its neighborhood before the immediate future of the oil-market can be predicted with any degree of certainty. From appearances, at present writing, the well will be small. The highest price has been 74½c., and 71c. the lowest, closing to-night 74c. bid. The Phillips well still maintains its phenomenal production of about 105 barrels an hour. The clearances in the two New York Petroleum Exchanges for September were 495,000,000 barrels, against 297,000,000 barrels in Oil City and 131,000,000 in Bradford. The Pipe Line statement for the month will show a reduction in stock of over 300,000 barrels. The exports have been large, averaging nearly 53,000 barrels a day. The New York Petroleum Exchange has begun the experiment of trading in fractional shares of railroad stocks, leading shares only, and has met with quite a success.

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

	Opening.	Highest.	Lowest.	Closing.	Sales.
Sept 27	\$0.73½	\$0.74	\$0.71	\$0.71¾	6,656,000
29	.71¾	.72¾	.70¾	.71	6,173,000
30	.71¾	.73¾	.71	.73¾	5,824,000
Oct. 1	.73¾	.74½	.72¾	.73¾	4,265,000
2	.73	.74½	.72¾	.74¾	4,647,000
3	.74½	.74½	.72¾	.74½	5,284,000
Total sales					32,849,000

**SAN FRANCISCO MINING STOCK QUOTATIONS.**

Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS.				
	Sept. 26.	Sept. 27.	Sept. 29.	Sept. 30.	Oct. 1.
Albion					
Alpha					
Alta	2.00	2.00	2.12½	2.00	1.87½
Argenta					
Bechtel					
Belcher				.90	1.00
Belle Isle					.85
Best & Belcher	1.87½	1.87½	2.00	2.00	1.87½
Bodie	2.00	2.12½	2.25	1.75	2.12½
Bullion					
Bulwer					
California		.30	.35		.35
Chollar	2.25	2.12½	2.25	2.37½	2.60
Con. Pacific		.65	.60		.60
Con. Virginia		.20	.20	.20	.20
Crown Point		1.25	1.25	1.50	1.62½
Day					1.37½
Elko Cons.					
Eureka Cons.	3.00	3.00	3.00	3.00	2.87½
Excelsior					
Gould & Curry	1.62½	1.50	1.50	1.50	1.37½
Grand Prize	2.87½	2.87½	3.00	3.00	2.87½
Hale & Norcross					2.75
Independence					.30
Martin White				.50	
Mexican	1.50	1.50	1.50	1.50	1.50
Mono					
Mount Diablo	3.00	3.00			3.00
Navajo	3.62½		3.62½		2.62½
Northern Belle					3.62½
North Belle Isle					
Ophir	1.12½	1.12½	1.12½	1.25	1.25
Overman					1.12½
Potosi	1.37½	1.25	1.25	1.25	1.25
Savage	1.12½	1.00	1.00	1.00	1.00
Scorpion					.90
Sierra Nevada	1.37½	1.37½	1.50	1.50	1.37½
Silver King					1.37½
Tip Top					
Union Cons.	1.25	1.25	1.12½	1.25	1.12½
Utah	1.25	1.12½	1.12½	1.12½	1.25
Wales Cons.					1.12½
Yellow Jacket	1.75		1.75	1.87½	2.00

**Boston Copper and Silver Stocks.**

[From our Special Correspondent.]

BOSTON, Oct. 2.

There is but little improvement to note in copper stocks, but the market is fairly steady and prices a shade firmer than at our last report. The volume of business is very small, and hardly furnishes in the

week's transactions an average commission for one day in active times. Calumet & Hecla seems to have touched bottom, at least for the present, and under good buying orders, what little stock is now offered at from \$143@145 is quietly taken. Quincy is very steady at \$28, at which price all the sales were made the past week. There seems to be plenty of it at this price, and any pressure to sell it would doubtless result in lower prices. Small lots of Franklin sold at \$7 and \$5½, with \$5½ bid for round lots and none offered under \$7½. Pewabic declined from \$2 (September 1st) to \$1½ on sales of 150 shares. Huron sold at \$1, same as last week. This tells the whole story.

In silver stocks, Catalpa sold at 25c., and a small lot at 20c. At the Mining Exchange, there is but little doing, and prices are irregular. Bowman Silver declined to 5c. early in the week, but has since rallied to 8c. Dunkin, dull at 23c. bid and 25c. asked. Breece sold at 23c., and is offered at that. No bid for Sullivan, which is offered at 7c., assessment, 5 cents, paid.

3 P.M.—At the afternoon sessions, there was no improvement. A small lot of Calumet & Hecla sold at \$145, and the stock closed offered at \$145, and no bid. Franklin, offered at \$7. Osceola, offered at \$9½. Quincy, \$27 bid, none offered. Atlantic, offered at \$7. The rest of the list not quotable.

**BULLION MARKET.**

New York, Friday Evening, Oct. 3.

Silver has been steady abroad, but sterling exchange here having declined, our market is lower and somewhat nominal at the figures of the annexed table:

DATE.	London.	N. Y.	DATE.	London.	N. Y.
	Pence.	Cents.		Pence.	Cents.
Sept. 27	50 13-16	110¾	Oct. 1	50 13-16	110¾
29	50 13-16	110¾	2	50 13-16	110¾
30	50 13-16	110¾	3	50 13-16	110¾

**BULLION PRODUCTION FOR 1884.**

MINES.	States.	Month of August.	Year from Jan. 1st, 1884.	
			\$	\$
*Alice, g. s.	Mont.	+	520,843	
*Belmont	Mont.		7,780	15,881
*Black Bear, g.	Cal.			19,600
Bodie, g.	Cal.		4,563	400,627
*Bonanza King, g.	Cal.			191,891
*Boston & Montana, g.	Mont.		36,265	309,800
*Caledonia, g.	Dak.			73,511
*Chrysolite, s. l.	Colo.		10,830	109,308
*Consolidated Bobtail, g.	Colo.		12,128	69,199
*Contention, s. g.	Ariz.			293,607
*Deadwood-Terra, g.	Dak.		37,913	347,928
*Derbec Blue Gravel, g. s.	Colo.		16,467	106,281
*Father de Smet, g.	Dak.		42,310	308,947
Grand Prize, s.	Nev.		18,000	43,000
*Hecla Cons., g. s. l. c.	Mont.	+		320,052
*Helena, g. s. l. c.	Mont.		107,000	732,036
*Homestake, g.	Dak.		119,922	835,706
*Hope, s.	Mont.			39,301
Horn-Silver, s. l.	Utah		225,000	1,639,087
*Iron Silver, s. l.	Colo.		72,716	411,976
*Kentuck, g. s.	Nev.		638	21,215
*Lexington, g. s.	Mont.		102,630	812,110
*Mammoth Bar, g.	Nev.			682
*Moulton, g. s.	Mont.		84,014	516,161
*Mount Diablo, s.	Nev.			24,820
*Murchie, g. s.	Cal.			19,000
*Navajo, g. s.	Nev.		52,788	259,985
North Belle Isle, s.	Nev.			5,874
*Ontario, s. l.	Utah		200,359	1,439,556
*Original, s. c.	Mont.			29,724
*Oxford, g.	N. S.		5,001	27,379
*Paradise Valley, s. g.	Cal.			104,950
*Plymouth Consolidated, g.	Cal.		78,869	702,416
*Rooks, g.	Vt.		6,595	35,256
*South Yuba, g.	Cal.		919	21,432
*Stormont, s. l.	Utah			117,595
*Syndicate, g. s.	Cal.			90,475
*Tombstone, s. l.	Ariz.			370,756
United Gregory, g.	Colo.			7,174
Total amount of shipments to date			\$11,425,122	

\* Official. † Assay value. ‡ Not including value of lead and copper; G. Gold; S. Silver; L. Lead; C. Copper. — No bullion produced. Silver valued by the different companies from \$1.05@1.29 per ounce.

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 2 per cent. During the week the bank lost £796,758 bullion, and the proportion of its reserve to its liabilities was reduced from 44½ to 38, against 43½ per cent at this date last year. October 2d, the Bank lost £84,000 bullion on balance.



**BOSTON MINING STOCKS.**

	Sept. 26.		Sept. 27.		Sept. 29.		Sept. 30.		Oct. 1.		Oct. 2.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Amle.....	.07								.07				800
Atlantic.....													
Belle Isle.....													
Bijou Cons.....	.13		.13				.14		.13		.13		1,300
Bodie.....									2.25		2.38		70
Bonanza D.....							1.07		.08		.08		8,850
Bowman Sll.....			.07	.05	.07		.09	.07	.08		.07		400
Breece.....							.23						
Bulwer.....													
Cal. & Hec.....	144	143	144		145	144	145				145		65
Catalpa.....	.25		.25		.26	.25			.26	.20			751
Cedar Sp'g.....									.64				500
C-n. Pacific.....					.62		.63		.62		.63		1,800
Con. Va.....					.31		.24		.23		.23		500
Crecent.....					.15								230
"Cuel".....					.85						.90		300
Dunkin.....	.22				.23								250
Durango.....													
Empire.....													
Eur. ka.....					3.50								20
Franklin.....	7.00		5.75										13
Grand Prize.....													
Huron.....			1.00		1.00		1.00						275
Mascot.....	.77 1/2	.75											250
Ontario.....							21.60						10
Oscola.....					9.00								7
Pewabic.....	1.38		1.25				1.25		1.13				245
Quincy.....	25.00		28.00		28.00		28.00		28.00		28.00		91
Robinson.....	.18										1.30		300
Standard.....			1.45				1.30						110
Sutro Tun.....					.16		.16		.16		.16		500

**PHILADELPHIA MINING STOCKS.**

	Sept. 26.		Sept. 27.		Sept. 29.		Sept. 30.		Oct. 1.		Oct. 2.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Argent.....													
Cincinnati.....													
Comprom'e.....													
Contention.....													
Con. Pacific.....													
Con. Va.....													
Dauntless.....													
Denver City.....													
Eureka.....													
Gr'd Union.....													
Iowa Gulch.....													
Iron Silver.....													
Little Chief.....													
Little Pitts.....													
Little Maud.....													
Mt. Sheridan.....													
Ophir.....													
Palmetto E.....													
Penn-Breck.....													
Pizarro.....													
Rara Avis.....													
Rara Avis E.....													
Sierra Apac.....													
Sierra Be.la.....													
Sierra G'nde.....													
Sierra Nev.....													
Silver Cord.....													
Sutro Tun'l.....													
Tombstone.....													

No quotations have been received for this market.

from 1'80@2c., according to quality and location of mill. Common iron, 1'60@1'75c.

**Plate and Tank-Iron.**—Small sales are made daily, but nothing worthy of special notice. Quotations are 2'10c. for Common Plate; 2'75c. for Shell; 3'75c. for Flange, and 4'25c. for Fire-Box.

**Structural Iron.**—Demand is lighter than it has been, and smaller lots are asked for. Most of the sales reported are in from 25 to 50-ton lots; occasionally 100 tons being ordered at a time. There is very little inquiry, mills are getting near to the ends of their orders in some cases, and prices are weak at old quotations. The Philadelphia Bridge-Works, at Pottstown, have secured the contract for a bridge 188 feet long on the Delaware Extension Junction Railroad. The Phoenix Iron Company has reduced wages of puddlers 25 cents a ton. Other mill labor is reduced about 60 cents a day.

**Nails.**—Prices of nails have declined to very near cost limits, and this is about the only reason why a further decline is not to be reported, as the market is very flat. Demand is of a retail character for ordinary lots; \$2.10 is the usual price paid.

**Steel Rails.**—An additional firmness is to be reported in steel rail prices, and the Pennsylvania Steel Company states that it has declined all orders under \$28. The sales through the week have been mostly of small lots and for immediate delivery, but inquiry has improved.

**Old Rails.**—Old rails are in some little demand, and would sell more freely at concessions, but holders are pretty firm at \$17.50@18.50, according to quality and location.

**Scrap-Iron.**—There are considerable stocks of foreign Scrap offering at \$17, and this has a depressing effect on the market. Domestic Scrap has weakened to \$19@20. Demand is moderate.

**COAL TRADE REVIEW.**

NEW YORK, Friday Evening, Oct. 3.

**Anthracite.**

The anthracite coal trade has remained dull during the week, with prices practically unchanged. Buyers have settled down to a hand-to-mouth policy, with the conviction, justified by the action of the coal companies, that they have nothing to lose by covering only immediate wants, and possibly may be gainers. There may be short-lived spurts during the coming month, but there is no prospect whatever of any sustained advance unless the companies act promptly.

**Bituminous.**

Bituminous coal continues very cheap, with low freights and many anxious sellers. From the Cumberland region, comes the report of considerable difficulty in moving coal by the canal.

**Philadelphia.**

Oct. 3.

[From our Special Correspondent.]

All the talk as to a break in the anthracite coal combination is mere talk, and amounts to nothing. There will be nothing done in the matter of a new combination until December, when the presidents of the various companies will probably decide on some

such plan as that now in operation. Rumors are current as to another suspension in November, but there has been nothing decided as to the exact date. It is said in coal trade circles here that the policy of the Daily Record in supplying coal at \$5.75 [?] will squeeze out a number of the smaller dealers, but will not harm the coal trade at large. It is all a cash business, and though profits are very light, and sometimes nothing at all, it can be made to pay in the long run while done for cash and in large quantities. The firm having the contract in hand (believed to be Newton & Co.) is one of our largest retailing firms, and has special arrangements for freight from the Lehigh region. Stocks at Port Richmond to-day are 97,000 tons. But this week's suspension will enable the Reading Company to clear them out. It has abundant orders on hand, and has no difficulty in selling all the coal it can mine and deliver. The cry for restriction comes from other quarters. The Lehigh people, by their energetic management, are doing well, and are in no need of favors. Vessels are plenty, and freights are still low. The manufacturing demand in Eastern Pennsylvania is very light. Mills and furnaces are buying very little. The line trade is still fluctuating, but the local demand is improving rapidly. A committee of Councils has in hand the question of buying coal in bulk at a fixed price, instead of the different departments buying for themselves, at varying prices. The desire is, to enable the city to purchase to the best advantage. There are some political objections to the plan, but none on the score of economy. There are rumors of more or less dissatisfaction among the anthracite miners, who expected to have steady work at advanced rates as soon as the fall trade opened. Somehow it seems that this hope was held out to them, but it has not been realized. It must be admitted that the selling prices of coal are not as firm as would be desirable, and restriction must be continued. The coal is safe in the hills, and the managers know better than to engage in a useless competition for business. The coal tonnage of the Philadelphia & Reading Company last week was 362,863 tons, an increase of 42,370 tons over the same week last year. During the past week, the Record has sold 1142 tons of coal. The St. Mark's Workmen's Club has combined and secured its coal at \$4.45 a ton. There are 400 members in the club, all of them heads of families. From this time out, the domestic sizes of coal will be in active demand. The manufacturing sizes are plenty and dull. Last week's production was 843,000 tons, against 744,000 tons for the corresponding week last year. The total production reported to date is 20,260,000 tons, as against 21,540,000 tons for the same time last year. The Pennsylvania Company is carrying from 40,000 to 45,000 tons of coke every week. Total deliveries of coke in the East thus far this year, 2,180,000 tons. The total production of the Clearfield region this year is reported at 2,300,153 tons, an increase of 218,508 tons over the same time last year. The production for the last week reported was 59,917 tons. The Cumberland production for the week just reported was 29,731 tons, a decrease of 1118 tons, as compared with the same week last year, but the total production to date shows an increase of 132,005 tons.

**Buffalo.**

Oct. 3.

[From our Special Correspondent.]

The anthracite and bituminous coal trade remains in the same condition as recorded for several weeks past. Prices are without change, excepting an occasional cut in soft coal. Coke is quiet, with no new features worth mentioning.

It is understood that the meeting held last Tuesday in New York was harmonious; the dignitaries determining to leave "Well enough alone."

There are symptoms of a better demand for odd sizes to fill orders among Western dealers, whose receipts thus far have not been large enough of certain kinds. The yards here are pretty well cleaned up. The shipments have been widely distributed.

Coal freights by lake are unchanged; shipments light; seven eighths of the vessels cleared since my last letter without cargoes. The engagements were at the following rates: 60c. to Chicago and Milwaukee; 20c. to Toledo and Detroit; 40c. and on contract to Superior City; 30c. and on contract to Duluth; 15c. to Sandusky; 60c. to Escanaba, Green Bay, and Racine; 70c. to Kenosha; 45c. to Ashland; 30c. to Saginaw, Bay City, and Marine City. Closing firm. Sixty cents was the going rate for coal September 30th, 1882 and 1883.

The shipments by lake from September 25th to October 2d, both days inclusive, were 42,630 tons; namely, 19,640 to Chicago, 5320 to Milwaukee, 1560 to Toledo, 1180 to Detroit, 2400 to Duluth, 150 to Marine City, 370 to Kincardine, 2950 to Sandusky, 600 to Escanaba, 250 to Bay City, 1130 to Ashland, 3000 to Superior City, 330 to Kenosha, 700 to Saginaw, 640 to Racine, 310 to St. Clair, and 1800 to Green Bay.

Receipts by lake for the week and the month of September, none; from opening of navigation, 830 tons only.

Shipments by lake for the month of September were 199,920 tons; for the season, 1,069,930 tons, as compared with 883,300 tons in 1883, and 811,360 tons in 1882—a large increase this year.

Railroad shipments are not reported, as returns from all lines are not furnished for publication.

Receipts by Lake Shore & Michigan Southern Railroad the past week were 552 tons; for the month of September, 3898 tons; for the six months past, 19,479 tons, namely, 12,051 tons for Buffalo, and 7428 tons for other points.

Receipts by canal for the week were 9467 tons; for the month, 34,559 tons; for the season, 151,520 tons—an increase over the same period in 1883 of about 20,000 tons.

Shipments by canal for the week were 604 tons; for the month, 2999 tons; for the season, 24,878 tons—an increase over the same period in 1883 of 3320 tons.

Coal charters by canal included one boat-load to Port Jackson at \$1.05 per net ton, captain to pay unloading; and two loads of coal-dust to Syracuse at 65c. per gross ton, free of loading, and captain to pay 10c. unloading. The nominal asking rate to New York, \$1.50, and to Albany \$1.25 per net ton, captain to pay unloading.

Large vessels from Oswego to upper lake ports only take on a portion of their cargoes at the former place,

in consequence of inability to pass through the Welland Canal when fully loaded. The Nipigon, en route for Milwaukee, called here a few days since, and completed her cargo by adding 200 tons of coal, making 1200 tons in all, at \$1.20 per net ton freight.

The anthracite coal shipments from the port of Tonawanda, a few miles from Buffalo, on the Erie Canal, for the month of September, were 1022 tons, as compared with 256 tons the corresponding month in 1883.

No returns have been received from Duluth this week.

The following city ordinance will be added to those already in effect here, if the wishes of the Health Board and of many citizens are acceded to. It will be a severe blow to the bituminous coal interests for the time being: Section 29. Every furnace employed in the working of engines by steam or in any mill, factory, house, dye-factory, iron foundry, glass house, distillery, brew-house, sugar refinery, bake-house, gas-works, or in any other buildings used for the purpose of trade or manufacture, shall be so constructed as to consume or burn the smoke arising therefrom, unless a permit to the contrary be obtained from this Board.

According to the official reports, just published to September 30th, 1884, the Nickel Plate Railroad freight traffic included 19.02 per cent of coal, and the Lake Shore & Michigan Southern Railroad 18 per cent of coal.

The Telephone Company operates in the evening with electricity obtained from Niagara Falls—twenty-two miles from Buffalo. How is that for a novelty? Is it not the beginning of a great acquisition to and enlargement of our motive power independent of coal?

The freighting interest on our great lakes is very much depressed, and it is expected that at least one fourth of the vessels will be withdrawn from commission in a few days. Low rates of freight, and very little at these low rates, is the cause. It is barely possible, however, that a change for the better may be developed, but there are no such indications at present.

Until last year, the Northwestern Fuel Company had a monopoly of the wholesale coal business of Duluth. A local newspaper says that "last year, the Philadelphia & Reading Railroad started to do something there, and this year the Ohio Central Coal and Barge Company located at Duluth. The Northwestern has found itself at great disadvantage since freights began going down; for its contracts for transportation were made, it is said, at 90 cents, while freights have ruled from 20 to 30 cents below that figure. This has given its rivals considerable advantage, and an opportunity to rapidly extend their operations in the Northwestern field, which has so long been almost exclusively in the hands of the Northwestern Company."

**Boston.** Oct. 2.

[From our Special Correspondent.]

Trade has settled down into the quiet grooves to be naturally expected in such a condition of affairs. The companies either will not or can not give the retailers a further guarantee of the market than is to be had from one week's stoppage, and this is not enough to produce confidence in the future. The trade considers it wise to buy against immediate wants only. Outside of the retail demand, orders are small. Manufacturers never used so little hard coal as this year. Water-power has been abundant.

The nominal face of the anthracite market remains unchanged. The scarcity of some sizes of special coal enables the companies to get full prices, and full prices, say 15 cents off circular, are generally asked for. Actual transactions should be based on \$4.10@ \$4.15 for Stove f. o. b. at New York, of which there is a great abundance. Outside coal is selling to those who are willing to take the risk of its purchase all the way from \$3.90 to \$4 f. o. b. at New York for Stove.

We quote f. o. b. prices nominally as follows: At New York, Stove, \$4.10@ \$4.15; Broken and Egg, \$3.50@ \$3.65; individual coals, \$3.90@ \$4 for Stove, \$3.25@ \$3.50 for Broken and Egg. At Philadelphia, \$3.90@ \$4 for Stove, \$3.65 for Chestnut, \$3.30@ \$3.50 for Broken and Egg, \$2.35 for Pea. Special coals, \$4.85@ \$5 for Broken, \$5.35@ \$5.50 for Stove.

There is a light movement in bituminous coal. As a general thing, contracts are delivered up to the storage capacity of the consumer. A little new business is picked up. Some of it is taken at this time from the anthracite trade. We hear of parties having the option on their anthracite contracts of taking an additional 1000 tons or so, October 1st, who are buying that additional 1000 tons, or such part of it as they need, of bituminous agents. If there is any thing stirring in the way of trade, the argus-eyed bituminous man is pretty sure to get hold of it. Freights are so low that they would about as soon sell delivered as f. o. b. The delivered price ranges from \$3.50@ \$3.65.

It hardly seemed possible that Nova Scotia culm coal could be subjected to further pressure. Nevertheless, it has now been crowded down to \$2.25 delivered, almost wholly at the expense of Cape Breton freights. The rates at Bay of Fundy have been so high comparatively that about all the shipping has been from Cape Breton this year. The season is very nearly over. If it were not for the fact that culm is a favorite with tanners for mixing with spent tan-bark, the demand would have fallen off this year even more than it has. As it is, the tanners in the vicinity of Salem and Lynn have bought about their usual quantity.

The lowest rates known in many years are now

given on freights. The report that vessels are hauling up, if true, does not apparently lessen the supply. So long as ice and lumber freights are an inducement for vessels to come East, rates will not advance. From New York to Boston, 75 cents is quoted; but from New York to Providence, where there is no inducement of return freights, 70 cents is asked. We quote:

New York, 75@90c.; Philadelphia, 90c.@ \$1; Baltimore, \$1.15; Newport News, \$1@ \$1.10; Richmond, \$1.15; Cape Breton, \$1.35; Bay of Fundy, \$1.30.

There is a very fair retail movement at unchanged figures. We quote: White ash, furnace, and egg \$5.50; " " stove and nut 5.75; Red ash, egg 6.00; " " stove 6.25; Lorberrry, egg and stove \$6.75@ 7.00; Franklin, egg and stove 7.50; Lehigh, furnace, egg and stove 5.75; " " nut 5.75.

Wharf quotations: \$4.50, Broken; \$4.85, Stove.

**STATISTICS OF COAL PRODUCTION.**

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

Tons of 2240 lbs.	1884.		1883.	
	Week.	Year.	Week.	Year.
<b>Wyoming Region.</b>				
J. & H. Canal Co.	132,590	2,816,562	116,862	2,945,398
D. L. & W. RR. Co.	118,513	3,694,067	113,368	3,646,107
Penna. Coal Co.	40,333	941,125	30,121	1,062,128
L. V. RR. Co.	31,961	1,026,522	23,821	1,028,840
P. & N. Y. RR. Co.	4,948	164,538	4,339	155,600
N. Y. RR. of N. J.				1,202,978
Penn. Canal Co.	12,339	335,020	12,928	347,760
North & West Br. RR.	14,270	611,350	7,155	323,746
	354,954	9,559,194	314,594	10,711,657
<b>Lehigh Region.</b>				
L. V. RR. Co.	124,234	3,314,855	120,614	3,661,591
D. RR. of N. J.				1,126,889
S. H. & W. B. RR.		130,802		27,597
	124,234	3,445,657	120,614	4,816,077
<b>Schuylkill Region.</b>				
P. & R. RR. Co.	344,776	8,054,519	303,536	6,470,256
Shamokin & Lykens Val.				950,363
	344,776	8,054,519	303,536	7,420,619
<b>Sullivan Region.</b>				
Line & Sul. RR. Co.	2,416	49,071	2,183	48,873
<b>Total</b>	826,380	21,108,441	740,927	22,997,226
Increase				
Decrease		1,888,785		

\* Included in tonnage of the Philadelphia & Reading Railroad.

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

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

Tons of 2000 pounds, unless otherwise designated.

	1884.		1883.	
	Week.	Year.	Week.	Year.
<b>Cumberland Region, Md.</b>				
Tons of 2240 lbs.	61,823	2,080,722	64,169	1,861,352
<b>Barclay Region, Pa.</b>				
Barclay RR., tons of 2240 lbs.	7,060	223,166	7,633	235,208
<b>Broad Top Region, Pa.</b>				
Huntington & Broad Top RR., of 2240 lbs.	4,677	143,953	4,000	139,298
East Broad Top			1,643	30,756
<b>Clearfield Region, Pa.</b>				
Snow Shoe	3,248	133,205	6,019	173,371
Karthus (Keating)	2,051	35,939		
Tyrone & Clearfield	59,230	2,292,793	59,551	2,064,651
<b>Alleghany Region, Pa.</b>				
Gallitzin & Mountaintain	9,262	283,237	7,955	315,633
<b>Pittsburg Region, Pa.</b>				
West Penn RR.	5,813	205,741	8,267	294,033
Southwest Penn. RR.	1,659	94,624	2,843	81,005
Pennsylvania RR.	5,812	203,070	14,375	441,838
<b>Westmoreland Region, Pa.</b>				
Pennsylvania RR.	28,083	960,402	22,276	1,024,953
<b>Monongahela Region, Pa.</b>				
Pennsylvania RR.	3,697	112,944		
<b>Total</b>	192,414	6,769,796	198,731	6,662,426
Increase		167,370		

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

Tons of 2000 pounds.

	1884.		1883.	
	Week.	Year.	Week.	Year.
<b>Gallitzin &amp; Mountaintain (Alleghany Region)</b>				
West Penn. RR.	2,819	99,285	835	60,195
Southwest Penn. RR.		24,865	1,380	77,069
<b>Total</b>	26,579	1,625,030	36,924	1,554,160
<b>Penn. &amp; Westmoreland Region, Pa. RR.</b>				
Monongahela, Penn. RR.	4,183	142,472	4,080	164,477
<b>Pittsburg Region, Pa. RR.</b>				
Penn. RR.	1,000	55,905		
<b>Snow Shoe (Clearfield Region)</b>				
Snow Shoe	141	16,910	216	13,572
<b>Total</b>	34,812	1,964,603	47,162	1,874,165
Increase		90,438		

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

	Week.	Year. 1884.	Year. 1883.
Coal for shipment at Coal Port (Trenton)	3,972	76,938	87,615
Coal for shipment at South Amboy	18,466	457,235	474,832
Coal for distribution	22,111	576,843	607,528
Coal for company's use	5,964	137,070	118,858
<b>Total</b>	50,513	1,247,886	1,283,834
Increase			
Decrease		35,948	

**FREIGHTS.**

**Coastwise Freights.**  
Per ton of 2240 lbs.

Representing the latest actual charters to October 3d.

PORTS.	From Philadelphia.		From Elizabethport, Port Johnston, South Amboy, Hoboken, and Weehawken.
	From Philadelphia.	From Baltimore.	
Alexandria	.70@.75		
Annapolis			
Albany			
Baltimore	.58		
Bangor	1.15	1.10	
Bath, Me.	.90@1.00	1.10	.75
Beverly	.90@1.00		
Boston, Mass.	.90@1.05	1.10	.70
Bristol	1.00	1.10	
Bridgeport, Conn.		1.00	.50
Brooklyn		1.00	
Buffalo, N. Y.			
Cambridge, Mass.	1.05		
Cambridgeport	1.00@1.05		.70@.75
Charleston, S. C.	.75	.65@.70	
Charlestown	1.00		.70@.75
Chelsea	.90@1.05		.70@.75
City Point			.70@.75
Com. Pt., Mass.			.70@.75
E. Boston	.90@1.05		.70@.75
East Cambridge	1.00		
E. Greenwich, R. I.			
Fall River	1.00		.70
Galveston		2.00	
Gardiner, Me.	1.15		
Georgetown, D. C.	.70		
Gloucester	1.00@1.05		
Hartford			
Hackensack			
Hudson			
Lynn	1.10@1.25		
Marblehead	1.10		
Medford			
Millville, N. J.			
Milton			
Newark, N. J.		1.20	
New Bedford	.85	1.00	.70
Newburyport		1.25	
New Haven		1.00	.50
New London		1.00	.65
New Orleans	2.10		
New-Berne			
Newport	1.00		.70
New York	.85	1.00	
Norfolk, Va.	.60		
Norwich		1.20	
Norwalk, Conn.			
Pawtucket		1.25	
Philadelphia			
Portland, Me.	.65	1.00	
Portsmouth, Va.	.60		
Portsmouth, N. H.	1.15	1.20	.85
Providence	.85	1.00	.70
Quincy Point			
Richmond, Va.	.80		
Rockland, Me.			.75
Rockport			.80
Roxbury, Mass.	.90		
Saco	1.10		
Sag Harbor			
Salem, Mass.	.90@1.15		.75
Saugus			
Savannah		.75@.90	
Somerset	.90	1.05	
Staten Island		.90	
Trenton			
Troy			
Wareham		1.20	
Washington	.70		
Weymouth			
Williamsbr., N. Y.		1.00	
Wilmington, Del.			
Wilmington, N. C.		.90	
St. Thomas, W. I.			

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

Freights firm. GEORGE W. JONES & Co.

**DIVIDENDS.**

**OFFICE OF THE PLYMOUTH CONSOLIDATED GOLD MINING COMPANY,**  
23 NASSAU STREET, Oct. 1, 1884.

**DIVIDEND NO. 17.**

The Board of Trustees of this Company have this day declared the regular monthly dividend of fifty thousand dollars, being one per cent on the capital stock, or FIFTY CENTS per share, payable on demand.

W. VAN NORDEN, President.